APPENDIX A-1

Regional Economic Impact Model of Owyhee County, Idaho and the Four County Area Including Ada, Canyon, Elmore, and Owyhee Counties

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Background

A socio-economic study of Owyhee County was completed in 1998-1999 (Rimbey, et al. 1999; Harp and Rimbey 1999; Darden, et al. 1999), and information derived in that analysis was used in the Owyhee Resource Area Draft Resource Management Plan (ORMP). The county level economic impact analysis of the earlier study answered many questions about the economic structure of Owyhee County and potential economic impacts resulting from changing public land forage allocations. Owyhee County is located in the Southwestern corner of the state, bordering Elko County, Nevada and Malheur County, Oregon. The county spans over 4.9 million acres with approximately 83% managed by federal or state government agencies and 17% private and tribal owned lands.

The population of the county has grown approximately 2.6% per year from 1991 to 2000 while the state of Idaho's population grew at 2.5% per year over the same time period. Both the state and Owyhee County's population grew approximately 25% between 1991 to 2000. Due to this growth in population and various other factors, much has changed in Owyhee County since the first study was completed and is reflected in the new economic impact model of the county. The biggest change in the economy came in 1999. In the wake of a decline in gold prices Kinross Gold Corporation closed its DeLamar and Stone Creek Mines. Following the closure, the mining industry in Owyhee County lost approximately 180 jobs (150 from DeLamar itself) and over $17 million in output. Although only 6% of the total employment and output in the county, the mining industry at one time had also provided a fiscal boost to the state and county coffers garnering a 2% mining license tax on the value of ores extracted as well as Ad Valorem taxes and royalties from payments to the federal government. Other changes to the economy included a boom in the dairy industry resulting in a doubling of output from that sector and an increase in the manufacturing production in the county.

Methods and Procedures

Model Construction

Input-output models for Owyhee County and the four county region, including Ada, Canyon, Elmore, and Owyhee counties, were developed using the microcomputer IMPLAN model. The Micro IMPLAN model was developed by the U.S. Forest Service to estimate sectoral and regional impacts of alternative forest management scenarios (Alward et al. 1989). The update and further development of Micro IMPLAN has been conducted by the Minnesota IMPLAN Group, Inc (1997) and is now available as desktop software. However, before using the IMPLAN software and models, data and matrices should be tested for validity and consistency. In a publication by Holland et al. (1997) several steps are provided that can be used to validate the model and linearly adjust sectoral output and income based upon introduced employment figures.

An input-output model is a mathematical representation of the purchase and sales patterns within a given economy at a point in time. The model estimates total regional economic impacts of exogenous “shocks” to an economy in terms of output, personal income (wages and salaries plus proprietor income), and employment (jobs). Figure 1 shows the basic concepts behind the functioning of a regional economy.

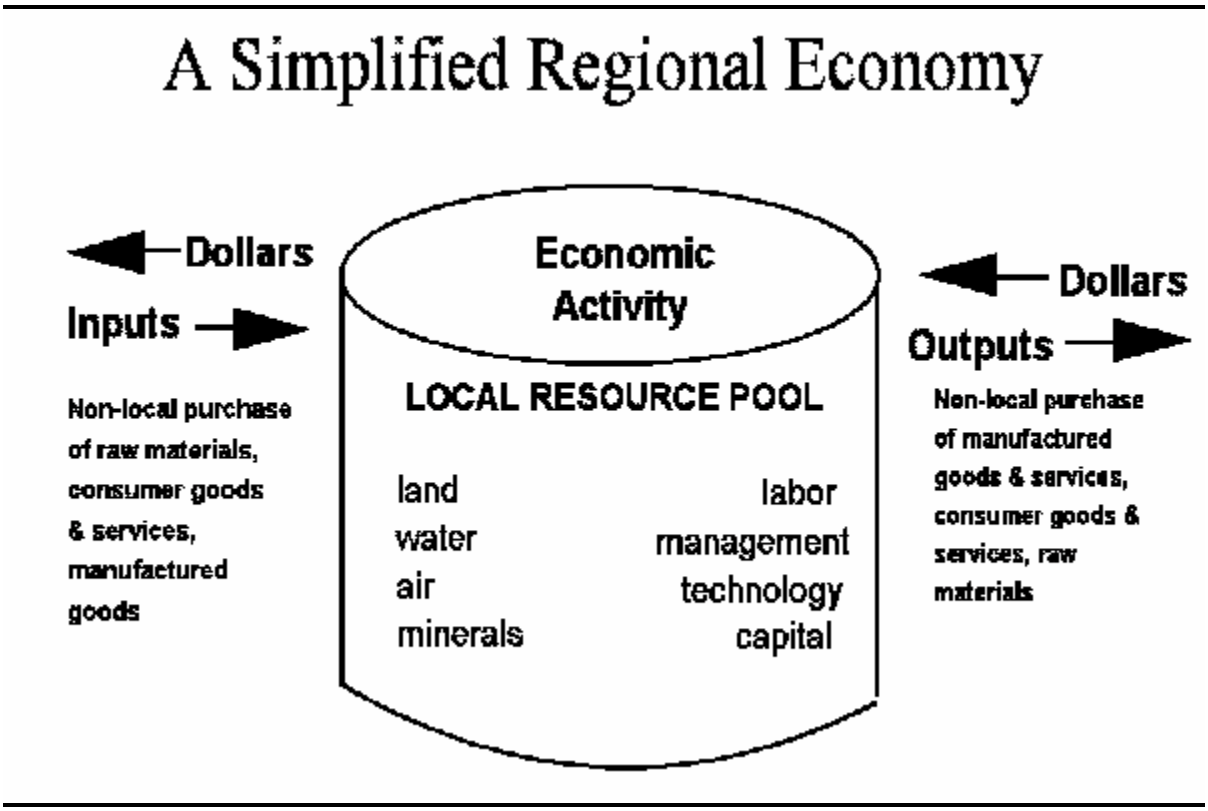

Figure 1. A Simplified Illustration of Flows In and Out of an Economy.

The basic components that make up the input-output model are the employment, output and income generated from each economic sector in the economy. The total employment figures are based on Regional Economic Information System (REIS) data (U.S. Department of Commerce, 2001) and are full or part-time employees of a given sector. The employment values are for jobs not full time equivalents. Sectoral income is derived by the summation of wages and salaries paid to employees plus the proprietors' income, which is also based upon the REIS data. Output is simply the gross sales for non-agricultural industries and gross value of production for agricultural products. The agricultural values of production are based upon a 5-year (1996-2000) average for Owyhee County and each of the four county region's agricultural production from the Idaho Agricultural Statistics Service (IASS, 1993-1997). All output values for non-agricultural sectors are based upon IMPLAN data adjusted using methods described previously. Tables 1 and 2 list each economic sector of the Owyhee County and 4 County input-output models along with the corresponding employment, output, and income values.

Table 1. Output, Employment and Personal Income, Owyhee County Model 2000.

Sector	Employment	Output	Personal Income
1 Dairy Farm Products	76	$23,194,383	$4,010,796
2 Misc. Livestock	28	$2,784,633	$458,498
3 Range Cattle	235	$23,308,481	$5,429,547
4 Cattle Feedlots	20	$7,715,005	$2,210,728
5 Grains	51	$5,964,599	$984,891
6 Forage Crops	494	$26,895,789	$4,572,562
7 Misc. Crops	151	$17,511,735	$5,250,088
8 Sugar Beets	63	$7,167,485	$1,250,225
9 Ag Services	227	$6,501,637	$2,836,301
10 Mining	4	$479,972	$82,029
11 Construction	251	$28,547,230	$12,293,300
12 Manufacturing	156	$45,730,615	$6,626,364
13 Transportation and Communication	120	$12,261,124	$2,277,678
14 Gas and Electric Services	15	$10,485,643	$1,381,683
15 Irrigation, Sanitation, and Water Serv.	72	$18,896,515	$3,466,995
16 Wholesale Trade	48	$3,080,621	$1,257,856
17 Retail Trade	76	$1,667,722	$741,160
18 Food Stores	156	$7,324,724	$3,937,894
19 Automotive Dealers & Service Stations	69	$2,877,000	$1,160,671
20 Eating & Drinking	157	$4,741,152	$1,429,231
21 F.I.R.E.	20	$19,461,151	$204,198
22 Hotels and Lodging Places	4	$97,096	$33,902
23 Health Care	320	$12,854,758	$6,736,506
24 Services	392	$19,464,840	$9,737,970
Totals	3,205	$309,013,654	$78,371,072

Table 2. Output, Employment, and Income, 4 County Model 2000.

Sector	Employment	Output	Personal Income
1 Dairy Farm Products	558	$118,022,481	$48,029,970
2 Misc. Livestock	316	$12,643,561	$3,148,653
3 Range Cattle	639	$53,315,925	$13,126,974
4 Cattle Feedlots	232	$65,655,011	$20,266,075
5 Grains	622	$40,383,168	$9,368,667
6 Forage Crops	3,098	$94,443,911	$24,701,930
7 Misc. Crops	2,868	$185,071,655	$68,466,910
8 Sugar Beets	516	$42,743,144	$8,931,441
9 Ag Services	4,625	$120,619,740	$50,877,700
10 Mining	191	$18,609,041	$8,004,885
11 Construction	23,482	$3,987,598,539	$1,247,946,500
12 Manufacturing	39,154	$9,405,260,245	$2,569,763,900
13 Transportation and Communication	13,326	$1,453,129,735	$481,456,850
14 Gas and Electric Services	1,182	$684,569,317	$122,387,610
15 Irrigation, Sanitation, and Water Serv.	299	$60,750,437	$17,020,505
16 Wholesale Trade	15,120	$1,601,741,641	$667,822,410
17 Retail Trade	22,658	$790,623,082	$389,517,690
18 Food Stores	9,585	$543,728,595	$323,306,060
19 Automotive Dealers & Service Stations	4,703	$353,404,768	$157,700,231
20 Eating & Drinking	16,663	$558,178,895	$198,838,400
21 F.I.R.E.	24,138	$3,164,523,827	$518,125,200
22 Hotels and Lodging Places	2,637	$124,743,200	$46,956,984
23 Health Care	20,002	$1,525,650,193	$893,373,200
24 Services	64,825	$ 3,217,042,063	$1,520,746,600
Totals	271,439	$25,024,874,951	$9,409,885,345

Using published cost and return studies for agricultural production practices (Rimbey, et al. 1999) and procedures developed by Darden et al. (1999), agricultural budgets were bridged into input-output sectors for this analysis. The purpose of input-output modeling is to capture impacts to regional economies. With that in mind, the substitution of localized production functions and purging of imports, through margining retail purchases, allows for the true regional interaction of those augmented sectors with other sectors in the economy as explained by Coupal and Holland (1995) and Willis and Holland (1997).

Finally, models were constructed using general econometric practices to create a Leontief input-output model as explained in Miller and Blair (1985). One subtle difference between this model and the previous model built for Owyhee County is that the adjustment for in-commuter income, done in the previous model, was not attempted in this model. In the previous model, Journey to Work data were available for the counties through the Bureau of Economic Analysis (BEA) (U.S. Dept. of Commerce, 2002) by economic sector. In the earlier study, interviews were conducted with local businesses throughout Owyhee County to arrive at estimates of personal income earned in the county along with that flowing out to another county or even state. However, the 2002 BEA data only reports the number of in-commuters and where they are commuting from. Therefore, to keep the two models consistent we did not make adjustments for this outflow of income. There should not be a problem with overestimation of local household spending due to the fact that the basis for IMPLAN's wage and salary income and proprietor's income are derived from BEA income figures which are adjusted for both in-commuters and out-commuters.

Final Demand and Output Requirements

The final demand and output requirements are the basis for the Input-Output model framework. These figures make up the multipliers used to estimate impacts in the models. Appendix B shows the final demand requirements (final demand multipliers) and output requirements (output multipliers) used for the Owyhee County Economic Impact Model while Appendix C shows the requirements for the 4 County Economic Impact Model. Great care must be taken when using and interpreting the multipliers generated from this type of analysis. To decide which type of multiplier to use, ask the question of whether the impact causes an export sale, sale to final demand, or causes a change in output from the affected sector. For instance if drought reduces the amount of water available for irrigation and therefore reduces hay production by one ton per acre an output multiplier would be used to calculate impacts. However, the construction of a new golf course would warrant the use of final demand multipliers. The main difference between final demand and output multipliers is that the final demand multipliers let the impacted sectors interact with themselves as well as the other sectors in the economy.

Multipliers are the main force behind input-output modeling and become the mechanism from which all impacts are generated. To better explain multipliers, Figure 2 shows the lifespan of a dollar in the economy. When a dollar enters the economy, part of that dollar stays in the economy and part leaves in the form of savings or as payment for imported goods. By dividing the $1 worth of output by the output multiplier, in this case 1.42, the first transaction yields $0.30 staying in the economy and $0.70 leaving the economy. Dividing the remainder of the dollar in the economy by the same 1.42 gives a value of $0.09 leaving the economy ($0.30 /1.42 = $0.21) and $0.09 ($0.42 - $0.24 = $0.18) staying within the economy. Repeat these steps until the amounts staying within the economy have all disappeared. Adding all of the amounts calculated as staying in the economy plus the original dollar yields the multiplier of 1.42.

To use the multipliers without the use of the actual I-O model, find the sector you would like to show the output impacts to and read down the list to find the number in the column total for that sector. This is the output multiplier, for instance the range cattle sector has an output multiplier of 1.79. This means that for every $1 of livestock production output there is another $0.79 in output and income generated throughout the economy in indirect and induced effects. Likewise, for income impacts, use the number in the column corresponding to the household sector only and multiply by the $1.00 output impact. This yields $0.35 in household income for every dollar worth of output.

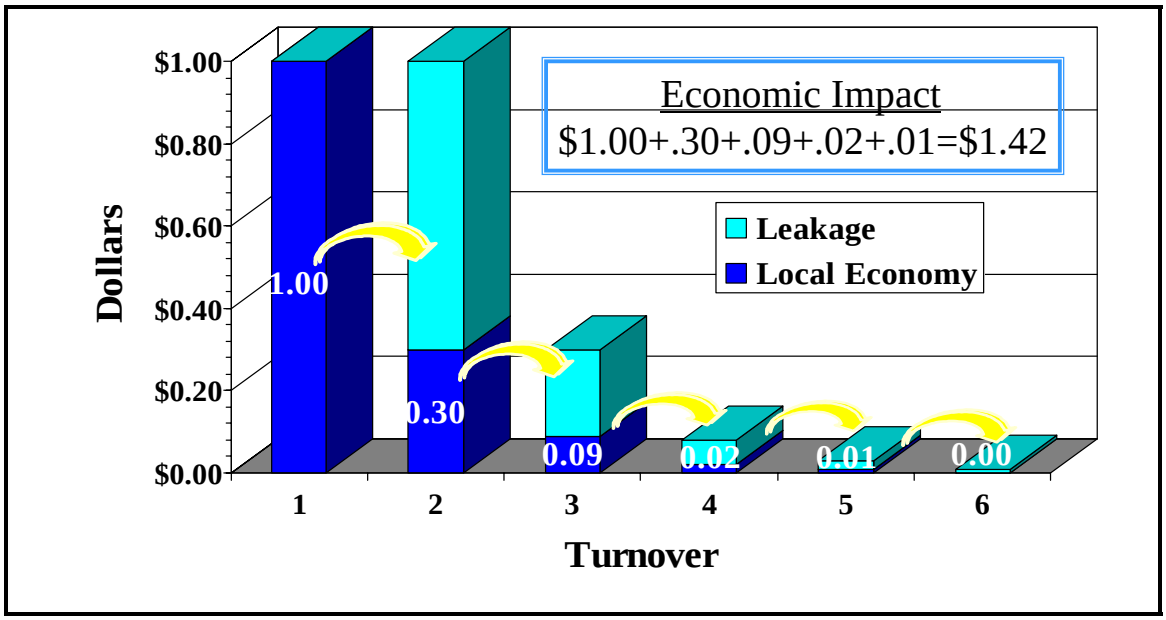

Figure 2. An Example of a Multiplier.

Results

Owyhee County Economic Impact Model

The Owyhee County Economic Impact Model was built specifically for the Bureau of Land Management (BLM) with the analysis of grazing management change impacts specifically in mind. The following are examples of the use of the Owyhee County model for economic impact analysis: 1) Changes in permitted BLM grazing, and 2) Impacts of the dairy industry.

Grazing Impacts

To calculate the direct impacts of public forage losses, a total value of output lost or value of output lost per animal unit month (AUM) must be calculated. Total value of production for the range cattle sector in Owyhee County was based on a five-year average derived from Idaho Agricultural Statistics Service (IASS 1997-2001) estimates for beef cows that have calved from 1996 through 2000. The five-year average value of production was estimated to be $23,308,634. The second step was to find how many

AUMs there are in the county regardless of source. The total number of AUMs in the county was estimated to be 602,640 (including private land). This value was based on Workman's (1986) evaluation that for a 300-cow operation, 4,464 total AUMs are required for all classes of cattle for the year. This results in a factor of 14.88 AUMs for every cow animal unit (AU) ((4464 ¸ 300) = 14.88). Multiplying the 14.88 AUMs/cow by NASS' estimate of 40,500 cows yields approximately 602,640 AUMs in Owyhee County. By dividing the value of production by the total estimated AUMs, a value of output of $38.68 was estimated for each AUM.

Using ranch budgets and linear programming models, Rimbey et al. (2003) were able to determine the loss of AUYs a Bruneau, Idaho ranch might suffer given different reductions in BLM AUMs. Using results from these models an estimate of the economic impacts those grazing losses will have on the Owyhee County economy can be made. For instance, Rimbey et al. (2003) report that their Bruneau Ranch Model suffers an average loss of 230 AUY with a 50% reduction in cattle numbers from the representative ranch. By multiplying 230 AUY by 12 months, a total of 2,760 AUMs are lost to the ranch due to the reduction in BLM AUMs over a five-year period. Table 3 shows the economic impacts if 10 ranches similar to the Bruneau Ranch Model were cut by 50% of their BLM AUMs.

The direct impacts result in an industry output reduction of $1,067,500 (26,700 X $38.68 = $1,067,500). The total industry impacts or output impacts to Owyhee County's economy from the loss of 27,600 AUMs of grazing is a total loss of $1,534,711 with indirect and induced impacts being $467,211 ($1,067,500 - $1,534,711 = $467,211). The indirect and induced impacts are the impacts to the different sectors in the economy that occur because of the range livestock sector interactions with them and induced impacts of the spending of personal income by households. The impacts to personal income, which include wages and salaries of workers and proprietor's income, amount to a loss of $380,413. The policy causing the 50% reduction in BLM AUMs also causes a loss of 17 jobs in the economy with 11 of those jobs coming from the range cattle industry.

Table 3. Economic Impacts of a 26,700 Reduction in AUMs Due to 50% BLM Reduction.

Sector		Direct Output Impacts	Indirect/Induced Output Impacts	Total Output Impacts	Total Employment Impacts
Dairy	1	$0	($270)	($270)	0
Misc. Livestock	2	$0	($1,200)	($1,200)	0
Range Cattle	3	($1,067,500)	$0	($1,067,500)	-11
Feedlots	4	$0	($47,967)	($47,967)	0
Grains	5	$0	($26,010)	($26,010)	0
Forage Crops	6	$0	($30,367)	($30,367)	-1
Misc. Crops	7	$0	($5,281)	($5,281)	0
Sugar Beets	8	$0	($88)	($88)	0
Ag Services	9	$0	($40,854)	($40,854)	-1
Mining	10	$0	($1,495)	($1,495)	0
Construction	11	$0	($37,121)	($37,121)	0
Manufacturing	12	$0	($58,927)	($58,927)	0
Transportation and Communication	13	$0	($31,104)	($31,104)	0
Gas and Electric Services	14	$0	($6,420)	($6,420)	0
Irrigation and Water Serv.	15	$0	($17,780)	($17,780)	0
Wholesale Trade	16	$0	($10,675)	($10,675)	0
Retail Trade	17	$0	($5,044)	($5,044)	0
Food Stores	18	$0	($6,781)	($6,781)	0
Auto Dealers & Service Stations	19	$0	($14,306)	($14,306)	0
Eating & Drinking	20	$0	($8,760)	($8,760)	0
F.I.R.E.	21	$0	($47,968)	($47,968)	0
Hotels and Lodging Places	22	$0	($171)	($171)	0
Health Care	23	$0	($27,799)	($27,799)	-1
Services	24	$0	($40,825)	($40,825)	-1
Regional Income	25	$0	($380,413)	($380,413)	0

	Direct Impacts	Indirect/Induced Impacts	Total Impacts
Total Industry Impacts	($1,067,500)	($467,211)	($1,534,711)
Total Regional Income	$0	($380,413)	($380,413)
Total Employment Impacts			-17
Total Economic Impacts	($1,067,500)	($847,624)	($1,915,124)

Dairy Impacts

The recent increase in dairy herd size and new dairies coming into Owyhee County might cause concerns to the state and county due to various environmental concerns related to the dairy industry. However, before hastily condemning the opening and expanding of dairy facilities, the county would be smart to look at the economic impacts these dairies have on the county.

By taking the value of dairy production, which includes the sale of milk and cull animals, and dividing that figure by the total number of dairy cows in the county an estimate of value of production per dairy cow can be established. The value of production per dairy cow in Owyhee County is $1,657 ($23,195,356 / 1,400 = $1,656.81). Table 4 shows the economic impacts of a 1,500 head dairy operation to Owyhee County's economy.

The total economic impact of one 1,500 head dairy to the Owyhee County economy amounts to $4,395,081 of which $1,150,956 are indirect and induced impacts. This dairy also supports 8 jobs in the dairy industry and an additional 17 jobs spread throughout the rest of the industries. A total of $758,908 in regional income is generated as well.

Table 4. Economic Impacts of a 1,500 head Dairy to Owyhee County's Economy.

		Direct Output Impacts	Indirect/Induced Output Impacts	Total Output Impacts	Total Employment Impacts
Dairy	1	$2,485,217	$0	$2,485,217	8
Misc. Livestock	2	$0	$2,732	$2,732	0
Range Cattle	3	$0	$943	$943	0
Feedlots	4	$0	$1,568	$1,568	0
Grains	5	$0	$84,587	$84,587	1
Forage Crops	6	$0	$123,212	$123,212	2
Misc. Crops	7	$0	$12,041	$12,041	0
Sugar Beets	8	$0	$62,759	$62,759	1
Ag Services	9	$0	$99,086	$99,086	3
Mining	10	$0	$3,638	$3,638	0
Construction	11	$0	$52,859	$52,859	0
Manufacturing	12	$0	$133,926	$133,926	0
Transportation and Communication	13	$0	$55,080	$55,080	1
Gas and Electric Services	14	$0	$31,231	$31,231	0
Irrigation and Water Serv.	15	$0	$35,866	$35,866	0
Wholesale Trade	16	$0	$28,347	$28,347	0
Retail Trade	17	$0	$22,603	$22,603	1
Food Stores	18	$0	$13,492	$13,492	0
Auto Dealers & Service Stations	19	$0	$17,080	$17,080	0
Eating & Drinking	20	$0	$18,384	$18,384	1
F.I.R.E.	21	$0	$95,552	$95,552	0
Hotels and Lodging Places	22	$0	$372	$372	0
Health Care	23	$0	$55,436	$55,436	1
Services	24	$0	$200,164	$200,164	4
Regional Income	25	$0	$758,908	$758,908	0

	Direct Impacts	Indirect/Induced Impacts	Total Impacts
Total Industry Impacts	$2,485,217	$1,150,956	$3,636,173
Total Regional Income Impact	$0	$758,908	$758,908
Total Employment Impacts			25
Total Economic Impacts	$2,485,217	$1,909,864	$4,395,081

4 County Economic Impact Model

The 4 County Economic Impact Model was constructed in the same manner as the Owyhee County Economic Impact Model with the expected use of examining the economic impacts of non-residential tourist visitors to the Snake River Birds of Prey (BOP) National Conservation Area and other uses of BLM managed lands in Ada, Canyon, Elmore, and Owyhee Counties.

Estimating the impacts of recreational visitor days (RVDs) can be difficult and caution should be used when evaluating expenditures by visitors and the number of RVDs used to calculate total impacts. Some things to pay close attention to when developing surveys are the fact that in order to have an economic impact on an economy, the recreationist or tourist must visit from outside the study area. In this instance, the recreationist may not live in any of the 4 counties as this represents. This is due to the fact that it is assumed that if the activity, whether it is bird watching, hunting, golfing, or even going to the movies, were not available the local person would find another local activity to spend their disposable income on. Other considerations while surveying recreational/tourist visitors should include whether the visitor is on a day trip, staying overnight at the recreational area, or staying overnight at a local hotel, as well as the number of days visiting the recreational/tourist site. The number of days visiting the specific site is important as to not overestimate average daily spending associated with the recreational area and spending at other recreational/tourist activities.

As there currently are no estimated reports of visitor days or expenditures associated the BOP the following analysis will draw on data from a study by Stynes and Sun (2002) estimating impacts of spending on recreation at Crater Lake National Park in Oregon. Table 5 shows the non-local day user expenditures and expenditures for those visitors camping in the park (Stynes and Sun, 2002). The retail expenditures included (groceries; gas and oil; and souvenirs), need to be adjusted for leakages outside the local economy due to the fact that most retail goods are not produced in the local economy. This process is called margining the retail trade expenditures.

Table 5. Visitor Spending by Sector at Crater Lake National Park ($ per day).

Spending category	Non-local day user	Margined[1] Non-local	Camp-In	Margined[1] Camp-In
Lodging Fees	$0.00	$0.00	$14.90	$0.00
Restaurants and Bars	$10.38	$10.38	$4.93	$4.93
Groceries, take-out food/drinks	$6.52	$1.63	$11.74	$2.94
Gas and Oil	$9.42	$2.36	$11.97	$2.99
Local Transportation	$0.17	$0.17	$0.09	$0.09
Admissions and Fees[2]	$8.18	$8.18	$7.82	$7.82
Souvenirs and other	$16.11	$4.03	$10.50	$2.63
Totals	$50.79	$26.75	$61.96	$21.40

[1]The margined expenditures assume that retail goods are not produced locally, therefore only the mark-up is considered as a local impact. In this case the margin is 25%. Therefore, for every $1.00 worth of goods purchased 75% of that purchase is considered an import.
[2]Admissions/fees are considered services for purposes of this analysis. If any admission charges or user fees are charged and paid to the government, these fees would be subtracted as government is exogenous of this model.

Using the margined figures in Table 5 as surrogates for visitor expenditures to BOP, the impacts of non-local recreational visitors can be estimated. Table 6 shows the impacts of 20,000 non-local recreational visitor days to the BOP recreational area. It is assumed that these visitors are participating in non-consumptive activities such as bird watching or hiking. This example economic activity from recreational visitors to the 4 County Regional economy from 20,000 RVD's totals a direct impact of $534,900 with regional income totaling $409,947. The total economic impact amounts to $1,445,579 and supports 19 jobs.

Table 6. Economic Impacts of 20,000 Recreational Visitor Days at Birds of Prey National Conservation Area.

		Direct Final Demand Impacts	Indirect/Induced Final Demand Impacts	Total Final Demand Impacts	Total Employment Impacts
Dairy	1	$0	$283	$283	0
Misc. Livestock	2	$0	$204	$204	0
Range Cattle	3	$0	$474	$474	0
Feedlots	4	$0	$488	$488	0
Grains	5	$0	$31	$31	0
Forage Crops	6	$0	$71	$71	0
Misc. Crops	7	$0	$3,174	$3,174	0
Sugar Beets	8	$0	$49	$49	0
Ag Services	9	$0	$1,340	$1,340	0
Mining	10	$0	$177	$177	0
Construction	11	$0	$12,805	$12,805	0
Manufacturing	12	$0	$115,912	$115,912	0
Transportation and Communication	13	$3,400	$33,457	$36,857	0
Gas and Electric Services	14	$0	$8,121	$8,121	0
Irrigation and Water Serv.	15	$0	$2,242	$2,242	0
Wholesale Trade	16	$0	$29,458	$29,458	0
Retail Trade	17	$80,600	$20,475	$101,075	3
Food Stores	18	$32,600	$6,142	$38,742	1
Auto Dealers & Service Stations	19	$47,100	$7,943	$55,043	1
Eating & Drinking	20	$207,600	$15,861	$223,461	7
F.I.R.E.	21	$0	$88,126	$88,126	1
Hotels and Lodging Places	22	$0	$4,254	$4,254	0
Health Care	23	$0	$38,155	$38,155	1
Services	24	$163,600	$111,490	$275,090	6
Regional Income	25	$0	$409,947	$409,947	0

	Direct Impacts	Indirect/Induced Impacts	Total Impacts
Total Industry Impacts	$534,900	$500,733	$1,035,633
Total Regional Income Impact	$0	$409,947	$409,947
Total Employment Impacts			19
Total Economic Impacts	$534,900	$910,679	$1,445,579

Summary and Conclusions

There is an increasing demand for economic impact studies of agricultural commodity production and tourism in rural communities because of federal, state, and local policy decisions and the quest of these communities to diversify their local economies. Lawmakers, land managers, and concerned citizens need this type of information to make informed decisions that have the possibility of impacting, whether negative or positive, rural economies and residents' livelihoods. Input-output modeling is a quantitative tool used to estimate these types of impacts to local or regional economies. However, oftentimes nationally based models are used without regard to the varying production practices and differing economic linkages that rural communities in the Western United States enjoy. Robison (1997) states that the regional input-output model is valuable in estimating impacts of rural issues. However, the off-the-shelf IMPLAN model needs refinement to include a rural community focus along with local expenditure flows.

As shown previously there are many different applications to input-output models like public land policy analysis, impacts of various industries on a local economy, and the impact of tourism and recreational visitors to a local or regional economy. Great care should be taken as to the direct impacts used for any of these activities. There are many things to consider when estimating the regional economic impacts of these activities.

For example, when estimating the impacts of BLM policy changes to the range cattle sector, the impacts of all affected production should be included. In the example provided, the actual loss of BLM AUMs on the Bruneau ranch model amounted to only 2,490 but affected an additional 270 AUMs from other sources that could no longer be used. The difference in direct impacts to the economy if the value of production from additional AUMs is omitted seems paltry at a mere $10,400. However, when expanded to include losses on other ranches in the area the underestimation expands to over $104,000.

Recreational tourism impacts on a regional economy can be problematic to estimate as well. One of the hardest figures to come across in this type of analysis is the expenditure pattern of the non-local visitors. Most times a visitor survey must be administered with careful consideration given to the questions asked and the compilation

of data in a way as to not over- or underestimate impacts. In the same vein, there are many estimates of non-local recreational visitor expenditures available to use as an estimate in a given region, if proper consideration is given to the complexity or simplicity of the rural economy being studied. If the number of recreationists visiting an area is available without expenditure data and there is no time to survey for those expenditures, a policy maker might want to modify existing data for similar recreation activity expenditures to meet the needs of their analysis. As with the example shown, no data for BOP recreational visitor expenditures were available so data from a different, federally managed, recreational area were adjusted to estimate potential impacts of recreation in the BOP National Conservation Area. Some of those adjustments included margining the retail trade, omitting camping fees due to government management of camping areas, and the omission of any user fees for the same reason.

Lastly, when comparing impacts from one activity to another, consideration should always include the preservation of current economic activities when proposing new ones. A job is a job does not necessarily hold true in all cases. Economies are complex, some jobs pay more than others and some industries provide more local impacts than others due to their purchase and sale patterns. These are just some of the things to consider when looking at tradeoffs between industries and impacts decisions and policies have on regional or local economies. As Taylor et al. demonstrated, there are also impacts on the local community that go beyond just the businesses that are directly impacted. As they examined in a case study in Wyoming, when ranching is reduced in favor of recreation, there will be a shift in the effects. Those that lose will not likely be the same as those who gain, nor will the gainers necessarily be better off than they were before. As they showed, the earnings per job in the recreation industry are about two-thirds of what they are in the ranching industry. The results of their study showed that it would be better for the local economy if both industries were maintained or improved rather than casting the argument that it is an either/or decision.

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APPENDIX A

Users' Guide for the Owyhee County and 4 County Economic Impact Models

Owyhee County and 4 County Economic Impact Model Programs

The Owyhee County and Four County Study Area Economic Impact Models are fully functional Windows applications. A computer running under a Windows© platform (Windows 3.1, Windows 95©, Windows 98©, Windows 2000©, and Windows XP©) and at least five megabytes of hard disk space are needed to install and operate the impact model. The user enters values representing "shocks" to the economy in terms of final demand or industry output. The values entered are then used to derive economic impacts for the study area, changes in household income, and employment. The program has a menu used for entering data, calculating impacts, printing output and saving data. Figure 3 shows the title screen of the impact model.

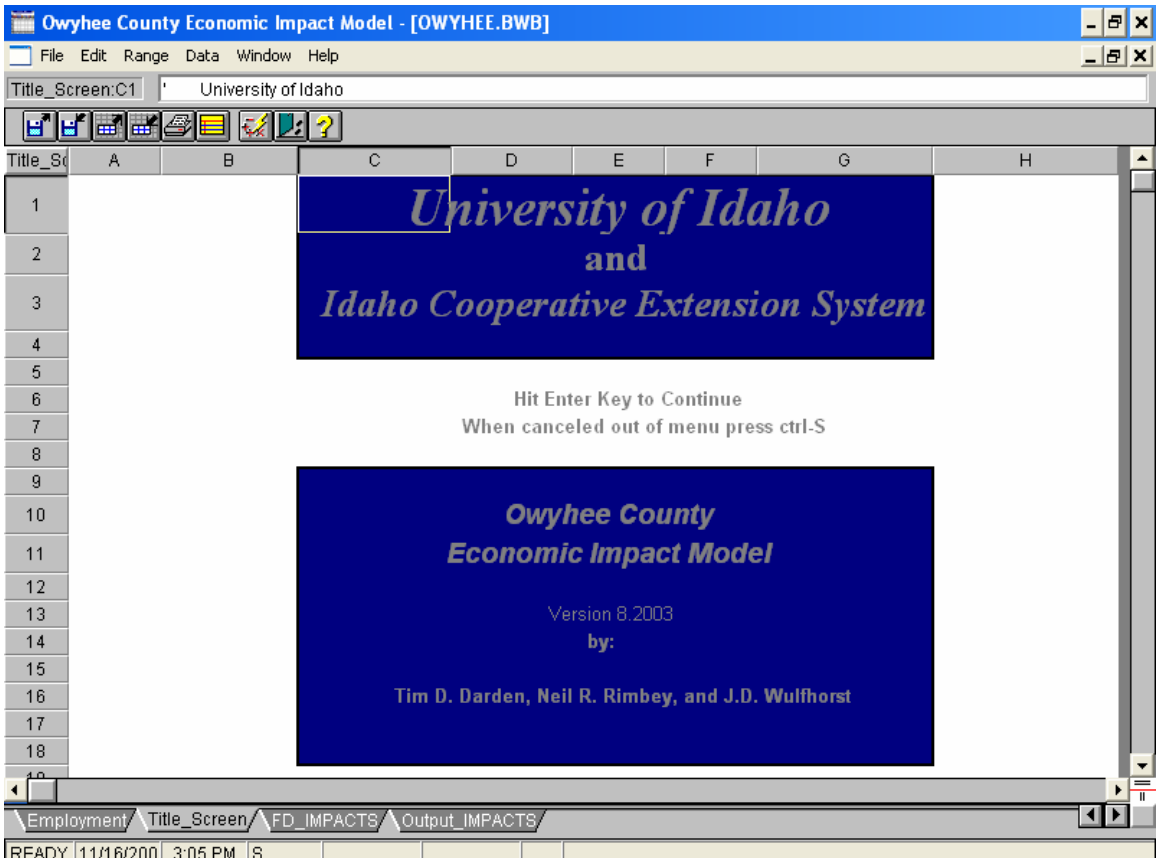


Figure 3. Owyhee County Economic Impact Model Title Screen.

Program Installation

To install the program under the Windows 2000© or Windows XP© platforms run the setup.exe program. To do this click on "Start" then "Run" from the program window and type "A:\Setup" or follow the instructions for your version of Windows©. The install wizard will guide the user through the installation and setup of the program. The installation will create a program group with icons and a copy of this document in Adobe Acrobat© format. To uninstall the programs simply go to the "Control Panel", select "Add/Remove Programs" and find the Owyhee Economic Impact (4 County Economic Impact) software and select remove. For more information please refer to your Windows User's Guide.

1.1 Program Menu

The primary Owyhee County (4 County) Economic Impact model will automatically open upon starting the program and the title screen will appear. Once the user "clicks" the mouse or strikes a key on the keyboard a menu as seen in Figure 4 will open. The menu contains eight options, an OK, Cancel and Help button. The eight available options consist of:

1. FD Changes – Final demand changes.

2. Calculate FD – Final demand impact calculation.

3. Output Changes – Output changes.

4. Calculate Output – Output impact calculation.

5. Print FD – Print final demand impact table.

6. Print Output – Print output impact table.

7. Quit – Exit the model.

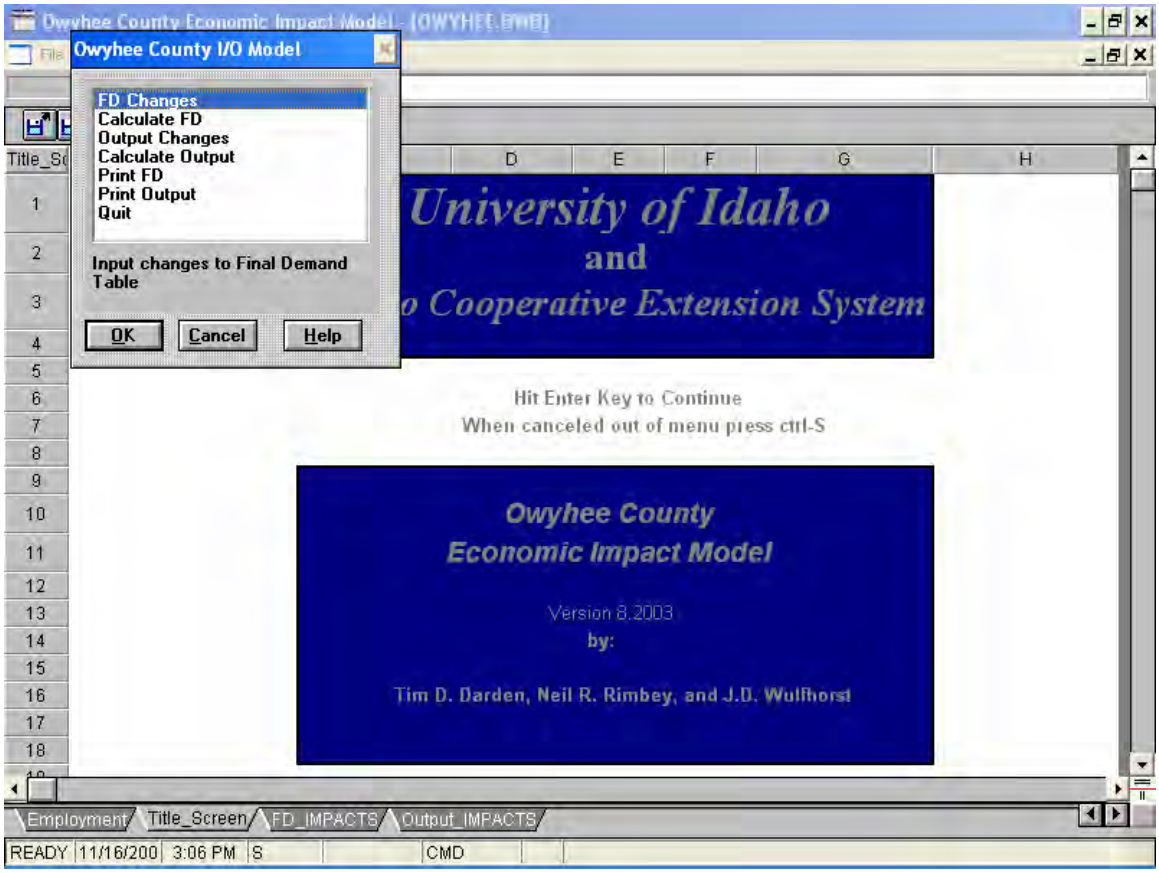


Figure 4. Owyhee County Economic Impact Model Menu.

The OK button works the same as double clicking with the mouse, or pressing enter on the keyboard while trying to execute a menu item. The Cancel button works to allow the user to exit from the menu and move around or look at the tables in the model, however there are limits to changes that can be made. *If the menu is cancelled for any reason it will not reappear until the user presses Ctrl and S on the keyboard simultaneously*.

Finally, the Help button is used to bring up the custom help file for use in operating the program or finding definitions of terms used in the impact model program.

Estimation of Final Demand Changes

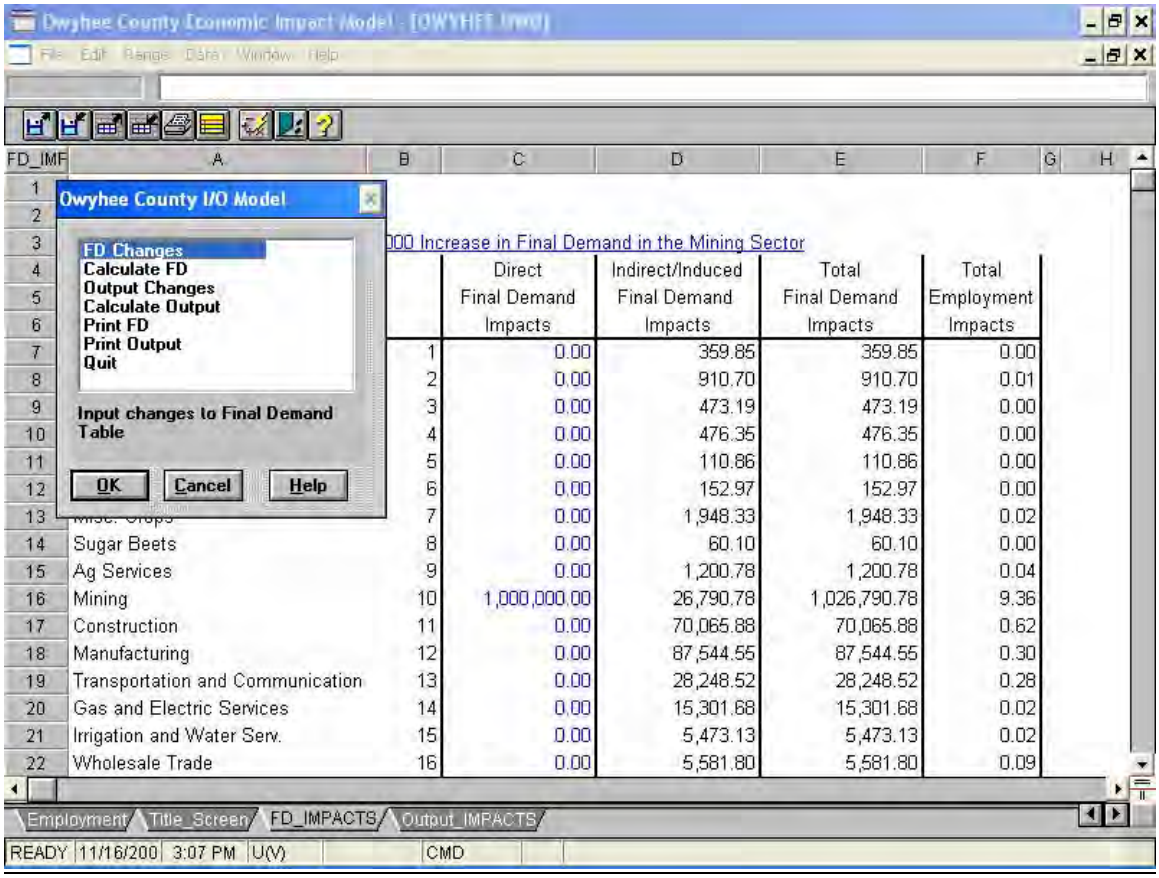
To calculate final demand impacts with the Owyhee County (4 County) Economic Impact Model the user clicks on the FD Changes option located at the top of the menu. The screen will now show the final demand impact table and allow the user to enter a

value in the “Direct Final Demand Impacts” column only (Figure 5). In this example the analysis calls for a $1,000,000 increase in final demand sales for the Mining sector in the Owyhee County area economy. The impacts do not have to occur in only one economic sector. Enter as many values as needed to accurately estimate an impact.

After entering the desired economic “shocks” the user can strike the enter key or click anywhere on the screen to bring the model menu back. The user should then select the “Calculate FD” option and calculate the final demand impacts.

Table 6 shows the impacts calculated by the model for a $1,000,000 increase in mining final demand in Owyhee County. This change in the economy yields a total economic impact of $1,671,882. Employment impacts are shown as a total of 13 jobs in Owyhee County supported by this increase in economic activity with approximately 9 jobs created in the mining industry.

Distributional impacts are also shown to give the user an idea of where in the economy the impacts are taking place and to show the interaction between the directly impacted economic sector(s) and the rest of the study area economy. The bottom portion of Table 6 shows a summary of the total impacts by industry, household income, employment, and total economic impacts.



		Direct Final Demand Impacts	Indirect/Induced Final Demand Impacts	Total Final Demand Impacts	Total Employment Impacts
	1	0.00	359.85	359.85	0.00
	2	0.00	910.70	910.70	0.01
	3	0.00	473.19	473.19	0.00
	4	0.00	476.35	476.35	0.00
	5	0.00	110.86	110.86	0.00
	6	0.00	152.97	152.97	0.00
Misc. Crops	7	0.00	1,948.33	1,948.33	0.02
Sugar Beets	8	0.00	60.10	60.10	0.00
Ag Services	9	0.00	1,200.78	1,200.78	0.04
Mining	10	1,000,000.00	26,790.78	1,026,790.78	9.36
Construction	11	0.00	70,065.88	70,065.88	0.62
Manufacturing	12	0.00	87,544.55	87,544.55	0.30
Transportation and Communication	13	0.00	28,248.52	28,248.52	0.28
Gas and Electric Services	14	0.00	15,301.68	15,301.68	0.02
Irrigation and Water Serv.	15	0.00	5,473.13	5,473.13	0.02
Wholesale Trade	16	0.00	5,581.80	5,581.80	0.09

Figure 5. Final Demand Change Analysis Screen (FD Changes Menu Item).

Table 6. Final Demand Impacts Derived from Owyhee County Economic Impact Software.

Table 1. Economic Impact of $1,000,000 Increase in Final Demand in the Mining Sector

		Direct Final Demand Impacts	Indirect/Induced Final Demand Impacts	Total Final Demand Impacts	Total Employment Impacts
Dairy	1	0.00	359.85	359.85	0.00
Misc. Livestock	2	0.00	910.70	910.70	0.01
Range Cattle	3	0.00	473.19	473.19	0.00
Feedlots	4	0.00	476.35	476.35	0.00
Grains	5	0.00	110.86	110.86	0.00
Forage Crops	6	0.00	152.97	152.97	0.00
Misc. Crops	7	0.00	1,948.33	1,948.33	0.02
Sugar Beets	8	0.00	60.10	60.10	0.00
Ag Services	9	0.00	1,200.78	1,200.78	0.04
Mining	10	1,000,000.00	26,790.78	1,026,790.78	9.36
Construction	11	0.00	70,065.88	70,065.88	0.62
Manufacturing	12	0.00	87,544.55	87,544.55	0.30
Transportation and Communication	13	0.00	28,248.52	28,248.52	0.28
Gas and Electric Services	14	0.00	15,301.68	15,301.68	0.02
Irrigation and Water Serv.	15	0.00	5,473.13	5,473.13	0.02
Wholesale Trade	16	0.00	5,581.80	5,581.80	0.09
Retail Trade	17	0.00	2,430.45	2,430.45	0.11
Food Stores	18	0.00	5,035.09	5,035.09	0.11
Auto Dealers & Service Stations	19	0.00	4,527.12	4,527.12	0.11
Eating & Drinking	20	0.00	7,523.00	7,523.00	0.25
F.I.R.E.	21	0.00	70,392.26	70,392.26	0.07
Hotels and Lodging Places	22	0.00	355.47	355.47	0.01
Health Care	23	0.00	16,978.62	16,978.62	0.42
Services	24	0.00	47,851.15	47,851.15	0.96
Regional Income	25	0.00	272,089.40	272,089.40	0.00

	Direct Impacts	Indirect/Induced Impacts	Total Impacts
Total Industry Impacts	$1,000,000.00	$399,792.61	$1,399,792.61
Total Regional Income Impact	$0.00	$272,089.40	$272,089.40
Total Employment Impacts			13
Total Economic Impacts	$1,000,000.00	$671,882.01	$1,671,882.01

Estimation of Output Changes

To use the Owyhee County (4 County) Economic Impact Model to derive impacts from output changes the user clicks on the "Output Changes" option (see Figure 3) that will transfer the user to the output impacts screen as shown in Figure 6. For this example the user assumes a decrease of $1,000,000 in the range cattle sector output of Owyhee County. After inputting the $1,000,000 decrease in the direct impact column the economic impacts are calculated by striking the enter key and clicking on the "Calculate Output" option from the menu.

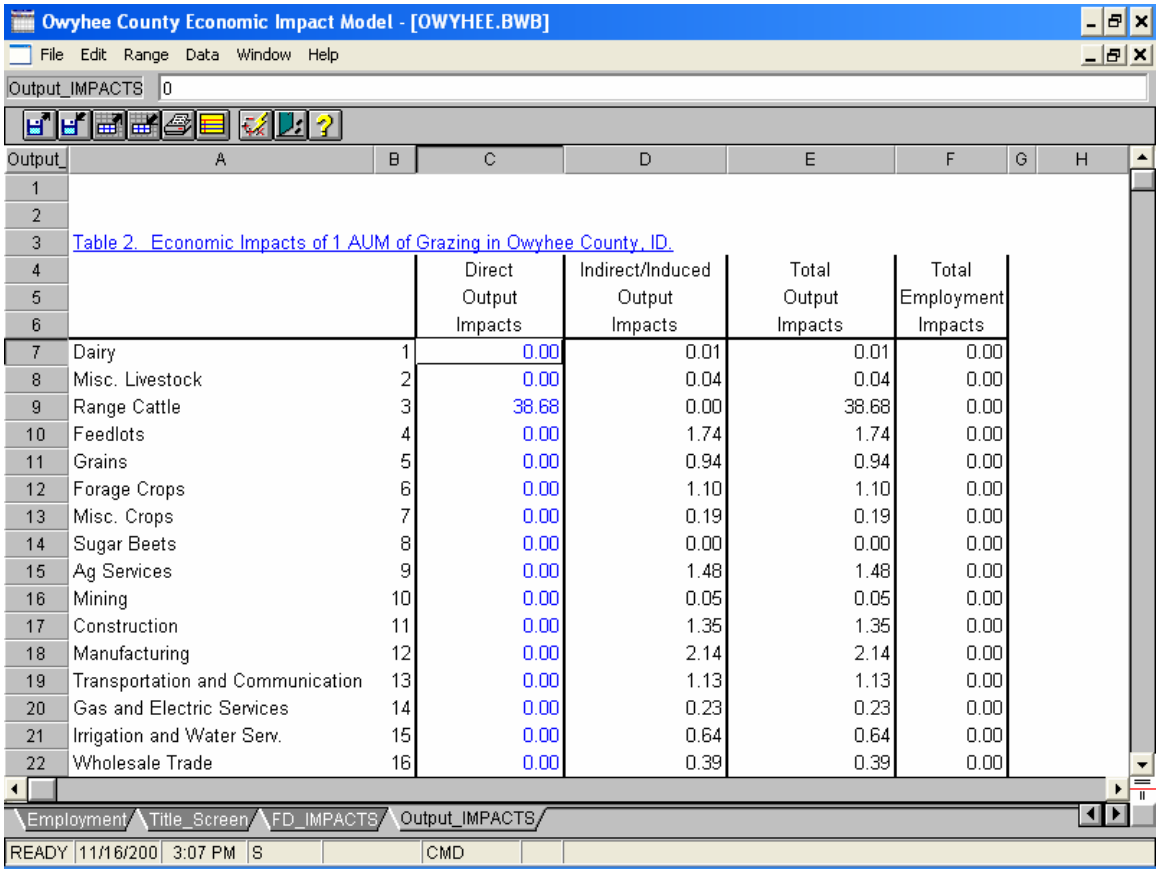


Table 2. Economic Impacts of 1 AUM of Grazing in Owyhee County, ID.

		Direct Output Impacts	Indirect/Induced Output Impacts	Total Output Impacts	Total Employment Impacts
Dairy	1	0.00	0.01	0.01	0.00
Misc. Livestock	2	0.00	0.04	0.04	0.00
Range Cattle	3	38.68	0.00	38.68	0.00
Feedlots	4	0.00	1.74	1.74	0.00
Grains	5	0.00	0.94	0.94	0.00
Forage Crops	6	0.00	1.10	1.10	0.00
Misc. Crops	7	0.00	0.19	0.19	0.00
Sugar Beets	8	0.00	0.00	0.00	0.00
Ag Services	9	0.00	1.48	1.48	0.00
Mining	10	0.00	0.05	0.05	0.00
Construction	11	0.00	1.35	1.35	0.00
Manufacturing	12	0.00	2.14	2.14	0.00
Transportation and Communication	13	0.00	1.13	1.13	0.00
Gas and Electric Services	14	0.00	0.23	0.23	0.00
Irrigation and Water Serv.	15	0.00	0.64	0.64	0.00
Wholesale Trade	16	0.00	0.39	0.39	0.00

Figure 6. Output Change Analysis Screen (Output Changes Menu Item)

Table 7 shows that with a $1,000,000 decrease in output from the Owyhee County range cattle sector there will be an extra $437,669 decrease in industrial economic activity through indirect and induced effects for a total negative industry impact of $1,437,669. Household income will decrease by $356,359. Also, total employment is

expected to decrease by 16 jobs. Once again the table shows distributional impacts to industry output, household income, employment, total county revenues, and total county expenditures in a summary at the bottom of the table.

Table 7. Output Impacts Derived from UCED Impact Software.

Table 2. Economic Impact of a $1,000,000 decrease in the Range Cattle Sector in Owyhee County, ID.

		Direct Output Impacts	Indirect/Induced Output Impacts	Total Output Impacts	Total Employment Impacts
Dairy	1	0.00	(252.85)	(252.85)	(0.00)
Misc. Livestock	2	0.00	(1,124.24)	(1,124.24)	(0.01)
Range Cattle	3	(1,000,000.00)	0.00	(1,000,000.00)	(10.08)
Feedlots	4	0.00	(44,933.86)	(44,933.86)	(0.12)
Grains	5	0.00	(24,364.95)	(24,364.95)	(0.21)
Forage Crops	6	0.00	(28,446.42)	(28,446.42)	(0.52)
Misc. Crops	7	0.00	(4,946.96)	(4,946.96)	(0.04)
Sugar Beets	8	0.00	(82.40)	(82.40)	(0.00)
Ag Services	9	0.00	(38,270.91)	(38,270.91)	(1.34)
Mining	10	0.00	(1,400.21)	(1,400.21)	(0.01)
Construction	11	0.00	(34,773.53)	(34,773.53)	(0.31)
Manufacturing	12	0.00	(55,200.54)	(55,200.54)	(0.19)
Transportation and Communication	13	0.00	(29,137.35)	(29,137.35)	(0.28)
Gas and Electric Services	14	0.00	(6,014.22)	(6,014.22)	(0.01)
Irrigation and Water Serv.	15	0.00	(16,656.09)	(16,656.09)	(0.06)
Wholesale Trade	16	0.00	(9,999.97)	(9,999.97)	(0.16)
Retail Trade	17	0.00	(4,724.61)	(4,724.61)	(0.22)
Food Stores	18	0.00	(6,352.67)	(6,352.67)	(0.14)
Auto Dealers & Service Stations	19	0.00	(13,401.61)	(13,401.61)	(0.32)
Eating & Drinking	20	0.00	(8,205.86)	(8,205.86)	(0.27)
F.I.R.E.	21	0.00	(44,935.08)	(44,935.08)	(0.05)
Hotels and Lodging Places	22	0.00	(159.77)	(159.77)	(0.01)
Health Care	23	0.00	(26,041.58)	(26,041.58)	(0.65)
Services	24	0.00	(38,243.19)	(38,243.19)	(0.77)
Regional Income	25	0.00	(356,358.62)	(356,358.62)	0.00

	Direct Impacts	Indirect/Induced Impacts	Total Impacts
Total Industry Impacts	($1,000,000.00)	($437,668.85)	($1,437,668.85)
Total Regional Income Impact	$0.00	($356,358.62)	($356,358.62)
Total Employment Impacts			(16)
Total Economic Impacts	($1,000,000.00)	($794,027.46)	($1,794,027.46)

Printing of Software Tables

After final demand and output estimations have been calculated the software allows the user to print the tables by selecting the “Print FD” or “Print Output” option from the menu. Upon selecting one of these options the user will be asked to enter a title for the table as shown in Figure 7. This user may enter any text or not have any text at all by deleting the highlighted text in the title entry box. The table format will look just like tables 1 and 2 when printed.

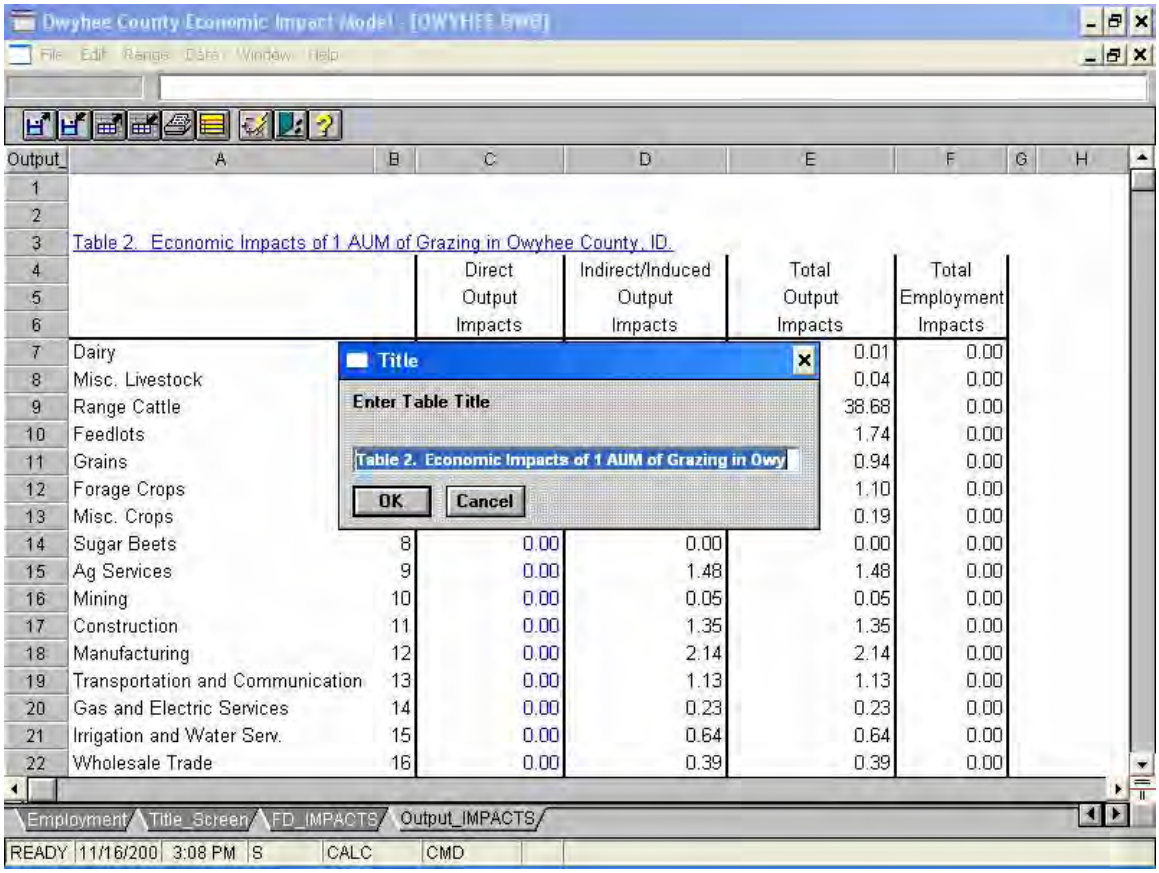


Figure 7. Example Title for Analysis Table Printing

Help Directory

A help directory has been included with the model to assist the user in operation and definition of terms used in the impact modeling software. The help directory consists of four sections. Section one lists definitions of the economic sectors used in the model. Section two shows the definitions of selected economic terms and functions used in the

impact model. Section three provides a step-by-step guide to impact analysis using the Owyhee County (4 County) Economic Impact Model. Lastly, section four provides a description and definition of the Economic Impact software menu items.

Exiting the Program

To exit the impact software program the user must first select “Quit” from the menu and strike enter on the keyboard or click “OK” with the mouse pointer. If any changes were made to the tables in the impact software the program will ask if you would like to save the file. The user can choose to save or not to save the program as entering zeros and recalculating the final demand impacts or output impacts will always reset the program.

APPENDIX B

Final Demand and Output Requirements (Multipliers)

for the

Owyhee County Economic Impact Model

Table 1B. Final Demand Requirements (Multipliers) for Owyhee County Economic Impact Model.

Sector		Dairy	Misc. Livestock	Range Cattle	Feedlots	Grains	Forage Crops	Misc. Crops
		1	2	3	4	5	6	7
Dairy	**1**	1.0812760	0.0007939	0.0002608	0.0007677	0.0004690	0.0004998	0.0005882
Misc. Livestock	**2**	0.0011886	1.0550475	0.0011598	0.0009271	0.0020642	0.0022628	0.0029157
Range Cattle	**3**	0.0004101	0.0356059	1.0316180	0.0394039	0.0007841	0.0008572	0.0010082
Feedlots	**4**	0.0006821	0.0032722	0.0463546	1.0407604	0.0012887	0.0014671	0.0016909
Grains	**5**	0.0368025	0.0152625	0.0251353	0.0593551	1.0026038	0.0027102	0.0011274
Forage Crops	**6**	0.0536073	0.0426014	0.0293458	0.0600309	0.0040148	1.0048795	0.0040323
Misc. Crops	**7**	0.0052388	0.0090713	0.0051034	0.0039158	0.0115880	0.0141426	1.0340015
Sugar Beets	**8**	0.0273056	0.0156757	0.0000850	0.0000725	0.0001651	0.0001873	0.0002201
Ag Services	**9**	0.0431107	0.0997055	0.0394810	0.0165536	0.0791721	0.0953036	0.1080722
Mining	**10**	0.0015828	0.0013532	0.0014445	0.0014622	0.0035686	0.0037645	0.0035066
Construction	**11**	0.0229979	0.0173302	0.0358730	0.0095288	0.0242198	0.0248432	0.0243325
Manufacturing	**12**	0.0582690	0.0516499	0.0569459	0.0557887	0.1139399	0.1214097	0.1425341
Transportation and Communication	**13**	0.0239645	0.0211838	0.0300586	0.0233560	0.0369950	0.0378930	0.0259044
Gas and Electric Services	**14**	0.0135880	0.0080641	0.0062044	0.0074045	0.0263651	0.0265704	0.0084841
Irrigation and Water Serv.	**15**	0.0156046	0.0077412	0.0171827	0.0057962	0.0148458	0.0163086	0.0249445
Wholesale Trade	**16**	0.0123332	0.0107616	0.0103162	0.0079407	0.0156773	0.0158809	0.0138672
Retail Trade	**17**	0.0098343	0.0508039	0.0048740	0.0043748	0.0025329	0.0080593	0.0038270
Food Stores	**18**	0.0058699	0.0058612	0.0065535	0.0071181	0.0053449	0.0056874	0.0081747
Auto Dealers & Service Stations	**19**	0.0074312	0.0048092	0.0138253	0.0115113	0.0040322	0.0095425	0.0060029
Eating & Drinking	**20**	0.0079984	0.0078432	0.0084653	0.0092009	0.0071561	0.0075711	0.0107185
F.I.R.E.	**21**	0.0415730	0.0417212	0.0463558	0.0422513	0.0694852	0.0588215	0.0647148
Hotels and Lodging Places	**22**	0.0001619	0.0001758	0.0001648	0.0001665	0.0001974	0.0001792	0.0002253
Health Care	**23**	0.0241194	0.0252824	0.0268650	0.0282862	0.0187415	0.0228977	0.0287742
Services	**24**	0.0870879	0.0378721	0.0394524	0.0338558	0.0586005	0.0533058	0.0523044
Regional Income	**25**	0.3301880	0.3305177	0.3676260	0.4036162	0.2999901	0.3192843	0.4610068
Final Demand Multiplier		1.9122258	1.9000067	1.8507511	1.8734452	1.8038422	1.8543291	2.0329784
Industry Multiplier		1.5820378	1.5694890	1.4831251	1.4698290	1.5038521	1.5350448	1.5719716

Table 1 B. Continued.

Sector		Sugar Beets 8	Ag Services 9	Mining 10	Construction 11	Manufacturing 12	Transportation and Communication 13	Gas and Electric Services 14
Dairy	**1**	0.0003448	0.0005001	0.0003598	0.0008307	0.0051816	0.0005971	0.0002009
Misc. Livestock	**2**	0.0015907	0.0102487	0.0009107	0.0020709	0.0103789	0.0014345	0.0005475
Range Cattle	**3**	0.0005830	0.0024882	0.0004732	0.0010945	0.0067601	0.0007829	0.0002645
Feedlots	**4**	0.0009736	0.0023833	0.0004763	0.0011113	0.0067944	0.0007847	0.0002648
Grains	**5**	0.0006440	0.0004891	0.0001109	0.0003735	0.0012466	0.0001798	0.0000651
Forage Crops	**6**	0.0022926	0.0010612	0.0001530	0.0004817	0.0015091	0.0002127	0.0000876
Misc. Crops	**7**	0.0064064	0.0722068	0.0019483	0.0050597	0.0111305	0.0026961	0.0013242
Sugar Beets	**8**	1.0167810	0.0002251	0.0000601	0.0001395	0.0008172	0.0000979	0.0000340
Ag Services	**9**	0.0614294	1.0129351	0.0012008	0.0040315	0.0035843	0.0011443	0.0006388
Mining	**10**	0.0019917	0.0027880	1.0267908	0.0052673	0.0104689	0.0033721	0.0215483
Construction	**11**	0.0229568	0.0175741	0.0700659	1.0080972	0.0158444	0.0357833	0.0560304
Manufacturing	**12**	0.0834346	0.1180796	0.0875445	0.2022855	1.2729915	0.1456213	0.0486829
Transportation and Communication	**13**	0.0189634	0.0459865	0.0282485	0.0426026	0.0443468	1.1634095	0.0197650
Gas and Electric Services	**14**	0.0057998	0.0059742	0.0153017	0.0062249	0.0097264	0.0054258	1.0260071
Irrigation and Water Serv.	**15**	0.0215393	0.0081836	0.0054731	0.0092550	0.0099957	0.0169671	0.0078866
Wholesale Trade	**16**	0.0207695	0.0105006	0.0055818	0.0114996	0.0152599	0.0072304	0.0027089
Retail Trade	**17**	0.0397413	0.0050611	0.0024304	0.0069734	0.0028134	0.0030169	0.0017985
Food Stores	**18**	0.0056759	0.0102647	0.0050351	0.0122830	0.0049646	0.0063425	0.0038032
Auto Dealers & Service Stations	**19**	0.0043142	0.0074182	0.0045271	0.0179296	0.0040189	0.0053146	0.0032225
Eating & Drinking	**20**	0.0184112	0.0139700	0.0075230	0.0135101	0.0082149	0.0101465	0.0052170
F.I.R.E.	**21**	0.0600761	0.0568583	0.0703923	0.0541858	0.0368003	0.0492079	0.0263230
Hotels and Lodging Places	**22**	0.0001705	0.0003602	0.0003555	0.0003298	0.0004385	0.0004417	0.0001685
Health Care	**23**	0.0220714	0.0362429	0.0169786	0.0354278	0.0173308	0.0217965	0.0129929
Services	**24**	0.0641758	0.0768211	0.0478512	0.0871245	0.0720495	0.1279654	0.0362373
Regional Income	**25**	0.3187100	0.5802644	0.2720894	0.5678030	0.2759690	0.3481888	0.2082451
Final Demand Multiplier		1.7998471	2.0988852	1.6718820	2.0959921	1.8486362	1.9581606	1.4840646
Industry Multiplier		1.4811371	1.5186208	1.3997926	1.5281891	1.5726672	1.6099717	1.2758195

Table 1 B. Continued.

Sector		Irrigation and Water Serv.	Wholesale Trade	Retail Trade	Food Stores	Auto Dealers & Service Stations	Eating & Drinking	F.I.R.E.
		15	16	17	18	19	20	21
Dairy	**1**	0.0007596	0.0003914	0.0003383	0.0003427	0.0003364	0.0006703	0.0000629
Misc. Livestock	**2**	0.0017480	0.0011520	0.0010725	0.0011386	0.0010436	0.0027514	0.0002183
Range Cattle	**3**	0.0009945	0.0005163	0.0004480	0.0004538	0.0004455	0.0009187	0.0000938
Feedlots	**4**	0.0009975	0.0005152	0.0004484	0.0004512	0.0004473	0.0009032	0.0001276
Grains	**5**	0.0002111	0.0001167	0.0001075	0.0001072	0.0001077	0.0002154	0.0000675
Forage Crops	**6**	0.0002641	0.0001676	0.0001678	0.0001637	0.0001696	0.0003592	0.0002115
Misc. Crops	**7**	0.0030251	0.0030199	0.0030272	0.0033678	0.0028777	0.0187138	0.0007372
Sugar Beets	**8**	0.0001234	0.0000675	0.0000598	0.0000610	0.0000593	0.0001287	0.0000163
Ag Services	**9**	0.0012270	0.0013455	0.0017124	0.0015046	0.0018044	0.0035686	0.0053753
Mining	**10**	0.0045293	0.0022156	0.0019507	0.0019736	0.0019410	0.0038859	0.0003572
Construction	**11**	0.0916124	0.0097388	0.0132094	0.0102623	0.0145112	0.0170630	0.0185148
Manufacturing	**12**	0.1855573	0.0944568	0.0812781	0.0820756	0.0809443	0.1629969	0.0152716
Transportation and Communication	**13**	0.0555741	0.0413315	0.0332233	0.0304238	0.0344644	0.0373999	0.0108071
Gas and Electric Services	**14**	0.0135015	0.0064735	0.0079913	0.0075791	0.0081748	0.0102487	0.0013732
Irrigation and Water Serv.	**15**	1.1101633	0.0092843	0.0107058	0.0093152	0.0113211	0.0179835	0.0047638
Wholesale Trade	**16**	0.0094081	1.0069420	0.0043248	0.0044864	0.0042545	0.0130995	0.0008425
Retail Trade	**17**	0.0035139	0.0042759	1.0045500	0.0051799	0.0042733	0.0036465	0.0004517
Food Stores	**18**	0.0067963	0.0093471	0.0099270	1.0114298	0.0092668	0.0077391	0.0008975
Auto Dealers & Service Stations	**19**	0.0074653	0.0070402	0.0075850	0.0083800	1.0072362	0.0059605	0.0009050
Eating & Drinking	**20**	0.0092531	0.0130110	0.0136461	0.0152494	0.0129423	1.0156830	0.0015844
F.I.R.E.	**21**	0.0408805	0.0560475	0.0679423	0.0655254	0.0690223	0.0616796	1.0521947
Hotels and Lodging Places	**22**	0.0003669	0.0004159	0.0003856	0.0003544	0.0003994	0.0004587	0.0001152
Health Care	**23**	0.0217558	0.0326970	0.0346216	0.0401547	0.0321903	0.0269814	0.0029540
Services	**24**	0.0725019	0.1014394	0.0922125	0.0779317	0.0985271	0.0918410	0.0332184
Regional Income	**25**	0.3484677	0.5240223	0.5550037	0.6439281	0.5159294	0.4321638	0.0471478
Final Demand Multiplier		1.9906977	1.9260308	1.9459390	2.0218401	1.9126898	1.9370604	1.1983094
Industry Multiplier		1.6422300	1.4020086	1.3909353	1.3779120	1.3967604	1.5048966	1.1511616

Table 1 B. Continued.

Sector		Hotels and Lodging Places	Health Care	Services	Regional Income
		22	23	24	25
Dairy	**1**	0.0003609	0.0005476	0.0005209	0.0004980
Misc. Livestock	**2**	0.0010974	0.0016202	0.0015929	0.0017847
Range Cattle	**3**	0.0004831	0.0007243	0.0006903	0.0006593
Feedlots	**4**	0.0005033	0.0007249	0.0006896	0.0006476
Grains	**5**	0.0001418	0.0001638	0.0001605	0.0001514
Forage Crops	**6**	0.0002735	0.0002465	0.0002401	0.0002220
Misc. Crops	**7**	0.0030698	0.0040627	0.0039381	0.0056469
Sugar Beets	**8**	0.0000658	0.0000949	0.0000911	0.0000898
Ag Services	**9**	0.0045203	0.0022261	0.0021657	0.0016089
Mining	**10**	0.0021400	0.0031084	0.0029500	0.0028607
Construction	**11**	0.0295728	0.0118809	0.0278860	0.0070926
Manufacturing	**12**	0.0870943	0.1323651	0.1258009	0.1185738
Transportation and Communication	**13**	0.0533000	0.0410027	0.0478610	0.0360971
Gas and Electric Services	**14**	0.0108940	0.0075928	0.0083101	0.0097161
Irrigation and Water Serv.	**15**	0.0253121	0.0118366	0.0129613	0.0096982
Wholesale Trade	**16**	0.0047591	0.0068937	0.0067663	0.0067811
Retail Trade	**17**	0.0039553	0.0052884	0.0053523	0.0089544
Food Stores	**18**	0.0085851	0.0116806	0.0117080	0.0200451
Auto Dealers & Service Stations	**19**	0.0066337	0.0083793	0.0087473	0.0139178
Eating & Drinking	**20**	0.0124915	0.0171217	0.0164272	0.0257244
F.I.R.E.	**21**	0.0815924	0.0735776	0.0760826	0.0869135
Hotels and Lodging Places	**22**	1.0004303	0.0004744	0.0005043	0.0004241
Health Care	**23**	0.0298935	1.0473957	0.0410284	0.0710651
Services	**24**	0.1063772	0.1044533	1.1372784	0.0744172
Regional Income	**25**	0.4789806	0.6606948	0.6573800	1.1401078
Final Demand Multiplier		1.9525277	2.1541573	2.1971329	1.6436970
Industry Multiplier		1.4735472	1.4934625	1.5397530	0.5035897

Table 2 B. Output Requirements (Multipliers) for Owyhee County Economic Impact Model.

Sector		Dairy	Misc. Livestock	Range Cattle	Feedlots	Grains	Forage Crops	Misc. Crops
		1	2	3	4	5	6	7
Dairy	**1**	1.0000000	0.0007525	0.0002528	0.0007376	0.0004677	0.0004974	0.0005688
Misc. Livestock	**2**	0.0010992	1.0000000	0.0011242	0.0008908	0.0020588	0.0022518	0.0028198
Range Cattle	**3**	0.0003793	0.0337481	1.0000000	0.0378607	0.0007821	0.0008531	0.0009751
Feedlots	**4**	0.0006308	0.0031014	0.0449339	1.0000000	0.0012853	0.0014600	0.0016353
Grains	**5**	0.0340362	0.0144662	0.0243650	0.0570305	1.0000000	0.0026970	0.0010904
Forage Crops	**6**	0.0495778	0.0403786	0.0284464	0.0576799	0.0040044	1.0000000	0.0038997
Misc. Crops	**7**	0.0048450	0.0085980	0.0049470	0.0037624	0.0115579	0.0140739	1.0000000
Sugar Beets	**8**	0.0252531	0.0148578	0.0000824	0.0000697	0.0001647	0.0001864	0.0002128
Ag Services	**9**	0.0398702	0.0945033	0.0382709	0.0159053	0.0789665	0.0948408	0.1045184
Mining	**10**	0.0014639	0.0012826	0.0014002	0.0014049	0.0035594	0.0037462	0.0033913
Construction	**11**	0.0212692	0.0164260	0.0347735	0.0091556	0.0241569	0.0247226	0.0235323
Manufacturing	**12**	0.0538891	0.0489550	0.0552005	0.0536038	0.1136440	0.1208201	0.1378471
Transportation and Communication	**13**	0.0221631	0.0200785	0.0291373	0.0224413	0.0368989	0.0377090	0.0250526
Gas and Electric Services	**14**	0.0125667	0.0076434	0.0060142	0.0071145	0.0262966	0.0264413	0.0082051
Irrigation and Water Serv.	**15**	0.0144316	0.0073373	0.0166561	0.0055692	0.0148072	0.0162294	0.0241242
Wholesale Trade	**16**	0.0114062	0.0102001	0.0100000	0.0076297	0.0156366	0.0158038	0.0134112
Retail Trade	**17**	0.0090951	0.0481532	0.0047246	0.0042035	0.0025263	0.0080201	0.0037012
Food Stores	**18**	0.0054287	0.0055554	0.0063527	0.0068393	0.0053310	0.0056597	0.0079059
Auto Dealers & Service Stations	**19**	0.0068726	0.0045583	0.0134016	0.0110604	0.0040218	0.0094962	0.0058055
Eating & Drinking	**20**	0.0073972	0.0074340	0.0082059	0.0088405	0.0071375	0.0075343	0.0103660
F.I.R.E.	**21**	0.0384481	0.0395444	0.0449351	0.0405965	0.0693047	0.0585359	0.0625868
Hotels and Lodging Places	**22**	0.0001497	0.0001666	0.0001598	0.0001600	0.0001969	0.0001784	0.0002179
Health Care	**23**	0.0223065	0.0239633	0.0260416	0.0271784	0.0186929	0.0227865	0.0278280
Services	**24**	0.0805418	0.0358962	0.0382432	0.0325298	0.0584483	0.0530470	0.0505844
Regional Income	**25**	0.3053689	0.3132728	0.3563586	0.3878089	0.2992110	0.3177339	0.4458473
Final Demand Multiplier		1.7684900	1.8008732	1.7940275	1.8000734	1.7991575	1.8453249	1.9661271
Industry Output Multiplier		1.4631211	1.4876003	1.4376688	1.4122645	1.4999465	1.5275910	1.5202798

Table 2 B. Continued.

Sector		Sugar Beets 8	Ag Services 9	Mining 10	Construction 11	Manufacturing 12	Transportation and Communication 13	Gas and Electric Services 14
Dairy	**1**	0.0003391	0.0004937	0.0003505	0.0008240	0.0040704	0.0005133	0.0001958
Misc. Livestock	**2**	0.0015645	0.0101178	0.0008869	0.0020543	0.0081531	0.0012330	0.0005336
Range Cattle	**3**	0.0005734	0.0024565	0.0004608	0.0010857	0.0053104	0.0006729	0.0002578
Feedlots	**4**	0.0009575	0.0023529	0.0004639	0.0011024	0.0053373	0.0006745	0.0002581
Grains	**5**	0.0006333	0.0004828	0.0001080	0.0003705	0.0009793	0.0001545	0.0000634
Forage Crops	**6**	0.0022548	0.0010477	0.0001490	0.0004778	0.0011855	0.0001829	0.0000854
Misc. Crops	**7**	0.0063007	0.0712847	0.0018975	0.0050190	0.0087436	0.0023174	0.0012906
Sugar Beets	**8**	1.0000000	0.0002222	0.0000585	0.0001384	0.0006420	0.0000842	0.0000332
Ag Services	**9**	0.0604156	1.0000000	0.0011694	0.0039991	0.0028157	0.0009836	0.0006226
Mining	**10**	0.0019588	0.0027524	1.0000000	0.0052249	0.0082239	0.0028985	0.0210021
Construction	**11**	0.0225779	0.0173497	0.0682377	1.0000000	0.0124466	0.0307573	0.0546101
Manufacturing	**12**	0.0820576	0.1165717	0.0852604	0.2006607	1.0000000	0.1251677	0.0474489
Transportation and Communication	**13**	0.0186504	0.0453993	0.0275115	0.0422604	0.0348367	1.0000000	0.0192640
Gas and Electric Services	**14**	0.0057040	0.0058979	0.0149024	0.0061749	0.0076406	0.0046637	1.0000000
Irrigation and Water Serv.	**15**	0.0211838	0.0080791	0.0053303	0.0091807	0.0078521	0.0145840	0.0076867
Wholesale Trade	**16**	0.0204268	0.0103666	0.0054362	0.0114073	0.0119874	0.0062148	0.0026403
Retail Trade	**17**	0.0390854	0.0049965	0.0023670	0.0069174	0.0022101	0.0025931	0.0017529
Food Stores	**18**	0.0055822	0.0101336	0.0049037	0.0121843	0.0038999	0.0054516	0.0037068
Auto Dealers & Service Stations	**19**	0.0042430	0.0073235	0.0044090	0.0177855	0.0031571	0.0045681	0.0031408
Eating & Drinking	**20**	0.0181073	0.0137916	0.0073267	0.0134016	0.0064532	0.0087214	0.0050848
F.I.R.E.	**21**	0.0590846	0.0561322	0.0685556	0.0537506	0.0289085	0.0422963	0.0256558
Hotels and Lodging Places	**22**	0.0001677	0.0003556	0.0003462	0.0003271	0.0003444	0.0003797	0.0001643
Health Care	**23**	0.0217072	0.0357801	0.0165356	0.0351432	0.0136142	0.0187350	0.0126636
Services	**24**	0.0631166	0.0758401	0.0466026	0.0864247	0.0565986	0.1099917	0.0353188
Regional Income	**25**	0.3134500	0.5728544	0.2649901	0.5632423	0.2167878	0.2992831	0.2029666
Final Demand Multiplier		1.7701423	2.0720825	1.6282597	2.0791567	1.4521985	1.6831224	1.4464468
Industry Output Multiplier		1.4566924	1.4992281	1.3632696	1.5159144	1.2354107	1.3838393	1.2434802

Table 2 B. Continued.

Sector		Irrigation and Water Serv. 15	Wholesale Trade 16	Retail Trade 17	Food Stores 18	Auto Dealers & Service Stations 19	Eating & Drinking 20	F.I.R.E. 21
Dairy	**1**	0.0006842	0.0003887	0.0003367	0.0003389	0.0003340	0.0006600	0.0000597
Misc. Livestock	**2**	0.0015745	0.0011441	0.0010677	0.0011258	0.0010361	0.0027089	0.0002075
Range Cattle	**3**	0.0008958	0.0005127	0.0004460	0.0004487	0.0004423	0.0009045	0.0000891
Feedlots	**4**	0.0008985	0.0005116	0.0004464	0.0004461	0.0004441	0.0008893	0.0001213
Grains	**5**	0.0001902	0.0001159	0.0001070	0.0001060	0.0001069	0.0002121	0.0000641
Forage Crops	**6**	0.0002379	0.0001665	0.0001670	0.0001618	0.0001684	0.0003537	0.0002011
Misc. Crops	**7**	0.0027249	0.0029990	0.0030135	0.0033297	0.0028570	0.0184248	0.0007006
Sugar Beets	**8**	0.0001111	0.0000670	0.0000595	0.0000603	0.0000589	0.0001267	0.0000155
Ag Services	**9**	0.0011053	0.0013362	0.0017047	0.0014876	0.0017915	0.0035134	0.0051086
Mining	**10**	0.0040799	0.0022004	0.0019419	0.0019513	0.0019271	0.0038259	0.0003395
Construction	**11**	0.0825216	0.0096716	0.0131495	0.0101464	0.0144069	0.0167996	0.0175964
Manufacturing	**12**	0.1671442	0.0938056	0.0809100	0.0811481	0.0803628	0.1604801	0.0145140
Transportation and Communication	**13**	0.0500594	0.0410466	0.0330728	0.0300800	0.0342168	0.0368224	0.0102710
Gas and Electric Services	**14**	0.0121617	0.0064289	0.0079551	0.0074934	0.0081160	0.0100905	0.0013051
Irrigation and Water Serv.	**15**	1.0000000	0.0092202	0.0106573	0.0092099	0.0112397	0.0177058	0.0045275
Wholesale Trade	**16**	0.0084745	1.0000000	0.0043052	0.0044357	0.0042239	0.0128972	0.0008007
Retail Trade	**17**	0.0031652	0.0042464	1.0000000	0.0051213	0.0042426	0.0035902	0.0004293
Food Stores	**18**	0.0061219	0.0092827	0.0098820	1.0000000	0.0092002	0.0076196	0.0008529
Auto Dealers & Service Stations	**19**	0.0067245	0.0069917	0.0075506	0.0082853	1.0000000	0.0058685	0.0008602
Eating & Drinking	**20**	0.0083349	0.0129213	0.0135843	0.0150771	0.0128493	1.0000000	0.0015058
F.I.R.E.	**21**	0.0368239	0.0556611	0.0676346	0.0647850	0.0685264	0.0607272	1.0000000
Hotels and Lodging Places	**22**	0.0003305	0.0004130	0.0003839	0.0003504	0.0003966	0.0004516	0.0001095
Health Care	**23**	0.0195970	0.0324716	0.0344647	0.0397009	0.0319590	0.0265647	0.0028075
Services	**24**	0.0653074	0.1007401	0.0917949	0.0770511	0.0978192	0.0904229	0.0315706
Regional Income	**25**	0.3138887	0.5204096	0.5524899	0.6366514	0.5122228	0.4254908	0.0448090
Final Demand Multiplier		1.7931576	1.9127525	1.9371251	1.9989921	1.8989487	1.9071505	1.1388666
Industry Output Multiplier		1.4792689	1.3923429	1.3846352	1.3623407	1.3867258	1.4816596	1.0940576

Table 2 B. Continued.

Sector		Hotels and Lodging Places 22	Health Care 23	Services 24	Regional Income 25
Dairy	**1**	0.0003608	0.0005228	0.0004580	0.0004368
Misc. Livestock	**2**	0.0010969	0.0015469	0.0014006	0.0015654
Range Cattle	**3**	0.0004829	0.0006915	0.0006069	0.0005783
Feedlots	**4**	0.0005031	0.0006921	0.0006064	0.0005680
Grains	**5**	0.0001417	0.0001564	0.0001411	0.0001328
Forage Crops	**6**	0.0002734	0.0002354	0.0002111	0.0001948
Misc. Crops	**7**	0.0030684	0.0038789	0.0034627	0.0049529
Sugar Beets	**8**	0.0000658	0.0000906	0.0000801	0.0000787
Ag Services	**9**	0.0045184	0.0021254	0.0019043	0.0014112
Mining	**10**	0.0021391	0.0029677	0.0025939	0.0025092
Construction	**11**	0.0295601	0.0113433	0.0245199	0.0062210
Manufacturing	**12**	0.0870568	0.1263754	0.1106157	0.1040023
Transportation and Communication	**13**	0.0532770	0.0391473	0.0420838	0.0316611
Gas and Electric Services	**14**	0.0108893	0.0072492	0.0073070	0.0085221
Irrigation and Water Serv.	**15**	0.0253012	0.0113010	0.0113967	0.0085063
Wholesale Trade	**16**	0.0047570	0.0065817	0.0059495	0.0059477
Retail Trade	**17**	0.0039536	0.0050491	0.0047062	0.0078540
Food Stores	**18**	0.0085814	0.0111521	0.0102947	0.0175817
Auto Dealers & Service Stations	**19**	0.0066309	0.0080002	0.0076914	0.0122075
Eating & Drinking	**20**	0.0124861	0.0163470	0.0144443	0.0225631
F.I.R.E.	**21**	0.0815573	0.0702482	0.0668989	0.0762327
Hotels and Lodging Places	**22**	1.0000000	0.0004530	0.0004435	0.0003720
Health Care	**23**	0.0298807	1.0000000	0.0360759	0.0623319
Services	**24**	0.1063314	0.0997267	1.0000000	0.0652721
Regional Income	**25**	0.4787745	0.6307977	0.5780290	1.0000000
Final Demand Multiplier		1.9516879	2.0566795	1.9319218	1.4417036
Industry Output Multiplier		1.4729134	1.4258818	1.3538927	0.4417036

APPENDIX C

Final Demand and Output Requirements (Multipliers)

for the

4 County Economic Impact Model

Table 1C. Final Demand Requirements (Multipliers) for 4 County Economic Impact Model.

Sector		Dairy	Misc. Livestock	Range Cattle	Feedlots	Grains	Forage Crops	Misc. Crops
		1	2	3	4	5	6	7
Dairy	**1**	1.0005468	0.0012739	0.0013703	0.0012560	0.0007493	0.0008005	0.0008136
Misc. Livestock	**2**	0.0003281	1.0080944	0.0002937	0.0002919	0.0004175	0.0004436	0.0004912
Range Cattle	**3**	0.0008893	0.0016544	1.1831857	0.0008198	0.0011928	0.0012596	0.0012356
Feedlots	**4**	0.0009269	0.0017297	0.0008761	1.1157870	0.0012498	0.0013220	0.0013027
Grains	**5**	0.0083590	0.0037675	0.0088397	0.0078309	1.0006767	0.0007161	0.0003031
Forage Crops	**6**	0.0201541	0.0090182	0.0213174	0.0188839	0.0015587	1.0016742	0.0006670
Misc. Crops	**7**	0.0039381	0.0064328	0.0032115	0.0031888	0.0069927	0.0080897	1.0179396
Sugar Beets	**8**	0.0001775	0.0003755	0.0001396	0.0001308	0.0002915	0.0003263	0.0003675
Ag Services	**9**	0.0299102	0.0706013	0.0199294	0.0178234	0.0565045	0.0651160	0.0776124
Mining	**10**	0.0002945	0.0004578	0.0002765	0.0002725	0.0004493	0.0004568	0.0003478
Construction	**11**	0.0161330	0.0192177	0.0208548	0.0195784	0.0236834	0.0237782	0.0246048
Manufacturing	**12**	0.1870345	0.3317228	0.1876180	0.1839501	0.2320107	0.2385462	0.2174085
Transportation and Communication	**13**	0.0583042	0.0634948	0.0590932	0.0573633	0.0541479	0.0553614	0.0554150
Gas and Electric Services	**14**	0.0129581	0.0131916	0.0101742	0.0104017	0.0107080	0.0110312	0.0137034
Irrigation and Water Serv.	**15**	0.0023176	0.0025651	0.0022772	0.0022934	0.0042814	0.0046221	0.0042192
Wholesale Trade	**16**	0.0697155	0.0678233	0.0719834	0.0677509	0.0844811	0.0834915	0.0754328
Retail Trade	**17**	0.0334008	0.0282645	0.0272124	0.0298256	0.0258558	0.0279256	0.0340720
Food Stores	**18**	0.0101315	0.0085388	0.0082196	0.0090250	0.0077875	0.0084199	0.0102985
Auto Dealers & Service Stations	**19**	0.0124867	0.0107129	0.0103196	0.0112429	0.0098994	0.0106540	0.0128921
Eating & Drinking	**20**	0.0228728	0.0196883	0.0186786	0.0204308	0.0178695	0.0192649	0.0234327
F.I.R.E.	**21**	0.1227115	0.1132932	0.1300336	0.1326649	0.1545420	0.1549592	0.1527018
Hotels and Lodging Places	**22**	0.0047456	0.0047556	0.0042776	0.0044849	0.0044277	0.0046711	0.0053781
Health Care	**23**	0.0654643	0.0594925	0.0586987	0.0629621	0.0485301	0.0525151	0.0643524
Services	**24**	0.1041411	0.1057669	0.0961344	0.0995425	0.1068708	0.1120460	0.1234952
Regional Income	**25**	0.6823556	0.5731878	0.5516906	0.6066314	0.5214618	0.5643006	0.6915949
Final Demand Multiplier		2.4702971	2.5251210	2.4967059	2.4844329	2.3766399	2.4517917	2.6100817
Industry Multiplier		1.7879416	1.9519333	1.9450152	1.8778015	1.8551781	1.8874912	1.9184868

Table 1C. Continued.

Sector		Sugar Beets	Ag Services	Mining	Construction	Manufacturing	Transportation and Communication	Gas and Electric Services
		8	9	10	11	12	13	14
Dairy	**1**	0.0006082	0.0005031	0.0003497	0.0008852	0.0026581	0.0005280	0.0001879
Misc. Livestock	**2**	0.0003348	0.0017558	0.0002296	0.0004842	0.0014532	0.0003055	0.0001177
Range Cattle	**3**	0.0009580	0.0023973	0.0005993	0.0015654	0.0053971	0.0008877	0.0003185
Feedlots	**4**	0.0010050	0.0024634	0.0006172	0.0016117	0.0055362	0.0009144	0.0003281
Grains	**5**	0.0001975	0.0000985	0.0000385	0.0001476	0.0002216	0.0000556	0.0000219
Forage Crops	**6**	0.0004358	0.0002266	0.0000885	0.0003463	0.0005226	0.0001260	0.0000503
Misc. Crops	**7**	0.0043354	0.0443444	0.0022035	0.0040455	0.0064489	0.0025102	0.0010923
Sugar Beets	**8**	1.0132188	0.0001036	0.0000591	0.0001517	0.0004453	0.0000878	0.0000317
Ag Services	**9**	0.0485124	1.0082060	0.0015621	0.0047693	0.0022578	0.0015612	0.0007683
Mining	**10**	0.0003436	0.0002893	1.0042340	0.0007518	0.0015618	0.0003171	0.0048309
Construction	**11**	0.0221568	0.0219884	0.0414831	1.0144392	0.0178120	0.0314122	0.0421986
Manufacturing	**12**	0.1825535	0.1989350	0.1474218	0.3856625	1.3738193	0.2184323	0.0782809
Transportation and Communication	**13**	0.0418841	0.0696202	0.0422722	0.0755011	0.0651280	1.1643424	0.0263231
Gas and Electric Services	**14**	0.0108949	0.0102754	0.0175475	0.0116869	0.0161662	0.0108751	1.0292025
Irrigation and Water Serv.	**15**	0.0058104	0.0022111	0.0020404	0.0031785	0.0031115	0.0042349	0.0020466
Wholesale Trade	**16**	0.0602132	0.0654344	0.0349112	0.0874955	0.0835203	0.0450397	0.0173227
Retail Trade	**17**	0.0222089	0.0364363	0.0336870	0.0561658	0.0304550	0.0341625	0.0162630
Food Stores	**18**	0.0066851	0.0110096	0.0100856	0.0134979	0.0091562	0.0102015	0.0048038
Auto Dealers & Service Stations	**19**	0.0085198	0.0138014	0.0131530	0.0359058	0.0117300	0.0134502	0.0066244
Eating & Drinking	**20**	0.0152310	0.0258352	0.0232273	0.0252185	0.0226981	0.0248657	0.0110034
F.I.R.E.	**21**	0.1243599	0.1361044	0.1493192	0.1395416	0.1185122	0.1350486	0.0615995
Hotels and Lodging Places	**22**	0.0039738	0.0066542	0.0058098	0.0068182	0.0075920	0.0072468	0.0028040
Health Care	**23**	0.0416378	0.0688087	0.0625170	0.0666305	0.0570427	0.0631777	0.0294475
Services	**24**	0.0903360	0.1613824	0.1109711	0.2071871	0.1541991	0.2092149	0.0679420
Regional Income	**25**	0.4474263	0.7391594	0.6720086	0.7157501	0.6121985	0.6782656	0.3164763
Final Demand Multiplier		2.1538409	2.6280441	2.3764365	2.8594379	2.6096435	2.6572636	1.7200860
Industry Multiplier		1.7064146	1.8888847	1.7044279	2.1436878	1.9974451	1.9789980	1.4036097

Table 1C. Continued.

Sector		Irrigation and Water Serv.	Wholesale Trade	Retail Trade	Food Stores	Auto Dealers & Service Stations	Eating & Drinking	F.I.R.E.
		15	16	17	18	19	20	21
Dairy	**1**	0.0005209	0.0004333	0.0003619	0.0003494	0.0003715	0.0006225	0.0002258
Misc. Livestock	**2**	0.0003004	0.0002637	0.0002383	0.0002455	0.0002369	0.0005148	0.0001331
Range Cattle	**3**	0.0009204	0.0007068	0.0005907	0.0005814	0.0006008	0.0010759	0.0003453
Feedlots	**4**	0.0009470	0.0007286	0.0006091	0.0005992	0.0006196	0.0011080	0.0003587
Grains	**5**	0.0000523	0.0000476	0.0000413	0.0000384	0.0000431	0.0000648	0.0000447
Forage Crops	**6**	0.0001209	0.0001086	0.0000942	0.0000879	0.0000981	0.0001491	0.0000998
Misc. Crops	**7**	0.0022813	0.0024439	0.0024035	0.0025787	0.0023378	0.0109508	0.0015036
Sugar Beets	**8**	0.0000847	0.0000741	0.0000629	0.0000596	0.0000652	0.0001057	0.0000577
Ag Services	**9**	0.0013629	0.0017706	0.0019118	0.0016445	0.0020629	0.0028470	0.0069845
Mining	**10**	0.0003639	0.0002614	0.0002315	0.0002247	0.0002370	0.0003978	0.0001256
Construction	**11**	0.0638175	0.0148056	0.0155355	0.0119303	0.0174788	0.0210898	0.0295225
Manufacturing	**12**	0.2283252	0.1725960	0.1438704	0.1423254	0.1459556	0.2647213	0.0768320
Transportation and Communication	**13**	0.0718823	0.0640291	0.0485101	0.0438780	0.0512676	0.0613963	0.0323136
Gas and Electric Services	**14**	0.0173490	0.0117550	0.0127230	0.0118080	0.0132963	0.0174850	0.0061446
Irrigation and Water Serv.	**15**	1.0243781	0.0027888	0.0029393	0.0025384	0.0031665	0.0054451	0.0024526
Wholesale Trade	**16**	0.0477706	1.0473749	0.0308740	0.0313523	0.0309168	0.0792075	0.0168255
Retail Trade	**17**	0.0310530	0.0357498	1.0377555	0.0417997	0.0360792	0.0348910	0.0172708
Food Stores	**18**	0.0089062	0.0107212	0.0113485	1.0126680	0.0107927	0.0104603	0.0051250
Auto Dealers & Service Stations	**19**	0.0137710	0.0138825	0.0145525	0.0156737	1.0141251	0.0135632	0.0069360
Eating & Drinking	**20**	0.0203166	0.0254899	0.0263153	0.0287009	0.0253635	1.0311665	0.0123148
F.I.R.E.	**21**	0.1061171	0.1412481	0.1519129	0.1447778	0.1568650	0.1588605	1.1776104
Hotels and Lodging Places	**22**	0.0057077	0.0075165	0.0064434	0.0059450	0.0067513	0.0081854	0.0039838
Health Care	**23**	0.0532129	0.0665796	0.0705880	0.0793112	0.0668733	0.0649456	0.0315521
Services	**24**	0.1449009	0.2033259	0.1639955	0.1372205	0.1788717	0.1912647	0.1130964
Regional Income	**25**	0.5717921	0.7153562	0.7586411	0.8525769	0.7186266	0.6977613	0.3389500
Final Demand Multiplier		2.4162547	2.5400574	2.5025502	2.5689155	2.4831030	2.6782796	1.8808089
Industry Multiplier		1.8444627	1.8247013	1.7439091	1.7163386	1.7644764	1.9805184	1.5418589

Table 1C. Continued.

Sector		Hotels and Lodging Places	Health Care	Services	Regional Income
		22	23	24	25
Dairy	**1**	0.0004251	0.0005830	0.0005729	0.0004956
Misc. Livestock	**2**	0.0002568	0.0003698	0.0003521	0.0003686
Range Cattle	**3**	0.0006794	0.0009796	0.0009309	0.0008396
Feedlots	**4**	0.0007017	0.0010093	0.0009598	0.0008647
Grains	**5**	0.0000569	0.0000628	0.0000651	0.0000526
Forage Crops	**6**	0.0001286	0.0001437	0.0001485	0.0001208
Misc. Crops	**7**	0.0025473	0.0033701	0.0030823	0.0039982
Sugar Beets	**8**	0.0000818	0.0000997	0.0000992	0.0000831
Ag Services	**9**	0.0045912	0.0027198	0.0026826	0.0020688
Mining	**10**	0.0002828	0.0003533	0.0003440	0.0003205
Construction	**11**	0.0337235	0.0182182	0.0357905	0.0128959
Manufacturing	**12**	0.1622682	0.2400080	0.2267916	0.2064464
Transportation and Communication	**13**	0.0793034	0.0681674	0.0757795	0.0583740
Gas and Electric Services	**14**	0.0181325	0.0144608	0.0147786	0.0161297
Irrigation and Water Serv.	**15**	0.0077026	0.0038299	0.0038422	0.0032084
Wholesale Trade	**16**	0.0351160	0.0504003	0.0482579	0.0465158
Retail Trade	**17**	0.0348221	0.0469541	0.0428531	0.0663375
Food Stores	**18**	0.0104007	0.0142211	0.0128370	0.0202236
Auto Dealers & Service Stations	**19**	0.0137005	0.0176444	0.0167018	0.0243731
Eating & Drinking	**20**	0.0253293	0.0348865	0.0308999	0.0450529
F.I.R.E.	**21**	0.1910015	0.1900087	0.1854224	0.2029458
Hotels and Lodging Places	**22**	1.0076496	0.0089728	0.0091594	0.0080729
Health Care	**23**	0.0643760	1.0989585	0.0796648	0.1272013
Services	**24**	0.2115173	0.2214453	1.2747918	0.1669647
Regional Income	**25**	0.6916335	0.9566107	0.8557298	1.3675896
Final Demand Multiplier		2.5964284	2.9944779	2.9225377	2.3815440
Industry Multiplier		1.9047949	2.0378672	2.0668079	1.0139547

Table 2C. Output Requirements (Multipliers) for 4 County Economic Impact Model.

Sector		Dairy	Misc. Livestock	Range Cattle	Feedlots	Grains	Forage Crops	Misc. Crops
		1	2	3	4	5	6	7
Dairy	**1**	1.0000000	0.0012637	0.0011581	0.0011257	0.0007488	0.0007991	0.0007992
Misc. Livestock	**2**	0.0003279	1.0000000	0.0002483	0.0002616	0.0004172	0.0004429	0.0004826
Range Cattle	**3**	0.0008888	0.0016411	1.0000000	0.0007348	0.0011920	0.0012575	0.0012138
Feedlots	**4**	0.0009264	0.0017158	0.0007405	1.0000000	0.0012489	0.0013198	0.0012797
Grains	**5**	0.0083544	0.0037373	0.0074711	0.0070183	1.0000000	0.0007149	0.0002977
Forage Crops	**6**	0.0201431	0.0089458	0.0180170	0.0169243	0.0015577	1.0000000	0.0006552
Misc. Crops	**7**	0.0039360	0.0063811	0.0027143	0.0028579	0.0069879	0.0080762	1.0000000
Sugar Beets	**8**	0.0001774	0.0003725	0.0001180	0.0001172	0.0002913	0.0003257	0.0003610
Ag Services	**9**	0.0298938	0.0700344	0.0168439	0.0159739	0.0564663	0.0650072	0.0762446
Mining	**10**	0.0002943	0.0004541	0.0002337	0.0002442	0.0004490	0.0004560	0.0003416
Construction	**11**	0.0161242	0.0190634	0.0176260	0.0175467	0.0236673	0.0237385	0.0241712
Manufacturing	**12**	0.1869323	0.3290593	0.1585702	0.1648613	0.2318538	0.2381475	0.2135770
Transportation and Communication	**13**	0.0582723	0.0629849	0.0499441	0.0514106	0.0541113	0.0552688	0.0544384
Gas and Electric Services	**14**	0.0129510	0.0130857	0.0085989	0.0093223	0.0107008	0.0110127	0.0134619
Irrigation and Water Serv.	**15**	0.0023163	0.0025445	0.0019246	0.0020554	0.0042785	0.0046144	0.0041448
Wholesale Trade	**16**	0.0696774	0.0672787	0.0608386	0.0607203	0.0844239	0.0833520	0.0741034
Retail Trade	**17**	0.0333825	0.0280375	0.0229992	0.0267306	0.0258383	0.0278790	0.0334715
Food Stores	**18**	0.0101260	0.0084702	0.0069470	0.0080885	0.0077823	0.0084058	0.0101170
Auto Dealers & Service Stations	**19**	0.0124799	0.0106268	0.0087219	0.0100762	0.0098927	0.0106362	0.0126649
Eating & Drinking	**20**	0.0228603	0.0195302	0.0157867	0.0183106	0.0178574	0.0192327	0.0230197
F.I.R.E.	**21**	0.1226444	0.1123835	0.1099013	0.1188980	0.1544375	0.1547002	0.1500107
Hotels and Lodging Places	**22**	0.0047430	0.0047175	0.0036153	0.0040195	0.0044247	0.0046633	0.0052833
Health Care	**23**	0.0654285	0.0590148	0.0496107	0.0564284	0.0484972	0.0524274	0.0632183
Services	**24**	0.1040842	0.1049176	0.0812505	0.0892128	0.1067985	0.1118587	0.1213188
Regional Income	**25**	0.6819826	0.5685854	0.4662756	0.5436803	0.5211092	0.5633574	0.6794066
Final Demand Multiplier		2.4702971	2.5251210	2.4967059	2.4844329	2.3766399	2.4517917	2.6100817
Industry Output Multiplier		1.7869644	1.9362605	1.6438800	1.6829391	1.8539236	1.8843364	1.8846765

Table 2C. Continued.

Sector		Sugar Beets 8	Ag Services 9	Mining 10	Construction 11	Manufacturing 12	Transportation and Communication 13	Gas and Electric Services 14
Dairy	**1**	0.0006002	0.0004990	0.0003482	0.0008726	0.0019349	0.0004534	0.0001825
Misc. Livestock	**2**	0.0003304	0.0017415	0.0002287	0.0004773	0.0010578	0.0002624	0.0001143
Range Cattle	**3**	0.0009455	0.0023778	0.0005968	0.0015432	0.0039285	0.0007624	0.0003095
Feedlots	**4**	0.0009919	0.0024434	0.0006146	0.0015888	0.0040298	0.0007853	0.0003188
Grains	**5**	0.0001949	0.0000977	0.0000383	0.0001455	0.0001613	0.0000478	0.0000212
Forage Crops	**6**	0.0004301	0.0002248	0.0000882	0.0003413	0.0003804	0.0001082	0.0000489
Misc. Crops	**7**	0.0042789	0.0439835	0.0021942	0.0039879	0.0046941	0.0021559	0.0010613
Sugar Beets	**8**	1.0000000	0.0001027	0.0000589	0.0001495	0.0003242	0.0000754	0.0000308
Ag Services	**9**	0.0478795	1.0000000	0.0015555	0.0047014	0.0016435	0.0013409	0.0007465
Mining	**10**	0.0003391	0.0002869	1.0000000	0.0007411	0.0011368	0.0002723	0.0046939
Construction	**11**	0.0218677	0.0218094	0.0413082	1.0000000	0.0129654	0.0269785	0.0410013
Manufacturing	**12**	0.1801718	0.1973158	0.1468002	0.3801731	1.0000000	0.1876015	0.0760598
Transportation and Communication	**13**	0.0413377	0.0690536	0.0420940	0.0744264	0.0474065	1.0000000	0.0255762
Gas and Electric Services	**14**	0.0107528	0.0101918	0.0174735	0.0115205	0.0117674	0.0093401	1.0000000
Irrigation and Water Serv.	**15**	0.0057346	0.0021931	0.0020318	0.0031332	0.0022648	0.0036372	0.0019886
Wholesale Trade	**16**	0.0594276	0.0649019	0.0347640	0.0862501	0.0607943	0.0386825	0.0168312
Retail Trade	**17**	0.0219192	0.0361397	0.0335450	0.0553664	0.0221681	0.0293406	0.0158016
Food Stores	**18**	0.0065979	0.0109200	0.0100431	0.0133058	0.0066648	0.0087616	0.0046675
Auto Dealers & Service Stations	**19**	0.0084087	0.0136891	0.0130976	0.0353948	0.0085382	0.0115517	0.0064364
Eating & Drinking	**20**	0.0150323	0.0256249	0.0231294	0.0248596	0.0165219	0.0213560	0.0106912
F.I.R.E.	**21**	0.1227374	0.1349966	0.1486896	0.1375554	0.0862647	0.1159870	0.0598517
Hotels and Lodging Places	**22**	0.0039219	0.0066000	0.0057853	0.0067212	0.0055262	0.0062239	0.0027244
Health Care	**23**	0.0410946	0.0682486	0.0622534	0.0656821	0.0415213	0.0542604	0.0286120
Services	**24**	0.0891575	0.1600688	0.1105033	0.2042381	0.1122412	0.1796850	0.0660143
Regional Income	**25**	0.4415890	0.7331432	0.6691753	0.7055623	0.4456179	0.5825310	0.3074966
Final Demand Multiplier		2.1538409	2.6280441	2.3764365	2.8594379	2.6096435	2.6572636	1.7200860
Industry Output Multiplier		1.6841521	1.8735106	1.6972418	2.1131752	1.4539358	1.6996701	1.3637838

Table 2C. Continued.

Sector		Irrigation and Water Serv.	Wholesale Trade	Retail Trade	Food Stores	Auto Dealers & Service Stations	Eating & Drinking	F.I.R.E.
		15	16	17	18	19	20	21
Dairy	**1**	0.0005085	0.0004137	0.0003487	0.0003450	0.0003663	0.0006037	0.0001917
Misc. Livestock	**2**	0.0002932	0.0002518	0.0002297	0.0002424	0.0002336	0.0004992	0.0001130
Range Cattle	**3**	0.0008984	0.0006748	0.0005692	0.0005742	0.0005924	0.0010434	0.0002932
Feedlots	**4**	0.0009245	0.0006956	0.0005869	0.0005917	0.0006110	0.0010745	0.0003046
Grains	**5**	0.0000510	0.0000455	0.0000398	0.0000379	0.0000425	0.0000629	0.0000379
Forage Crops	**6**	0.0001180	0.0001037	0.0000907	0.0000868	0.0000968	0.0001446	0.0000847
Misc. Crops	**7**	0.0022270	0.0023334	0.0023160	0.0025464	0.0023053	0.0106198	0.0012768
Sugar Beets	**8**	0.0000827	0.0000707	0.0000607	0.0000589	0.0000643	0.0001025	0.0000490
Ag Services	**9**	0.0013305	0.0016905	0.0018423	0.0016239	0.0020342	0.0027609	0.0059311
Mining	**10**	0.0003552	0.0002495	0.0002231	0.0002219	0.0002337	0.0003858	0.0001066
Construction	**11**	0.0622988	0.0141359	0.0149703	0.0117811	0.0172354	0.0204523	0.0250699
Manufacturing	**12**	0.2228915	0.1647892	0.1386361	0.1405450	0.1439227	0.2567202	0.0652440
Transportation and Communication	**13**	0.0701717	0.0611329	0.0467452	0.0433291	0.0505535	0.0595407	0.0274400
Gas and Electric Services	**14**	0.0169362	0.0112233	0.0122601	0.0116603	0.0131111	0.0169565	0.0052178
Irrigation and Water Serv.	**15**	1.0000000	0.0026626	0.0028324	0.0025067	0.0031224	0.0052805	0.0020827
Wholesale Trade	**16**	0.0466337	1.0000000	0.0297507	0.0309601	0.0304862	0.0768135	0.0142878
Retail Trade	**17**	0.0303140	0.0341327	1.0000000	0.0412768	0.0355767	0.0338364	0.0146660
Food Stores	**18**	0.0086942	0.0102362	0.0109356	1.0000000	0.0106424	0.0101441	0.0043520
Auto Dealers & Service Stations	**19**	0.0134433	0.0132545	0.0140231	0.0154776	1.0000000	0.0131532	0.0058899
Eating & Drinking	**20**	0.0198331	0.0243369	0.0253579	0.0283419	0.0250102	1.0000000	0.0104575
F.I.R.E.	**21**	0.1035917	0.1348592	0.1463861	0.1429667	0.1546801	0.1540590	1.0000000
Hotels and Lodging Places	**22**	0.0055718	0.0071766	0.0062090	0.0058706	0.0066573	0.0079380	0.0033829
Health Care	**23**	0.0519465	0.0635680	0.0680199	0.0783191	0.0659419	0.0629827	0.0267933
Services	**24**	0.1414526	0.1941290	0.1580290	0.1355039	0.1763803	0.1854838	0.0960389
Regional Income	**25**	0.5581846	0.6829991	0.7310403	0.8419115	0.7086173	0.6766718	0.2878286
Final Demand Multiplier		2.4162547	2.5400574	2.5025502	2.5689155	2.4831030	2.6782796	1.8808089
Industry Output Multiplier		1.8005683	1.7421662	1.6804625	1.6948680	1.7399000	1.9206582	1.3093116

Table 2C. Continued.

Sector		Hotels and Lodging Places	Health Care	Services	Regional Income
		22	23	24	25
Dairy	**1**	0.0004218	0.0005305	0.0004494	0.0003624
Misc. Livestock	**2**	0.0002548	0.0003365	0.0002762	0.0002695
Range Cattle	**3**	0.0006743	0.0008914	0.0007303	0.0006139
Feedlots	**4**	0.0006964	0.0009184	0.0007529	0.0006323
Grains	**5**	0.0000565	0.0000571	0.0000510	0.0000385
Forage Crops	**6**	0.0001276	0.0001307	0.0001165	0.0000884
Misc. Crops	**7**	0.0025280	0.0030666	0.0024179	0.0029235
Sugar Beets	**8**	0.0000811	0.0000907	0.0000778	0.0000608
Ag Services	**9**	0.0045563	0.0024749	0.0021044	0.0015128
Mining	**10**	0.0002807	0.0003215	0.0002699	0.0002344
Construction	**11**	0.0334675	0.0165777	0.0280756	0.0094297
Manufacturing	**12**	0.1610364	0.2183958	0.1779048	0.1509564
Transportation and Communication	**13**	0.0787014	0.0620291	0.0594446	0.0426839
Gas and Electric Services	**14**	0.0179948	0.0131587	0.0115929	0.0117943
Irrigation and Water Serv.	**15**	0.0076441	0.0034850	0.0030139	0.0023460
Wholesale Trade	**16**	0.0348495	0.0458619	0.0378555	0.0340130
Retail Trade	**17**	0.0345578	0.0427260	0.0336158	0.0485069
Food Stores	**18**	0.0103217	0.0129406	0.0100699	0.0147878
Auto Dealers & Service Stations	**19**	0.0135965	0.0160556	0.0131016	0.0178219
Eating & Drinking	**20**	0.0251370	0.0317451	0.0242392	0.0329433
F.I.R.E.	**21**	0.1895515	0.1728989	0.1454531	0.1483967
Hotels and Lodging Places	**22**	1.0000000	0.0081648	0.0071850	0.0059030
Health Care	**23**	0.0638872	1.0000000	0.0624924	0.0930113
Services	**24**	0.2099116	0.2015047	1.0000000	0.1220868
Regional Income	**25**	0.6863829	0.8704702	0.6712702	1.0000000
Final Demand Multiplier		2.5964284	2.9944779	2.9225377	2.3815440
Industry Output Multiplier		1.8903345	1.8543622	1.6212905	0.7414174

Appendix A-2

Social and Community Impacts of Public Land Grazing Policy Alternatives in the Bruneau Resource Area of Owyhee County, Idaho

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BACKGROUND

The Owyhee has never been an easy land. With searing heat, Artic cold, rattlesnakes, and the distinct possibility of getting truly lost, the Owyhee does not give of itself easily. But when it reveals itself in a sudden waterfall or cougar tracks circling your camp, or a 1,000-foot chasm appearing out of nowhere, you realize that its beauty is unsurpassed. To come to accept the Owyhee on its own terms is to learn something infinitely valuable about yourself. — Brad Purdy[1]

In August 2002, the University of Idaho began social assessments of Owyhee County and the four southwestern Idaho counties to gather information to be used in the preparation of a Bruneau Resource Area Draft Resource Management Plan (BRMP) and a management plan for the Snake River Birds of Prey (BOP) National Conservation Area. This effort will update social and economic information relative to Owyhee County (Harp and Rimbey 1999) and provide new information on the users of public lands in southwestern Idaho as well as their perceptions towards natural resource management. The scope and focus of this analysis includes the following: 1) natural resources management throughout Owyhee County; 2) recreational use and impacts related to the Birds of Prey National Conservation Area and Bruneau areas; and 3) changing patterns of urban-user impacts to adjacent rural public lands in Owyhee County. Because of the interrelated and complex nature of these issues, the areas of focus are also compounded by other social structures and resource management policies.

The vast Owyhee region has a rugged appeal. Much like the landscape, many of the region's residents have an independent and likeable character. Local actions and attitudes demonstrate the strong interest to persevere in this place because of the desire and commitment to experience this place as home. The quality and character of the

[1] Quoted in Nokkentved (2001).

Owyhee region is continually renewed by strong family and community ties, as well as strong attachments to the natural resources that make this place attractive.

On a broad scale, Owyhee County has recently undergone, and will continue to experience, rapid social change. Although many traditional cultural patterns persist in the communities of Owyhee County—ranching, farming, and a rural lifestyle—external forces related to population growth and shifts in regional economic bases have brought new and rapid changes to the county in the past decade. The high sage deserts, mountain peaks, and remote rivers attract many others besides the families who settled and have stayed in the region as farmers and ranchers since the mid-1800s. These changes continue to force local residents and officials to address local resource management and community sustainability issues, often in the context of federal and state policies due to the significant proportions of public lands within the region.

Previous research has found that although rapid social change may significantly affect well-being and quality of life, small rural western communities like those found in Owyhee County often do not experience lasting social disruption (Smith *et al*. 2001; Hunter *et al*. 2002). Nonetheless, one of the key outcomes of this assessment documents substantive sociocultural impact to the ways of life, livelihood, and perceived independence many residents of Owyhee County wish to maintain. For many local people in Owyhee County, things such as neighbors, land-use policy, and sources of environmental impact are not the same as in recent memory.

Following a section on *Methodological Procedures*, the remainder of this report is the *Analytical Results*, organized into three thematic sections—*Public Land Management*, *Community Involvement in Resource Management & Planning*, and

Changing Perceptions in the Local Community and Landscape—with an attempt to integrate qualitative and quantitative data collected as a part of this assessment. Rather than including a separate background section on history and culture of the region, those points are included within the analysis in order to emphasize the relationships between local heritage and contemporary life that characterize many local residents and their views on life on this land.

METHODS AND PROCEDURES

We used complimentary qualitative and quantitative research methods to gather data for this analysis and report. Collection of background information and research design for both of these components began in late summer of 2002 and was completed in late summer of 2003.

Qualitative Assessment

In addition to ongoing ethnographic fieldwork, a total of 30 key-informant interviews were conducted during the winter and spring of 2003 with elected officials, community leaders, agency representatives, and interest group representatives. Most interviewees are also residents of Owyhee County, but several live in counties bordering Owyhee County and have either work or recreational interests that bring them to the county.

Interviews ranged from one-to-four hours and were conducted primarily at the homes or business offices of local residents, or at public restaurants nearby. Those interviewed were selected via a snowball sampling method using a cross-section of

repeatedly noted potential interviewees derived from suggestions made by a variety of constituents solicited for input. Position, knowledge, and local relationship/interest to the issues of focus were also used as secondary criteria for respondent selection. The goal of this methodology is to maximize what can be learned from a particular case or set of circumstances while remaining sensitive to various forms of respondent bias (Stake 1995).

Each interview session was conducted via a semi-structured format (Denzin 1989). The interview protocol for these sessions included the questions listed below in Table 1.

Table 1. Protocol for Semi-Structured Interview Sessions.

- Please describe life in Owyhee County with respect to social, economic, and political contexts.
- What are the predominant land-management practices and values in this region? Are there alternative or competing local perspectives?
- To what extent do you find social cohesion in Owyhee County communities? Why or why not?
- What factors, in your view, most affect the levels of social cohesion for people living in Owyhee County?
- What social conflicts and/or cooperation do you observe with respect to public lands management on open range, but also specifically in relation to the Snake River Birds of Prey National Conservation Area & Bruneau Resource Area?
- Thinking about multiple recreation interests, how does the Bureau of Land Management balance and prioritize uses within the Birds of Prey and Bruneau Resource Areas?

Quantitative Assessment

We also applied a quantitative research design within this study to develop statistically representative results to a variety of measures across a broader four-county (Owyhee, Elmore, Ada, and Canyon) region affecting land management and policy

within the Owyhee area. The overall objective of the quantitative assessment was to ask individuals their opinions and attitudes regarding their community, usage of the Snake River Birds of Prey (BOP) National Conservation Area, and other natural resource management factors.

A set of 75 attitudinal and demographic measures were established for three randomly selected stratified samples purchased from a commercial sampling firm and were administered by the Social Science Research Unit (SSRU) at the University of Idaho in the spring of 2003. We designed a total sample of 2,400 names divided into three stratified samples with the following designations: Owyhee, Urban, and Rural. Table 2 displays the number of responses and response rates for each of these subgroups.

Table 2. Completed Responses, Non-Responses, Refusals, Ineligibles and Rates by Sample Area.

Sample	# Completed	# Refusals	# Non-responses & Ineligibles	% Response Rate
Owyhee	385	134	81/200	64%
Urban	356	178	116/150	55%
Rural	368	148	116/168	58%

Sample Frames:

Owyhee: Population in Owyhee County, ID proper as well as Jordan Valley, OR.

Urban: Urban and suburban areas of Elmore, Ada, and Canyon Counties, ID (including Mountain Home, Boise, Caldwell, Eagle, Kuna, Meridian, and Star.

Rural: Rural areas of Elmore, Ada, and Canyon Counties, ID (including Atlanta, Boise River, Glenns Ferry, Melba, Middleton, Parma, Prairie, Tipanuk, Wilder, and unincorporated areas).

As noted in Table 2, the sampling frames for the three subgroups comprised a four-county area. The Owyhee sampling frame included all residents of the County as well as the adjacent community of Jordan Valley, OR. The Urban sampling frame included the

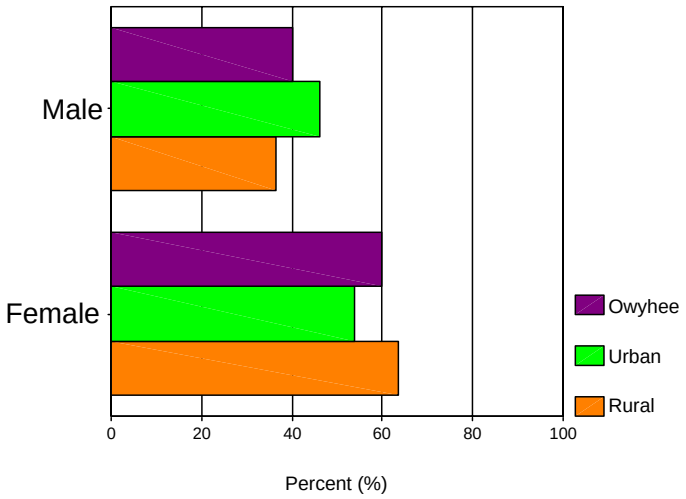
metropolitan areas within Elmore, Ada, and Canyon counties only; and the Rural sampling frame included all non-metropolitan and unincorporated areas within the same non-Owyhee three-county area. Some of the charts presented below include all of the respondents from the three areas combined, while others report results broken out by each of the three areas.

To increase the response rate, a pre-calling postcard was sent to all potential respondents. Using trained interview staff, the SSRU administered the questions via fifteen Computer Assisted Telephone Interviewing (CATI) stations. Interviewers recorded those who completed the questions, asked to be called back, were no longer eligible to participate, and refusals. Interviewers were monitored during each calling session by a trained supervisor. The SSRU staff included two interviewers, fluent in Spanish, who secured responses from a total of 47 Spanish-speaking individuals included in the data. Additionally, a total of 35 soft-refusals were converted to completed responses. Data were collected into a SPSS data entry program for verification and analyses.

Demographic Profile

This section briefly outlines the demographic profile for respondents in the quantitative assessment. Women constituted a majority of the overall sample (59%), and an even greater majority of the sample were married (72%). With regard to racial and ethnic makeup, the sample is relatively homogeneous with 90% of respondents indicating they are White/Caucasian and 6% indicating a Hispanic/Latino background. Figure 1 illustrates the percentage male and female response by sample group. The median

Figure 1. Sex



age of the respondents was 53 years. The education level of respondents is a relatively normal distribution ranging from 'less than a high school degree'(10%) to 'graduate education' (9%) with over one third of respondents, as well as the mean value, falling within the 'some college or vocational training' category (34%). Figures 2 - 3 display the distributions of respondents' education levels for the entire sample as well as sample

Figure 2. What is the highest level of education you have completed?

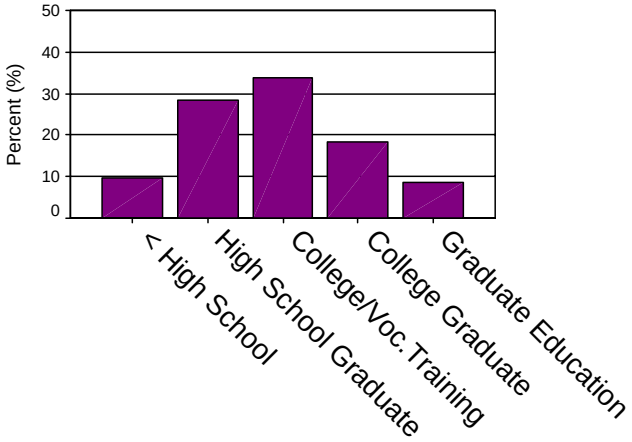
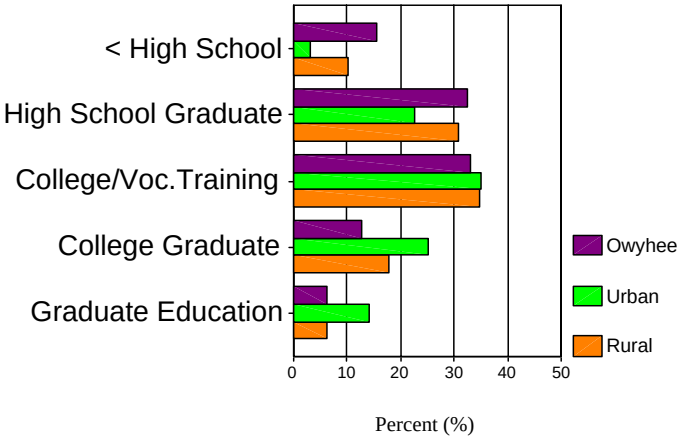
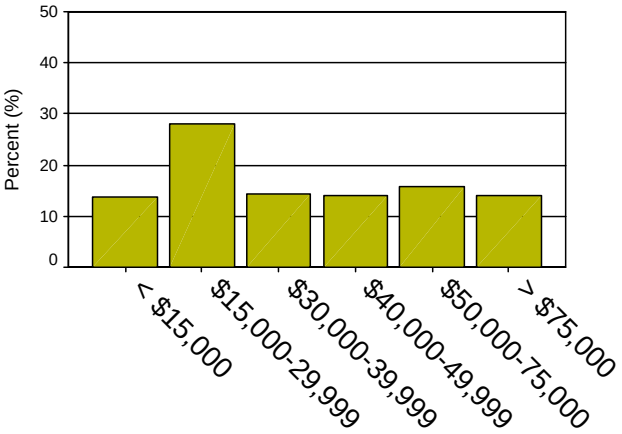


Figure 3. What is the highest level of education you have completed?



groups, respectively. As shown in Figure 4, the median annual household income in 2002 for all respondents was between $30,000 – 39,999, although the most frequent

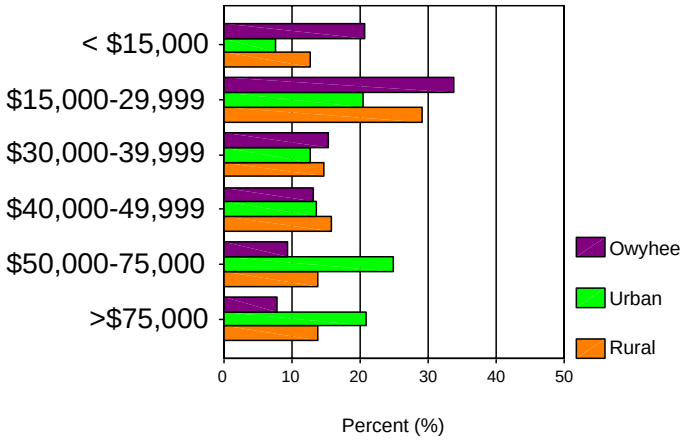
Figure 4. What was your total household income before taxes in 2002?



response across the entire sample was between $15,000 – 29,999. Figure 5 illustrates the variability of income levels between the three subgroups, with the Owyhee and Rural samples skewed toward the lower income range categories, and the Urban sample

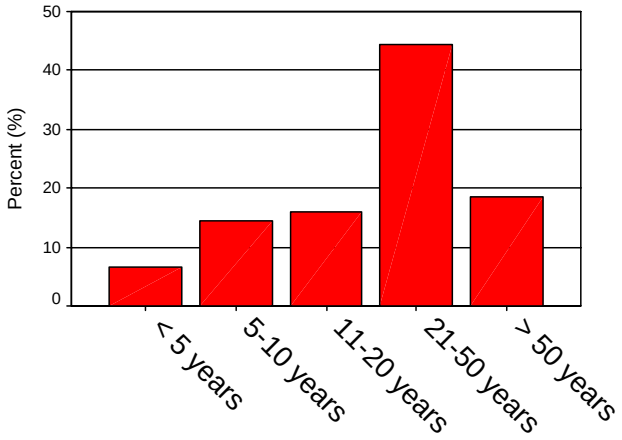
showing a slightly bi-modal response toward either end of the continuum, but skewed more heavily toward the higher income categories.

Figure 5. What was your total household income before taxes in 2002?



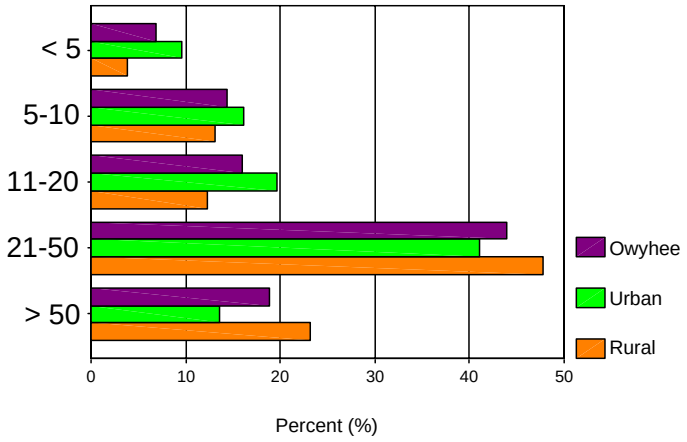
We also asked respondents about their length of residence in southwestern Idaho. Figures 6 – 7 show that nearly half of all respondents have lived in this four-county region for between 21 and 50 years. While nearly 20% of the sample has lived in the

Figure 6. How many years have you lived in southwestern Idaho?



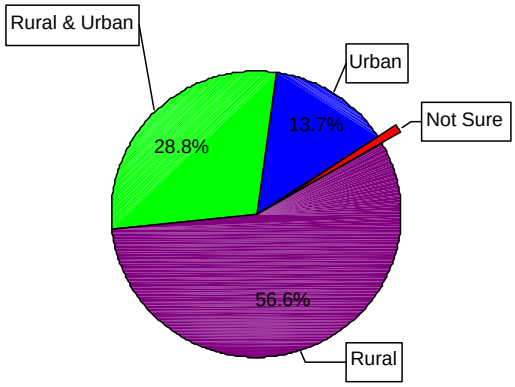
region for over 50 years, less than 10% has lived in the region for less than five years. While these trends generally hold true for each of the sub groups, the Rural group tends

Figure 7. How many years have you lived in southwestern Idaho?



to have a longer length of residence, and the Urban group tends to have a relatively shorter length of residence compared to the other two groups. On another measure, respondent's selected from three categories 'Rural,' 'Urban,' or 'Rural & Urban' to identify a perceived description of their community. Figure 8 indicates that the majority of respondents consider themselves rural residents across the overall sample.

Figure 8. Respondents' self-description of their community



Given the average response rates and that the demographic profile matches comparable Census data measures with relative approximation,[2] the quantitative assessment sample appears to constitute a representative cross-section of the four-county population.[3]

County-Level Demographic Changes

Tables 3 and 4 below compile data from the most recent U.S. Census (2000) to present population, employment, and income figures across the four-county region. The most notable changes include:

- A substantial overall increase in employment for Ada (50%) and Canyon (52%) Counties especially, but for Owyhee (22%) and Elmore (29%) Counties as well;
- A high rate of growth in nonfarm employment in Owyhee County (90%) from 1990 to 2000, in part due to the manufacturing plants recently sited and expanded in the County;
- substantial increase—ranging from 48-56%—in income for each of the four counties; and
- Similar to many other ex-urban areas around the West, parts of each of these counties had unprecedented residential population growth rates, ranging from a low of 27% in Owyhee County to a high of 46% in Ada and Canyon Counties (see Field 2002).

While these demographic trends are important, they do not tell a full story or provide much in the way of explanation as to why phenomenon emerge as they do. The

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[2] The median age of respondents was higher than the median age of the population in the four-county region. However, the distribution and age range of respondents reflected a normal distribution pattern.

[3] One probable limitation within the overall sample that continues to present a contemporary challenge to this methodology is the increase in cell phone users (numbers for whom are not included in most sampling databases) that also choose to abandon their landline. Such a shift—now with cell phones comprising up to 43% of all U.S. phones—may systematically exclude an expanding segment of the population (Carroll 2003).

Table 3. Southwest Idaho Population Change in Four Counties (1990 - 2000).

COUNTY	1990				2000				% Change 1990 to 2000			
	Popul.	Sex (M/F)	Age ≤ 18	Age ≥ 65	Popul.	Sex (M/F)	Age ≤ 18	Age ≥ 65	Popul.	Sex (M/F)	Age ≤ 18	Age ≥ 65
Ada	205,775	101,227 104,548	58,243	21,451	300,904	150,893 150,011	82,045	27,301	46%	49% 43%	41%	27%
Canyon	90,076	44,374 45,702	27,712	12,344	131,441	65,299 66,142	40,679	14,461	46%	47% 45%	47%	17%
Elmore	21,205	11,070 10,135	6,679	1,594	29,130	16,077 13,053	8,142	2,079	37%	45% 29%	22%	30%
Owyhee	8,392	4,384 4,008	2,775	1,073	10,644	5,551 5,093	3,703	1,293	27%	27% 27%	33%	21%

Source: U.S. Census (2000)

Table 4. Southwest Idaho Income and Employment Change in Four Counties (1990 - 2000).

COUNTY	1990			2000			% Change 1990 to 2000		
	Household Income ($)	Nonfarm Employment[a]	Total Employment	Household Income ($)	Nonfarm Employment	Total Employment	Household Income ($)	Nonfarm Employment	Total Employment
Ada	30,246	91,797	104,423	46,140	145,958	156,634	53%	59%	50%
Canyon	22,979	23,462	39,181	35,884	37,305	59,634	56%	59%	52%
Elmore	23,750	3,041	7,373	35,256	3,741	9,492	48%	23%	29%
Owyhee	18,595	773	3,602	28,339	1,468	4,389	52%	90%	22%

[a] Calculated from Census 2000 figures.

Source: U.S. Census (2000)

following analytical section offers a variety of local perspectives gathered from within the four-county region in an effort to describe many of the consequences and effects of the changes in relation to resource management and community in the Owyhee region.

ANALYTICAL RESULTS

This section of the report provides analytical results in three broad topic areas: 1) public lands management; 2) community involvement in resource management and planning; and 3) changing perceptions in the local community and landscape. The first section focuses on several dimensions of public land management in the Owyhee region including Bureau of Land Management (BLM) policies (pertaining to livestock grazing as well as recreation), military land use in this region, as well as the County's land-use planning related to residential growth and resource-management. The second section, although still focused on the context of public lands, emphasizes local perspectives about publicly-owned spaces *as local resources*. The third and final section of the analysis concentrates on the change this region will likely continue to experience, largely associated with the influx of permanent residents and non-resident recreational users.

Public Lands Management

Like the state of Idaho, and much of the western U.S., a substantial proportion of the 4.9 million acres that make up Owyhee County, have a designation as public lands—nearly 83% including federal- and state-owned lands.[4] Many private landowners adjacent to the public lands in Owyhee County lease and depend on those lands, primarily for

[4] The County publishes this figure, but it includes 76% federal land and 6.7% state-owned land, leaving just over 17% of lands in Owyhee County as privately owned (Owyhee County 2003).

livestock grazing. Recreational uses also occur, with increasing frequency, on the same lands. While it is *not* common practice to blatantly defy the County or the BLM policies, many local residents and ranchers approach the lands—public or private—with a mix of genuine consideration, care, and independence that is often found among those who *do* own something privately, in the form of material property. Access to public lands has become more complicated in recent years with regard to logistical, social, and ecological concerns. Some of this is due to the increase in recreational users, while others have emerged from changing BLM policy.

The first analytical section, on *Public Lands Management*, is divided into several key sub-section themes. The first of these is 'Rangeland Changes,' incorporating general aspects about the BLM and its local influences to the community. The second section, focusing on 'Recreation Impacts, Property Rights, and Access' examines attitudes toward the burgeoning level of outdoor recreation and related issues occurring in the Owyhee region. The third section on 'Environmental Impacts' emphasizes local definitions and meanings about what is happening to the land and who is responsible.

Rangeland Changes—Policy, Personnel, and Peril

Many of those interviewed who live and work the land in the Owyhee region, in some form reflected negatively on the broad change in orientation they perceive has occurred in the BLM during the past three decades, whether intentional or not. Originally established in 1934 as The U.S. Grazing Service via the Taylor Grazing Act, the BLM emerged as the federal entity assigned to manage the non-US Forest Service (est. 1906) lands following the "race for grass" in the mid-1800s and subsequent droughts in the

1920s and 1930s (Gorte and Baldwin 1999).

The crux of the change many described is an inversely correlated pattern between the loss of range scientists and the addition of recreation-oriented staff. The implications of this pattern perceived by ranchers in the Owyhee region are that the change in personnel both *reflected and caused* a political and environmental reprioritization of rangeland uses and impacts to de-emphasize livestock grazing and favor recreation interests and uses. One local individual who works on the land described the trend this way:

> When we had Range Cons out here, they had a broad perspective. Now with all these wildlife biologists running around, they're all too narrow. When all the Range folks were taken out of management in the '80s and '90s, THAT's when the range deteriorated!

Another respondent offered a similar perspective, but in the specific context of how the change has affected the Birds of Prey (BOP) National Conservation Area:

> Our regional district is corrupt. That happened when they changed the BOP to single-use. With this, they needed lots of [recreation] hires to run this—not the range. They think they're making good decisions for the raptors, but their management has let 70% of the BOP burn in the last 20 years with the multi-use designation. Before this, the nests were full. Now they're not because of the loss in the vegetation base.

This passage represents commonly held viewpoints and relates to the contemporary views on increased levels of recreation and related impacts described in a later section of this analysis (see pp. 22 - 44).

The perspective about a re-orientation toward recreation dates back to the early- and mid-1970s[5] when the BLM began attempting to implement required Environmental Impact Statements (EIS) as a part of the National Environmental Policy Act (NEPA)

[5] Foss alluded to the growth of the concept of multiple-use at least a decade earlier in the classic *Politics and Grass* (1960).

passed by Congress in 1969. The federal court case, *Natural Resources Defense Council v. Morton* ended in an out-of-court settlement in 1974, requiring the BLM to conduct 212 site-specific grazing Environmental Impact Statements—with little in the way of "planning" expertise—rather than a single impact statement covering its entire grazing program in the West (Davis 1993).[6] Several areas in Idaho were targeted as high priorities on the required EIS list, including the Owyhee area (Hanley 2002).

In the fall of 1979, a group of Owyhee cattleman organized to stimulate a county-level response to the Owyhee Grazing EIS and other grazing reform measures (Hanley 2001). Establishment of this group, originally coined as "The Can Do Cowboys" and more formally known since as the Owyhee Action Committee, followed some of the initial disagreements between the BLM and local cattleman in the 1940s and 1950s over disputed appropriate levels of livestock grazing (Hanley and Lucia 1999). The Owyhee Action Committee catalyzed at roughly the same time as other pockets of resistance to federal land control around the West, commonly known as the "Sagebrush Rebellion" (Cawley 1993; Yandle 1995). The movement emerged as "a protest against the growth of environmental regulations throughout the 1960s and 1970s" (Cawley 1993, p. ix) and in response to the Department of Interior's "moratorium on claiming desert land for farming purposes" (Marzulla 1996, p. 39).

In Idaho, and specifically within the Lower Snake District of the BLM, Owyhee respondents decried the changes in the agency during the 1980s and 1990s that reflected the national-level reorientation and corresponding policy reform. A ranching couple we

[6] The Federal Land Policy and Management Act of 1976 (FLPMA) and Public Range Improvement Act of 1978 (PRIA) were two additional pieces of legislation that increased the recognition given to ecological criteria in public land decision-making amidst the range policy reform era (Davis 1993).

interviewed described their views of some of these effects:

> The latest round of BLM changes that hurt us was in the Clinton era. Seemed like the whole Lower Snake District office changed then. They took on this notion that the 'interested public' has as much say as anyone. Well, I know it's public land and all, but it affects whether we can make a living. And just a few people up there can change it all. The District Manager shouldn't have the authority to just change the whole RMP…One of them just clearly didn't want the cows out here and said they're the cause of all the damage.

Related to this perspective, much of the blame for current problems and conflicts over public lands management in the Owyhee region is placed on the loss of longstanding relationships local cattleman shared with BLM personnel. One respondent expressed his views with the following:

> Way back in 1968, we had a controversial decision on some allotments over in the Vale [southeastern Oregon] area. The BLM had set up some pilot projects to make improvements, but then just ended up cutting the permits. Lots of these cases happened when the BLM changed its administration—that really hurt us. They just come in, have never seen the country, and they have to say 'it's bad off' so it appears better when they leave and get moved around the agency.

Hess (1992) used this same case to describe what he termed "welfare ranchers," or those who receive federal subsidies to the point that they become a disincentive to implement range improvements in a multiple-use market situation. In theory, the competition for such a market would lead to greater conservation efforts on the range, but Hess (1992, p. 166) argues that with subsidies, ranchers ignore the increasing disfavor of livestock grazing on public lands among the public. This debate raged again recently with the claim that "welfare ranchers" continue to come under fire from the small, but fierce "cattle-free movement" (Horning 2002; Lanner 2003; Marston 2002; Wuerthner and Matteson 2002).

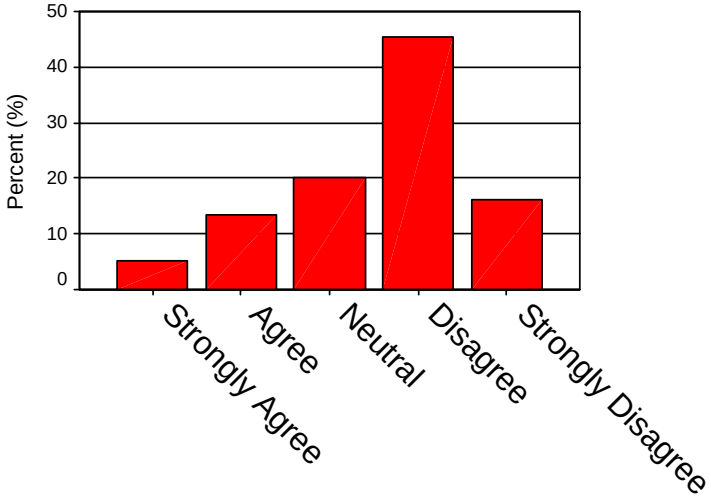
Similarly, a longtime resident of the Owyhee region noted how local ranchers

often characterize this pattern as related to the way they perceive the BLM uses scientific evidence:

> Some of us signed cooperative agreements, and they were working, but once we started making progress and seeing the land improve, the permits began to go by the wayside. I've got pictures I can show you how the deferred and rest-rotation systems was working. There's been times when the BLM says they're making scientific decisions, but they just haven't had the science to back it up.

These passages, combined with portrayals of the modern state of "welfare ranching" call into question the level of support for grazing on federal public lands. Results from the quantitative measure used to assess that issue is displayed below in Figure 9. Clearly, the

Figure 9. We need less livestock grazing on public lands



distribution of results indicates much stronger levels of disagreement than agreement with the statement "We need less livestock grazing on public lands." In fact, all three subgroups indicate disagreement with the statement across the four-county region, and not just within Owyhee County, where one might presume these results to be even more extreme. Even if a regional perspective to support livestock grazing in southwestern Idaho remains an anomaly among the changing tides of federal resource policy and

public attitudes, the cowboy ironically remains an American icon and idol associated with heroism, endurance, and independence (Starrs 1998).

Changes in policy and personnel also highlights the levels of distrust many ranchers espouse and have become accustomed to when asked about the BLM and the agency's basis for sound decision-making. A longtime rancher who moved to Owyhee County to ranch added this perspective:

> It's all relative; this District [Lower Snake] is way better than the one I dealt with before. But getting the BLM to be honest? They're just predisposed in the people they hire; before they even get their first paycheck, you know what their Science is going to be. Some of them are good people, and they try hard, but they just don't want thinkers working there. They just want tape recorders—people that will follow the rules and spit it back out.

Nelson (1995) concluded that much of what led public land permittees to develop attitudes like the above description stemmed from awkward and sometimes inconsistent juggling of both biological and now economic criteria for rangeland decision-making in the 1970s. Many of those interviewed made it clear they felt the agency had shifted too far in the direction of newer ecological and recreation-based emphases at the expense of common sense economic decisions to guide rangeland management of the federal lands they lease.

Recreation Impacts, Property Rights, and the Politics of Access

A number of distributional issues surround recreational use in Owyhee County. The major population center of Idaho lies in the Treasure Valley, north of Owyhee County. Ada and Canyon counties experienced over a 45 percent growth rate in population between 1990 and 2000 and currently account for a third of Idaho's total

population (432,345 residents in Canyon and Ada counties and 1,293,953 residents in the state). On a broad scale, recreational patterns of these residents have changed with this population growth. Individuals interviewed during the Social Assessment revealed a pattern of attempting to "escape" the sometimes over-crowded conditions in the "traditional" recreation areas to the north of Boise.

General Recreation Issues and Impacts. Many interviewees indicated a popular trend toward "desert" recreational activities and away from the forested mountains with lakes and streams. Horse enthusiasts, snowmobilers, ATV users and others expressed enthusiasm for recreational opportunities in Owyhee County. In addition to the spectacular aesthetics of the Owyhee landscapes, reasons cited included an escape from people and overcrowding, closer distances to their residences, open rangelands with numerous trails and seasonal differences which allowed use earlier in the spring and later in the fall and winter for the non-snow related activities. Snowmobile use is usually centered in the months of January through March, but is highly dependent upon the amount of snowfall in the peak use areas of Cow Creek, Silver City and others. Regardless of the season, however, such a notable increase in recreational usage across all respondents symbolized a widely held perception of the Owyhee region having "been discovered" by a multitude of outsiders.

As a result of this increased use of Owyhee County for recreational opportunities, the local government units face some distributional issues in terms of real and potential impacts on the land, the citizens of Owyhee County, and its increasing numbers of visitors. Interviews with elected officials of Owyhee County revealed that the 10,000+ residents of the county cannot afford to provide recreational related services to the

visitors without help from outside sources. Representatives from the Owyhee County Sheriff's office explained the constraints related to a relatively small population and tax base trying to support policing and search and rescue activities for a much larger populace. A law enforcement representative estimated that there were 4,000 out-of-county visitors to C.J. Strike Reservoir and 2,500 visitors to Silver City on Memorial Day of 2003. The sheriff's office emphasized concerns of being able to police these areas with a limited staff of approximately 13 FTE's (including the sheriff), especially considering the 7,643 square miles that constitute the county. Normal staffing for a rural police force of this kind is about 1.5 FTE's per 1,000 population.

Issues of backcountry (southern Owyhee County, away from the Snake River corridor) recreational use raised a number of other issues among county personnel. To help address issues of vandalism, trespass and lost or injured travelers, the sheriff's department has hired a back country patrol agent. Seasonal help is also hired in the peak recreational use seasons of Spring-Fall. One interviewee who has worked for over two decades in Owyhee County noted that there have been a total of less than 5 search and rescue efforts of Owyhee County residents during that period. The Owyhee backcountry is no less dangerous or treacherous for local residents, and perhaps even more so, for those who work on the land. However, the county estimates a ten-fold increase in recreational visitors in the last five years and an exponential increase in required search and rescue efforts. Thus, the bulk of the search and rescue efforts have been devoted to finding out-of-county residents that are lost, having mechanical problems and/or injured.

The scope of search and rescue usually varies with the recreational activity. For example, search and rescue for motorcycle and ATV users usually involve injuries; out-

of-county "tourists" or sightseers are usually stuck or having mechanical problems; those that frequently become lost are from the whole spectrum of recreational users. Increasing incidence of trespass and vandalism is also occurring in the backcountry areas of the county. Cow camps that were usually stocked and left open for travelers are now being locked and checked more frequently.

Search and rescue activities are conducted through the Patrol component of the Sheriff's budget, which amounted to $13,600 in FY 2003. By comparison, the total operating budget for the Owyhee County Sheriff's Department was about $900,000 in FY 2003. Search and Rescue supplies amounted to $1,000 of the $13,600 total. Quite obviously, one major search and rescue operation can consume the total search and rescue allotment for patrols. Traditionally, Owyhee County forms a posse to assist with search and rescue efforts. There are rational as well as cultural reasons behind that tradition. The following extensive passage illustrates a common local perspective on the interrelationships of these types of impacts, as well as the "local knowledge" tied to the landscape and more traditional lifestyles in the region:

> The conservationist groups tell us to get the cows off the land. Way I see it though, is that we're the caretakers of the land. I'm constantly picking up trash in the canyon. BLM or the County can't provide the manpower to do all I do. When those folks come down here and get lost, law enforcement comes to us. The community forms a posse, and by necessity, we become the search & rescue. Ranchers are the ones who know the backcountry. It'll bite you if you're not too careful. Those kids from Boise just swarm up here now, but if they want to protect the land they should keep the people out of here. It's people doing the damage, not the cows. The 150 years of ranching we've done here has made all these people want to save it as wilderness.

More recently, the county has begun attempts to address the financial shortfalls of these situations by billing those that have been searched for or rescued over the past few

years. Not unexpectedly, the problem has been actually collecting these nominal fees (approximately $500 per person), as only about half of those rescued have paid. One individual sensitive to these impacts summarized their point of view succinctly:

> It's not fair or reasonable to ask taxpayers to subsidize these mishaps. You can't expect little old ladies living on a limited income to be paying for these idiots to wreck their ATVs.

The state of Idaho does provide some financial assistance for rural counties to reimburse for volunteer related expenses. There is a program that allows for reimbursement (from state gas tax and vehicle registration sources) for expenses related to search and rescue up to a maximum of $4,000 per incident. The Sheriff has billed the Bureau of Land Management for backcountry patrols but there was no indication that funds had actually been transferred to the county. The County also recognizes its cooperative agreement with the BLM on patrols and procedures within the vast landscape. Recent attempts have also been made to start a process to deputize the BLM ranger, but to date, nothing has officially been finalized in this regard.

Many respondents also expressed concern with the effects of publicity about Owyhee County recreational opportunities on increasing use in the area. Both the contingent promoting recreation as well as those disgruntled with the trends in the Owyhee region, cited articles in local, regional and national media about Owyhee County. Those unhappy with the change described a lagged effect of increased recreational use and associated issues related to public safety and community impacts that usually followed. One individual even knew about an article, featuring the Owyhee Canyonlands, that recently appeared in a southern California newspaper. Local officials have also noticed correlations between that sort of high-profile publicity and visitors from

particular places (including the Boise metropolitan area) that require assistance over the course of the 6 weeks to 3 months following.

General Trends in Recreational Activities. As part of the quantitative assessment, respondents were asked whether they had participated in a variety of recreational activities within the past year in the four southwestern Idaho counties. Table 5 shows the results of these data. The table illustrates the data by subgroups in order to discern differences within the populations of the four-county area. Generally, the most frequent activities across the population included Fishing, Bird Watching, Hiking, and

Table 5. Recreational participation in southwestern Idaho in the past year.

Have you done the following recreational activity in the past year?	% YES		
	Owyhee	**Urban**	**Rural**
Fishing	60	63	52
Birding	58	51	47
Hiking	50	50	59
Other Types of Boating	43	50	48
Off-Road Vehicle Use	40	38	30
Big-Game Hunting	30	26	14
Ride Horses for Pleasure	30	34	17
Biking	26	34	51
Birdhunting	23	21	13
White-Water Rafting	9	16	21

Sample Frames:
Owyhee: Population in Owyhee County, ID proper as well as Jordan Valley, OR.
Urban: Urban and suburban areas of Elmore, Ada, and Canyon Counties, ID (including Mountain Home, Boise, Caldwell, Eagle, Kuna, Meridian, and Star.
Rural: Rural areas of Elmore, Ada, and Canyon Counties, ID (including Atlanta, Boise River, Glenns Ferry, Melba, Middleton, Parma, Prairie, Tipanuk, Wilder, and unincorporated areas).

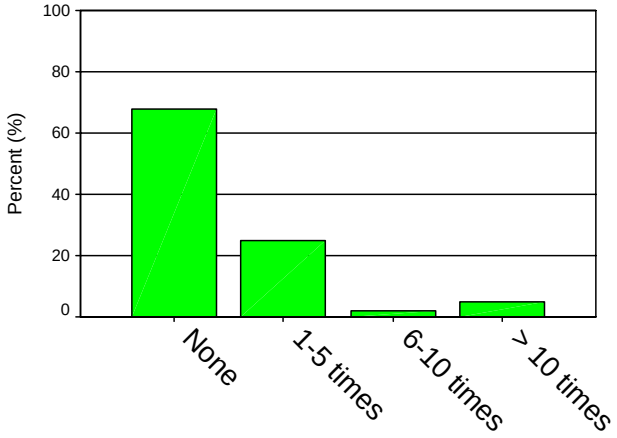
types of Boating other than white-water rafting. Comparatively, the Urban group tended to recreate more as bicyclists and white-water rafters than the Owyhee or Rural groups,

but did not participate much in Horseback Riding for pleasure, Bird Hunting, or Big Game Hunting as much. About 40% of Owyhee County residents used Off-Road Vehicles in the past year, a slightly higher average than among the Rural user group. The same pattern holds true for the measures on Bird Watching, Bird Hunting, and Big-Game Hunting.

Recreation and Access in The Snake River BOP Area. Recreation at the BOP National Conservation Area offers a case of significant recreational use of public land designated for special or particular use and access in the Owyhee region. The BOP—home to the densest concentration of nesting birds of prey in North America—is designated as a multiple use area with recreational activities ranging from camping, boating, and hiking, to wildlife viewing and horseback riding. In addition to recreation and wildlife management, the BOP also provides forage resources for livestock grazing in portions of the BOP as well a training area for use by the Idaho National Guard which conducts military exercises in the region (Bureau of Land Management 2003).

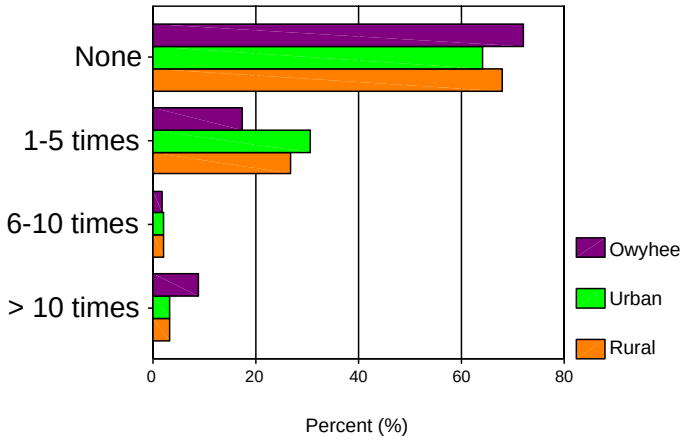
As a part of the quantitative assessment, we asked individuals about their usage patterns related to the BOP. Figures 10 - 11 display the number of times respondents visited the BOP Area last year for both the sample as a whole, as well as by subgroups. Among the overall sample (Figure 10), nearly three-quarters of all respondents did not visit the BOP last year, but over 20% of respondents did visit the BOP between one and five times, and less than 5% of respondents visited the BOP for each of the more frequent categories of six-to-ten times or more than ten times. Figure 11 displays the comparison between subgroups for visits to the BOP, and indicates a greater average frequency of visitation among the Urban group more than the Rural or Owyhee groups. For the range

Figure 10. How many times did you visit the Snake River Birds of Prey Area last year?



of visits between one and five, the Owyhee group ranked lowest of the three groups, but highest among the three groups for those having visited more than ten times in the last

Figure 11. In the past year, how many times did you visit the Birds of Prey Area?



year. This pattern indicates a more frequent average use among Owyhee region residents than Urban area residents *for those that do go to the BOP*.

Similarly, Figures 12 - 13 display whether any of the respondents' recreational activities were done in the BOP. For the sample as a whole shown in Figure 12, slightly under half (44%) of all respondents participated in recreational activities inside the BOP

Area. A few respondents indicated that they did not know whether their recreational activities were in the BOP Area or not. Figure 13 clearly shows that from this sample, Owyhee residents have a higher rate of recreational use of the BOP area than either the Urban or Rural groups.

Figure 12. Were any of your recreational activities done in the Birds of Prey Area?

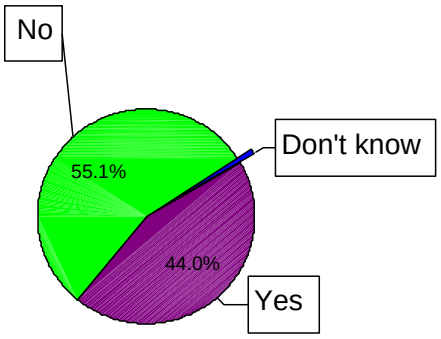
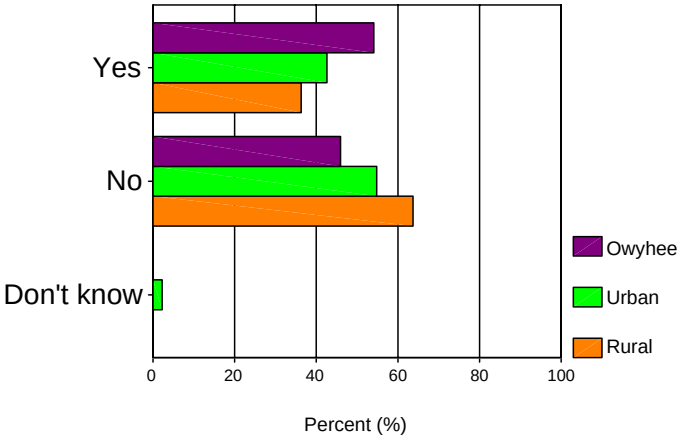


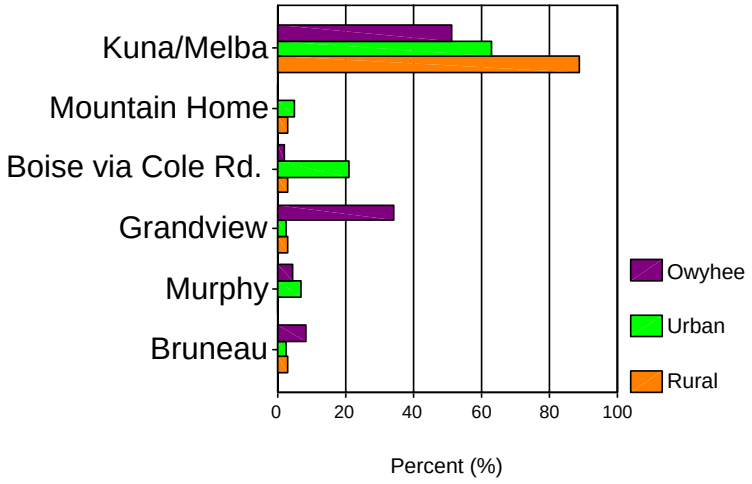
Figure 13. Were any of your recreational activities done in the Birds of Prey Area?



With regard to access of BOP Area entry and exit, the Kuna/Melba access route is far and away the preferred choice among all three of the groups. Figures 14 - 15 display

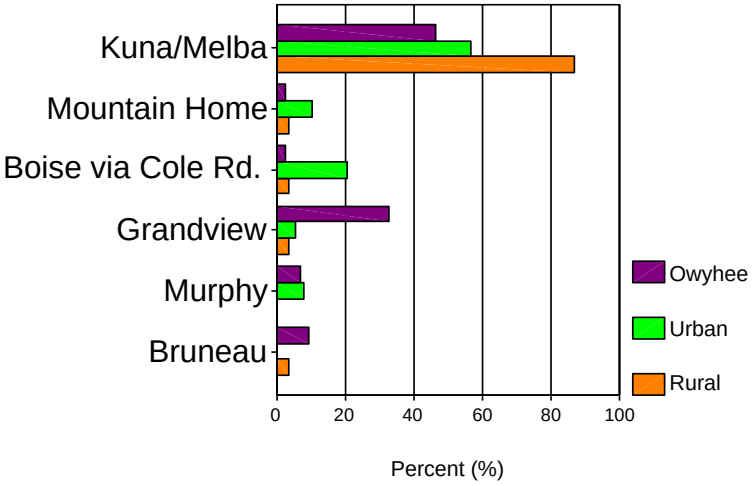
results for the BOP entry and exit patterns for the sample by comparisons of subgroups. In the case of Owyhee residents, the Grandview access route is also heavily used with

Figure 14. Where did you most often enter the Birds of Prey Area?



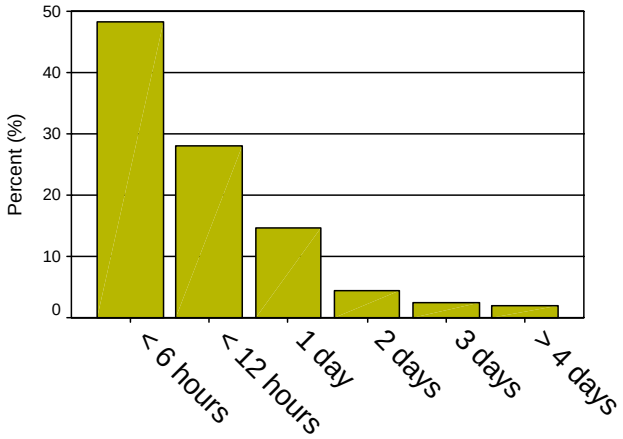
over one-third of respondents from that group indicating where they most often enter and exit the BOP. For the Urban group, about one-fifth of respondents also indicate they most often enter and exit from the Cole Rd. route to and from Boise.

Figure 15. Where did you most often exit the Birds of Prey Area?



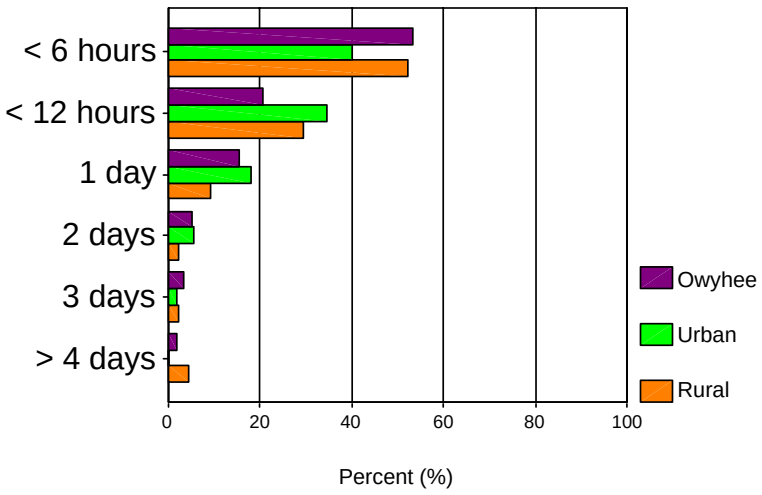
Related, we also asked respondents how long they spent on their last trip to the BOP Area. Figures 16 - 17 display an interesting pattern between the overall sample results and the subgroup results for duration of their visits. For the sample as a whole,

Figure 16. How long was your last trip to the Birds of Prey Area?



nearly half of all respondents indicated their last visit to the BOP area was for less than six hours. The subgroup comparisons show that only 40% of Urban visitors stayed for

Figure 17. How long was your last trip to the Birds of Prey Area?



this short of a time, while over 50% of both the Owyhee and Rural visitor groups stayed for less than six hours. The Urban group ranked highest among the three groups for the 'more than 12 hours' and '1 day' categories, as shown in Figure 17. The heavily skewed data charts indicate recreation use in the BOP is much more oriented to day-use than multi-day use across each of the three groups.

The next series of Figures below represents results from several measures used in the quantitative assessment related to perceptions of the military use in the BOP. The Idaho Army National Guard currently conducts some military training within the BOP Area, and the Mountain Home Air Force Base is a substantial military operation located just north of the C.J. Strike Reservoir toward the southeastern end of the BOP Area. Nokkentved (2001) also provided an account of the Air Force's controversial proposals to expand the Saylor Creek Bombing Range by up to almost 1.4 million acres almost completely overlapping a large portion of Owyhee County.[7]

The first question asked respondents how many times they saw the military in the BOP in the past year. Figures 18 - 19 display the results for the overall sample and comparisons of the three groups in response to this question. Nearly three-quarters of all respondents did not see the military at all in the BOP, nearly 20% saw the military between one and five times, and less than 10% saw the military more than ten times in the past year. Within the subgroup comparisons, the Urban visitors to the BOP ranked highest for the category of having seen the military one-to-five times in the BOP during the past year, while the Owyhee group ranked highest for the category of having seen the military more than ten times in the past year in the BOP Area.

[7] The current Saylor Creek Bombing Range lies approximately 25 miles southeast of the C.J. Strike Reservoir (Nokkentved 2001).

Figure 18. In the past year, how many times did you see the military in the Birds of Prey Area?

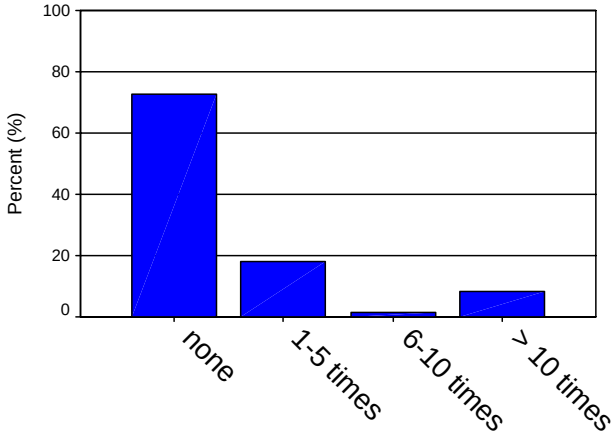
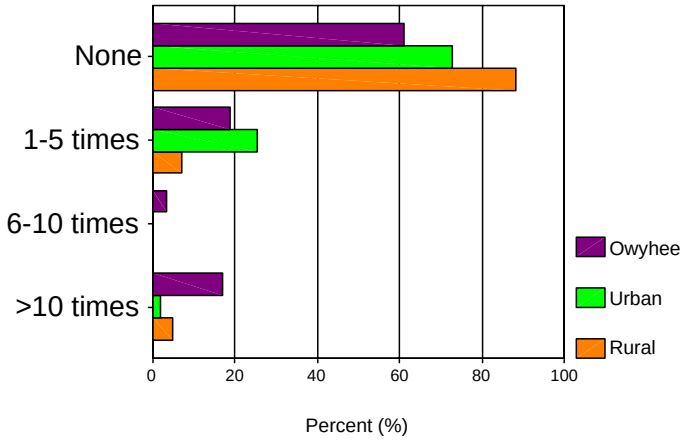


Figure 19. In the past year, how many times did you see the military in the Birds of Prey Area?



Figures 20 - 21 show a consistent pattern of results that respondents overall, as well as within each of the three subgroups, indicate more agreement than disagreement with the military using the BOP Area. This overall pattern is slightly different when we distinguish the three subgroups, with the Urban group having a more normally distributed response (showing less agreement with the military presence) distribution than either the Owyhee or Rural groups; the latter two groups indicated stronger agreement with the military presence in the BOP Area.

Figure 20. Do you agree or disagree with the military using the Birds of Prey Area?

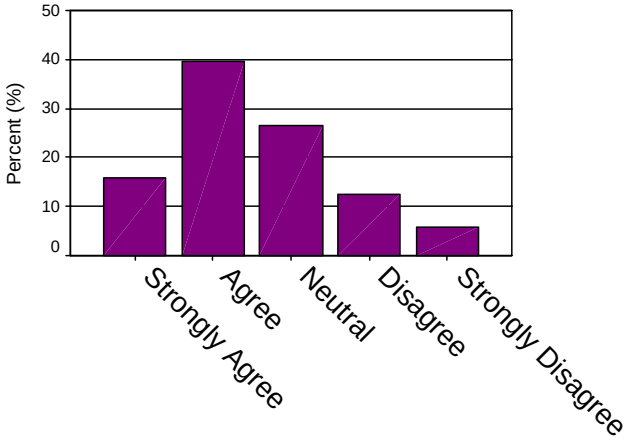
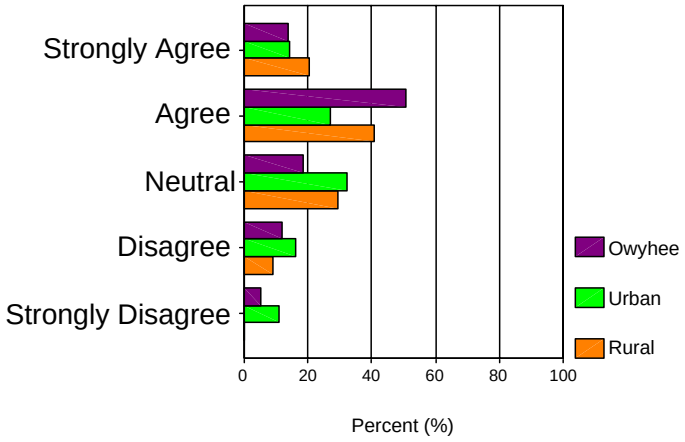


Figure 21. Do you agree with the military using the Birds of Prey Area?



Finally, we asked respondents whether they agreed or disagreed with both military *and* recreational use in the BOP Area. Figures 22 - 23 display results for these responses. The overall pattern is similar to the previous question, with a tendency among the general population to agree with both military and recreational use in the BOP Area. Within the 'Strongly Agree' category, the Rural group ranked highest in the frequency distribution, and the Owyhee group had the highest frequency within the 'Agree' category.

Figure 22. Do you agree with military and recreational usage in the Birds of Prey Area?

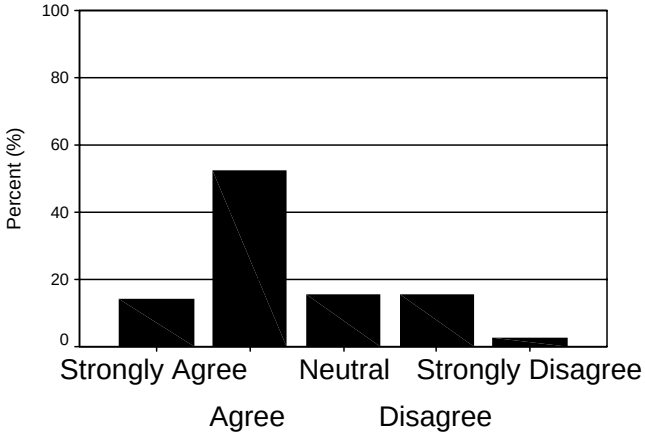
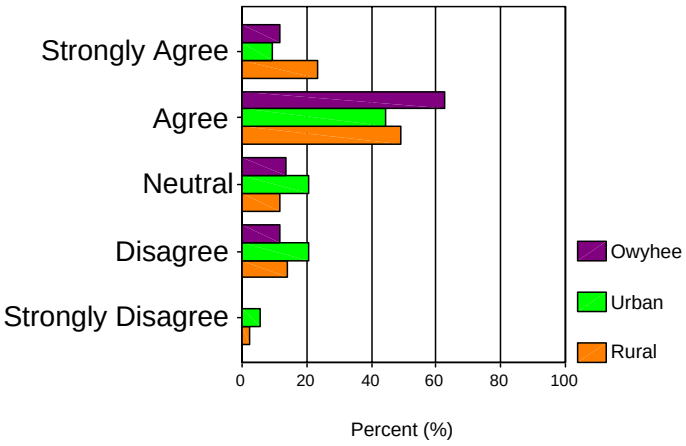


Figure 23. Do you agree with military & recreation use in the Birds of Prey Area?



In general, the patterns of these results reflect that the Snake River Birds of Prey National Conservation Area receives a wide mix of visitors from this four-county region. However, visitors from the metropolitan area north of the site constitute a significant percentage of all visitors and are likely to increase as the urban population continues to grow. Most of these visitors tend to use the BOP Area for day-use once or twice a year

and overwhelmingly take the entry and exit route via Kuna/Melba. Results from the same population appear to show substantial support for continuation of livestock grazing and military use in this region.

Environmental Impacts

Stewardship and Perception. One of the more poignant subjects for respondents to reflect on during interviews centered on the topic of environmental impact. Long criticized as those responsible for rangeland degradation, ranchers interviewed for this project as well as many others in the region we spoke with feel such a view mischaracterizes their identity, behavior, and livelihood. Many in this region, as explained by this individual, conceive of themselves as the stewards of the land:

> This isn't really an easy life you know? Sometimes we struggle with it, but we like the life. Mostly, we just do our best to try to take care of the resource. Those environmentalists say they have to 'protect' this from us! But we're the ones that have used it all these years and they don't give us any credit for it being the 'pristine' place they want to lock away. They just look at this as an all or nothing thing, but we're doing what's right for the land.

Others who had similar perspectives explained their points in a way that they felt the constraint to fit within regulatory frameworks that change with science and policy. Numerous informants emphasized the economic relationship of range stewardship and their own lives to illustrate:

> Well, on the BLM permits, of course we're limited to their regulations, but if you're in this for the long haul—and I don't know any ranchers who aren't working on this as *at least* a 2nd generation outfit—you're not going to treat it bad anyway. Why would we do that? It's our own livelihood. We know we can't survive if we try to run on too little grass because the cows can't survive on that. Their argument that way just doesn't make any sense.

Another county resident whose friend's ranch put it more bluntly:

> Most of 'em are lifers, these guys. We're all environmentalists when you get down to it even though they wouldn't want me to say that. Hell, it's a renewable resource. It's grass. It'll come back, if you eat it. There's times you regulate being out there, and times you have to get off the range. We know that. That's who we are and what we do.

And still others found the need to illustrate this perspective using examples of previous rangeland improvement efforts that obviously vary with interpretation of costs and benefits:

> We initiated one of the first coordinated range plans down here. There was all this emphasis in the new policy, but nothing had been studied for long enough yet to know whether it was working or not, according to the plans on their books. But we didn't try to tell 'em how to fix their experiments. We knew what would work and what wouldn't with those fences because we've had four generations learning about this, and we may not have it all written down in a science book, but I can tell what's going to happen just as good as they can, or better.

Connected vs. Disconnected Interests. On a general level, those interviewed for this project who were not affiliated with the ranching sector of the local communities can be subdivided into two analytical groups: *connected interests* and *disconnected interests*. The former of these—connected interests—are generally Owyhee County residents and either haves ties to the people and places of this region and/or take a particular interest to use the Owyhee resources for recreational interests, including motorized and non-motorized uses. The latter group—disconnected interests—consist of individuals and organizations based outside the County but acting with the intent to influence land use and policy at the local level.

A significant split generally exists between these two types of interests with regard to perspectives on responsibility for environmental impacts. A pattern exists among the connected interests to focus on attempts to cooperate and negotiate workable

agreements with private landowners such as ranchers. The connected interests, by and large, do not emphasize perceived problems with the landscape, but alternatively, attempt to suggest ways that multiple uses could and should still function. In contrast, the disconnected interests tend to present more polarized and oppositionist viewpoints, resulting in less cooperative outlooks about whether ranching and recreation can coexist. The disconnected interests often place categorical and direct blame on ranchers and their livestock for problems of resource health.

First, to convey the compiled perspective of the connected interests, several passages exemplify how these groups and individuals aim to remain connected to the communities potentially impacted by their recreation:

> I've recreated in the Owyhees all my life. That's where I went on my first hunt. We try to work with the ranchers on agreements about where we can go and where we shouldn't. Take Upper Reynolds Creek for instance. We had a protocol agreement with the ranchers there that may still work out, but now other things are affecting this. The last BLM draft told people it'd be against the law to go off road with the ATVs now. But lots of people don't know that, or don't respect it and have jeopardized our relationship to the landowners.

And the following passage comes from a group of representatives interviewed from an Urban/Suburban-based non-motorized recreational interest group:

> The terrain in the Owyhees is spectacular. It's unmatched for being close to here. It's very accessible and isn't overcrowded yet because it's never been publicized much. The ranchers are few and far between. They'd prefer to just have responsible people out on the land. They're a conduit for communication and helping create an atmosphere for responsible recreation. They shouldn't have to put up with the bad apples and the renegades, but there are always a few of those that spoil it for everyone. It's just a few people that leave all the trash.

From the disconnected interests, views focusing primarily on the resources rather than human-landscape relationships dominate their perspectives. As a moderate example,

The Nature Conservancy (TNC) is undertaking an Owyhee Weed Project as a rangeland conservation effort (The Nature Conservancy 2002). Although not comprehensive or representative of the entire plan, the following offers some perspective on this organizational point of view regarding their weed management objectives:

> *Do we have strong views on the issues*? Yes, though others will have to help validate the urgency and scale of the threat;…*Do we want to persuade others*? Yes! This is the number one threat to this landscape and we believe the issue is urgent. Without TNC's advocacy, we will likely lose this battle…*Do our constituents see us as a legitimate advocate*? More so all the time. TNC is perhaps the lone conservation group that has pushed weeds to the front of our agenda, given it more media attention than any other issue for the chapter over the last year (TNC 2002, p.6).

An often more radical point of view comes forth from other disconnected interests with strong preservation agendas less community-oriented than TNC. For instance, The Committee for the Idaho High Desert (CIHD) webpage suggests that grazing and corporate grazing:

> Causes pernicious slow, steady harm to land and water; Results in weeds, polluted water, soil erosion. End result is long-term loss of native plants and wildlife, loss of biodiversity (CIHD 2003).

The well-known activist John Marvel holds special irreverent status for many in Owyhee County because of their perception of his personal attack on the state of the land and lifestyles in the Owyhee region, especially with respect to grazing livestock on public lands. Precisely because the lawsuits and actions Marvel has brought to bear on the Owyhee communities are legal, the local residents perceive and feel the impacts directly and substantively. While CIHD aims to hold local people accountable for perceived degradation of a public resource, local residents are affronted at the thought of being the perpetrators of environmental impact to resources they view as their own homes and businesses.

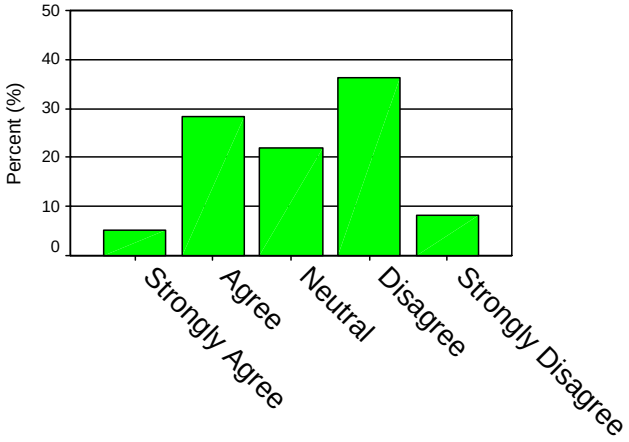
The Increase & Impact of Motorized Recreation. A number of others interviewed consistently emphasized recreational impacts from ATV (all-terrain vehicles) and OHV (off-highway vehicles) as the greatest potential impact and area of concern facing the Owyhee region and landscape. This point of view was nearly universal across all informants. Many respondents also included snowmobiles in this category as the winter-season equivalent, however, snowmobile advocates and enthusiasts argued their environmental impacts were not the same or of the magnitude as with ATVs and motocross bikes because the snowpack buffers the contact with the resources.

While observations in the communities and remote areas of the county provided evidence that a wide spectrum of residents and types of users ride ATVs—including rural and urban, young and old,—a significant contrast exists among local residents' impressions of which ATV users are the culprits for damage on the landscape that has escalated dramatically over the past five years: *the outsiders*. Implicit in many respondents' remarks were the assumptions or characterizations that outsiders were urbanites from north of the river, as if to indicate the river demarcated a symbolic point of intrusion on the landscape that is home for Owyhee residents. These notions are summarized in the following individual's description of the problem:

> We have too many ATVs coming out here from the city. These types of users are the ones damaging the resources. For instance, out at C.J. Strike [Reservoir], I've seen them just go down the hills all over; if the agency or county can't enforce the regulations, they just go anywhere. There's lots of abuses all over the county with circles and hill-climbing. Some organized events have good cooperation to reduce the impact, but as soon as no one's looking, they ride the range just like the cattle.

Interestingly, the quantitative assessment measure used to gauge public levels of interest in this activity yielded mixed results. As shown in Figure 24 a slightly higher proportion

Figure 24. We need more off-road vehicle recreation opportunities on public lands



of respondents indicated at least some level of disagreement with the statement 'We need more off-road vehicle recreation opportunities on public lands' which may indicate the pervasive point of view about the increased impact to the landscape from ATV use. While a full third of respondents did indicate agreement with the notion of more recreational opportunities, this distribution is more evenly distributed than a number of other measures in the assessment, showing greater variation within the overall sample.

Interestingly, data gathered by the Idaho Department of Parks and Recreation (IDPR) on ATV and Snowmobile registration confirms a substantial increase in the number of units, which likely implies increased recreational use. Tables 6 and 7 below document the numbers and percent-change of registrations for Motorbike/ATV and snowmobiles in this region from 1998-2002. The IDPR requires registration of these vehicles. Although IDPR reports these numbers are not absolute, they also estimate a 50% compliance rate for Motorbike/ATV registration (Cook 2003), and much higher for snowmobiles. In essence, these data indicate that the *percentage growth* registration of motorized recreational vehicles in each of these four counties has increased dramatically,

Table 6. Southwest Idaho Motorbike/ATV Registrations By County, 1998-2002.

COUNTY	1998 Registrations	1999 Registrations	2000 Registrations	2001 Registrations	2002 Registrations	1998-2002 % Change
Ada	7,701	9,093	10,397	11,889	13,646	77.20%
Canyon	3,225	3,799	4,473	5,499	6,651	106.20%
Elmore	585	749	872	1,024	1,216	107.90%
Owyhee	241	282	338	393	513	112.90%
Total	**11,752**	**13,923**	**16,080**	**18,805**	**22,026**	**87.40%**

Source: **Cook (2003).**

Table 7. Southwest Idaho Snowmobile Registration By County, 1998-2002.

COUNTY	1998 Registrations	1999 Registrations	2000 Registrations	2001 Registrations	2002 Registrations	1998-2002 % Change
Ada	5,167	5,488	5,690	6,013	6,141	18.90%
Canyon	1,618	1,761	1,814	1,842	2,125	31.30%
Elmore	411	432	480	509	525	27.70%
Owyhee	84	93	102	127	140	66.70%
Total	**7,280**	**7,774**	**8,086**	**8,491**	**8,931**	**22.70%**

Source: **Cook (2003).**

but that the actual numbers of increase within Ada County especially, but also Canyon County, are staggering to consider in such a short time frame. One can only assume that there is a correlated increase in the amount of use of these machines on public lands in southwestern Idaho, but there are no use-data to support this assumption except anecdotal observations.

The above results related to ATV use from the quantitative assessment, combined with the Idaho Department of Parks and Recreation data on ATV registration, suggest that the emphases and multiple viewpoints expressed by many of those interviewed are grounded empirically. However, when we consider data from Figure 9 (p. 21) and Figure 24 (p. 42), we observe somewhat divergent trends that many local residents of this

four-county region perceive less impact from livestock grazing than from ATV/OHV use on public lands. The vast increase in registration and use of the latter confirms this perspective.

Community Involvement with Resource Planning

Many who live in the Owyhee County area share a strong sense of independence and attachment related to the remote and often unforgiving landscape. Given that previous research has documented the strong sense of place often articulated by rural community residents in a variety of settings throughout the West (see Keiter 1998), as well as other locales (see Vitek and Jackson 1996), this raises the question of whether the Owyhee sense of independence and attachment is unique? If not, is it part of a significant pattern reflecting community-level impacts and change within the region? Although answers to these questions could vary according to one's theoretical perspective, this analytical section provides evidence to suggest that, *at least with respect to resource management and planning*, several conditions and characteristics of the Owyhee communities and residents co-exist to create *the perception of a unique landscape and community situation*.

From local perspectives, the important question and essential threat to social structures in the Owyhee region is the control over resource-planning and decision-making. This sense of control appears to manifest itself in at least two primary ways—both of which affect the opportunities and quality of life of local people in this region. First, the negotiation of federal decisions and policy of public land-use remains a set of contested issues often on the minds and part of the daily activities of local people.

Second, in addition to the long-term and more familiar context of the first point (federal land-use policy), many perceive the intrusion of special interests, newcomers, and non-local user groups as the futuristic picture of resource control and planning. Coupled with this is the strong sense of community and attachment associated with most Owyhee County communities, as documented by Harp and Rimbey (1999)

No History, No Future?

The open space and range resources so plentiful in the Owyhee region have always served as a natural asset. The grass, soil, water, and wildlife have enabled life and livelihood in this landscape, in spite of the often harsh level of conditions. For settlers as well as current residents, the historical characterization of the Owyhee landscape as foreboding mistakenly defines life as unmanageable or a struggle with questionable return value. During the recent 125th Anniversary meeting of the Owyhee Cattleman's Association held annually in Silver City, a commemorative oral history presentation emphasized the local perspective of life in the Owyhee region:

> People often say we live without a history and we have no future here. The first cattle migration opened up this country in 1843. The legacy of the Owyhees is continued by everyone here today. In the early days, they used to say you had to have enough cattle to be respectable, and enough sheep to make a living after the hard winter of [18]'88 when we lost a lot of cattle and the Irish, Scottish, and Basque migrated here with all the sheep. Generations later, we really came of age—after the railroad, the [Taylor] Grazing Act, and the age of the acronym[8]—to help get the Sagebrush Rebellion started. When the newspapers used to report about that, they'd list those represented or in attendance as New Mexico, Wyoming, Nevada, and Owyhee County! Some things haven't changed out here much: what affects one of us affects us all, and we're all just trying to make a living around here (Hanley 2003).

[8] By the "age of the acronym", the presenter referred to the era of change in the BLM and federal land management during the 1970s and 1980s discussed above on pp. 17 - 22.

This passage illustrates much about the color and character of life in the Owyhee region by illustrating a will to battle the odds, confront setback, and persevere. These qualities, more than most, define the sense of community commonly described in the area.

The above description also highlights the importance of how integral the resource planning process is to the very nature and essence of community in this place. Resource management decisions regardless of who makes them, affect local patterns and ways of doing things. This direct significance, however, is precisely why it matters a great deal to local people who makes resource management decisions. In many cases, it makes sense to people in local communities to have the chance to make the decisions of local relevance (Snow 1997). In other words, those policies, regulations, or management schemes applicable to a region or locality arguably affect that regional or local population more, as well as more directly, than others not local to the place. This is the reason and basis for local people in rural communities surrounded by public lands often asserting their claims to management, "ownership," and/or rights to the resources. Because it affects them substantively, is part of the local landscape, and requires management, it logically follows those who live there could provide the most relevant knowledge for decision capacities. The Experimental Stewardship Program, mandated under Section 12 of the Public Rangeland Improvement Act (PRIA, 43 USC 1901, PL 95-514) is an example of an attempt from a previous era to involve local people in federal land planning at the local level (U.S. Congress 1978).

The perspective described here, is not an academic argument for or against the idea of local control (Krannich and Smith 1998). Our point is merely to stress the source of such perspectives is not wholly political, nor is it a bias. Ironically in fact, the

perspective of local control should seem quite familiar, albeit a different structure and context, to many who do not live proximate to large tracts of public land. For those who live in and around primarily privately owned resources, their existence and regulatory structure is quite locally-controlled relative to communities surrounded by public lands. With some comparative perspective in mind then, it might seem quite normal for those in the Owyhee region, as well as many western community settings, to define the needs and wants of their community in the context of control of their own surroundings. The idea of local control, in other words, is not an aberration among remote rural westerners, often labeled as radical for those positions.

Many who live and work in the Owyhee region see their existence there not so much of a struggle as a delicate balance between political decision-making, the weather, economic markets at multiple levels, and increasingly, the whims of the recreationists and other non-local visitors who "leave the occasional gate open, or vandalize remote cow camps." One individual made it known during his interview that he'd lost 6 head of cattle that spring as a result a single gate left open by an unknown, but likely visitor. Who can replace those animals as an investment? Who is responsible for the loss? What is a land-owner to do given appropriate fencing, etc., but one's crop walks off due to carelessness from what, in some instances at least, amounts to an absentee owner dropping by for a visit.

Most individuals we talked with who owned or worked the land were particularly careful to *not overgeneralize* with respect to impacts from visitors. Despite the fact that these impacts produce anxiety and a significant feeling of lost control among the local population, almost universally the "problem" visitors are considered the minority, "a few

bad apples," or described as the ones "you know you'll always have a few of them in any crowd." Impacts attributed to these types of individuals range from open gates, to vandalism, to garbage left behind. One interviewee relayed this story:

> Well, we always used to leave the cow camps open you know. They'd just be unlocked in case someone was up there in a snowstorm or had some emergency—you know the weather that happens in this kind of country out here. The honest folks would just get in there and leave it that way. Then last winter, we never were up there because that year we didn't have any need to and found out this spring they'd taken the whole kitchen. People come out here and just have this perception that it's ALL public land, which it's not, and that they can do whatever they want on public land. So, they do whatever they want, wherever they want.

This type of impact, small as it may seem in isolation of its context and other related incidents, characterizes much of how local people in the Owyhee region feel a loss of control manifests within their communities and their own lives. They work within a system of federal, state, and local laws, not all of which are clear to all the passersby that seek freedom and a lack of constraint to explore the wild. Another individual put all these issues in the context of his relationship with the BLM in order to provide an illustration of how the effects translate into practical impacts:

> There's a tremendous increase in how many people are coming out here. I'd say it's doubled in the past couple years. Most of them are pleasant people and get along well with others. Some of them even understand this concept that we're trying to make a living off this land. Usually, they shut the gates and contact you if they find one of your animals with a broken leg. But twice, just this year, I've had gates left open, and cows get out. I could be just sittin' here doing nothing and not even know, just depending on whether they understand how the ranch works or not. But how could they? The BLM is understanding about the impacts from open-gates, but no one can change the impacts once the damage is done or our cows are gone.

Many of the private landowners in Owyhee County that lease public land also consider the resource "theirs" with respect to stewardship as well as 'rights' to decision-

making and management. This perspective has several important aspects. First, local concepts of stewardship about the land and surrounding environment are both individualized and collective. By this, we mean land owners and operators, or lessees as the case may be, approach the land around them that they use with experiential and local knowledge about how to take care of it. In the Owyhee region, however, group work—for branding, rounding up livestock, search & rescue, etc.—still dominates the minds of many people such that they perceive a level of local oversight and 'peer review' helps ensure good practices on the land.

A related second point is that fending for oneself and for family is not only accepted and taken-for-granted within Owyhee County's local culture, but also remains a source of significant pride and respect. Those interviewed often emphasized tradition and heritage to make the point of how this relates to autonomy, free-will, and decision-making:

> If you choose this life, it's obviously not to make a lot of money. And you kind of know it, that except some help from your neighbors, you're pretty much on your own out here. Three generations before us in my family have run cattle here. They did a decent job and we're just trying to keep that up.

This point relates to control and involvement with resource planning because, here, the land is part of the community in a way that local people understand how land-management decisions affect their long-term viability. In some respects, the communities of this region existed before the regulatory structure that now governs their lives. They are a proud people to transcend the latter by virtue of their history.

The third and final point with regard to stewardship, "rights" to the land, and the relationship with involvement in resource planning results from the ambiguity of

language and law that changes and gets continually reinterpreted over time. Several ranchers noted their 'preference rights' on certain public lands established in the 1950s from which the concept of split estates developed. This in turn led to a local understanding that the federal government owns what is below ground and the operator owns what is above ground. Similarly, the recent *Hage v. United States* legal battle has been used to bring attention to contested questions of ownership and property rights related to some public lands in Owyhee County. The Hage case put the question of 'what property rights do ranchers own on their grazing allotments?' before the US Court of Federal Claims. The following excerpt from the ruling judge's opinion described this issue of 'takings' with the following:

> 'The Government cannot deny citizens access to their vested water rights without providing a way for them to divert that water to another beneficial purpose if one exists. The Government cannot cancel a grazing permit and then prohibit the plaintiffs from accessing the water to redirect it to another place of valid beneficial use. The plaintiffs have a right to go onto the land and divert the water.' (Bedford, 2002, p. 7).

Although this case is no doubt significant with regard to 'takings', the court also ruled against Hage's surface claims.[9]

A relatively recent debate about public lands within Owyhee County coalesced local efforts in a contemporary case of maintaining or losing control over rights and uses associated with public land status. In November 2000, on the heels of President Clinton's twelve-fold expansion of the acreage of Idaho's only National Monument—Craters of the Moon—a coalition of conservation groups from southern Idaho made a final push to lobby the President for an additional national monument designation (*Capital Press*

[9] The County also references another legal case of Cliff Gardner in Nye County in which the Ninth Circuit Court of Appeals ruled that the United States does own the land (Owyhee County 2003, p. 1).

2000). One report (conducted by the Owyhee-Bruneau Canyonlands Coalition who supported the designation) cited 80% of Idahoans supported the monument (Nokkentved 2000).

Had the Order gone forward, up to 2.7 million acres, all within and constituting over one-half of Owyhee County in the Owyhee-Bruneau canyonlands area, could have been designated as a national monument with restrictive uses similar to the Grand Staircase-Escalante National Monument that still catalyzes criticism and resentment among local communities in southern Utah (Nijhuis 2003). This case, often cited as a high point in public involvement and activism among people from and within Owyhee County, catalyzed the largely motorized-vehicle use special interest group known as 'People for the Owyhees'. The debate also sparked the Owyhee County Commission to formulate "the Owyhee Initiative" detailed in the next section due to the current, innovative, and substantive expression of public lands policy and management it seeks to pioneer.

The Owyhee Initiative

The Frontier of Collaboration? Two years ago, the Owyhee County Commission brought a vision of change into action for how a local collaborative working group could implement decision-making regarding federal lands surrounding their communities. That effort is the Owyhee Initiative (OI), currently peaking in its effort to find balance and compromise among a set of diverse constituent representatives. Although the OI has its naysayers, hardly anyone could disagree that it has offered a new model and forum in hope of resolving long-term conflict over public lands management.

In a similar vein to collaborative groups forming in different regions of the West to address natural resources management conflicts (Wondolleck and Yaffee 2000), the Owyhee County Commission proactively convened the OI to:

> Develop and implement a landscape-scale program in Owyhee County that preserves the natural processes that create and maintain a functioning, unfragmented landscape supporting and sustaining a flourishing community of human, plant, and animal life, that provides for economic stability by preserving livestock grazing as an economically viable use, and that provides for the protection of cultural resources.

The working group now includes representatives from the following entities and organizations: the US Air Force; The Nature Conservancy; Idaho Conservation League; Sierra Club; The Wilderness Society; Owyhee Borderlands Trust; Owyhee Cattleman's Association; People for the Owyhees; Idaho Outfitters and Guides Association; Owyhee County Commissioners; Owyhee Soil Conservation District; staff from Senator Mike Crapo's office (ID) and the BLM offices; and chairperson, Fred Grant (Beeson 2003).

Much of the actual substantive work of the Initiative has revolved around a proposal to accomplish two interlinked and complimentary objectives:

1) to negotiate a fixed number of acres and particular areas, long under restriction as Wilderness Study Areas (WSAs) within the BLM management, that would be promptly and permanently designated as wilderness with standard restrictions; and

2) to 'release' the remaining WSAs as such and allow multiple use in these areas while protecting ranching interests from repeated lawsuits and arbitrary grazing restrictions they currently feel threatened by within the current management system.

The final number of acres decided upon as wilderness is not yet set; however, the total could range up to 450,000 (Grant 2003).

In addition to the initial resolve of the contested wilderness lands in Owyhee County, the OI would also establish a Scientific Review Team whereby the collaborative

process could provide objective, independent scientific review of proposed BLM decisions under guidelines set by representatives from the Initiative. If the BLM chooses not to follow the advisory decision of the scientific review panel, the agency must explain why (Grant 2003). Additionally, the OI would also establish more managed control of public lands uses via the following: a research center; enforced management of OHV/ATVs; additional funding for local law enforcement; funding for search and rescue; an ongoing Work Group as a Board of Directors for the OI; and protection of grazing in designated wilderness.

The list of "improvements" noted above would substantially address many of the issues already outlined in this report as concerns among the elected officials, residents, and special interests of the Owyhee region. Based on that accomplishment alone, the OI is a concerted effort that deserves reckoning. Whether or not we label the OI as unique, innovative, or successful pales in comparison to the energy and symbolic interaction it has created for, within, and about the Owyhee region. The collaboration and compromise, albeit not perfect, static, or finally resolved in full, indicates the magnitude of cooperation that this landscape commands. The remainder of this section details different interpretations and descriptions of the opportunities and costs associated with the OI from local perspectives.

Staying in Business, or Selling Out? Many of those still ranching or working on the land in Owyhee County have worried a great deal about the OI. Some long-time residents of the County that have lived through different management regimes within the BLM and seen changes come and go are not yet sold on the idea that the collaboration will hold together long-term:

> Well, that Owyhee Initiative…..Seems like some good things could come of it. They're saying to turn several hundred thousand acres to wilderness. But these collaborations have never worked here in the past. Whenever we compromise, it's always *our* compromise in *our* territory. In some ways, this puts all the Ag industry secondary to people's other interests. Who's going to grow their food?

Others emphasize the pattern many who work with livestock on public lands feel continues to plague them from conservation or environmental interests. Describing the Initiative, one who stands to be directly affected had this to say:

> It is better than what we were going to get, but I still feel it is leaning toward the left wingers. They are trying too hard to appease them I think. They are still going to make it tough for the cattleman to operate with full numbers it looks to me. It is going to be too easy for someone to holler and get the rights cut down some more, which in order to get everything set up, that is what they do (Beeson, 2003, p.8).

On the other end of the spectrum, some landowners and livestock operators are more optimistic. If implemented, the Initiative would free ranchers' abilities to make range improvements many believe are essential to a healthy range ecosystem. At a recent address to a group of cattleman, the chair of the OI emphasized this point:

> The Board of Commissioners presented testimony in Congress within the past year pointing out how the 'no-action agreement' of wilderness study areas crippled the ranchers plagued with them in their allotments. The draft proposal now would free those study areas for proper grazing management and for multiple use (Grant 2003).

Similarly, many OI representatives have found each other not to be the enemies they thought they were:

> When we started meeting, there was a lot of tension—and there still is some times because we just don't agree on everything. But now, we've gotten to know one another a bit more, and in a lot of cases, we realize that what we want is a lot of the same things. Basically, we all want to take care of the land.

Others have been highly critical of some of the process and results of the OI. For

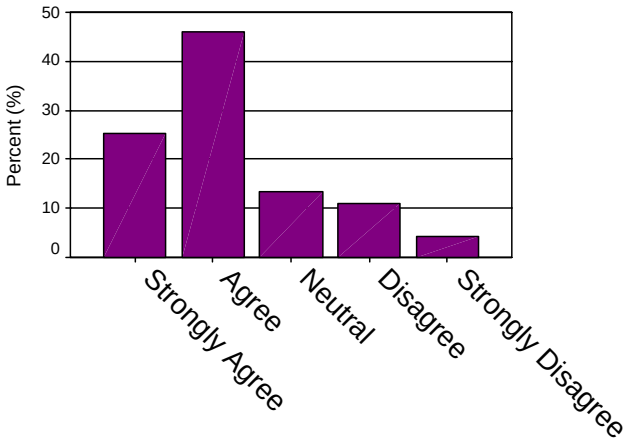
instance, this excerpt from a recent letter to the editor in the local newspaper emphasizes the complex social and community issues associated with collaborative working groups:

> It concerns me that decisions about the future of the Owyhees will be made without the knowledge and consent of the majority of the residents of this county and the state. Yes, the Owyhee Initiative Workgroup meetings are public….but has anyone ever seen a public notice for the meetings? A process that is going to dictate use in the Owyhees should invite public comment. I fear that many users are going to wake up one day to find locked gates and 'keep out' signs on public land they they have responsibly used for generations, and wonder how this could have happened without their knowledge.

This passage raises an interesting set of questions about representation and decision-making. Assuming "consensus" as he has noted before, Senator Mike Crapo (ID) intends to sponsor Congressional legislation that would implement the Owyhee Initiative, with that process beginning as early as this fall. However, some we interviewed said it remains unclear whether 'consensus' will be considered full-consensus only, or if 'most' representatives and broad support will suffice.

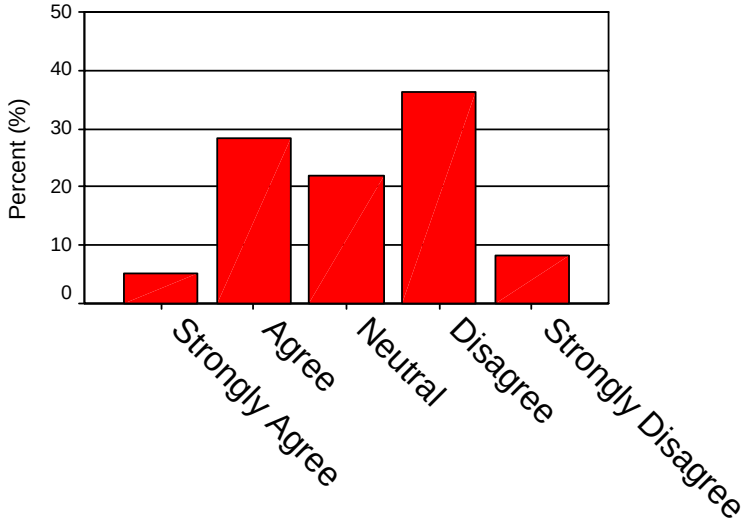
Figure 25 illustrates results from another measure asked of respondents in the quantitative assessment about whether Idaho already has enough legally-designated

Figure 25. We have enough legally-designated wilderness areas in Idaho



wilderness areas. By the distribution of response in Figure 25, a substantial proportion of respondents indicated at least some level of agreement, implying reservation about additional designation. This result suggests support for wilderness among the population in the southwestern corner of Idaho is mixed at best. In a related measure, Figure 26 shows a similar pattern, although not quite as strong, with respect to levels of agreement about wildlife protection in Idaho.

Figure 26. We have enough wildlife protection in Idaho



Symbolically, the OI has promoted the standard to full-consensus. However, recent indicators suggest one group in particular—motorized recreation (represented by the People for the Owyhees)—is not in agreement with the current form of the proposal. The representative for that coalition organization (originally formed to oppose Clinton's proposal for a national monument in Owyhee County) has been the solitary 'no vote' on recent opinions taken from the Workgroup which intended to produce a final proposal during the late summer this year. Several people we interviewed indicated they feel

members of the community have been betrayed because they were led to think the process would only operate on full-consensus, but now appears to still be moving forward despite the lack of alliance between all the represented groups. One individual, who is not an OI representative, but sympathizes with the dissenting vote, argued that local constituents are giving too much to the other interests represented on the Committee:

> The Initiative is rubbing some people the wrong way. It's becoming a big problem. The Enviro's are just getting their way, but we're getting blamed for 'not cooperating'. We just don't believe in Wilderness, but it looks like people are going to just take that, which is disappointing.

In contrast, others have publicly stated the amount of effort and cooperation exemplified by how well the process *has held together* for two years now is indicative of substantial and unprecedented progress, translating to less conflict and better policy and management by asserting local control. Most agree that in the end, the success of the Owyhee Initiative will rest on the ability of the County Commission and involved constituents to follow through, as they perceive this phase is when other similar efforts have fallen apart.

Changing Perceptions of Community and the Landscape

Although the Owyhee Initiative highlights a high-profile example of an era of change from "how things have always been," the Initiative is also a symptom of a larger pattern of change occurring on an everyday level within the region. The collaborative Initiative effort symbolizes the rise and fall of new and old social relationships. Simultaneously, the effort has catalyzed the need for new and ongoing discussion about the future and sustainability of community for this region as the numbers of in-migrants continue to increase.

Ranch Consolidation, Community Subdivision

Within discussions about changes happening within the region regarding both the surrounding natural environment as well as the communities, interviewees described two divergent yet related patterns. The first trend focused on changes within ranching communities and families, and largely emphasized the pattern of consolidation some see occurring, but many more fear is on the horizon at a new level. The second trend focused on the combination of changes associated with land development, residential growth, and affects to the longstanding social structures many find so familiar.

For most interviewed in the Owyhee region, describing changes to ranches, farms, or other similar uses of the land did not come easy. In fact, such change often stimulated emotions of sadness, despair, and/or frustration. Many face the difficult question of how to reconcile the expectations that honest hard work should be sufficient to make a living with many of the external forces such as outside interest groups and federal land management policies perceived to directly or indirectly constrain their opportunities.

Along these lines, the emotions associated with a threat to the loss of one's livelihood induce social-psychological impacts. For some these transitions may occur in a manner that evolves into positive opportunities. One former farmer described his personal change in the context of the trend happening within the community area:

> Farming is going corporate—just getting bigger and bigger. You have to get huge or get out. Staying in farming, if you can, is just survival and I didn't want to do that. I want a return on my investment so I don't have to be frustrated with my quality of life. Some people love farming so much they don't want to do anything else, no matter how bad it pays. Some are also scared because they don't think they *could* do anything else. To those kinds of farmers, the land is not just dirt—it's alive; the farm is their friend.

> When I sold my farm, I wanted people to know I was just making a change and accepting a new challenge. Even though we have all this growth in the County, our main economic base is still agriculture here. Times are tough with the prices where they are, so I'm not sure it could get any worse.

Equally true, however, seems to be the case where change may not be welcome or desired. For a number of ranchers in particular, changes in the land available for them to use has manifested itself in at least two distinct ways. Some interviewed referred to the first of these as a change or "loss" of permits they or their families have traditionally held on BLM lands. By change or "loss" here, we mean either non-renewal of a grazing permit once held, or in many cases, a new restriction to an old permit that has a significant effect on the local operator and how livestock are managed in a given area. A few cases of this type of loss are well-known in this community area and are the source of worry and concern at a collective level because of how many perceive the pattern to illustrate a changing orientation within the BLM as the primary management agency.

The second distinct way ranchers have experienced change is via land consolidation. While it may not suit this phenomenon to call it a trend or pattern pervasive in the local area, many fear it could become so as evidenced by the decline of numbers of farms and ranches as well as increases in the average size of farms and ranches in recent decades. Many in the communities in Owyhee County discussed several cases of ranch consolidation they had experienced or perhaps heard about from neighbors, friends, and family. One rancher put his observations bluntly:

> We keep just having to buy more and more as we go. We can't keep doing that forever. We've got to be able to still pay the bills on our debt load, so we need to get more land, so we can run more cows. It's simple—you have to have 'X' amount of cows to pay your bills, and you know what that number is. With the changes the BLM has been making on us, we have to get more land to stay at that same number of head of

> cattle. They also change the grazing periods on us by makin' 'em shorter, so that can mean you have to get even more land still to keep the same AUM level you're at with your ranch. Then, once we get all this land, we can't keep it all up, and it's getting harder and harder to find decent help for that. So it just keeps getting bigger and bigger, and it feels like it's going to reach a point where we can't manage it anymore. Then what do we do?

This passage represents a sentiment of confusion and frustration about the future of the ranching industry. Many local operators perceive the potential need for consolidation as unsustainable and ultimately, a threat to their livelihood. Meanwhile, individuals in the Owyhee region continue to adapt in order to maintain their operations, but often describe the collective plight of the industry in negative and pessimistic, if not bitter, terms.

It should be noted that the trend to fewer ranches and running more livestock on more land, is not something that is specific to only Owyhee County, Idaho. USDA figures reveal the trend is true in Idaho, other western states, as well as the nation overall. The number of people involved in agriculture is shrinking and the number of livestock and, and the amount of land per farm is increasing. Precisely because many are aware of these consolidation trends in other regions that have large allotments of public lands, the anxiety from anticipation of whether they have to follow the same path becomes a measurable impact in the present.

Perhaps unrelated to the consolidation of large landholdings described above, an equally notable trend occurring across the region is ex-urban development. Compared with the likes of Las Vegas, NV, Denver, CO, or Phoenix, AZ (Howe et al. 1997; Jenkins 2003; Vesbach 2003), one hesitates to label the Boise metropolitan area and its outstretched ex-urban fingers now surfacing on the northern rim of Owyhee County as sprawl (Knight et al. 2002; Rome 2001). However, growth and development are relative

to time, space, and context, such that the *rate of change* may make as much impact as the material changes occurring on a landscape (Krannich and Greider 1984; Wilkinson et al. 1982). And by all accounts, the rate of change in northern Owyhee County has escalated dramatically in the past five years.

Although different interviewees described the pattern in different ways, a constant message within all the interviews emphasized the perceived impacts associated with residential growth to the communities. In addition, many described this pattern in conjunction with and related to the widespread increase of those coming to the Owyhee region to recreate. The perception exists within the Owyhee region, that with the increase in recreation on the part of urban outsiders, those outsiders adopt the notion to relocate to the area in order to benefit from the quality of life in a rural or ex-urban environment. One local elected official expounded upon this point of view:

> This rapid growth has become a huge issue for our County. We're starting to see subdivisions in our communities that were once considered rural and far away from the city. Some are coming out here to get out of the city, but there's lots of newcomers that locate here because it's less expensive and more affordable as an all-around cost-of-living. We have all kinds of opportunities for people to volunteer and get involved in things, but many of them seem to have individualistic patterns, and because so many of them commute to work in Boise, lots of them *don't have time to get involved* in the community they now live in.

Long-term residents of the region that were interviewed often stressed how these immigration patterns continue to affect social structures in the local communities:

> This growth hasn't even gotten out of control yet, but the County is already having trouble meeting all the demands for services like garbage pickup, resources at the schools, and emergency needs. You see the change too, because you used to know all the kids at the school, and their families. But now, there are more and more people in town, at the schools, the grocery, the post office and other places—just folks that I've never even seen before. It's hard for some of them to integrate here. Without roots here, it can be hard to become part of the social fabric.

Local officials, such as the County Commission, have begun addressing this rapid change with Planning & Zoning efforts, which many accept as needed, but others resist in principle. One long-term resident of Owyhee County explained how this effort has caused some local friction:

> I'd say 80% of the people around here don't even want planning and zoning because they think it's going to infringe on their personal property rights. Maybe they'll change their minds when all of a sudden they're surrounded by an unplanned subdivision that doesn't have any regulations. We can't afford that kind of thing anyway. We've got to protect our land base because a third of our tax base is from ranching here. We can't just ignore that or let it wither away. But the people are just going to keep moving out here too. We can't stop that train, so we've got to figure out a way to control it.

By focusing on the dilemmas of controlling rapid residential in-migration, local interviewees also emphasized the expectation that their surrounding environment would suffer as a result of the combined increase in development and recreation (Theobald et al. 1997). Huntsinger (2002, p 84) summarized well the situation many perceive as Owyhee County's present and future:

> As a landscape becomes more residential and less rural, conflicts with neighbors may add to the costs and frustrations with ranching. Trespass by people and pets, complaints about agricultural activities, negative car/animal interactions—all can impinge on the rancher's livelihood. Urbanization makes ranching more difficult, and it also affects the outlook of ranchers (*footnoting Ellickson 1991 in original*).

Social Impacts to Family, Community, and Identity

The changes and difficult situations discussed above cumulatively add to significant effects to family, community, and identity. While some ecocentric groups outwardly define their primary interests and goals as the natural non-human world, ignoring our own role(s), need(s), and place on the landscapes seems misguided if not naïve.

Arguments aside about whether we have to choose between cows or condominiums, the human race continues to do its share of damage to our own nest (Knight 2002). Ironically, in the Owyhee region, extreme traditional and conservative values coexist with the action and intent to set aside, in designated Wilderness, segments of resources that intuitively impact who they are and what makes up their daily lives. Regardless of the motivations, something undeniably personal is at stake and under negotiation in the Owyhees. This final section of the report outlines a set of impacts to the human communities and well-being in the Owyhee region deserving consideration from all.

Family is an entity amidst all the change in the Owyhee region that has not escaped impact. As in many rural areas, tensions exist in these communities between grandparents, parents, and *their* children about whether the latter can and will take over the family ranch or farm. At one community celebration, our interview questions sparked a significant, and apparently ongoing, debate between these three generations of one family, with the eldest scolding the two younger generations for not having changed careers and lifestyles *away from* ranching because of how tough it has become to start or maintain a ranch within the regulations and boundaries of the law. The younger generations' decisions to continue ranching, however, occurs in the context of the strength of those values within the local community to preserve this way of life as a healthy pattern for humans and the range. This local community intuitively understands the limits in the economics of ranching.

Another family situation exposed during the interviews illustrated how the chronic negative stress suffered by the parents from changes in public land grazing permits, litigation, and the looming threat that the economic tide may turn on their

operation has negatively affected their children's outlook on the ranch as an option for *their* future. One of the parents expressed these points:

> Our ranch and this place you see here is not just our business—it's our home and our collective heart too. But our kids grew up in this house, and even though they've helped us everyday, they had to grow up listening to all this anger and frustration about who we are and what we do—sometimes it was us being upset with one another, which was not good for them to see, you know, as their own parents, but usually it was both of us just being so strung out by the agency [BLM] for the past fifteen years. I mean, THAT has been their life—almost the entirety of it—seeing us fighting with the BLM and almost always losing. What would you think if that's all you saw and heard everyday? You wouldn't want to take over the family ranch either. Even though they have some of their own cows, it's just for cash; they don't want to do this for a living. They want out of here. It hurts us, but we can't hardly blame them.

Emotionally, this type of effect within the family and community was often difficult for interviewees to explain because it causes embarrassment and shame for many to highlight the negativity, fatalism, and feeling of defeat. The seriousness and magnitude of the feelings, however, helped some individuals overcome the reservation to disclose these impacts.

Another level of impact related to the stress of these changes occurs when individuals or families have to confront the bottom line of their operation's economics. But true to what seems to matter most in the Owyhee region, this rancher explained to me that it's not really a question of money, even when things have become unsustaining:

> I remember in '94 when we went up to Babbitt's land management hearings in Boise. They held that meeting on the 50th anniversary of the invasion of Normandy, which some of our community's ancestors here died in that battle. They died in vain so that we could have our freedom here. Have a chance to make something of our lives, even though it's kind of tough in Owyhee County. But this isn't really about dollars and cents anymore. We've gone past the point of good business practice and knowing when to quit. Our cause and reason to be here is much greater than the business end of our operation. I have an obligation to my

> children and grandkids to leave them something good, to leave them the land in better shape, *so that I can pass it on*. It seems odd that I know now I'll go broke doing this because I've worked hard all my life out here, trying to make an honest living. I may go broke. But that doesn't upset me—it's about exposing my kids to a set of values that go beyond their needs and wants.

As this account illustrates, the ties and challenges between the social community and the landscape run deep. In that way, which extends beyond economic rationality perhaps, local attitudes and behavior illustrate a pattern some outsiders seem to mischaracterize as a lack of stewardship and a lack of willingness to change. The change that would be required would be to leave behind one's culture, one's livelihood, and one's identity.

Others we interviewed alluded to some of these same types of effects, but explained them more in the context of community morale and a loss of cohesion. This individual despairingly offered the following:

> This community continues to get more and more alienated. If the ranchers here aren't making any money—and they're not—then no one is. The grocery store, gas station, and restaurant here—they're all hurting. Cows are our main crop, and prices have been down. I've seen some have to get out of the business and I don't like what I see that it's doing to them. They've turned angry and don't know how to deal with it. Ranch communities are at risk for becoming dysfunctional places now where we turn on our own just like in the ghettos. I see more abuse, more alcoholism—all those same things that happened to the forest-dependent communities. We're not the healthy community we were 20 years ago. You can't see a future for children here. We're hanging on now, but our industry is hurting and some don't even see how they'll be able to retire after a full life of hard work.

As a final illustration, we return to the Owyhee Initiative as a symbol of the crossroads facing the communities and natural resources in the Owyhee region. Much of the time and energy of the community, as a whole, has gone into this effort, and to date not every individual is yet satisfied. In fact, in the middle of this past summer, our observations

indicate an increase of private and informal discussions to negotiate the home stretch of the proposal occurred and increased the anxiety of some anticipating its resolution and how that may or may not carve out the next chapter of effects in local lives as described above. At the recent Owyhee Cattleman's Association meeting in Silver City, one longtime rancher in Owyhee County summarized his thoughts while the community listened:

> I've heard two of my friends, who have long opposed Wilderness, stand here today and support what's going on around us [the Owyhee Initiative]. If those two guys even support *one acre* of Wilderness, there's got to be something right going on with that Owyhee Initiative. Maybe all those people we're fighting aren't the same enemies we thought they were. We're still not going to agree on *everything;* but if *not* the Initiative, then *WHAT*? We're changing fast. We can't sustain this fight for another 11 years. Our community needs this now. It's strange for me to say that, but maybe this is what we ought to do.

Even though the Initiative symbolizes substantial change that makes many uncomfortable −even some of its supporters−it appears to be a forward-looking community-based solution and a marked improvement over the conflict so many long to get away from.

SUMMARY AND CONCLUSION

The Land-use and Management Plan (Owyhee County 2003, p. 1) published by the County summarizes the essence of what the place and people of the Owyhee region are about:

> The custom and culture of the County includes the determination of its people. Life was never easy for the settlers of the County. This is a land in which nature plays the upper hand. Water is scarce and access is difficult. The settling developers of this land worked hard to establish their livelihood, and today's residents work hard to maintain their livelihood. The settling developers were diligent in pursuing legal protection of their property rights. Today's residents continue with that

diligence.

Owyhee's roots that helped seed the Sagebrush Rebellion are alive, well, and responsive to the actions of 'outsiders' perceived to threaten the local patterns and ways of life. Long-term Owyhee residents aim to be involved and will likely be creative to ensure that possibility.

New recreational scars on the landscape from a largely affluent and predominantly in-migrating urban population have begun to change the social structure of Owyhee County. Clashes over the old and the new will remain, but high levels of visitation have already motivated changes in local perceptions in everything from planning and zoning, to the local economic base, to how well you can depend on your neighbors. This worries long-term residents because they know those patterns can often make the difference for people in a constrained rural environment.

Owyhee residents should not be categorically characterized as resistant to change. Rather, they will stand up and assert their rights, values, and beliefs no matter who they perceive as the foe. One interviewee highlighted the paradoxical irony that much of the recent conflict faced in this region has had for the community:

> Our young people have a center, a resourcefulness, and a perseverance you don't see in every community. Producing food is a fundamentally good thing to do. It used to pull us together and add to our cohesion. This fight—some days I don't know who we're fighting: Marvel, the BLM, or each other—but this fight has also helped unify this community against who or whatever it is. And that's a good thing, because without it, we never would have been unified. We just needed a common enemy. And to be truthful, in each person's plight in dealing with this, there's worry about whether it'll all go bad, but we've got to try do something. Ranch people believe that the future will work out ok. We've been at this a long time.

As evidenced here, change rarely comes easy. But as the Owyhee region continues to

experience change at a rapid rate, even it's vast landscape may begin to feel constrained to those who like to wander or work within it. It's people, no doubt, will find a way to carry on.

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Appendix A-3

Ranch Level Economic Impacts of Public Land Grazing

Policy Alternatives in the Bruneau Resource Area of Owyhee

County, Idaho

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BACKGROUND

A socio-economic study of Owyhee County was completed in 1998-1999 (Rimbey, et al. 1999; Harp and Rimbey 1999; Darden, et al. 1999), and information derived in that analysis was used in the Owyhee Resource Area Draft Resource Management Plan (ORMP). The ranch-level analysis of the earlier study answered many questions about the economic structure of Owyhee County ranches, potential short-run adjustments resulting from changing public land forage allocations and linkages to rural communities and the regional economy.

Ranchers who were surveyed in the prior study provided information on adjustments they would make if forage allocations on Bureau of Land Management (BLM) rangelands were reduced. They indicated that their planning horizon for these adjustments was short-term in nature and that they would do everything they could to maintain their existing herd. Depending upon when the reductions occurred during the year, the ranchers identified alternatives for maintaining herd size and remaining in business: purchase (or not sell) additional hay (to replace forage in winter, early spring or late fall), and look for private pasture and rangeland leases (summer forage). The last alternative mentioned by ranchers was the reduction in the number of cattle they would run on their ranches. This was primarily due to leveraged ownership of Owyhee County ranches. Most ranches cannot operate without loans from financial institutions for variable expenses. In addition, the cyclic nature of cattle prices implies ties to financial institutions for equipment and land loans.

The purpose of this study was to build on the earlier report and provide a long-

term economic analysis of ranch-level impacts of alternative public land forage allocations. In addition, the economic models used in this analysis update the 1998 study and provide a method of removing the potential bias of relying on ranchers to divulge ranch management adjustments that may or may not be economically motivated. This segment should also provide a "check" against what ranchers said they would do in terms of adjustments from the earlier study.

Ranch budgets presented in the earlier study were updated and used to develop the economic models presented here. Researchers from western land grant universities and Western Regional Research Project W192 (Rural Communities and Public Lands in the West: Impacts and Alternatives) cooperatively developed the ranch-level economic models used in this assessment. Earlier versions of these economic models were used to assess the economic impact of sage grouse management alternatives (Torell, et al. 2002).

METHODS AND PROCEDURES

The economic situation, typical resource base, production rates and practices were defined for two model ranches in Owyhee County, Idaho. The data was used to build multi-period linear programming (LP) models to evaluate how optimal (profit maximizing) production strategies would change as permitted grazing use on public lands changed. The specific ranches considered included a medium-size ranch (528 Animal Units, AU) in the Marsing area and a larger ranch (735 AU) in the Bruneau area. These representative ranches were selected because livestock cost and return estimates and policy impact models were developed for these areas through the regional research project W192. Since the purpose of this project was to specify the economic impacts of policy changes in the Bruneau Resource Area, we used the Marsing and Bruneau ranch

models in estimating the impacts. Models are also available for the Three Creek and Jordan Valley area. The Jordan Valley model was used to estimate the economic impacts of alternative sage grouse management strategies (Torell, et al. 2002).

The economic analysis was completed in four steps. First, ranch-level data defining typical production practices, rates and costs were gathered from group interviews with area ranchers (Rimbey, et al. 1999). Second, multi-period linear programming models were developed to depict the production processes of each ranch. Published cost and return studies that provided baseline cost data were for the 1998 production years (Rimbey, et al. 1998; Rimbey, et al. 2000). All prices were adjusted to real 1997 levels, although cyclic variation in cattle prices was allowed in the model. Third, an initial baseline optimization was estimated for each model ranch. The final step was to estimate additional optimizations that evaluated profit maximizing production strategies under different public land policy scenarios (25, 50 and 100% reduction in BLM forage). The impact of changes in land use policies was estimated to be the difference in optimal herd size, forage use and economic returns from the baseline solution to the impact solutions.

Each representative ranch had different amounts and types of resources available for grazing, and different options for replacing public land forage. Substitute forages and strategies considered to be available as BLM allotment grazing capacity was reduced included leasing outside private forage, converting native meadow hayland to irrigated pasture, extending the hay feeding period, purchasing additional hay and reducing the size of the cow herd. Alternative sources of forage were considered to be available during selected seasons for both the base run and for additional policy impact runs.

Reductions to the BLM allotment were phased in over five years in equal

increments. The first 20 percent of the reduction was considered to occur during the second year, with the remainder taking place in years three through six. Results reported for the optimal number of BLM AUMs started with the sixth year when the full reduction had been implemented.

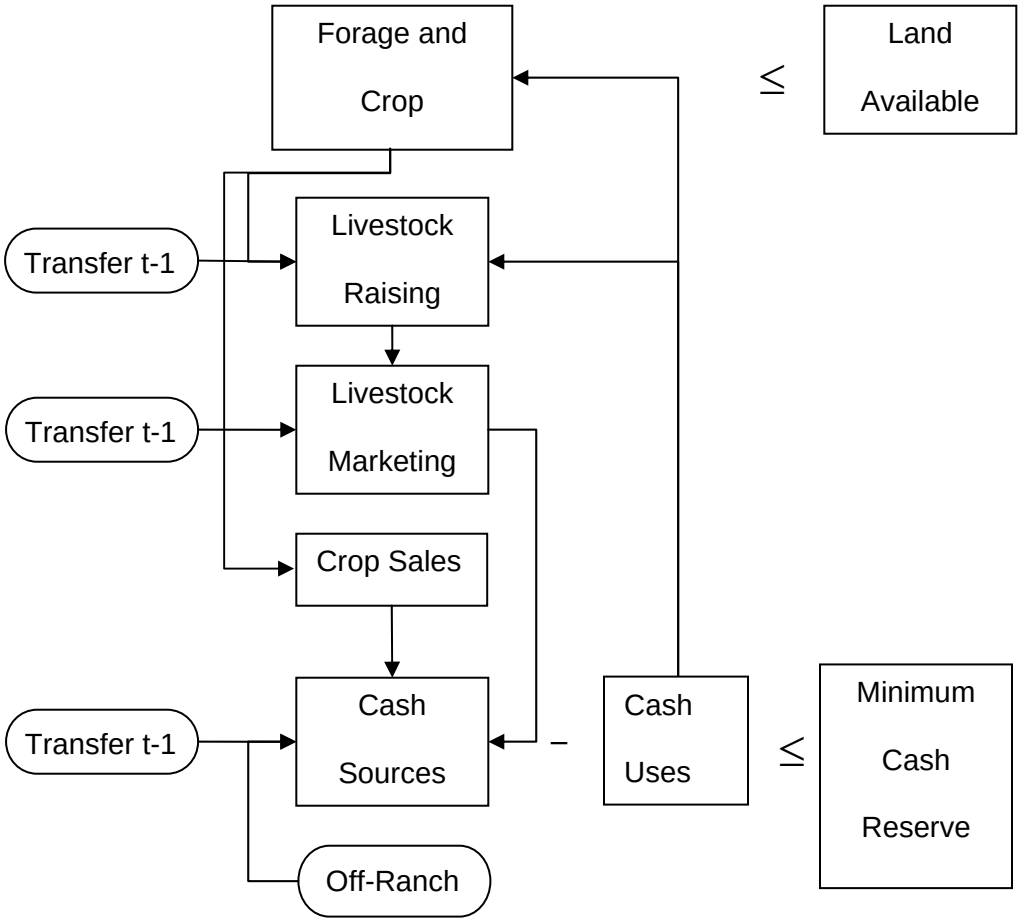
Linear Programming Model Description

The policy impact models used in this analysis were developed by researchers in five states and were structured for western livestock ranches that rely on both private and public lands for grazing capacity. Crop raising alternatives were included in the models, but only as these crops provided forage, crop residue and feed for livestock production.

The net present value (NPV) of discounted net annual returns (profit or gross margin) was maximized over the T-year planning horizon subject to linear constraints that define resource limitations and resource transfers between years. Seasonal forage supply and demand was explicitly considered through six distinct seasons, which varied by the ranch considered.

Figure 1 illustrates the general structure of the constraint set for the LP model during a given year t. The equations are discussed working from top to bottom in the figure:

A ranch has a given set of cropland and rangeland available for harvest and grazing. Each type of land is restricted at a level at or below some available upper limit, and that is the first block of equations in the model. Also considered in this block is recognition that certain forages will be restricted in use to only selected seasons, because of regulation, physical availability or production limitations.



The next block of equations is included to transfer forage and crop production to livestock raising activities and crop selling activities. Within the livestock raising block are equations that define the required ratio between different animal classes. As two examples, the number of bulls on each ranch is based on a specified bull-to-cow ratio, and the specified calf crop defines the number of young animals available for sale and herd replacement.

Seasonal forage requirements for each animal class were calculated based on defined animal unit equivalencies (Table 1) and the length of each grazing season. Equations are also included that transfer brood animals from the previous year. Typical

animal death loss and the relative number of different animal classes are considered at the time of the transfer.

The livestock-marketing block includes equations to transfer between livestock raising and livestock selling activities. Yearling animals are carried over from year t-1 to year t and this is another inter-year linkage in the model.

Table 1. Animal unit equivalences used to calculate seasonal forage requirements.

Animal Class	Animal Unit Equivalency (AUE)
Brood Cows	1.00
Bulls	1.25
Horses	1.25
Weaned calves	0.50
Yearlings	0.75

The next equations define the cash flow constraint. Crop and livestock sales generate income and are a source of cash. Livestock, crop and forage raising activities use cash. The cash constraint requires that a cash reserve be maintained to cover variable production expenses, fixed ranch expenses, family living expenses, loan obligations and an annual cash residual. Excess cash at year t-1 can be transferred to year t, and it is implicitly assumed that any excess cash from a “good” year will be transferred to cover expenses and cash shortfalls in future years. Other sources of cash include off-ranch income and annual borrowing. Any funds borrowed must be repaid during the next year. Borrowing is not allowed during the last year and all debt obligations must be paid in full by the end of the T-year planning horizon. While numerous equations are included to define the production and economic processes of the representative ranch, forage resources and available cash ultimately determine the level of production possibilities.

Torell, et al. (2001), and numerous other studies reviewed in that paper,

highlighted that western ranchers do not have profit maximization as their primary goal; rather, they ranch for the way of life and the desirable attributes of rural living. As noted by Van Tassell and Richardson (1998), western public land ranchers will, for the most part, continue to ranch until forced to do something else. How, then, is using profit maximization as our model objective justified? First, the utility maximization model subscribed to by ranchers is impossible to measure and quantify. Individual ranchers and families have differing levels of commitment to the ranching lifestyle, and decreasing annual ranch income through altered land use policies can be expected to dampen enthusiasm for ranching to varying degrees. It is not possible to accurately predict the number of ranchers a particular policy will force out of business (Torell, et al. 2001).

The profit-maximizing objective provides a measurable criterion against which to judge policy changes. It is tempered by considering only investment alternatives related to ranching and livestock production, and by including cash flow restrictions. The LP model determines the optimal production strategy with the current policy prescription and how optimal production changes with a new land use policy. The implicit assumption is that ranch families will continue to consider only the limited investment opportunities associated with the ranch property, they prefer more money to less, and they will continue to ranch until cash flow restrictions can no longer be met and they are forced from the business.

Representative Ranches

Table 2 summarizes characteristics and resources for each of the representative ranches.

Table 2. Characteristics and resources of the representative ranches.

	Number of Units		Objective Function Cost ($/unit)	
	Marsing	Bruneau	Marsing	Bruneau
Land resources owned				
Alfalfa hayland, acres				
Native meadow hayland, acres	340	240	50.00	50.00
Convert meadowland to pasture, acres[a]	340	240	13.75	13.75
Deeded rangeland, AUMs	1,406	720	3.25	3.25
Land resources leased or purchased[b]				
State trust land, AUMs	379	400	10.64	10.64
BLM, AUMs	2,965	4,977	7.19	7.19
USFS, AUMs				
Private leased land, AUMs	500	500	13.25	13.25
Purchase alfalfa hay, tons	Unlimited		100.00	85.00
Purchase meadow hay, tons	Unlimited		70.00	70.00
Sell alfalfa hay, tons	All available			
Sell meadow hay, tons	All available		55.00	55.00
Livestock resources[c]				
Animal units yearlong, AUY	528	735		
Brood cows, head	325	422	48.79	16.08
Replacement heifers, head	106	120	48.79	16.08
Bulls, head	24	22		
Horses, head	12	12		
Miscellaneous income/expenses				
Fixed ranch expenses, $			35,126	29,227
Family living allowance, $			24,000	24,000
Off-ranch annual income, $			10,000	10,000
Required minimum cash reserve, $			500	500
Efficiency measures[d]				
Calf Crop				
(Calves born as % of Jan. 1 cow inventory), %	88	86		
Calf death loss, %	4	3		
Cow death loss, %	2	2		
Bull death loss, %	1	1		
Steer calf sale weight, lb	475	485		
Heifer calf sale weight, lb	425	445		
Heifer yearling sale weight, lb	850	850		
Cull cow sale weight, lb	1,100	1,050		
Cull bull sale weight, lb	1,800	1,800		

[a]/Converting hayland to grazable pasture is not generally practiced but is a possible source of forage if public land AUMs are removed. This conversion would use some of the available hayland and thus would reduce the land available for crop production. The cost of the conversion was estimated by Van Tassell and Richardson (1998).

[b]/In addition to the $1.35/AUM grazing fee that has been paid for public land grazing in recent years, grazing costs shown include estimates of non-fee grazing costs (e.g. herding, checking, moving). These estimates were made by Van Tassell and Richardson (1998) using rancher producer panel data and grazing cost data reported by Van Tassell, et al. (1997).

[c]/Animal numbers reported are from the published cost and return publications. Optimal animal numbers in the LP model will vary by year as beef prices vary. Animal costs exclude the cost of feed stuffs and non-fee grazing costs which are separate activities in the LP model. Animal costs include expenses for other classes of animals like bulls and horses.

[d]/Other production parameters used to develop the LP models are defined in the cost and return series publications (Rimbey, et al. 1998; Rimbey, et al. 2000).

Notice that the cost per unit of harvesting both federal and private forage includes both fee and non-fee grazing costs (e.g. herding cattle, checking cattle, improvement maintenance) as estimated by Van Tassell, et al. (1997), and Van Tassell and Richardson (1998). Non-fee costs of harvesting BLM forage were estimated at $5.84/AUM. The cost of leasing private rangeland was set at $13.25/AUM to reflect the lease rate and non-fee costs.

The grazing seasons and the seasons when alternative forages were considered to be available for grazing are defined in Table 3. Grazing seasons were defined based on typical turn-out dates and livestock marketing dates.

Table 3. Seasonal availability (*) of hay and forage for representative ranches.

	Season					
Bruneau	15-Mar 15-Apr	15-Apr 15-May	15-May 15-Sep	15-Sep 1-Nov	1-Nov 1-Jan	1-Jan 15-Mar
State trust land	*	*	*	*	*	
BLM	*	*	*	*	*	
Private lease	*	*	*	*	*	
Deeded range	*	*	*	*	*	*
Aftermath grazing				*	*	*
Convert meadow to pasture	*	*	*	*	*	
Feed raised/purchased hay	*	*				*
	Season					
Marsing	1-Mar 15-Apr	15-Apr 15-May	15-May 1-Sep	1-Sep 1-Nov	1-Nov 1-Jan	1-Jan 1-Mar
State trust land		*	*	*	*	
BLM		*	*	*	*	
Private lease		*	*	*	*	
Deeded range	*				*	*
Aftermath grazing	*				*	*
Convert meadow to pasture	*	*	*	*	*	
Feed raised/purchased hay	*	*			*	*

Table 4 presents the assumed productivity of rangeland and pasture resources for both representative ranches. These rates were defined in the cost and return publications (Rimbey, et al. 1998; Rimbey, et al. 2000).

Table 4. Productivity measures for harvested and grazed forages.

	Unit	Idaho
Hay conversion to AUMs	AUMs/ton	2.42
Raised native hay	tons/acre	1.5
aftermath	AUM/acre	2.3
Deeded range	AUMs/acre	0.1875
Pasture native hayland	AUMs/acre	5.5

Linear Programming Analysis

Optimal production and economic returns for the representative ranches was simulated over a 40-year planning horizon with 100 different iterations (beef price situations). The ranch started the process in year 1 with an inventory of breeding animals (Table 2). From this point, during years 2 through 40, the model was free to adjust herd size (purchase or sell) to profit maximizing levels subject to forage and cash limitations. Forage and pasture could be grazed or not grazed depending on its potential contribution to profit. An exception to this was state trust land. Because the Idaho Department of Lands requires fees be paid whether the land is grazed or not, the restriction was included that state land AUMs had to be used.

Output Prices

Annual ranch income and optimal production strategies are greatly influenced by crop and livestock prices. To minimize the effect of beef prices on the results of the policy assessment, a Monte Carlo analysis was used (Hillier and Leiberman, 1986). Real (constant 1997) livestock prices were stochastic variables in the LP analysis. Monthly average livestock prices were used from Idaho markets for January 1, 1980 to August 24, 2000 (unpublished data supplied by David Weaber, Cattle-Fax, Inc., Centennial, CO, Sept. 8, 2000) to estimate a time series price-forecasting model. The beef price model considered and estimated an approximate 12-year cycle of beef prices. It considered the relative price spread between different classes of livestock and the interdependence of beef prices for different animal classes at any point in time. In other words, the cyclic variation in cattle prices was simulated over the course of the 40-year planning horizon.

The starting point of the beef price cycle was randomly assigned for each iteration of the model. Running the model with numerous alternative beef price scenarios and reporting averages and standard deviations across all iterations minimized the effect of beef prices in the policy impact assessment. Figure 2 plots simulated prices for 400-500 pound steer calves for four randomly selected price iterations. Prices for other livestock classes follow a similar trend for the same iteration, but shift up or down to conform to the price differentials between animal classes observed in the market.

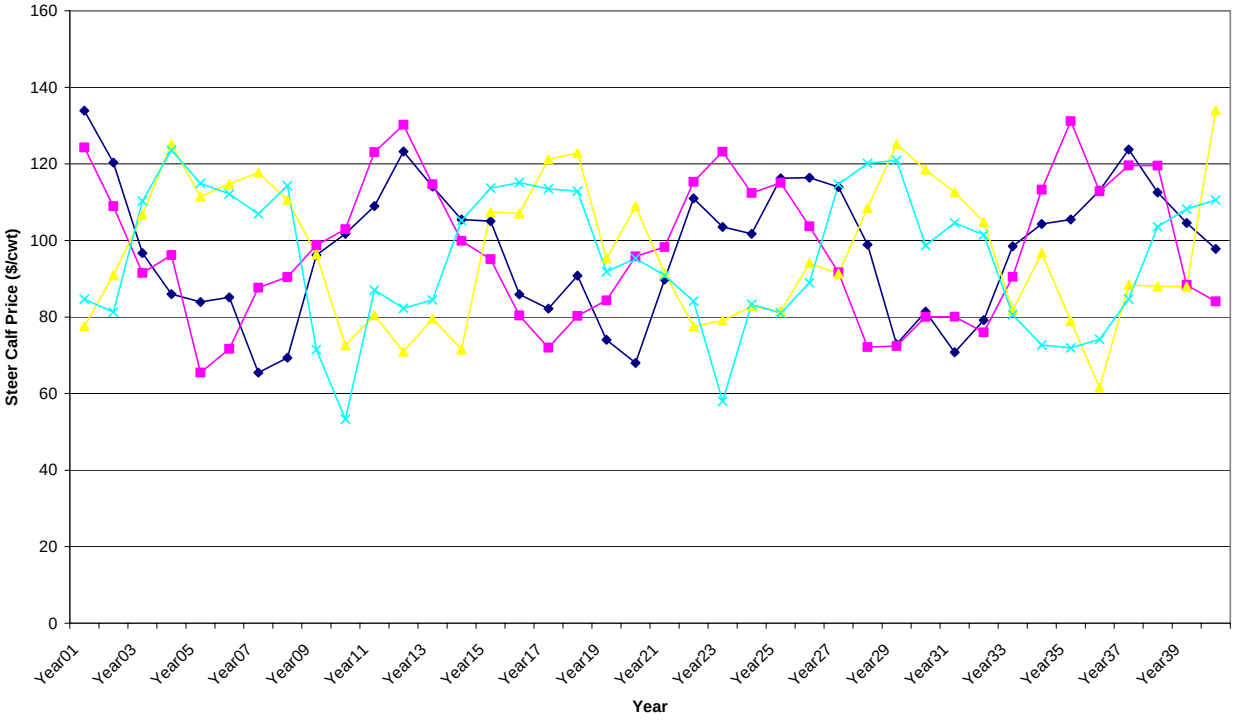


Figure 2. Simulated steer calf prices (constant real 1997) for four randomly selected iterations.

The cost of purchasing young bulls was not reported in the Cattle-Fax data. Data from the Tucumcari, NM bull sale was used to estimate that the sale price of bulls (constant 1997) was about twice that of bred cow prices.[1]

Hay prices were not varied by iteration because a long-term data series was not available to estimate annual price variability and relationships. The assumed real purchase and sale price of hay (Table 2) was considered to be the same during each year of the analysis.

Debt obligations were not considered as an expense category in the initial analysis

[1]/The regression equation estimated was Bull Price = 154 + 2.0549×Bred Cow Price, R^2 = 73%. Annual average prices from 1975 through 2001 were used to estimate the regression equation.

presented below. This was because cost and return data used to define typical production practices and costs and returns of the representative ranches did not include information about “typical” debt obligations of area ranchers. This personal data is generally not available and is known to vary widely from ranch to ranch. Gentner and Tanaka (2002) reported relatively low average debt loads for different classifications of public land ranchers responding to a west-wide survey.

The amount of off-ranch income and wealth available to ranch families was also variable. Recent studies found new ranch buyers are not the traditional ranch family that depends exclusively on the ranch for disposable income (Gentner and Tanaka, 2002; Torell, et al. 2001). An increasing number of western ranches are purchased by those with wealth or outside income. As an overall weighted average, Gentner and Tanaka (2002) found large, full-time ranchers have about $6,500 in annual off-ranch, retirement, and/or investment income. Small, part-time ranchers had $42,000 in off-ranch and other income, and depended on the ranch for less than 30% of annual disposable income. By comparison, full-time ranchers depended on the ranch for over 80% of disposable income.

While debt loads, wealth, and off-ranch income are highly variable between ranches, the commitment of western ranchers remains constant (Torell, et al. 2001; Gentner and Tanaka, 2002). Given this commitment and the variability in financial resources across ranches, two modeling procedures were followed. First, investment opportunities like land development or the stock market as alternative investment options were not included. The LP model maximized net discounted returns given the economic opportunity of raising cows or selling hay. Second, it was assumed that the representative

ranch would have at its disposal average levels of off-ranch income near that found by Gentner and Tanaka (2002). It was assumed both model ranches had $10,000 in off-ranch income. No initial wealth was assumed, other than the initial inventory value of breeding animals and the ranch investment. For the base run and impact assessment, there were no debt obligations against the cow herd or the land. The cash flow constraints of the LP model were of key importance for this assessment in that they required all variable, fixed and family living expenses to be covered each year, given calculated annual ranch returns and alternative assumptions about off-ranch income.

Annual borrowing was allowed (10% annual interest rate), with the full amount repaid the following year. The model allowed repeated borrowing from year-to-year across a 40-year planning horizon, but debt had to be repaid by the end of the T period planning horizon. Incurring an annual land payment or intermediate loan payment was equivalent to having an additional fixed expense obligation. If fixed expense obligations were too high, the cash flow constraint could not be met and an "infeasible solution" was obtained. Fixed obligations of the ranch, including depreciation and replacement of vehicles, equipment and improvements, electricity, telephone, and insurance, were subtracted as an annual expense (Table 2).

RESULTS

Marsing, Idaho Model

Table 5 presents the average and standard deviation (computed over 100 iterations and 40 years) of key production, economic and resource variables for the Marsing model under different levels of BLM AUM availability.

Table 5. Adjustments to reductions in Bureau of Land Management AUMs, Marsing Ranch Model.

	Percent reduction in BLM AUMs							
Adjustments in optimal use levels	0%		25%		50%		100%	
BLM available (AUMs)	3,000		2,250		1,500		0	
Optimal average BLM used (AUMs)[b]	2,965	(68)[a]	2,250	(201)	1,500	(64)	0	(0)
Percent of AUMs from BLM land	47%		25%		29%		0%	
Average number of brood cows (head)	325	(21)	292	(27)	262	(30)	199	(46)
Average number of AUY	528	(35)	476	(41)	428	(44)	326	(73)
Percent reduction in AUY (%)	--		-9.8%		-18.9%		-38.3%	
Average annual variable production costs ($)	89,804	(6,996)	78,746	(5,061)	67,441	(4,965)	55,767	(61,674)
Average annual variable production costs ($/AUY)	170		165		158		171	
Average annual net cash income ($)	21,234	(32,925)	15,671	(28,956)	9,729	(26,896)	-13,958	(68,515)
Average annual net cash income ($/AUY)	40.22		32.92		22.73		-42.82	
Average change in net cash income ($/BLM AUM removed)	--		-7.42		-7.67		-11.73	
Capitalized livestock value ($/BLM AUM)								
@ 3% capitalization rate			247.24		255.67		391.02	
@ 7% capitalization rate			105.96		109.57		167.58	
Deeded range (AUMs)	1,405	(12)	1,392	(18)	1389	(49)	1,335	(279)
Private lease (AUMs)	0	(0)	0	(0)	0	(0)	0	(0)
Meadow hayland acres hayed/grazed (acres)	223	(87)	193	(95)	135	(72)	32	(53)
Meadow acres converted to pasture (acres)	117	(87)	147	(95)	205	(72)	308	(53)
Raised meadow hay fed (tons)	0	(0)	0	(0)	0	(0)	0.16	(10)
Raised meadow hay sold (tons)	300	(155)	259	(159)	185	(118)	51	(85)
Purchased alfalfa hay fed (tons)	147	(43)	132	(35)	118	(32)	84	(50)
Average amount borrowed annually ($)	3	(189)	3	(172)	3	(164)	11,652	(59,362)

[a]/Number in parenthesis is the standard deviation measured over the 100 iterations and 40 years.

[b]/The assumption was made that the reduction in allowed grazing capacity would be incrementally phased in over 5 years. Thus, the computed average is for years 6 through 40 after the reduction is fully implemented.

The Marsing model relied upon BLM forage for about half of the ranch forage base (47%). State trust lands were used in conjunction with BLM forage and provided 379 AUMs of use during the 5½-month public land grazing season. In addition, the ranch had a considerable resource of deeded rangeland that was fully utilized, particularly in the face of reduced grazing capacity on BLM lands. The ranch fed hay from November through mid-April. Annual net cash income[2] was estimated to be $21,234 with a great deal of variability (standard deviation of $32,925). Periods of negative income occurred in low beef price years or when herd expansion was economically optimal.

With off-ranch income and assumed frugal behavior and saving, the Marsing model was always able to find a feasible solution, i.e., cash flow requirements could always be met, except with total removal of BLM forage. At the current situation and lower levels of reductions in permitted livestock use, a minimal amount of annual borrowing was required.

As BLM grazing was reduced, net annual ranch returns decreased. A 25% reduction of BLM grazing had an economic impact of reducing net returns by $5,563 ($7.42/BLM AUM removed). As BLM AUMs were reduced by 50% and 100%, increasing economic loss occurred (varying from $7.67/AUM removed with a 50% cut to $11.73/AUM for complete removal of BLM grazing). Annual net cash income decreased from $21,234/year under the current situation to -$13,958/year with a 100% BLM grazing reduction. With the total removal of BLM forage, the ranch was no longer a

[2]/Net cash income was defined to be gross crop and livestock sales + off-ranch income – variable production expenses – annual loan costs – fixed ranch expenses - family living expenses. It is the residual return to the investment in land, cattle and risk.

viable operation. Variable production costs declined as herd size was reduced to adjust to lower levels of BLM forage use (from the current level of $89,804 to $55,767 with complete removal of BLM forage). Short-term borrowing to pay operating expenses generally did not occur until the ranch faced total removal of BLM forage and slipped into a negative cash flow situation.

Eliminating BLM grazing reduced annual returns by $11.73 per BLM AUM removed. Capitalizing this value at 3% and 7% resulted in an estimated permit value of $391 and $168/AUM, respectively. By comparison, the market value of BLM permits in Nevada, Idaho and Oregon generally ranges from $35 to $75/AUM (USDI/USDA, 1992; Bartlett, et al. 2002). This capitalized value was the amount one would expect ranch to decline in market value if BLM grazing were removed. It is the estimated livestock production value of the BLM permit. The ranch model is based upon underlying resource linkages between land, labor and capital and the impacts of these linkages on profitability. In the face of BLM grazing reductions, the model generally adjusted these resource mixes (eg. grazed meadows rather than producing hay, more intensive use of deeded rangeland, etc.) before herd size reductions came into play.

Herd size declined as BLM forage was incrementally removed. The current situation involved the ranch operating 325 brood cows and 528 Animal Units, Yearlong (AUYs). Brood cow numbers declined to 199 head (326 AUYs) with total removal of BLM forage. In addition to herd size reductions, other optimal adjustments to reduced BLM AUMs included conversion of hayland to pasture and grazing and extensive use of deeded range. Hay sales from the ranch declined from 300 tons to 50 tons as meadowland was converted to pasture and intensive grazing. Private leased land was not

profitable to graze at the assumed $13.25/AUM cost.

Bruneau, Idaho Model

The Bruneau model (Table 6) was a larger ranch than the Marsing operation and was more dependent upon public land forage, due primarily to a larger herd size and longer grazing season. The ranch was permitted to utilize 5,000 AUMs of BLM forage and this forage source provided 56% of the forage base on the ranch. State trust lands were used in conjunction with the BLM permits and provided 400 AUMs of forage. Public land grazing was permitted during the 8½-month grazing season (March 15-January 1). Deeded rangeland and the haystack provided feed for the remaining 3½ months of the year. Net income was estimated to be $67,881 with a great deal of variability (standard deviation of $50,404).

As permitted BLM grazing declined, net annual ranch returns decreased. A 25% reduction of BLM grazing had an economic impact of reducing net returns by $15,624 ($12.50/BLM AUM removed). As BLM AUMs were reduced by 50% and 100%, economic losses ranged from $12.72/AUM removed with a 50% cut to $12.88/AUM for complete removal of BLM grazing. Annual net cash income decreased from $67,881 under the current situation to $3,480 with a 100% BLM grazing cut. Herd size was optimally reduced and variable production costs declined from the current level of $108,092 to $34,112 with complete removal of BLM forage. Short-term borrowing to pay operating expenses generally did not occur until the ranch faced total removal of BLM forage and slipped into a negative cash flow situation.

Table 6. Adjustments to reductions in Bureau of Land Management AUMs, Bruneau Ranch Model.

	Percent reduction in BLM AUMs							
Adjustments in optimal use levels (%)	0%		25%		50%		100%	
BLM available (AUMs)	5,000		3,750		2,500		0	
Optimal average BLM used (AUMs)[b]	4,977	(80)[a]	3,734	(61)	2,487	(47)	0	(0)
Percent of AUMs from BLM land	56%		50%		41%		0%	
Average number of brood cows (head)	422	(10)	357	(20)	290	(36)	155	(66)
Average number of AUY	735	(22)	620	(23)	505	(46)	275	(99)
Percent reduction in AUY (%)	--		-15.6%		-31.3%		-62.6%	
Average annual variable production costs ($)	108,092	(8,452)	89,386	(6,653)	70,918	(7,584)	34,112	(13,967)
Average annual variable production costs ($/AUY)	147		144		140		124	
Average annual net cash income ($)	67,881	(50,404)	52,257	(42,111)	36,091	(36,010)	3,480	(29,510)
Average annual net cash income ($/AUY)	92.36		84.29		71.47		12.65	
Average change in net cash income ($/BLM AUM removed)	--		-12.50		-12.72		-12.88	
Capitalized livestock value ($/BLM AUM)								
@ 3% capitalization rate			416.64		423.87		429.34	
@ 7% capitalization rate			178.56		181.66		184.00	
Deeded range (AUMs)	720	(0)	720	(0)	720	(0)	720	(0)
Private lease (AUMs)	0	(0)	0	(0)	0	(0)	0	(0)
Meadow hayland acres hayed/grazed (acres)	1	(2)	0	(0)	0	(0)	0	(0)
Meadow acres converted to pasture (acres)	239	(2)	240	(0)	240	(0)	240	(0)
Raised meadow hay fed (tons)	0	(2)	0	(0)	0	(0)	0	(0)
Raised meadow hay sold (tons)	0	(3)	0	(0)	0	(0)	0	(0)
Purchased alfalfa hay fed (tons)	593	(48)	498	(43)	403	(50)	213	(84)
Purchased meadow hay fed (tons)	0	(0)	0	(0)	0	(0)	0	(0)
Average amount borrowed annually ($)	0	(0)	0	(0)	0	(0)	0	(0)

[a]/Number in parenthesis is the standard deviation measured over the 100 iterations and 40 years..

[b]/The assumption was made that the reduction in allowed grazing capacity would be incrementally phased in over 5 years. Thus, the computed average is for years 6 through 40 after the reduction is fully implemented.

Eliminating BLM grazing reduced annual returns by $12.88 per BLM AUM removed. Capitalizing this value at 3% and 7% resulted in an estimated permit value of $429.34 and $184/AUM, respectively. This capitalized value was the amount one would expect the ranch to decline in market value if BLM grazing were removed. It is the estimated livestock production value of the BLM permit.

Herd size declined as BLM forage was incrementally removed. In the current situation the ranch operated 422 brood cows and 735 AUYs. Brood cow numbers declined to 155 head (275 AUYs) with total removal of BLM forage. Private leased land was not profitable to graze at the assumed $13.25/AUM cost.

Off-Ranch Income and Long-Term Debt

As shown by Gentner and Tanaka (2002), many public land ranchers have annual off-ranch income and wealth far in excess of the $10,000 assumed here. Whether ranchers will remain in business as federal AUMs are removed will depend on their willingness to incur reduced ranch income, and their commitment to the ranching lifestyle. The cash flow restriction does not limit production opportunities for those subsidizing the ranch enterprise with large amounts of off-ranch income and wealth.

It should also be noted that the ranch models used in this analysis included two critical assumptions related to long-term debt and family spending patterns. We assumed that the ranches had no long-term debt obligation to purchase the land, livestock, equipment and other resources. This information was not gathered as part of this project. The models were also based upon an assumption that ranchers are somewhat frugal and will not spend from ranch resources on items for personal consumption and use. In other

words, the ranch family spending for clothing, recreation and other personal aspects must be done within the financial resources available through family living expenses and off-ranch income. We hypothesize that the results presented would change significantly if a long-term debt load and more liberal family spending patterns were ascribed to the ranches.

Summary and Conclusions

Public land forage is an important resource utilized by western ranches. This resource provides the ranch with flexibility to produce hay, pasture and other feed resources on deeded lands to sustain the animals while they are not grazing public lands. The information presented provides a picture of how important these public forage resources are to ranchers within the Bruneau Resource Area in Owyhee County, Idaho. Rowe and Bartlett (2001) concluded that once hay was needed to compensate for public forage losses, reducing herd size would be the most cost effective adjustment. Our results generally support this conclusion. To some extent, the results presented here also validate the estimates of ranchers to public land forage losses presented in the earlier study of the Owyhee Resource Area (Rimbey, et al. 1999). The profit maximizing ranch will convert hayland to pasture, purchase feed, reduce hay sales, increase borrowing of operating funds and other actions in efforts to maintain the cow herd. Herd size was increasingly reduced at the higher levels of public land forage reductions. In many cases, high levels of reductions may move the size of the operation below the level required to be economically viable.

The economic impacts of reducing BLM grazing were found to vary widely

depending on several key factors. First, individual ranches are able to substitute alternative forages to varying degrees as federal AUMs are eliminated. Substituting grazed forages always minimizes economic losses relative to the option of feeding hay and reducing cow herd size. Ranches with restricted seasons of forage availability will have less ability to substitute alternative forages if BLM grazing is removed.

Economic losses from removing AUMs ranged from $11.73/AUM for the Marsing model, to nearly $13/AUM for the Bruneau model. Similar studies in the literature report even wider ranges. For example, Torell et al. (2002) presented economic losses ranging from $2.50/AUM to nearly $20/AUM resulting from public land adjustments in 3 states and cited other studies with even wider ranges in losses. The contributory value of the permit for livestock production varies widely depending on the seasonal complement of forage and pasture resources ranches have available, and the level of dependency on federal lands.

In both of the ranch models reported here, the capitalized livestock value of the BLM grazing permit was found to exceed the average market value of the permit. They also exceed the value being "offered" ($175/AUM) in a grazing permit buyout scheme designed by a coalition of environmental groups to end public land grazing. Seasonal forage limitations, the degree to which public land forages meet seasonal forage demands and the availability of substitute forages largely determine the economic value of the grazing permit. It is widely believed that the complement between public and private lands contributes greatly to the economics of western ranching. Our analysis clearly shows that to be the case.

For ranches with limited off-ranch wealth and income, reducing public land

grazing capacity by even marginal amounts was found to greatly impact the ability of ranchers to meet annual financial obligations and to repay debt. How many ranchers would potentially be forced from the business cannot be determined because debt loads are highly variable and unknown. Further, the level of commitment to remain on the ranch is also variable and unknown.

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APPENDIX – B

July 1998

Memorandum of Understanding
Between
Idaho Department of Fish & Game
And
Owyhee County Planning Committee

The purpose of this document is to establish working relationships to facilitate a local sage grouse working group for Owyhee County.

The Idaho Fish & Game commission is legislatively mandated and authorized to preserve, protect, and perpetuate the state's fish and wildlife resources. The Idaho Department of Fish and Game (hereafter Department) has undertaken an effort to establish the Idaho Sage Grouse Task Force to develop a state plan that addresses concerns for declining sage grouse populations in the state. This plan calls for establishment of local sage grouse working groups that will localize plans and programs to maintain, improve, and restore local sage grouse populations and their habitats. All interested parties within the general area of interest are eligible to participate in a local working group. Plans are generally expected to cover a 5-year period with recommendations for project management guidelines, inventory and improvement of habitat and requests for funding to address needed habitat improvement projects.

The Owyhee County Planning Committee is charged with development, revision and implementation of a Land Use and Management Plan for the Federal and State lands in Owyhee County. This plan addresses all of the resource values associated with these lands. As issues related to management of the federal and state lands arise the planning committee initiates the process developed for the overall plan to address those issues. Issues are handled as appropriate through the full committee or through sub-committees established for a specific purpose.

The Owyhee County Planning committee planning standards and procedures for addressing issues includes the following:

- ⇨ Develop a statement of common ***goal(s)*** to address the issue.
- ⇨ Research and develop a statement of the applicable federal and state statutes that provide ***guidance*** for addressing the issue.
- ⇨ Develop ***objectives*** for intermediate actions that are likely to achieve the goal.
- ⇨ Set forth the kinds, timing, location and frequency of ***monitoring*** efforts to evaluate progress toward the goal.
- ⇨ Set forth the ***standards for assessment and evaluation*** of monitoring data.
- ⇨ Periodic ***review and update*** occurs on the basis of appropriate assessment and evaluation of significant monitoring information.

The Department and Owyhee County have a mutual interest and concern for the issue of declining sage grouse populations. For this reason it is in the mutual interest of both parties to work closely and cooperatively in the development of a sage grouse population stabilization and recovery plan.

The Owyhee County Planning Committee and the Department will jointly facilitate the development of a plan by appointing a County Sage Grouse Sub-Committee / Local Sage Grouse Working Group for Owyhee County. The Sub-Committee / Local Working Group will be charged with development of a sage grouse stabilization and recovery plan for Owyhee County. Membership will be open to anyone with an interest in developing a plan for Owyhee County. The resulting plan document will be presented to the Owyhee County Planning Committee for adoption into the County Land use and Management Plan and to the Department for adoption as the local sage grouse working group plan for Owyhee County.

The Department will provide for a meeting facilitator for the first three meetings and thereafter if the sage grouse sub-committee requests continued facilitation.

The Department will provide information related to sage grouse ecology, population trends, predators, local population data, monitoring and interpretation and such other information, as the sub-committee deems appropriate.

The Department will maintain records and carryout mailings necessary to facilitate meetings and dissemination of information to members of the Sub-Committee / Local Working Group.

The Sub-Committee / Local Working Group will establish internal working procedures and protocols in accordance with planning standards and procedures of the Owyhee County Land Use and Management Plan. Owyhee County will provide leadership for meeting the planning standards of the Planning Committee through the chairman and members of the County Threatened, Endangered and Sensitive Species Sub-Committee.

In addition to fulfilling the planning standards for the Owyhee County Land Use and Management Plan, the Sub-Committee / Local Working Group will identify habitat improvement programs and investigate sources of funding to implement these programs.

This agreement becomes effective on the date of signatures of the parties and may be modified at any time by mutual agreement of the parties involved.

Owyhee County Land Use Planning Committee — **Date** 8/4/98

Idaho Department of Fish & Game — **Date** 7/10/98

Appendix C: SAGE GROUSE MANAGEMENT PLAN

OWYHEE COUNTY, IDAHO

ADOPTED JUNE 2000

AMENDED AND UPDATED
AUGUST 2004

Owyhee County
Sage Grouse Local Work Group

Release Date – August 18, 2004

SAGE GROUSE MANAGEMENT PLAN

OWYHEE COUNTY

JUNE 2000 – AMENDED AND UPDATED AUGUST 2004

PURPOSE OF THE PLAN

Utilize local input and knowledge to develop a long-term collaborative management plan providing a framework for sage grouse management in conjunction with federal, state and Owyhee County land management plans and actions in Owyhee County. This long-term management plan will provide guidance to resource and land management agencies as well as Owyhee County in dealing with issues that directly or indirectly affect the GOAL of the local working group. While the plan proposes a significant number of action items, the initial emphasis is to provide for better information on sage grouse and sage grouse habitat in Owyhee County to permit more informed decisions in the future.

GOAL

Preserve and increase sage grouse populations in Owyhee County.

GUIDING PRINCIPLES FOR PLAN DEVELOPMENT

The Idaho Fish and Game Commission is legislatively mandated and authorized to preserve, protect, and perpetuate the state's fish and wildlife resources. The Idaho Department of Fish and Game (IDFG) has undertaken an effort to establish the Idaho Sage Grouse Task Force to develop a state plan that addresses concerns for declining sage grouse populations in the state. This plan calls for the establishment of local sage grouse working groups that localize plans and programs that maintain, improve, and restore local sage grouse populations and their habitats.

The Owyhee County Natural Resources Committee is charged by the Owyhee County Commission with the development, revision and implementation of a Land Use and Management Plan for Owyhee County. This plan addresses all of the resource values associated with these lands. As issues related to management of lands arise, the Owyhee County Natural Resource Committee initiates the county process developed for the overall plan to address those issues.

The Idaho Department of Fish and Game and Owyhee County have a mutual interest and concern in the issue of declining sage grouse populations. For this reason, it is in the mutual interest of both parties to work closely and cooperatively in the development of a sage grouse population stabilization and recovery plan. The Owyhee County Sage Grouse Local Working Group was established to create a management plan that would establish a process and put into place a framework that would guide management efforts aimed at improving sage grouse populations and reverse recent declines of sage grouse.

The Owyhee County Sage Grouse LWG desired participation from as diverse a group as possible to ensure a collaborative and cooperative effort from all resource interests. Monthly meetings were held with as many as forty participants. Representatives have included the BLM, US Fish and Wildlife Service, Idaho Department of Fish and Game, Owyhee Cattlemen's Association, Idaho Cattleman's Association, Idaho Bird Hunters, Owyhee County Natural Resource Committee, Idaho Wildlife Federation, Idaho Wildlife Council, The Nature Conservancy, USDA NRCS and FSA, Ada County Fish and Game League, Chipmunk Grazing Association, 71 Livestock Association, Idaho Department of Lands, Idaho Off Road Vehicle (SIDRA), Wildlife Services, United States Air Force, and other general public interests.

GUIDING PRINCIPLES FOR THE LOCAL WORKING GROUP

1. Invite and include everyone interested in sage grouse management in Owyhee County.
2. Respect individual views and make decisions through collaboration and consensus.
3. Develop management plans and actions that are compatible with the objectives and actions contained in the Owyhee County Land Use and Management Plan for Federal and State Lands.
4. Develop management plans and actions that are compatible with the purpose and intent of the 1997 Idaho Sage Grouse Management Plan.
5. Implement management actions in ways that meet the Plan's GOAL as agreed to by the local working group.
6. This Plan is intended to be a fluid and dynamic plan that may change as new information becomes available.
7. The Plan's working time frame shall be 5-year intervals but it will be reviewed annually.
8. Additional funding will be required to accomplish needed actions.

MANAGEMENT PLAN DEVELOPMENT

The area of concern for the Owyhee County Sage Grouse LWG was agreed to encompass Owyhee County proper, or all of IDFG Management Area 1 and the western portion of Management Area 2. The Owyhee County Sage Grouse LWG compiled an extensive list of issues concerning sage grouse. This list was narrowed to forty-six issues of greatest importance. These forty-six issues were ranked and consolidated under five sage grouse management efforts.

Sage Grouse Management Efforts Are Focused on the Following:

1. Sage Grouse Habitat
2. Sage Grouse Predators
3. Sage Grouse Hunting
4. Sage Grouse Research and Monitoring
5. Program Funding

A Local Working Group sub-committee was established for each of the five sage grouse management efforts. Sage grouse management sub-committees were responsible for further developing each issue of immediate importance associated with its management effort. Subsequently, the full work group approved the elements of the plan as presented in the 2000 Sage Grouse Management Plan. In July of 2004, a subcommittee was established to review compatibility with the FWS Policy for Evaluation of Conservation Efforts (PECE) and develop a PECE matrix for existing management proposals. The committee developed recommended changes, deletions and additions to the plan along with PECE matrix information for those recommendations. An additional element needed for PECE compatibility is the identification of threats relative to the Owyhee County planning area, which is included. This plan reflects changes adopted by the Local Work Group at two meetings called to act on the subcommittee recommendations. The PECE matrix is attached as Appendix B.

SAGE GROUSE POPULATION INFORMATION

There are three primary sources of information on sage grouse populations in Owyhee County: lek counts, recruitment of young to the fall population, and sage grouse hunter participation measured at check stations. Each of these data sources has its limitations. In 2000, the hunting permit system was initiated to specifically identify sage grouse hunters for telephone survey and has substantially improved hunter take information and data. The currently available sage grouse population information for Owyhee County are presented in Appendix A.

Lek Counts and Surveys

Lek counts census number of males attending leks along established routes while lek surveys classify known leks as active or inactive each year (Autenreith et al. 1982). Lek counts have been concentrated in three parts of Owyhee County west of the Bruneau River as well of parts of eastern Owyhee County. Since only one to three leks were counted in each area and not all leks were counted every year, the counts must be interpreted with caution. Since 1999 there have been substantial efforts to increase lek count information including aerial surveys to find and count active and historic leks and to identify new lek sites.

Recruitment of young to the fall population (chick production)

This data is developed by examining wings from sage grouse harvested by hunters and determining the number of juvenile birds in the harvest. Research studies of sage grouse population dynamics indicate that the number of young sage grouse surviving to the fall for each adult hen is a good indicator of population trend (Johnson and Braun 1999). Recent population analyses indicate that a ratio of 2.25 chicks per adult hen provide adequate recruitment to maintain or slightly increase a population (J. Connelly, pers. communication). Most wings are collected from hunters in the Battle Creek / Big Springs area and south of Grasmere, areas with generally stable habitats. The only productivity estimates are for the entire county since not enough wings have been collected to determine differences in productivity among different areas in Owyhee County.

Hunter Participation and Success

Many factors impact sage grouse hunting activity. Weather, bag limits, status of the sage grouse populations, number of licensed hunters, and human population demographics are all factors that may influence hunter numbers as well as success (Table 5). Check station data provides limited meaningful information as to sage grouse populations. Hunter success was 1.1 birds per hunter in the 60's and 70's and remained virtually unchanged in the 80's and 90's at 0.97. Likewise, the average

hunting hours per bird has averaged 5.7 over the past 40 years with values of 4.7 in the 60's, 6.1 in the 70's, 6.6 in the 80's and 5.0 in the 90's. The check stations in Owyhee County have run on a variety of schedules. The number of check stations has declined with the number of sage grouse hunters. The four check stations operated opening weekend from 1958 to 1962 and again in 1999 are roughly comparable. In the 1960's and 1970's an average of over 900 hunters were checked annually. In 1999, 337 hunters were checked, about a 60% decline.

Summary

The lack of consistent and representative information limits the ability to define sage grouse populations generally in Owyhee County. There is a need to develop adequate data to establish a baseline from which to measure change. The need to improve the scope of data collection particularly for lek counts from more areas is apparent. A more direct measure of nesting success is also an important need.

SAGE GROUSE THREATS AND EXISTING CONDITIONS THAT AFFECT OR MAY AFFECT SAGE GROUSE AND THEIR HABITAT IN OWYHEE COUNTY

While there is no conclusive evidence that Sage grouse populations are either threatened or endangered in Owyhee County, there are situations that impact sage grouse habitat and thus provide opportunity to improve habitat and potentially increase sustainable populations. Overall improvement of sage-grouse populations and their habitat in Owyhee County will contribute to the stability and preservation of the specie throughout their range. In Owyhee County, sage-grouse population indicators such as lek counts have been constant since 1980 for those areas with relatively consistent data. Wing data indicates reproduction (addition of individuals to the population in one reproductive cycle, as indicated by Juvenile/adult female ratios) has trended upward since 1995. Reports from landowners and ranchers indicate noticeable population increases over the past 5 years. Hunter take data also indicates increased numbers. The Idaho Fish and Game hunter survey data shows hunter takes of 1,240 birds in 2,001, 1,498 birds in 2002 and 1,835 birds in 2003.

The most important ongoing resource effects related to sage grouse habitat in Owyhee County include: the encroachment of western juniper into sagebrush steppe habitats; the occurrence and past occurrences of wildfire; non-native invasive species including Cheatgrass, Medusahead rye and a number of species of Idaho State listed noxious weeds. Other factors related primarily to past management practices and wildfire are habitat fragmentation and perennial grasslands occupying sagebrush steppe habitat. Direct impacts on sage grouse populations include hunter harvest and predation. In addition over grazing by livestock can impact sage grouse habitat.

WILDFIRES IN SAGEBRUSH HABITAT

Fire is the greatest single factor responsible for the loss of Sage Grouse habitat in southeastern Owyhee County. Many of the fires occurred in the more arid Wyoming big-sagebrush habitat type, covered large areas and were often followed by increases in annual grasses, especially cheatgrass. There is very limited opportunity to restore these areas to their former state and they essentially represent a stable state that will not change without substantial human disturbance intervention. The increase in fine fuel in the form of cheatgrass has made these habitats more prone to fire and increased fire frequencies that result in loss of shrubs, especially sagebrush. Sagebrush seed is wind-dispersed and 95% is deposited within 30 feet of the parent plant, which largely precludes natural reseeding of large complete burns.

At the same time, areas that have not had wildfire recurrence for 15 to 20 years typically show substantial sagebrush recruitment, especially at the higher elevation range for Wyoming big-sagebrush and natural Mountain big-sagebrush communities). In addition, Mountain big-sagebrush typically re-established rather rapidly (Winward 1991) and such habitats may be fully occupied by big-sagebrush in 20 to 30 years..

In *Artemisia tridentata spp. vaseyeana* (Mountain big-sagebrush) habitats, normal fire frequency is estimated to have been estimated to be 15 to 25 years in southwest Idaho (in some instances as short as 3 to 7 years), (Burkhardt and Tisdale 1976) and 12 to 15 years in south central Oregon, (Miller and Rose 1999). In *A. t. wyomingensis* (Wyoming big-sagebrush) habitats fire return intervals have been estimated at 50 to 120 years (Whisenant 1990). Because of increased fine fuel from exotic annual grasses and more human-caused wildfires, fire frequencies are now as little as 5 years in some low-elevation habitats. Management strategies to decrease wildfire in these areas include increased fire suppression efforts, focused protection of key habitat areas during a wildfire, aggressive reseeding of sagebrush and where needed perennial grasses in burned areas, and developing greenstrips (strips of fire-resistant vegetation planted to slow wildfires) and other fuel breaks.

WESTERN JUNIPER ENCROACHMENT

Western juniper encroachment is a primary factor influencing loss of sage grouse habitat in west-central Owyhee County. The annual amount of juniper invasion on state and federal land has been estimated to be as high as 2500 acres annually (USDI-BLM, 1990). As early as 1990 estimates of total seral juniper stands ran from 250,000 acres to over 300,000 acres (USDI-BLM, 1990). More recent information provides similar estimates of 165,138 on Federal lands, 26,897 acres on State lands and 69,284 acres on private lands. Many higher elevation mesic sagebrush sites such as mountain big sagebrush-Idaho fescue are no longer useful sage grouse habitat because of tree encroachment and loss of understory shrubs and herbaceous plants. Photographic records and juniper stand age patterns clearly demonstrate that since about the 1870's western juniper has been extending its range from the fire-safe rim-rocks and rock outcrops into the valley slopes and bottoms (Burkhardt and Tisdale 1976).

Juniper has a high water transpiration rate (Miller's research at Squaw Butte in Oregon shows that a closed stand of Juniper will transpire up to 14" of precipitation annually). Dense seral juniper stands intercept and allow increased evaporation of precipitation. In heavy storm events, the loss of understory results in lower soil intake of moisture due to more rapid and increased runoff. The high transpiration rates further restrict moisture availability for species that would naturally occupy the site. Thus seral juniper stands create lower soil moisture availability and increase competition for moisture that is available. As seral juniper stands move into upland sagebrush-grass range sites and increase in density and size, the understory of shrubs, forbs and eventually perennial grass is steadily reduced and eventually eliminated entirely. Control of seral juniper expansion and removal of existing stands will restore the shrub-grass-forb communities that previously provided good sage grouse habitat. Reductions of seral stands should provide an additional benefit to sage grouse and other wildlife by providing increased water flow in streams, springs, bogs, and meadows. In many areas restoration will need to include reseeding of sagebrush and native grass and forbs.

INVASIVE, EXOTIC AND NOXIOUS WEED SPECIES

Cheatgrass is a prominent invasive species that has established some dense stands along the Snake River plain and some medium elevations along the Owyhee Front. Some areas south of Bruneau also support significant stands. This species provide a fine volatile fuel that tends to burn more

frequently and eliminate sagebrush from the site. Recent research indicates that methods are being developed to rehabilitate sites where precipitation will support establishment of perennial species. In most cases the strategy is to establish perennial bunchgrasses following fire. In most cases use of non-native species is the only reliable choice. These seedings prevent cheatgrass from dominating the site and allows sagebrush to re-establish through seeding, naturally or through further rehabilitation efforts. The cost of rehabilitation projects is quite high. The other prominent exotic species is Medusa rye. It is found mostly along the Oregon border in Owyhee County and has not spread significantly after becoming established. There are no cost effective ways to successfully convert these stands back to mixed native communities (Burkhardt and Tisdale 1976). The most threatening noxious weeds are Leafy spurge and Whitetop with a number of other listed weeds present in fewer areas and affecting fewer acres.

HABITAT FRAGMENTATION AND PERENNIAL GRASSLANDS

Habitat fragmentation can result from wildfire alteration of sagebrush cover and as a result of subdivision and development in rural areas. Land use planning policies discourage rural area developments but there is no mechanism to prohibit the development of private lands. The rural nature of the area, hot dry summer climate and condition of road access systems also discourages such development. It is the policy of Owyhee County through their Land Use and Management Plan for Federal and State Lands to promote ranching and livestock grazing as a viable sustainable land use, which will preserve open space and recreational access in rural Owyhee County.

Wildfire can result in a change to perennial grassland in two ways. First, the area may be seeded with perennial bunchgrass to avoid invasion by cheatgrass or to maintain soil stability and watershed function. Second, areas not prone to cheatgrass invasion with a prominent understory of perennial grass will naturally recover to perennial grassland. The longevity of perennial grasslands is largely site dependent. In the more arid Wyoming big-sagebrush habitat type seedings may last for many years before significant sagebrush recruitment occurs and intervention is necessary to shorten the recovery period.

In the Mountain big-sagebrush habitat type, sagebrush recovery may be sufficient to provide sage grouse habitat 10 to 15 years depending on site capability and the completeness of combustion. On these sites seeding of sagebrush is seldom necessary or cost effective. In Mountain big-sagebrush sites where fire frequencies have been substantially lengthened form historic occurrences, the increased density of sagebrush both suppresses the understory provides high fuel levels and when burned may require seeding to initiate rapid watershed protection. In some cases these sites may be slow to recover the shrub component and may require intervention seeding to hasten the process. Similarly, the sites where seeding of perennials is unnecessary the combustion may be complete enough over a large enough area the intervention seeding of sagebrush may be necessary to hasten recovery.

Recent estimate based on GIS analysis suggest there may be as much as 300,000 acres of perennial grassland in Owyhee County (USDI-BLM 2004). No information is available to determine the relative proportions of native grassland or seedings or the relative condition of these areas as to re-establishment of sagebrush.

PREDATION IMPACTS ON SAGE GROUSE

Some studies (Batterson and Morse 1948, Autenreith 1981) have collected data suggesting that ravens and/or other predators can destroy a large number of sage grouse nests. Connelly et al. (1991) also noted that ravens and magpies were common predators of sage grouse in eastern Idaho but they also documented good nesting success rates of over 50%.

Habitat is frequently cited as the most critical factor associated with the current status of sage grouse populations and consideration for maintaining and improving habitat is justified. However, the impacts of predators on sage grouse must also be considered. Long-term data (Sauer et al. 1997) shows that raven numbers have increased about 5% annually in Idaho for over 20 years. Data for the rate of coyote take per hour by aerial hunting over time shows that take rates have more than doubled in recent years. While predation of sage grouse and their nests is known to occur, the predation rates in Owyhee County have not been fully studied. Clearly, at some point increasing populations of predators will have a negative effect on total sage grouse populations regardless of habitat conditions. Predation data needs to be better defined for Owyhee County and where it is shown that predation is biologically important, predator management should be included in sage grouse management programs. Predator management should also be considered in combination with habitat restoration programs that may take several years to restore suitable sage grouse nesting habitat and cover.

Artificial nest studies at three areas in Owyhee County were conducted to identify sources of nest predation. The results show avian predation rates ranged from 58% to 71% of nest losses with mammalian rates from 19 to 38%. By species, coyote took 15 of 150 nests while raven took 40 of 150 nests. In addition, nests were destroyed by Magpie (9), Crow (1), Badger (4) and Bobcat (1). This study was not intended to determine the expected rate of nest predation but does indicate the relative importance of different predator species and provides direction for further study.

HUNTING

Studies have indicated that hunting is usually not a major factor in the population dynamics for healthy sage grouse populations (Braun 1998). However, hunting is a factor that can be changed relatively quickly if needed. In addition localized hunting pressure may have localized impact on sage grouse populations. The permit system for identifying sage grouse hunters has been valuable in collecting hunter survey data that provides good information as to sage grouse take Information gained from the wings of harvested birds can be important in determining sage grouse population dynamics.

A conservative hunting season and bag limit may be appropriate until new data suggests that this is biologically unsound or that increased take rates could be sustained along with healthy sustainable populations. Hunter take data shows that take levels have been steadily increasing with 1240, 1498, and 1835 birds taken in 01, 02 and 03 respectively. These data, while indicating increased populations, must be considered carefully relative to future take rates and potential need for changing season and bag limits or other measures that limit sage grouse harvest to maintain population growth.

LIVESTOCK GRAZING MANAGEMENT

Since the 1930's vast grazing management improvement programs have been implemented. Reductions in stocking levels, hundreds of miles of fence and extensive water developments have allowed for intensive control of the timing, frequency, duration and intensity of grazing. BLM data shows that during the 50 years between 1936 and 1986 areas classed as excellent or good condition doubled. During the same time period, poor and fair condition range decreased by 20% (USDI-BLM 1990). From

1981 to 1999 High seral and PNC rangeland in the Owyhee Resource Area increased by 25%, mid seral range increased by 34% and low seral range decreased by 24% (USDI-BLM 1999).

The Idaho Sage Grouse Management Plan (1997) states, *"In the 1960s and 1970s, Idaho had large numbers of sage grouse and extensive livestock grazing. This suggests that healthy sage grouse populations and livestock grazing are compatible. In short, livestock grazing that results in rangeland in good ecological condition also provides acceptable sage grouse nesting, chick rearing and winter habitat."* Never the less, additional improvement is possible.

Livestock grazing has been implicated as an impact on sage grouse habitat in two primary ways. First, over grazing (defined as grazing practices that cause deterioration of range resources) can lead to deteriorated habitat conditions by depleting understory plants and resulting in change toward excessively dense sagebrush stands. While this is a potential threat, there is no evidence of significant widespread occurrences of over grazing in Owyhee County at this time. Second, livestock grazing has been cited as having a potential impact on the amount and height of nesting cover that in turn allows higher rates of nest predation. Again, information from Owyhee County shows that nest success rates do not reflect predation rates above the norm and areas with sufficient data indicate increasing populations. This indicates that, in general, there are sufficient nesting areas with sites that have adequate cover to support normal nesting success rates.

While there is no evidence of wide spread range deterioration (downward trends) there is opportunity to develop or improve proper grazing management. (As used herein, "proper grazing management" means to plan, schedule, and control the timing, intensity, and duration of grazing and the occurrence of these over time, in a manner that achieves or trends toward management objectives. "Proper grazing management" includes appropriate consideration of all resource values.) Under BLMs Idaho Standards and Guidelines (ISG) implementation schedule, all grazing allotments in the Owyhee Resource area will have been evaluated and decisions issued by 2007. The Owyhee Field Office has completed ISG evaluations on all of the 151 allotments in the old ORA and 4 of the 43 allotments in the old Bruneau RA. The Jarbidge Field Office has completed 29 of 63 allotments and will complete and additional 15 in 2005. Together the field offices will have applied the ISG to 199 of the 268 allotments (75%) in Owyhee County by the end of 2005 and all allotments by 2009. The ISG addresses eight standards including Watersheds, Riparian systems, Native plant communities, Rangeland seedings and Threatened/Endangered/Sensitive species habitat. Where there is believed to be a deficiency for one or more of these standards, grazing management is reviewed and proper grazing management implemented to correct the deficiency. Thus, grazing management has or is being implemented to prevent any threat to sage grouse habitat. Thus, even where sage grouse habitat conditions may be less than optimum, grazing management is in place or being implemented to initiate improvement.

Meadows, springs, creeks, and other riparian areas can be important late brood rearing habitat in some areas. In particular irrigated forage crops on private lands provide large areas of high quality mid and late season brood rearing habitat. Studies have shown that managed livestock grazing can enhance late season brood rearing habitat. Proper grazing management increases the availability of succulent meadow vegetation and reduces tall cover which sage grouse avoid when feeding in meadow areas (Klebenow 1985, Evans 1985, Neel 1980). Further, Livestock water developments can benefit sage grouse habitat when properly designed and used to implement proper grazing management programs. Any alteration of extensive or intensive grazing management plans should be approached with caution. Grazing management plans capable of increasing the rate of range improvement result in permanent improvement of sage grouse habitat.

RECOMMENDED ACTIONS AND OBJECTIVES

All actions listed below will respect private property rights, are subject to funding being available and will be conducted in coordination with all agencies and adjoining counties and states to the greatest extent possible. Finding needed funding for identified actions is a key function of the Owyhee Sage Grouse Local Working Group.

SAGE GROUSE HABITAT INVENTORY ACTION PLAN

The sage grouse habitat action plan will begin immediately with a written evaluation done at least every 5 years. (Progress reviewed and evaluated in 2004).

A. **Map locations of all known active and historic sage grouse leks in Owyhee County by the end of 2001.** This will be accomplished by aerial and ground surveys, monitoring radio-marked sage grouse, review of historic lek data and interviews with local resource users (Lead: Idaho Department of Fish and Game (IDFG) (initial map completed in 2001 updates are ongoing).

B. **Identify and map sage grouse breeding (nesting and early brood) habitat associated with active leks by the end of 2004.** Sage grouse populations will be analyzed as to whether they are migratory or non-migratory. This will be accomplished using radio telemetry data or other techniques for each population. A physical inventory of the associated breeding habitat will then be accomplished on the ground by a wildlife biologist with the assistance of the local livestock operator and other interested parties. (Lead: Appropriate land management agency or private landowner with assistance of IDFG) (Initiated in 1999 and Ongoing).

C. **Identify and map known sage grouse wintering habitat by the end of 2001.** This will be accomplished by radio telemetry data, aerial and ground surveys, and input from local resource users. (Lead: Appropriate land management agency or private landowner with assistance of IDFG) (Initiated in 1999 and Ongoing).

D. **Perform a qualitative assessment of the sage grouse breeding (nesting and early brood) habitat associated with active leks.** An interdisciplinary team, including a wildlife biologist, will determine the quality of the breeding habitat. Factors such as soil type, moisture regime, vegetation and grazing systems should be analyzed. Under the Bureau of Land Management (BLM) Idaho Standard and Guidelines implementation schedule this will be accomplished on BLM land by 2007 in the Owyhee Resource Area and 2009 in the Jarbidge Resource Area. (Lead: Appropriate land management agency or private landowner with assistance of IDFG. The Owyhee Natural Resource Committee (NRC) will assist with work on private land). (Substantially completed and Ongoing).

E. **Map undesirable disturbance and habitat.** Map crested wheatgrass seedings, fires, juniper encroachment, sagebrush removal or overabundance and other undesirable habitat. (Lead: BLM). (Initial mapping completed in 2001 and Ongoing).

SAGE GROUSE HABITAT IMPROVEMENT ACTION PLAN

A. Grazing Management. Sage grouse habitat condition will be assessed through quantitative assessments conducted in accordance with the SAGE GROUSE HABITAT INVENTORY ACTION PLAN (Paragraph D) on state and private land. Sage grouse habitat conditions on lands managed by the Bureau of Land Management will be assessed through the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management. Standard 8 addresses threatened and endangered plants and animals and sensitive animals including sage grouse. If the assessment concludes, relative to sage grouse, that the standard is not being met due to livestock grazing, the Local Working Group will establish an interdisciplinary review (ID) team at the request of an affected party. The ID team will normally consist of a wildlife biologist, range scientist, livestock management specialist, livestock operator(s) and other affected interests who wish to participate. The ID team structure may be modified by agreement of the affected interests if specific participants are not reasonably available. Upon review of all quantitative data and other available information and following a site visit, the ID team will make grazing management recommendations to the Local Working Group. This team will consider both short and long-term benefits to sage grouse and impact on other potentially affected species. The team may recommend additional sage grouse habitat improvement actions based on quantitative assessments and other pertinent data. All grazing management recommendations will be developed on a site-specific basis with full consultation, cooperation and coordination with all affected landowners, management agency(s), permittee(s), lessee(s) and other affected interests. (Lead: Appropriate land management agency or private landowner). (Initiated in 1999 and Ongoing)

B. Develop maps that identify sage grouse habitat for high priority protection from wildfire. Using current information, provide maps to the fire management staff of all groups that fight fires in Owyhee County outlining critical sage grouse habitat in the county. Initial maps will be developed for the 2000 fire season and updated annually thereafter. (Lead: BLM). (Initial maps completed in 2001 and updates are ongoing).

C. Fire Rehabilitation. The sites of all future wildfires in high priority sage grouse habitat identified in Section C will, regardless of potential for natural recovery, be reseeded with sagebrush and, when needed, grasses and forbs best adapted to the site to hasten recovery of the habitat. This policy should be instituted immediately. (Lead: Appropriate land management agency or private landowner). (The action has been carried out since 2000 and is ongoing).

D. Sagebrush Restoration. Implement sagebrush restoration projects in historic sage grouse habitat where historic fires have removed sagebrush cover. A minimum of 1,000 acres of combined federal, state, and private lands shall be targeted for restoration annually with seed mixtures that are best for sage grouse and adapted to the site. (Lead: Appropriate land management agency or private landowner) (One project has been proposed and is being pursued but none completed).

E. Juniper Encroachment. Using the maps created by the Habitat Inventory Action Plan, identify existing and potential loss of sage grouse habitat due to juniper encroachment. The areas of greatest benefit to sage grouse will be prioritized so that juniper control activities can be scheduled. Suitable methods of juniper eradication such as prescribed burning, chemical control, woodland harvest, chaining, and other mechanical means should be evaluated and employed where appropriate. Treat and eradicate juniper on a minimum of 500 acres of state land (IDL Plan) and 12,000 acres of federal land (Owyhee RMP) annually to enhance sage grouse habitat by restoring

healthy sagebrush-grassland communities. (Lead: Appropriate land management agency/authority). (Two projects have been completed and planning is in progress throughout the Juniper encroachment zone)

F. Juniper treatment on private land. Funding will be identified to develop a 50/50 cost share program to assist private landowners in the reduction or eradication of seral juniper stands on their lands. (Lead: Owyhee LWG) (To be initiated, January 2005 and will be ongoing).

G. Juniper Treatment Grazing Policy. Initiate discussions with the BLM to review and seek change of the livestock grazing policy for prescribed burn programs that prohibits fall grazing use after a burn program has been completed. (Lead: Owyhee LWG) (To be initiated, January 2005 and will be ongoing).

H. Forage Reserve Program. Seek sponsors to develop a forage reserve program to provide off site grazing opportunity when livestock are displaced during juniper treatment programs. (Lead: Owyhee LWG) (To be initiated, January 2005 and will be ongoing).

I. Invasive Species and Noxious Weeds. Seek additional funding to support the activities of the Jordan Valley Cooperative Weed Management Area, which is conducting a variety of weed control and/or eradication programs throughout the Jordan Creek drainage basin. Encourage the development of additional CWMAs in other areas of the County and seek additional funding as needed to support those programs. (Lead: Owyhee LWG) (To be initiated, January 2005 and will be ongoing).

J. Habitat Fragmentation / Development. The LWG will provide comment and utilize other means as available to supports the policies of the Owyhee County Comprehensive Plan and Owyhee County Land Use Plan for Federal and State Lands to promote economically viable and sustainable ranching operations in order to discourage conversion of ranchland to rural/remote recreational home development. (Lead: Owyhee LWG) (To be initiated, January 2005 and will be ongoing).

PREDATOR ACTION PLAN

A. Using radio-telemetry tracking of sage grouse, determine the effect of predation on sage grouse. Complete the initial research on predation on nesting success and adult survival by the end of 2001. (Lead: IDFG) This action item cannot be accomplished with the current level of telemetry studies and is tabled until funding is sufficient to conduct more extensive studies.

B. Perform artificial nest studies in selected parts of Owyhee County to compare artificial nest fate in different types of habitat. Use established techniques to reduce potential biases and to identify species of predators involved. (Lead: Wildlife Services and IDFG). Complete initial research by the end of 2002 and continue as needed.

C. If predators are found to be an important biological factor in some areas, reduce numbers of those predators in those areas. Document whether control improves sage grouse survival or nesting success by comparing treated area to areas with no predator control. (Lead: Wildlife Services for removal and IDFG for monitoring). (No project areas yet identified, ongoing)

D. Use interviews of local landowners, hunters and others to gather data on predators. (Lead: University of Idaho and Owyhee County). (Initiated in 2004 to be completed in 2004).

HUNTING ACTION PLAN

A. Review hunting take data collected annually, and if the information indicates a need to change hunting seasons parameters, recommend hunting regulation changes in March of the following year to the Idaho Fish and Game Commission Lead: Owyhee LWG and IDFG (Initiated in 2000 and continuing annually.

B. Support legislation to allow IDFG Habitat Improvement Program funds to be used for sage grouse habitat improvement. (Completed 3/2000).

C. Recommend that the Idaho Fish and Game Commission require a free permit to hunt sage grouse to allow better monitoring sage grouse hunters and their harvest. (Completed 5/2000).

D. Offer all sage grouse permit holders mail-in envelopes for sage grouse wings. Include a letter explaining the need for the information obtained from wings. (Lead: IDFG) This action item was initiated but found to be ineffective and is tabled indefinitely.

E. Maintain needed check stations and wing barrels. (Lead: IDFG) (Ongoing)

F. Use a telephone survey of permit holders to estimate sage grouse harvest in each county. (Lead: IDFG) (Ongoing)

G. Band sage grouse in selected areas to help estimate harvest rates in those areas. (Lead: IDFG) This action item is ongoing and providing some data for population take percentages in areas where banding is occurring.

H. Re-evaluate this Hunting Action Plan annually. (Lead: IDFG) (Continuing annually)

SAGE GROUSE RESEARCH AND MONITORING ACTION PLAN

A. Provide a reliable estimate of the distribution and populations of sage grouse in Owyhee County by 2004. (Lead: IDFG) (expected completion, 2005).

B. Coordinate efforts by IDFG, BLM, USAF and others to systematically survey (fly or by other means) and/or otherwise identify through landowner surveys all active leks and historic leks in the county by the end of the spring 2004 breeding season. (Lead: IDFG, LWG and University of Idaho).

C. Determine which sage grouse populations are non-migratory and migratory. (Lead: IDFG). (Four areas completed or in progress, two areas proposed, program is ongoing)

D. Initiate radio-telemetry studies to determine causes of sage grouse chick mortality by 2002. (Lead: IDFG). This action item cannot be accomplished with the current level of telemetry studies and is tabled until funding is sufficient to conduct more extensive studies.

E. Investigate the impact of different weather on variation in sage grouse numbers in Owyhee County. (Lead: IDFG) (ongoing).

F. Encourage research on the impacts of human physical disturbance on sage grouse. (Lead: Owyhee County Natural Resource Committee). (ongoing).

PROGRAM FUNDING ACTION PLAN

The fundraising and implementation subcommittee will identify funds needed by year and organize efforts to obtain needed funding. Funding will be sought from federal and state agencies as well as others. Technical and financial assistance may be provided to landowners through the IDFG's Habitat Improvement Program.

A. Annually, obtain funding for additional radio-telemetry studies in western Owyhee County, one starting in 2001 and one starting in 2002 estimated to cost an estimated $25,000-30,000/year each. (Lead: Fundraising Subcommittee). (Ongoing).

B. Obtain funding for the landowner/hunter/other user survey listed in both the Predator and the Research and Monitoring Action plans to be conducted in 2001. (Lead: Fundraising Subcommittee working with University of Idaho and Owyhee County NRC). (Initiated 2004 to be completed 2004).

C. Obtain funding for quantitative and qualitative analysis of sage grouse habitat in Owyhee County as identified in the Habitat Inventory Action Plan. (Lead: Fundraising Subcommittee). (Ongoing).

D. Obtain funding for juniper eradication projects as specified under the Habitat Improvement Action Plan beginning immediately. (Lead: Fundraising Subcommittee). (Ongoing).

E. Obtain funding for fire rehabilitation projects as specified under the Habitat Improvement Action Plan beginning immediately. (Lead: Fundraising Subcommittee). (Ongoing).

F. Obtain funding for sagebrush restoration projects as specified under the Habitat Improvement Action Plan beginning immediately. (Lead: Fundraising Subcommittee). (Ongoing).

G. Obtain funding for the artificial nest studies under the Predator Action Plan starting immediately. (Lead: Fundraising Subcommittee). (Ongoing).

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APPENDIX - A

Review of Current Sage Grouse Population Data for Owyhee County

In August of 1997 the State of Idaho developed the Idaho Sage Grouse Management Plan to address what was termed “record low populations” and “dramatic downward trends”. The Idaho plan identified a number of local management areas and presented data purported to demonstrate the “dramatic downward trends” for each area including Owyhee County. In response, Owyhee County entered into a MOU with the Idaho Department of Fish and Game in 1998 to develop a Sage Grouse Management Plan. Two years later a plan was completed and many of the management actions have been implemented and more are in the various stages of completion.

One of the initial actions of the Owyhee County Local Work Group was to examine the existing data and determine where more or better data was needed. The existing population information relied heavily on lek counts, reproductive data obtained from wings counts and to some extent on hunter success rates and total take data. It became clear that the data purportedly showing population decline was entirely inadequate to quantify populations or trend and no direct census information was available.

The analysis of existing data could not justify a conclusion that populations were in decline or that the data differences over time were not normal fluctuation. The standard lek count procedure is to count each lek three times each season; however, in reality some are counted only once or twice and in some years not all leks are counted or no leks are counted. This is a reflection of the remoteness of the sites, the difficulty of overland travel to reach the sites in early spring and untimely inclement weather. Not only have lek counts been somewhat sporadic there have been few surveys to identify when and where birds abandon a lek and develop another site. Thus, some counts are simply conducted in the wrong place because there were no surveys to determine when birds moved to a new lek area to assure that all lek sites for a lek route were counted.

The following figures and table show the results of more in-depth consideration of the available data as well as information gained from more recent data. Review of the existing and new data does not support a contention that sage grouse populations in Owyhee County are in a downward trend.

Table 1 provides a different view of the lek count data for Owyhee County. Again, total numbers are difficult to equate to populations from lek survey data because different numbers of lek routes are counted in different years. However, Table 1 provides a comparison of total birds counted during years that the same lek(s) (routes) in a group were counted and is provided simply as and added view of the data. Five lek routes were all counted each year from 1980 to 1999 with the exception of 1990-91 and 1994-96 and are shown as group 1 in the table. Data from this group of lek routes does not indicate change within the area where data was collected. Group 2 consists of four lek routes that were counted annually from 1995 to 2003. The total number of birds counted increased throughout the nine years. Group 3 includes all lek routes, which were only counted five of the years from 1997 to 2003. While the

period of recorded counts is only five years, it does include all lek routes and again the total number of birds observed steadily increase.

Tables 2 through 5 present the available information relative to lek counts, reproduction, and hunter check station data. This information is also the source data for Figures 1 through 5.

The information presented in Figure 1 shows a long-term downward trend but the low R^2 value indicates the data is not a good predictor of trend and that the downward trend is primarily a result of the high numbers in the early years of data collection. While it is acknowledged locally that grouse numbers were very high in the 50s and 60s, there is no information to suggest that those populations were a historic norm because they occurred during a time that predator control activities were extensive and effective.

Figure 2 show an upward long-term trend in reproduction but again the R^2 value shows the data is not a reliable indicator. (reproduction or recruitment of new individuals into the population through one reproductive cycle is indicated by juveniles per 100 females). The numbers for juveniles per 100 females is presented as a 5-year rolling average, which is approximately half the normal population fluctuation cycle for sage grouse. Short-term data (1995 – 2003) shows an upward trend for reproduction that much higher trend predictability (Figure 3). Increasing reproductive rates also suggests that breeding, nesting and brooding habitats are also in an upward trend.

By contrast, the lek count data in Figure 4 shows a stable long-term population (no significant trend up or down). When populations fail to increase in the face of increased reproductive rates, the situation can logically be attributed to loss of adult birds related to adult bird predation, hunting take and perhaps disease and/or inadequate winter habitat.

Since not all lek routes are counted each year and some are not fully counted, the total number of birds counted annually does not provide useful comparative information. While imperfect, the average number of birds counted per lek route provides an indication of potential changes in total population (Figures 4 and 5). In this case the trend is essentially flat (The low R^2 value indicates no valid upward or downward trend). Figure 4 also shows the 5-year rolling average and a 10-12 year population cycle. While counts have fluctuated over time, the data suggests there has been no significant change over the past 24 years and numbers are essentially stable in those areas where good data is available.

In the areas where relatively good data is available for Owyhee County the information does not suggests that sage grouse populations are decreasing. Numbers have been largely stable over the past 24 years and have likely increased recent years (Figures 4 and 5). However, lek count and other data require careful examination and cautious interpretation when used to estimate population size or trend.

Figure 1.

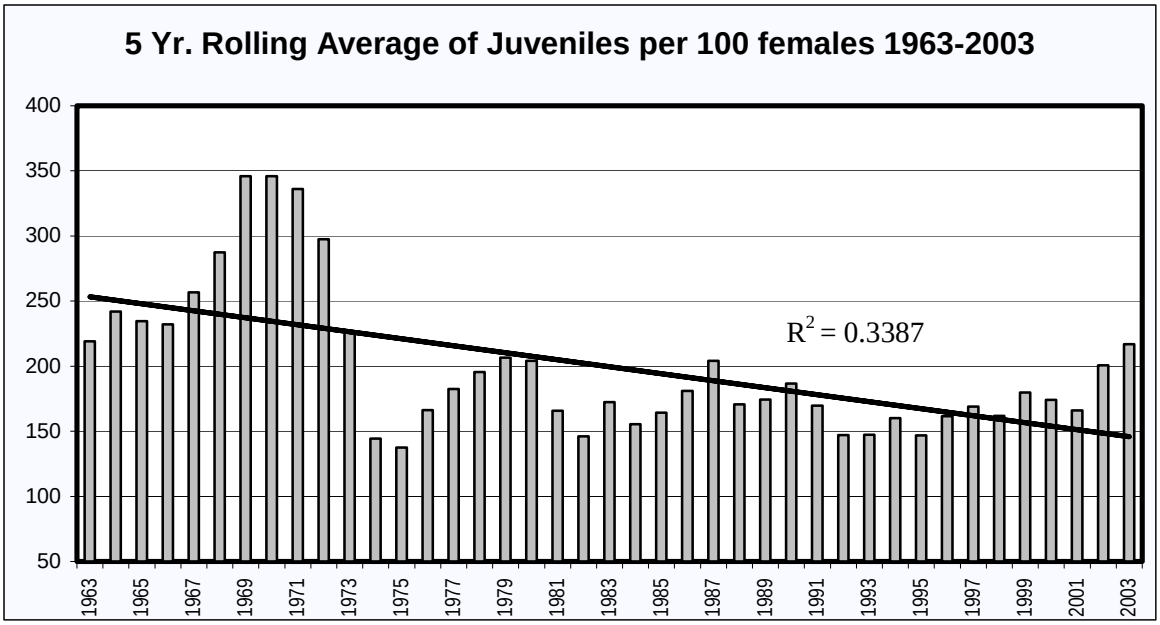


Figure 2

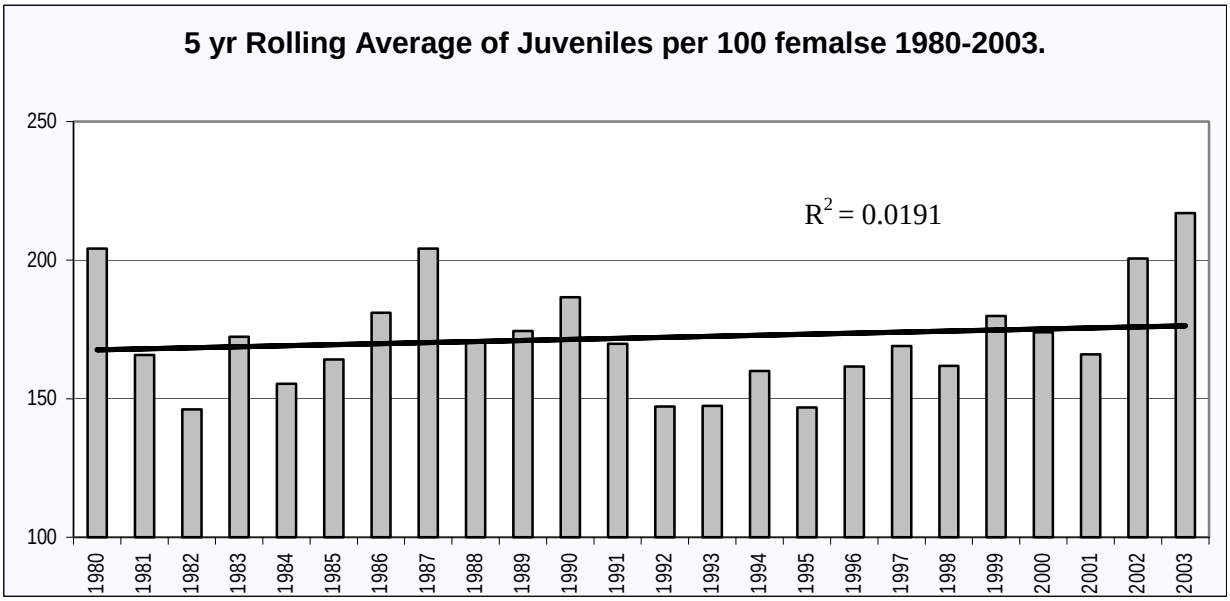


Figure 3

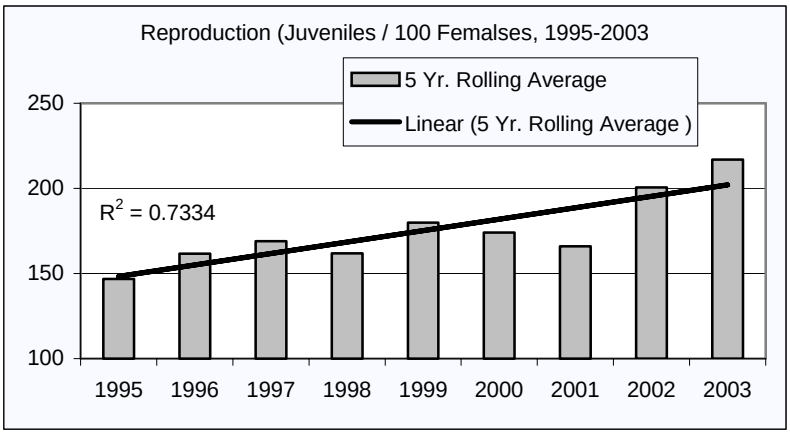


Figure 4

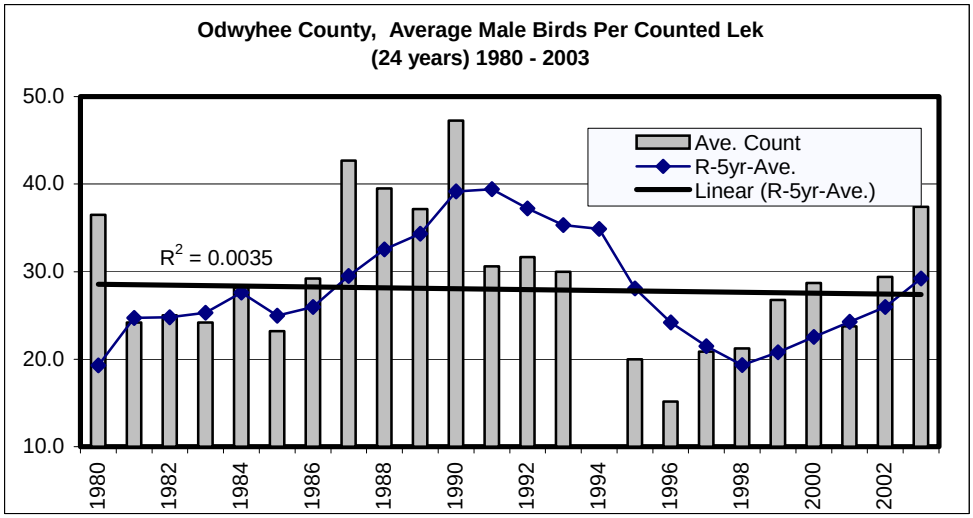


Figure 5

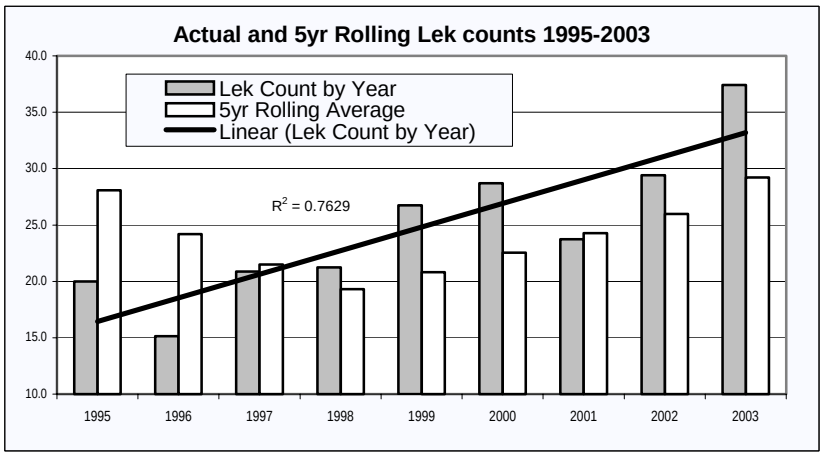


Table 1 – Total Adult Male Bird Counts for Lek Routes Counted in Common Years - Owyhee County.

Years	Lek route groups in years that all routes in the group were Counted	Total Birds Counted
1980	Lek route group 1 is made up of the following routes: Jackson Creek Cow Creek Goose Creek Bates Creek Rocky Knoll Average 131 birds Total	146
1981		121
1982		125
1983		121
1984		141
1985		116
1986		146
1987		207
1988		188
1989		179
1992		146
1993		118
1997		88
1998		81
1999		115
2001		119
1995	Lek route group 2 is made up of the following routes: Castle Creek Bates Creek Rocky Knoll Wickahoney Average 113 birds Total	80
1996		82
1997		78
1998		77
1999		112
2000		112
2001		140
2002		138
2003		197
1997	Lek route group 3 includes all lek routes: Jackson Creek Cow Creek Goose Creek Bates Creek Rocky Knoll Castle Creek Raymond Spring Wickahoney Average 184 birds Total	167
1998		170
1999		214
2001		190
2003		262

This table has no statistical relevance and is presented here as another way of viewing the information available to increase understanding of population dynamics over time.

Table 2 – Adult Male Bird Counts for Lek Sites - Owyhee County.

	Cow Creek Area				Oreana Area		Riddle Area				
Year	Jac. C.	Ray S.	Cow C.	Goose C.	Castl. C.	Bates C.	Rock Kn.	Wickah	Leks	Ave. Count	R5Yr
1980	24	-	3	40	-	41	38	-	4	36.5	19.3
1981	16	-	0	34	-	27	44	-	5	24.2	24.7
1982	17	-	19	29	-	29	31	-	5	25.0	24.8
1983	22	-	9	19	-	21	50	-	5	24.2	25.3
1984	29	-	23	16	-	34	39	-	5	28.2	27.6
1985	24	-	10	13	-	27	42	-	5	23.2	25.0
1986	19	-	22	22	-	41	42	-	5	29.2	26.0
1987	43	-	30	34	-	48	52	49	6	42.7	29.5
1988	29	-	29	34	-	50	46	49	6	39.5	32.6
1989	31	-	37	28	-	39	44	44	6	37.2	34.3
1990	31	-	29	29	-	-	100	-	4	47.3	39.2
1991	12	-	27	26	-	42	-	46	5	30.6	39.4
1992	22	-	20	24	-	14	66	44	6	31.7	37.2
1993	10	-	27	14	21	26	41	41	6	30.0	35.3
1994	-	-	-	-	-	-	-	-	-	-	34.9
1995	-	-	-	-	17	13	25	25	4	20.0	28.1
1996	15	-	3	6	10	17	27	28	7	15.1	24.2
1997	41	38	5	5	10	13	24	31	8	20.9	21.5
1998	39	51	0	3	12	16	23	26	8	21.3	19.3
1999	51	48	0	3	32	29	32	19	8	26.8	20.8
2000	48	41	0	-	16	43	34	19	7	28.7	22.5
2001	24	26	0	0	21	53	42	24	8	23.8	24.3
2002	-	-	-	9	26	33	54	25	5	29.4	26.0
2003	27	24	-	14	23	54	72	48	7	37.4	29.2
Ave. 76-03	27.3	38.0	14.7	19.1	18.8	32.3	44.0	34.5		29.2	
Ave. 90-03	29.1	38.0	11.1	12.1	18.8	29.4	45.0	31.3		27.9	
Ave. 99-03	37.5	34.8	0.0	6.5	23.6	42.4	46.8	27.0		29.2	

Dash (-) = no data, 0 = actual count.
Source Data for Figures 4 and 5.

Table 3. **Data from several Owyhee County sage grouse leks in the Jarbidge Resource Area, 1972-1999.**

Year	71 Pond/Draw	Juniper Ranch Rd.	Poison Butte SW	3 Saylor Cr. Range Leks
1972		24		
1973		20		
1974		14		
1975		2		
1976		4		
1977		9		
1978		14		
1979		20		
1980	45	25		
1981	35	26		
1982		12		
1983		10		
1984		10		
1985	39	10		
1986	33	11	15	
1987	141			
1988	52			
1989	41			
1990	58			
1991	65			
1992	43	12	41	17
1993	31			
1994	8			27
1995		0	21	9
1996	0	0	29	6
1997	0	0	4	7
1998	19	0	24	5
1999	27	0	23	6
2000				
2001				
2002				
2003				

Table 4. Sage grouse wing count data, Owyhee County

Most data prior to 2000 was collected in the Battle Creek / Big Springs and Grasmere / Riddle areas.

Year	No. Wings	Juv per 100 females	Decade Average	5year ave.
1963	888	338		219
1964	705	291		242
1965	589	152		235
1966	630	209		232
1967	993	294		257
1968	572	491		287
1969	1,745	584	294	346
1970	742	152		346
1971	1,066	160		336
1972	917	100		297
1973	830	136		226
1974	588	174		144
1975	485	118		138
1976	402	303		166
1977	299	181		182
1978	358	201		195
1979	479	230	176	207
1980	388	106		204
1981	512	111		166
1982	357	83		146
1983	91	332		172
1984	80	145		155
1985	299	150		164
1986	442	195		181
1987	550	199		204
1988	764	165		171
1989	639	163	165	174
1990	1350	211		187
1991	1564	111		170
1992	790	86		147
1993	385	166		147
1994	385	226		160
1995	208	145		147
1996	139	185		162
1997	271	123		169
1998	305	130		162
1999	546	316	170	180
2000	633	116		174
2001	558	145		166
2002	545	296		201
2003	637	212		217

1959 to 1962 ratios are 177, 189, 221 and 171 respectively (included in the 1963 - 5 yr. average)

Source Data for Figures 1, 2 and 3

Table 5. Owyhee County sage grouse check stations for opening weekends.

Year	Ck. St.	Days	Bag / Pos	Hunters	Birds	Hours	H / Bird	Hunter
1960	4	2	2/2s	1,046	981	4,280	4.4	0.9
1961	4	2	2/2s; 2/2p	1,022	761	5,051	6.6	0.7
1962	4	2	2/2s; 2/2p	660	734	3,012	4.1	1.1
1963	3	2	2/2; 3/6	733	1,102	2,915	3.0	1.5
1964	3	2	2/2; 3/6	662	1,019	3,721	3.6	1.5
1965	3	2	2/2; 3/6	857	657	5,365	8.2	0.8
1966	3	2	2/2; 3/6	747	934	4,445	4.8	1.3
1967	3	2	2/2; 3/6	760	1,461	4,524	3.1	1.9
1968	3	2	2/2; 3/6	699	639	4,429	6.9	0.9
1969	3	2	2/2; 3/6	960	2,050	5,340	2.6	2.1
1970	3	2	3/3; 4/8	1,222	1,432	6,349	4.4	1.2
1971	3	2	3/6; 4/8	1,310	1,984	8,741	4.4	1.5
1972	3	2	3/6; 4/8	1,392	1,220	9,653	7.9	0.9
1973	3	2	3/6; 4/8	917	1,024	6,346	6.2	1.1
1974	3	2	2/4; 3/6	752	769	5,055	6.6	1.0
1975	3	2	2/4; 3/6	597	556	3,648	6.6	0.9
1976	3	2	2/4; 3/6	557	435	3,464	8.0	0.8
1977	3	2	2/2	441	326	2,777	8.5	0.7
1978	3	2	2/2	505	412	2,835	6.9	0.8
1979	3	2	2/2	479	558	2,431	4.4	1.2
1980	3	2	2/2	504	441	2,955	6.7	0.9
1981	3	2	2/2	464	606	2,142	3.5	1.3
1982	2	2	2/2	359	236	2,178	9.2	0.7
1983	2	2	1/1	108	37	551	14.9	0.3
1984	2	2	1/1	47	31	160	5.2	0.7
1985	2	2	2/2	161	110	710	6.5	0.7
1986	2	2	2/4	245	330	1,407	4.3	1.3
1987	2	2	2/4	291	315	1,554	4.9	1.1
1988	2	2	2/4	329	284	1,619	5.7	0.9
1989	2	2	2/4	228	222	1,199	5.4	1.0
1990	2	2	3/6	476	883	2,914	3.3	1.9
1991	2	2	3/6	476	498	2,639	5.3	1.1
1992	2	2	3/6	599	412	3,172	7.7	0.7
1993	1	1	3/6	74	58	365	6.3	0.8
1994	1	1	3/6	99	109	414	3.8	1.1
1995	1	1	3/6	71	62	260	4.2	0.9
1996	1	1	1 /2; 2/4	44	29	174	6.0	0.7
1997	1	1	1 /2; 2/4	34	36	133	3.7	1.0
1998	1	1	1 /2; 2/4	23	23	87	3.8	1.0
1999	4	2	1 /2; 2/4	337	285	1,699	6.0	0.8
2000	4	2	1 /2; 2 /4	365	212	1,794	6.7	.08
2001	2	2	1 /2; 2 /4	150	179	983	5.5	1.2
2002	2	2	1 /2; 2 /4	285	293	1,468	5.0	1.0
2003	2	2	1 /2; 2 /4	246	254	1,267	5.0	1.0
Ave.				496.3	555.5	2,805	5.55	1

APPENDIX - B

Owyhee County LWG Sage Grouse Management Plan – PECE Matrix

Listing Factor / Threats or Conditions	Lead for Accomplishing Conservation Measures	How Threat or Condition Will Be Addressed	Funding Source(s)	Completion or Planned Implementation Date	Authorities Processes Required
Wildfire Management	BLM Field Office(s)	Sites with high priority sage grouse habitat will be re-seeded with sagebrush and as necessary with grass/forb mixtures	Budgeted BLM Emergency Fire Management Funds.	Initiate 2001. Ongoing as wildfires occur.	NEPA – EA for fire rehab plans
	BLM Field Office(s)	Fire rehab seedings have occurred regularly since 2001. Rehab projects: Rough Diamonds 2001, Trimbley 2002, Big Cow 2003	Budgeted BLM Emergency Fire Management Funds.	Hand seed, 26 ac Aerial seed, 51,954 ac Ground drill, 8,671 ac Plantings 103,000	NEPA – EA for fire rehab plans completed
	BLM Field Office(s)	Develop maps based on vegetation type, lek sites, telemetry data and survey data to identify high priority sage grouse habitat areas for wildfire management under BLM protocols for sage grouse habitat.	Budgeted. BLM Emergency Fire Management Funds.	Initiate 2001. Ongoing updates new information is available.	No authority or process constraints.
	IDFG	Lek surveys will identify new lek sites used to update maps of known high priority sage grouse habitat	IDFG, BLM, LWG / State OSC and USAF	Initiated in 2001. Ongoing.	No authority or process constraints.
	IDFG	Telemetry studies conducted in various areas will identify seasonal use areas and is used to refine maps of known high priority sage grouse habitat.	IDFG, BLM LWG / State OSC and USAF.	Initiated in 1999. Ongoing. **	No authority or process constraints.
	U of I and Owyhee LWG	Conduct Landowner survey to document current local sage grouse and predator characteristics and changes over time. Data used to update & improve maps of known high priority sage grouse habitat	$13,000 LWG / State OSC.	Initiated June 2004 completion Fall 2004	No authority or process constraints.
	Private Landowners	Seek cooperation of private landowners and obtain funding to provide financial assistance with fire rehab seedings where needed on private lands.	OCS and FWS funding	Kershner Fire 800 ac Completed 2003 Bluebucket Mine Fire 100 ac in process	Landowner cooperation

** Sheep Cr., Grasmere/Riddle Project – initiated 1999, to be completed Fall 2004, Cost $120,000.
Cow Creek, Project – Initiated in 2000, To be completed Fall 2004, Cost $75,000.
Castle Cr. / Bates Cr. Project, Initiated in 2001. To be completed Fall 2004. Current costs $50,000
Big Springs Project. Initiated in 2003. To be completed in 2005, $15,000 Annually.
Proposed - Big and Little Jacks Creek and Dickshooter ridge. Start both in 2005, Both to be completed in 2007, Each project $15,000 annually.

Listing Factor / Threats or Conditions	Lead for Accomplishing Conservation Measures	How Threat or Condition Will Be Addressed	Funding Source(s)	Completion or Planned Implementation Date	Authorities Processes Required
Western Juniper Encroachment	BLM Field Office(s)	Treat and eradicate seral Western juniper on a minimum of 12,000 Acres of Federal land annually.	Budgeted - Bureau of Land Management.	Initiated in 2002.. Ongoing.	NEPA Required for each project.
	BLM Field Office(s)	Pixley Basin Burn treated 3,337 ac BLM. Unauthorized 180 ac on private land. These including seedings conforming to wildfire management plan.	Budgeted - Bureau of Land Management.	Completed 2003.	NEPA Completed.
	Agric. Res. Service (ARS)	ARS – Reynolds Creek Project completed 166 ac planned additional 300 ac.	Budgeted ARS.	Initiated in 2002. Ongoing.	NEPA Completed.
	BLM Field Office(s)	Juniper Mountain Restoration Project to initiate burn program within the 300,000 Acre planning area	Budgeted - Bureau of Land Management.	Initiated in 2003. Ongoing.	NEPA in progress.
	Idaho Department of Lands	Treat and eradicate seral Western juniper on a minimum of 500 acres of State land. The IDL conducts juniper control programs annually on State lands in Owyhee County	Budgeted - Idaho Dept. of Lands.	2000 – 2004, Four projects covering 1,200 ac. Ongoing	No authority or process constraints.
	Private Landowners	Encourage Treatment programs on private lands by seeking 50/50 cost share for control programs.	$25,000 annually. LWG / OSC and FWS programs	Implement January 2005. 400 ac treated w/o cost share	No authority or process constraints. Landowner Participation.
	BLM Field Office(s)	Encourage permittee cooperation in treatment programs by seeking a change in BLM policy to allow grazing in the fall that burn treatments occur.	None Required.	Implement January 2005.	No authority or process constraints.
	Owyhee LWG	Develop a list of entities interested in supplying alternative forage and encourage sponsors to develop a grassbank program to encourage permittee treatment program participation	None Required.	January 2005.	No authority or process constraints.

Listing Factor / Threats or Conditions	Lead for Accomplishing Conservation Measures	How Threat or Condition Will Be Addressed	Funding Source(s)	Completion or Planned Implementation Date	Authorities Processes Required
Invasive species and Noxious Weeds	BLM Field Office(s)	Sites with high priority sage grouse habitat will be re-seeded with sagebrush and as necessary grass/forb mixtures to prevent annual grass dominance. Sagebrush seeding may be unsuccessful (generally in the Wyoming big-sagebrush zone) where annual grass dominance may be a threat following wildfire. In these cases, perennial grass seedings may be required to facilitate long-term future establishment of the shrub component.	Budgeted BLM Emergency Fire Management Funds.	Initiate 2001 Ongoing as wildfire occurs	Environmental Assessment for fire rehab plans
	Owyhee LWG Cooperative Weed Management Area Steering Committee & Cooperating Agencies	Support actions of the Jordan Valley CWMA covering the entire Jordan Creek Watershed. The CWMA participants include the Idaho and Oregon BLM, SCA, Owyhee County, Idaho Dept. of Lands, Owyhee Watershed Council and 10 ranchers. Seek additional funding to support projects of the JV-CWMA.	None Required for LWG activity. The JV-CWMA is 50% cost share funded Private w/ IDA. BLM provides additional funding. Potential additional sources include FWS, IDFG & OCS	JV-CWMA Organization completed 2002 2004 AOP $60,900 for mapping 1000 acres, herbicide treatment 500 acres and Bio-control 100 acres	No authority or process constraints. CWMAs are organized through landowner multi agency agreement or MOU
	Owyhee LWG	Encourage development of additional CWMA programs in other locations in Owyhee County and seek additional State, Federal and Private funding.	None Required for LWG activity.	Ongoing	No authority or process constraints.
	Idaho Department of Lands	Support IDL efforts to identify and control noxious weeds particularly leafy spurge.	IDL is funded to provide week control on State Lands	Annual treatments on Boulder Cr. have reduced leafy spurge to isolated plants	No authority or process constraints.

Listing Factor / Threats or Conditions	Lead for Accomplishing Conservation Measures	How Threat or Condition Will Be Addressed	Funding Source(s)	Completion or Planned Implementation Date	Authorities Processes Required
Livestock Grazing	BLM Field Office(s)	The Bureau of Land Management (BLM) Idaho Standards and Guidelines (ISG) implementation schedule will have assessments and decisions completed on all grazing allotments by 2007. The ISG addresses eight standards including Watersheds, Riparian systems, Native plant communities, Rangeland seedings and Threatened/Endangered/Sensitive species habitat. Where there is believed to be a deficiency for one or more of these standards, including sage grouse habitat, grazing management is reviewed and proper grazing management implemented to correct the deficiency.	ISG Administration Budgeted – BLM. ISG implementation projects funded through Dedicated Range Improvement Funds and BLM budgeted funds.	ISG decisions completed on 74 OFO allotments covering 1.44 million acres. All OFO allotments to be completed in 2007. All others in 2009. The JFO has completed 29 of 63 allotments with 15 scheduled for 2005.	Environmental Assessments for each ISG implementing decision.
	Idaho Department of Lands	The Idaho Department of Lands participates in the ISG plan development on State grazing lands intermingled with Federal land,	Idaho Department of Lands.	There are 87,603 acres of State land under ISG plans in 74 allotments.	IDL participates in ISG plan development.
	Private Landowners	landowners participate in the development of ISG management plans applicable to private land intermingled with Federal land.	Private Landowners.	There are 158,448 acres of private land under ISG plans in 74 allotments.	Private landowners participate in ISG plan development.
	Idaho Department of Lands	On State grazing lands that provide sage grouse habitat, the IDL will continue to conduct Resource Assessments on all expiring grazing leases and insure that new grazing leases include livestock management practices that address all resource concerns.	Idaho Department of Lands	Ongoing as part of IDL leasing program	IDL plan approval required
	Owyhee LWG Private landowners	Seek landowner cooperation in providing bird ladders in tanks for private water developments and pipelines.	None Required	Initiate in 2004, Ongoing	No authority or process constraints.

Listing Factor / Threats or Conditions	Lead for Accomplishing Conservation Measures	How Threat or Condition Will Be Addressed	Funding Source(s)	Completion or Planned Implementation Date	Authorities Processes Required
Utilization Hunting	IDFG	Change the bag limit to one bird per day and reduce the hunting season to 7 days in the northern part of Owyhee County.	None Required.	Completed	Idaho Fish and Game Commission approved.
	Local Working Group	Seek legislation to allow Habitat Improvement Program (HIP) funds to be used for sage grouse habitat improvement projects.	None Required.	Completed	Legislative action completed.
	Owyhee LWG	Recommend to Idaho Fish and Game Commission that a free permit system be implemented to identify sage grouse hunters and improve information gained from hunter surveys.	None Required.	Completed	Legislative and Idaho Fish and Game Commission action completed
	IDFG	Recommend addition and continuation of check stations and wing barrels.	None Required.	Initiated in 2000. Increased wing barrels and check stations ongoing.	No authority or process constraints.
	IDFG	Implement telephone survey of known sage grouse hunters to obtain better harvest data.	Idaho Fish and Game	Initiated in 2000 and ongoing.	No authority or process constraints.
	Owyhee LWG	Support and participate in BLM route designation efforts to keep ATVs and other vehicles on established roads and trails and avoid off road cross country travel. (Applies also to habitat fragmentation plan)	None required for LWG actions Budgeted w/BLM	Initiated in 2004 and Ongoing.	No authority or process constraints

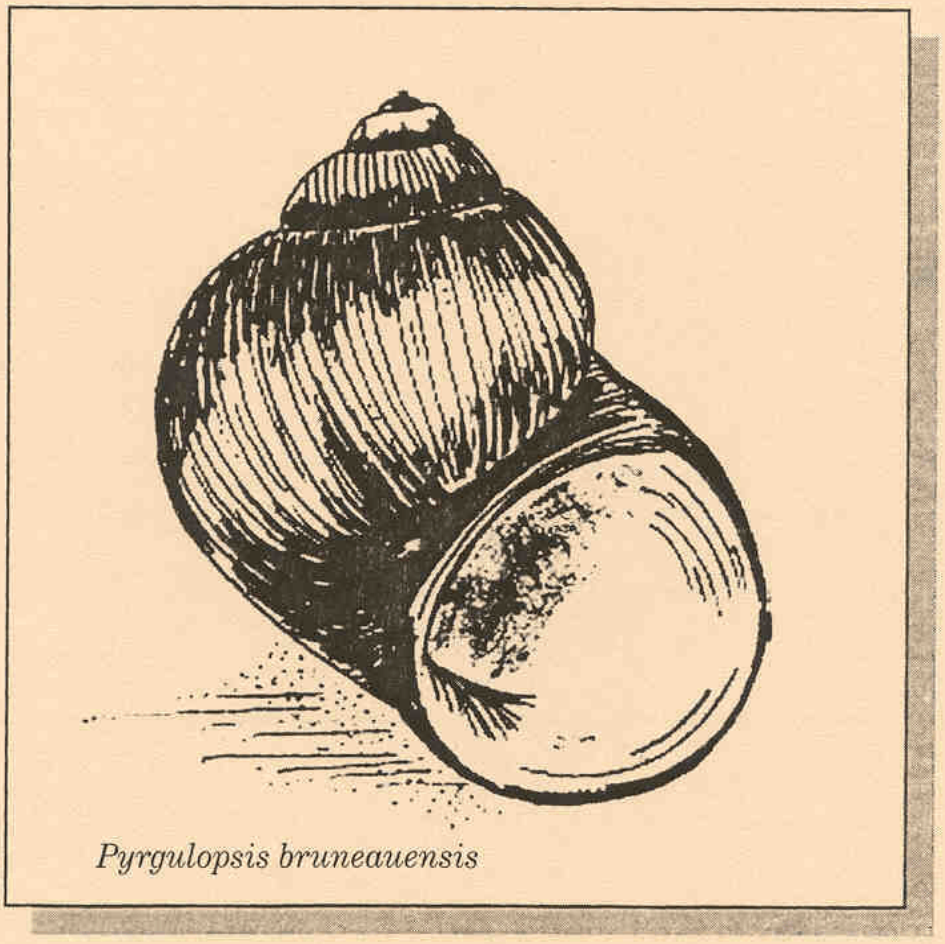
Listing Factor / Threats or Conditions	Lead for Accomplishing Conservation Measures	How Threat or Condition Will Be Addressed	Funding Source(s)	Completion or Planned Implementation Date	Authorities Processes Required
Predator Action Plan	Wildlife Services and IDFG	Conduct artificial nest studies to identify the primary sources of nest predation.	APHIS – WS IDFG LWG / State OSC.	Artificial nest predation study identified raven and coyote as primary nest predators.	NEPA – EA Completed.
	Wildlife Services and IDFG	Conduct a research project to evaluate the effect of predator suppression on nesting success rates in different habitat types. **	APHIS – WS IDFG LWG / State OSC.	Research project ongoing	NEPA – EA Completed.
	Wildlife Services predator removal. IDFG monitoring.	Where predation is identified as a important biological factor in a particular area, identified predators would be reduced. Document nest success and survival rate changes.	Funded, IDGF and Wildlife Services	Initiated 2000. Contingent on identification of problem areas	NEPA – EA Completed.
	U of I and Owyhee LWG	Conduct Landowner survey to document current local sage grouse and predator characteristics and changes over time. Data will be used to update and improve maps of known high priority sage grouse habitat	Funded. LWG / State OSC	Initiated June 2004 completion Fall 2004	No authority or process constraints. Landowner Cooperation.

** Wildlife Services prepared an environmental assessment for a research project to accomplish the proposed action. The effort was challenged and stopped by the Federal District Court. The LWG and Wildlife Services intend to pursue the research project.

Listing Factor / Threats or Conditions	Lead for Accomplishing Conservation Measures	How Threat or Condition Will Be Addressed	Funding Source(s)	Completion or Planned Implementation Date	Authorities Processes Required
Habitat Fragmentation & Perennial Grassland	See Wildfire Management and Western juniper encroachment	All of the actions proposed under Wildfire Management and Western juniper encroachment are proposed in part to avoid habitat fragmentation and/or prevent the establishment of perennial grassland.	See Wildfire Management and Western juniper encroachment	See Wildfire Management and Western juniper encroachment	See Wildfire Management and Western juniper encroachment
	Owyhee LWG	The LWG will provide comment and utilize other means as available to supports the policies of the Owyhee County in their Comprehensive Plan and Owyhee County Land Use Plan for Federal and State Lands to promote economically viable and sustainable ranching operations in order to discourage conversion of ranchland to rural / remote recreational home development.	None Required	Initiated 2004 Ongoing	Case by case issues are governed by the Planning and Zoning Commission.
	BLM Field Office(s). State Department of Lands. Owyhee LWG.	Implement sagebrush restoration in historic sage grouse habitat where historic fires have removed sagebrush creating perennial grasslands and fragmenting habitat. Target 1000 acres annually for combined Federal, State and Private lands.	Costs depend on annual acreage. Estimated $10 to $15 per acre. LWG / State OSC.	The first project is planned for 2005. Ongoing.	NEPA – EA on Federal lands. Concurrence of IDL or private landowner on non-federal lands..

U.S. Fish & Wildlife Service

Recovery Plan for the Bruneau Hot Springsnail



Pyrgulopsis bruneauensis

Cover illustration by Meggan Laxalt, used with permission.

RECOVERY PLAN

FOR THE

BRUNEAU HOT SPRINGSNAIL

(*Pyrgulopsis bruneauensis*)

Region 1
U.S. Fish and Wildlife Service
Portland, Oregon

Approved: Anne Badgley
Regional Director, Region 1, U.S. Fish and Wildlife Service

Date: 9/30/02

Disclaimer

Recovery plans delineate reasonable actions which are believed to be required to recover and/or protect the species. Plans are prepared by the U.S. Fish and Wildlife Service, sometimes with the assistance of recovery teams, contractors, State agencies, Tribal agencies, and others. Objectives will be attained and any necessary funds made available subject to budgetary and other constraints affecting the parties involved, as well as the need to address other priorities. Recovery plans do not necessarily represent the views nor the official positions or approval of any individuals or agencies involved in the plan formulation, other than the U.S. Fish and Wildlife Service. They represent the official position of the U.S. Fish and Wildlife Service only after they have been signed by the Regional Director or Director as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks.

Literature Citation should read as follows:
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Additional copies may be purchased from:
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E-mail: fwrs@fws.gov
http://fa.r9.fws.gov/r9fwrs/
Fees for the plans vary depending on the number of pages.

An electronic version of this recovery plan will also be made available at
http://www.r1.fws.gov/ecoservices/endangered/recovery/default.htm

Authors

The Bruneau Hot Springsnail (*Pyrgulopsis bruneauensis*) Recovery Plan was prepared by Jeri Wood and Steven Lysne, U.S. Fish and Wildlife Service, Snake River Basin Office, Boise, Idaho.

Executive Summary

Current Species Status: The Bruneau hot springsnail (*Pyrgulopsis bruneauensis*) was listed as endangered on June 17, 1998 (U.S. Fish and Wildlife Service 1998). The species currently survives in approximately 89 of 155 small, flowing geothermal springs and seeps along an approximately 8-kilometer (5-mile) reach of the Bruneau River and its tributary Hot Creek in southwestern Idaho. The species is found in a narrow elevation range of 803.7 to 815.7 meters (2,636.9 to 2,676.1 feet).

Habitat Requirements and Limiting Factors: The Bruneau hot springsnail has been found in flowing geothermal springs and seeps with temperatures ranging from 15.7 to 36.9 degrees Celsius (60.3 to 98.4 degrees Fahrenheit), with the highest densities of springsnails observed at temperatures ranging from 22.8 to 36.6 degrees Celsius (73 to 98 degrees Fahrenheit). Bruneau hot springsnails are found in these habitats on the exposed surfaces of various substrates, including rocks, gravel, sand, mud, and algal film. The principal threat to this species is the reduction and/or elimination of their geothermal spring habitat as a result of agricultural-related groundwater withdrawal and pumping.

Recovery Objective: To recover the species to the point where delisting is warranted.

Recovery Priority Number: The recovery priority for the Bruneau hot springsnail is 2C on a scale of 1 to 18, indicating that it is: 1) taxonomically, a species; 2) facing a high degree of threat; 3) rated high in terms of recovery potential; and 4) may be in conflict with construction or other development projects or other forms of economic activity.

Recovery Criteria: The Bruneau hot springsnail will be considered for downlisting to a threatened status when groundwater management activities have been implemented and monitoring indicates an increasing trend in water levels in the geothermal aquifer and occupied geothermal springs for a period of 10 years. Delisting of the species will be considered when: 1) water levels in the geothermal aquifer have increased and stabilized at 815 meters (2,674 feet) in

elevation (as measured in October in three of the Hot Creek area water monitoring wells [United States Geological Survey well numbers 03BDC1, 03BDC2, 04DCD1]); 2) the total number of geothermal springs discharging within the recovery area[1] is 200 or more and are distributed within the current range of the Bruneau hot springsnail; 3) more than two-thirds of available geothermal springs within the recovery area (approximately 131 springs) are occupied by stable, medium to high density populations of the Bruneau hot springsnail; and 4) groundwater levels are permanently protected against further reductions through implementation of groundwater management activities.

Actions Needed:

1. Implement conservation measures to increase water levels in the regional geothermal aquifer. Geothermal spring discharges should be permanently protected within the recovery area, as measured in October, annually, at three Hot Creek monitoring wells (United States Geological Survey well numbers 03BDC1, 03BDC2, 04DCD1), at an elevation of 815 meters (2,674 feet).

2. Implement a groundwater monitoring program to assess changes in the geothermal aquifer.

3. Implement a monitoring program to assess the survival and recovery of the Bruneau hot springsnail and its habitat.

4. Develop and implement a habitat restoration program within the recovery area.

5. Develop and implement a control program for non-native fish that prey upon the Bruneau hot springsnail within the recovery area.

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[1] The recovery area (see Figure 3) begins at the point where the Bruneau River crosses the southern boundary of Township (T) 08 South (S), Range (R) 06 East (E), Section (S) 12 and continues downstream (including Hot Creek from the confluence of the Bruneau River to the Indian Bathtub) to the point where the Bruneau River crosses the northern boundary of T07S, R06E, S35 of Owyhee County, Idaho (all within East Boise Meridian).

6. Manage Federal lands to promote recovery of the Bruneau hot springsnail.

7. Develop and implement a groundwater recharge model that stabilizes the geothermal aquifer at the recovery elevation. Conduct research to determine the feasibility of restoring Upper Hot Creek as suitable Bruneau hot springsnail habitat, and translocation and establishment of additional Bruneau hot springsnail colonies within the recovery area.

8. Seek funding for implementation of recovery tasks.

9. Monitor and evaluate the success of recovery actions with regard to fulfilling the recovery objectives, criteria, actions needed, and removal of threats as outlined in the plan.

Recovery Actions to Date: Since 1991, we, the U.S. Fish and Wildlife Service, have provided funding for annual Bruneau hot springsnail surveys and bi-annual range-wide surveys in geothermal springs within the range of the species in the Bruneau River. In addition, with our funding assistance, the U.S. Geological Survey completed monitoring of well water levels and spring discharges from the geothermal aquifer. The Bureau of Land Management has installed fencing along the east and west sides of the Bruneau River and Hot Creek to provide protection from livestock trampling of the geothermal springs (Bruneau hot springsnail habitat). The Bureau of Land Management has also co-funded, with us, the population monitoring of four geothermal springs occupied by Bruneau hot springsnails since 1993. The Bruneau hot springsnail conservation committee is currently reviewing proposals for funding that will conserve the use of geothermal water for irrigation.

Estimated Cost of Recovery: The estimated cost of downlisting is approximately $7.5 million over 10 years; for delisting, the estimated cost is approximately $15 million over a 15-year period beginning upon implementation of this plan.

Date of Recovery: Downlisting could be initiated immediately after recovery criteria have been met. However, at least 10 years following implementation of recovery tasks may be necessary before recovery criteria are fully or partially met.

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I. Introduction

A. Brief Overview

On June 17, 1998, we, the U.S. Fish and Wildlife Service, reaffirmed the 1993 listing of the Bruneau hot springsnail (*Pyrgulopsis bruneauensis*) as endangered (U.S. Fish and Wildlife Service 1998) in a court-ordered reconsideration of the 1993 final listing decision. The species occupies 89 geothermal springs in the Bruneau River/Hot Creek area, based on the last rangewide survey in 1999. Four of the occupied sites have been actively monitored since 1991, and monitoring of an additional 17 sites was initiated in 2000 (see the Conservation Measures section of this recovery plan) for a total of 21 monitoring sites (Rugenski and Minshall 2002). Restoration and protection of the geothermal aquifer from which preferred geothermal spring habitats arise along the Bruneau River is important to the continued survival of the Bruneau hot springsnail.

B. Species Account

The Bruneau hot springsnail was first collected in springflows at the Indian Bathtub in upper Hot Creek along the Bruneau River in 1952 (Hershler 1990). In 1953, J. P. E. Morrison determined that it represented a previously unknown genus and species of springsnail of the family *Hydrobiidae* (Hershler 1990). Taylor (1982) pursued subsequent field and laboratory studies of this species from 1959 through 1982. Based on these studies, Taylor prepared a brief physiological and biological description of the species and suggested the common name of the Bruneau hot spring snail. Subsequently, Hershler (1990) formally described the species from type specimens collected from the Indian Bathtub in Hot Creek as *Pyrgulopsis bruneauensis*, with a new common name of Bruneau hot springsnail (Figure 1).

Adult Bruneau hot springsnails have a small, globose (short, fat, rounded) to low-conic (short and cone-shaped, without many whorls) shell reaching a length of 5.5 millimeters (0.22 inches) with 3.75 to 4.25 whorls (Figure 1).

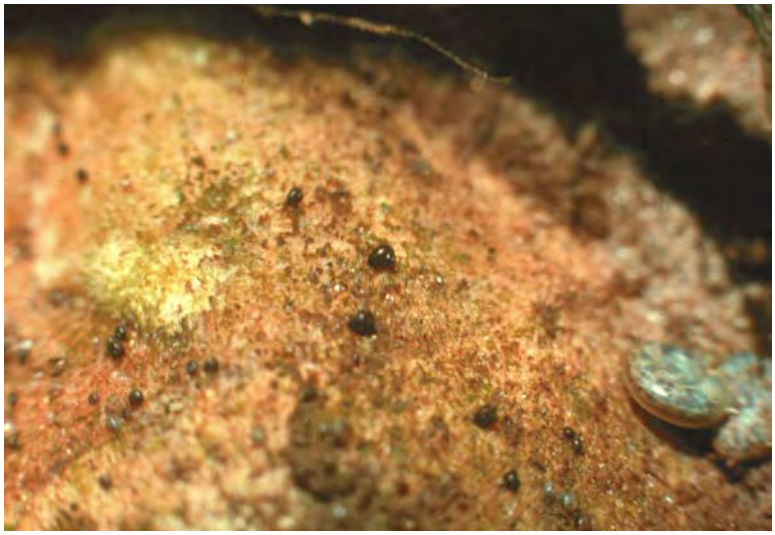


Figure 1. Photo of Bruneau hot springsnail (Pat Olmstead, BLM, used with permission)

Figure 2. Photo of typical Bruneau hot springsnail habitat (USFWS)

Fresh shells are thin, transparent, white-clear, appearing black due to pigmentation (Hershler 1990). In addition to its small size (less than 2.8 millimeters [0.11 inch] shell height), distinguishing features include a verge (penis) with a small lobe bearing a single distal glandular ridge and elongate, muscular filament.

Sexual maturity can occur at 2 months, with a sex ratio approximating 1 to 1. Reproduction occurs throughout the year except when inhibited by high or low temperatures (Mladenka 1992). At sites affected by high ambient temperatures during summer and early fall months, recruitment is seasonal, corresponding with cooler periods. Likewise, sites with cooler ambient temperatures would likely exhibit recruitment during the summer months (Mladenka 1992). Springsnails use "hard" surfaces such as rock substrates to deposit their eggs (Mladenka 1992).

The Bruneau hot springsnail appears to be an opportunistic grazer, feeding primarily on algae and diatoms. Springsnail densities are lowest in areas of bright green algal mats, while higher springsnail densities occur where periphyton communities[2] are dominated by diatoms (Mladenka 1992). Springsnail abundance generally fluctuates seasonally; abundance is influenced primarily by water temperature, spring discharge, and food availability (Mladenka 1992, Varricchione and Minshall 1997). Mladenka (1992) also noted that fluctuations in springsnail abundance corresponded with changes in food quality based on chlorophyll content.

The species has been found in flowing geothermal springs and seeps with temperatures ranging from 15.7 to 36.9 degrees Celsius (60.3 to 98.4 degrees Fahrenheit), with highest densities (greater than 1,000 per square meter, ≈1,000 per square yard) of snails noted at temperatures ranging from 22.8 to 36.6 degrees Celsius (73 to 98 degrees Fahrenheit) (Mladenka 1992). Temperature extremes (below 15.7 degrees Celsius, 60.3 degrees Fahrenheit, and above 35 degrees Celsius, 95 degrees Fahrenheit) affect both abundance and recruitment of Bruneau hot springsnails (Mladenka 1992). Geothermal spring elevations in the Bruneau River range from 803.7 to 815.7 meters (2,636.9 to 2,676.1 feet) (D. Brunner, in

[2] A dynamic “community” of single celled algae, protozoa, and bacteria, encased in a polysaccharide (simple sugar) matrix which exists on virtually all surfaces of continuously wetted aquatic substrates.

litt. 1994). The elevation at the Indian Bathtub spring, in Hot Creek, is 814.7 meters (2,672.9 feet).

Bruneau hot springsnails are found on the exposed surfaces of various substrates, including rocks, gravel, sand, mud, and algal film (Figure 2), within geothermal spring habitats (Mladenka 1992). However, during the winter period of cold ambient temperatures and icing, the springsnails are most often located on the underside of outflow substrates; habitats least exposed to cold temperatures (Mladenka 1992). In madicolous habitats (thin sheets of water flowing over rock faces), the species has been found in water depths less than 1 centimeter (0.39 inch). Current velocity is not considered a significant factor limiting Bruneau hot springsnail distribution, since they have been observed to inhabit nearly 100 percent of the available current regimes (Mladenka 1992).

As recently as 1999, the Bruneau hot springsnail occupied 89 of the 155 small, flowing geothermal springs and seeps along an 8-kilometer (5-mile) reach of the Bruneau River in southwestern Idaho (Mladenka and Minshall 1996) (Figure 3). Range-wide surveys indicate a decline in the total number of geothermal springs since 1991 by 27 percent, from 211 to 155. The number of geothermal springs occupied by Bruneau hot springsnails has also declined since 1991; from 131 to 116 occupied springs in 1996, and 66 occupied springs in 1998 (Mladenka and Minshall 1996, Myler and Minshall 1998 respectively). Most of the occupied springs are located along the Bruneau River at the confluence of, and upstream of, Hot Creek, on lands administered by the Bureau of Land Management (Figure 3). Some additional geothermal springs are located downstream of the Indian Bathtub and Hot Creek and are located on private land. Most do not provide suitable geothermal conditions for the Bruneau hot springsnail (Mladenka 1992).

The aquatic community associated with the Bruneau hot springsnail includes three additional rare plant and invertebrate species including an endemic snail, *Ambrysus mormon minor*, that has been found in Hot Creek and a few adjacent geothermal springs (Bowler and Olmstead 1991). The skiff beetle (*Hydroscapha natans)* historically occurred in Hot Creek, however, surveys conducted by Bowler and Olmstead (1991) did not find this species again. Hot Creek and the Bruneau River represent the northernmost location for this species. *Epipactis*

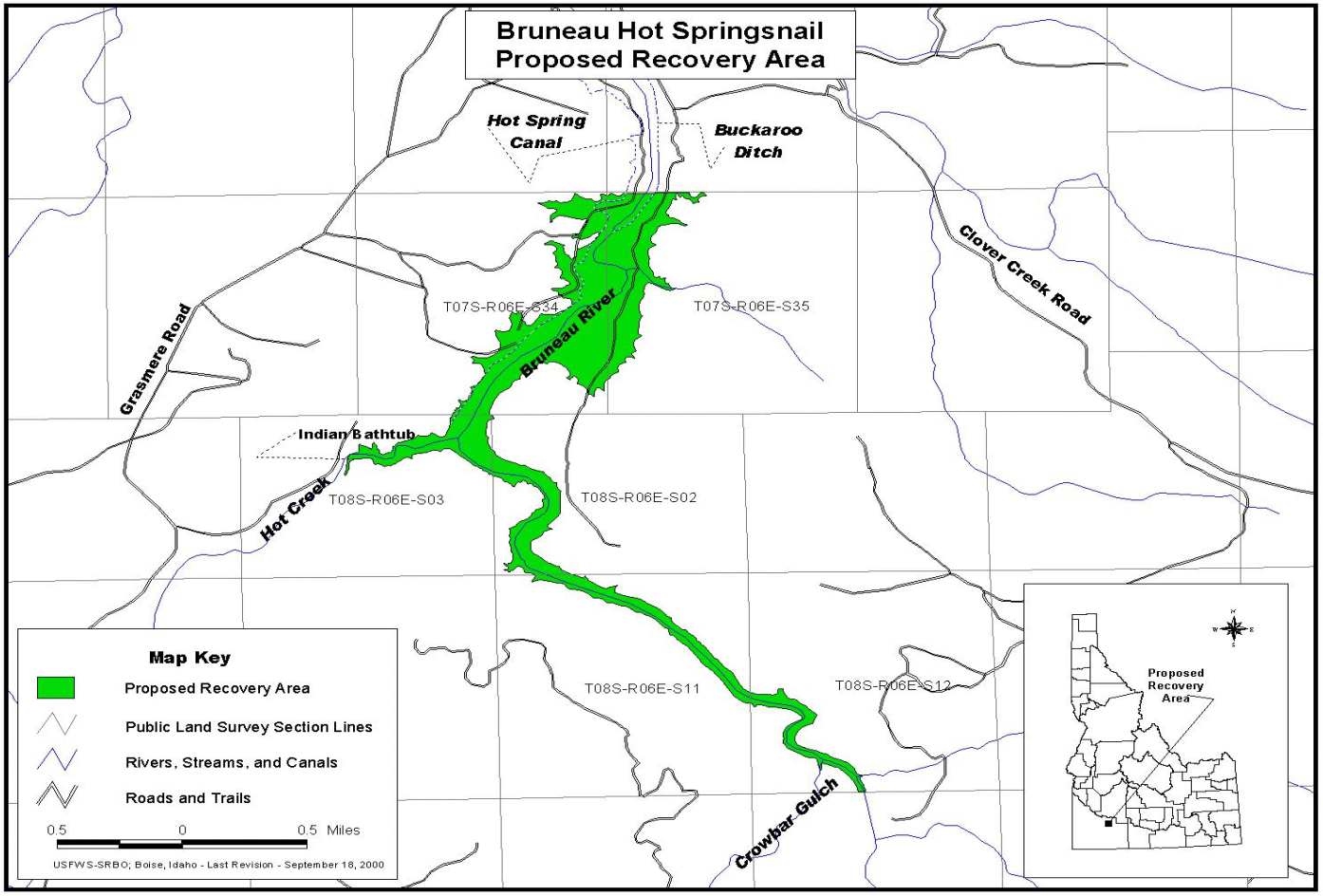


Figure 3. Map of the recovery area for Bruneau hot springsnail. The recovery area begins at the point where the Bruneau River (flowing from the south to the north) crosses the southern boundary of Township (T) 08 South (S), Range (R) 06 East (E), Section (S) 12 and continues downstream (including Hot Creek from the confluence of the Bruneau River to the Indian Bathtub) to the point where the Bruneau River crosses the northern boundary of T07S, R06E, S35 of Owyhee County, Idaho (all within East Boise Meridian).

gigantea (giant helleborine), a rare species of orchid, has been found in Hot Creek and along the Bruneau River associated with geothermal spring outflows. Other aquatic associates include two non-native fish species, *Poecilia reticulata* (a guppy) and a species of *Tilapia*. Guppies were apparently released into upper Hot Creek at the Indian Bathtub, from which they spread downstream and into nearby geothermal springs and seeps along the Bruneau River (Bowler and Olmstead 1991).

C. The Geothermal Aquifer

The geothermal spring habitats of the Bruneau hot springsnail are formed as a result of water discharging from faults or fractures originating from the underlying, confined volcanic-rock (geothermal) aquifer (Berenbrock 1993). These natural, geothermal springs (seeps or vents) discharge at the ground surface where the ground surface level or elevation is lower than the potentiometric or hydraulic head of the geothermal aquifer. As hydraulic pressures change (increase or decrease) within the geothermal aquifer as a result of recharge or continued groundwater pumping, the presence or absence of geothermal springs and the amount of surface area covered by springflows reflect these changes. The regional geothermal aquifer underlies a 1,554-square-kilometer (600-square-mile) area, which includes the Little, Sugar, and Bruneau Valleys in north central Owyhee County (designated the Bruneau/Grandview area) and is underlain with hydraulically connected sedimentary and volcanic rocks that together form the regional geothermal aquifer (Berenbrock 1993).

Groundwater in the regional geothermal aquifer originates through natural recharge from precipitation in and around the Jarbidge and Owyhee Mountains south of the Bruneau/Grandview area (Young and Lewis 1982, Mink 1984). Groundwater flows northward from volcanic rocks to sedimentary rocks where it is discharged as either natural springflow or groundwater well withdrawals, or leaves the area as underflow (Berenbrock 1993). Water in the volcanic rock in the northern part of the regional geothermal aquifer, near Hot Creek, is confined by the overlying sedimentary rocks, with temperatures at the surface ranging from 15 degrees Celsius (59 degrees Fahrenheit) to more than 80 degrees Celsius (176 degrees Fahrenheit) (Young *et al*. 1979). Natural recharge to the regional

geothermal aquifer is estimated to be approximately 57,000 acre-feet of water annually (Berenbrock 1993). Prior to extensive development, approximately 10,100 acre-feet of water was discharged from springflows alone. Underflow leaving the study area to the Bruneau and Snake Rivers was incalculable (Berenbrock 1993) but is assumed to equal, with springflow discharge, the natural recharge rate to the aquifer.

D. Reasons for Decline

There are more than 50 wells on private lands within 12.0 kilometers (7.5 miles) of the Indian Bathtub site utilizing geothermal waters for irrigation (Berenbrock 1993). Groundwater withdrawal and pumping threaten the Bruneau hot springsnail through a reduction or loss of geothermal spring habitats resulting from the depletion of the regional geothermal aquifer underlaying the Bruneau Valley area (Table 1). Within the past 30 years, discharge from many of the geothermal springs along Hot Creek and the Bruneau River has decreased greatly or ceased flowing, thus restricting springsnail habitat through the loss of wetted surface area (Young *et al*. 1979; Berenbrock 1993; Mladenka 1992, 1993; Mladenka and Minshall 1996; Myler and Minshall 1998) (Figures 4a - c). Changes in discharge at the geothermal springs correspond with changes in hydraulic pressure which fluctuate seasonally and are substantially less during late summer, when water withdrawals are greatest, than in the spring (Figure 5). From 1890 to 1978, well withdrawals increased from zero to approximately 49,900 acre-feet of water per year (Berenbrock 1993). Between 1978 and 1991, total well withdrawals averaged 42,000 acre-feet per year (Berenbrock 1993). Since 1992, the U.S. Geological Survey has continued monitoring of groundwater withdrawals and groundwater levels in a select number of springs and monitoring wells in the Bruneau/Grandview area. Withdrawals have averaged 53,800 acre-feet of water per year since 1992 and have been generally increasing since 1992 to a high of 66,200 acre-feet in 1999 (Table 1). Data for the 2001 monitoring year indicate a return to declining groundwater levels exceeding 1994 levels, previously the lowest monitored levels since 1991 (D. George, in litt. 2001).

Table 1. Ground water withdrawals (in acre-feet) for five water management units in the Bruneau-Grandview Groundwater Management Area (D. George, in litt. 2001).

Unit	1992	1993	1994	1995	1996	1997	1998	1999	2000
Bruneau Valley	5,800	5,700	5,200	4,900	5,500	5,700	6,800	7,800	7,500
Sugar Valley	6,400	5,700	6,700	6,400	7,100	5,900	5,700	6,500	8,200
Little Valley	31,800	29,800	32,400	27,200	28,500	31,100	32,000	34,400	30,900
Grand View	6,100	4,700	6,800	5,300	6,400	4,800	6,400	8,900	9,400
Castle Creek	9,100	7,000	8,200	6,200	6,000	6,500	6,900	8,600	9,900
Total	59,200	52,900	59,300	50,000	53,500	54,000	57,800	66,200	65,900

As of June 1997, there were 24 active Conservation Reserve Program agreements (acreage totaling 2,784 hectares; 6,880 acres) in the Bruneau area, 13 of which expired in October 1997, 8 in October 1998, and the remaining in October 1999. The Conservation Reserve Program is a conservation measure we support that temporarily removes private land from agricultural production thereby creating improved wildlife habitat and reducing groundwater withdrawals from the geothermal aquifer that would previously have irrigated the land enrolled in the program. There were approximately 6,400 hectares (15,822 acres) enrolled in the Conservation Reserve Program for all of Owyhee County. There has been no continuation of the Conservation Reserve Program in Owyhee County since 1999 due to a dramatic decline in monetary compensation per acre of land and, consequently, much of this land is now irrigated by geothermal waters. Bruneau hot springsnails have been eliminated from upper Hot Creek, including the type locality at the former Indian Bathtub spring site. Spring discharge at the Indian Bathtub declined from an estimated 9,300 liters per minute (2,400 gallons per

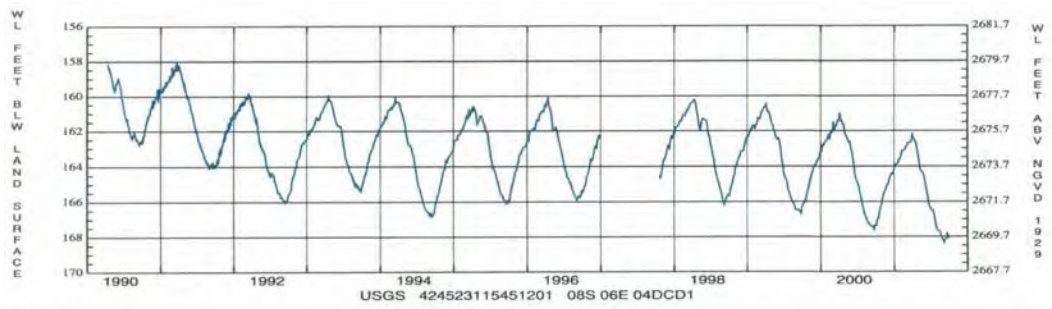
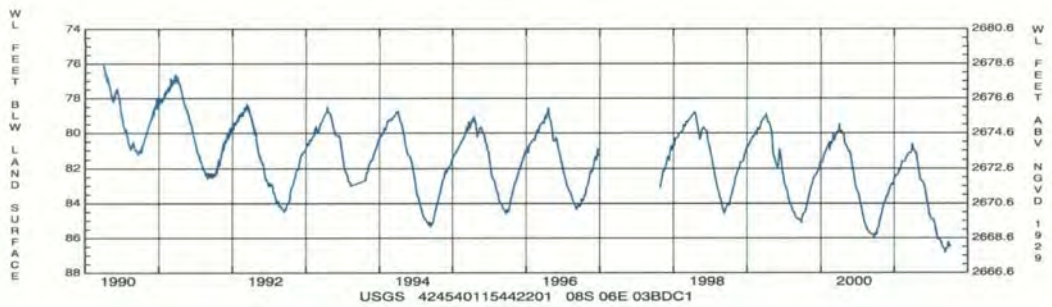


Figure 4a.



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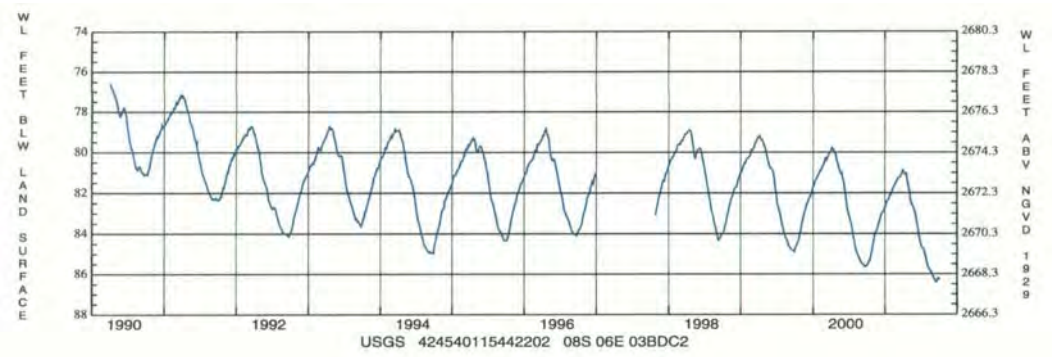

Figure 4c.

Figures 4a - c. Trends in three U. S. Geological Survey geothermal aquifer monitoring wells near the Indian Bathtub recreation area from 1990 to 2000 (D. George, in litt. 2001).

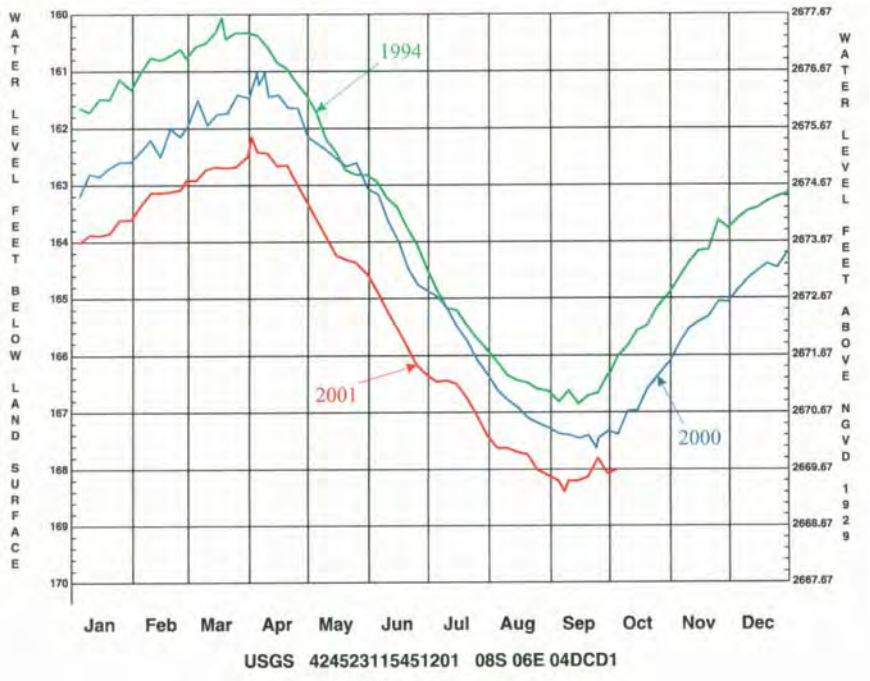

Figure 5. Annual fluctuations in one U. S. Geological Survey geothermal aquifer monitoring well near Indian bathtub recreation area (D. George, in litt. 2001).

minute) in 1964 to zero discharge by 1990 during the summer and early fall (Young *et al*. 1979, Berenbrock 1993). Visible spring discharge at the Indian Bathtub continues to be low and seasonally variable, ranging between 5.6 and 11 liters per second (0.21 and 0.39 cubic foot per second) with drying in the summer and early fall in most years (Varricchione and Minshall 1997; D. George, in litt. 2000). Today, water from the Indian Bathtub sinks below the ground surface and reemerges about 450 meters (984.3 feet) below the spring outlet area (Rugenski and Minshall 2002).

In 1991, a flash flood event in the Hot Creek drainage resulted in large amounts of sediment filling in the Indian Bathtub, causing a 50 percent reduction in the size of the Indian Bathtub (a portion of which is now covered by approximately 3 meters [10 feet] of sediment) (Mladenka 1992). The typical Bruneau hot springsnail rockface habitats of Indian Bathtub were severely reduced and

covered with sediment during this and other flash flood events (Mladenka 1992). Soils information from the Bureau of Land Management (S. Sather-Blair, in litt. 1993) suggests that the lower end of the Hot Creek drainage is highly erosive and probably was never stabilized with a heavy ground cover of perennial plants. Because visible spring discharge at the Indian Bathtub continues to be low and intermittent in most years (Varricchione and Minshall 1997; D. George, in litt. 2000), Bruneau hot springsnails have been unable to migrate to or inhabit the original upper Hot Creek/Indian Bathtub sites (Varricchione and Minshall 1997). Varricchione and Minshall (1997) suggested several factors including unsuitable substrate type (primarily silt and sand, with little to no available rockface surfaces), weak migration abilities, fish predation, and a lack of an upstream colonization, that may have prevented the Bruneau hot springsnails from returning to the upper Hot Creek and Indian Bathtub sites. While flash floods probably occurred historically, the effects of declining springflows on the flushing of sediment deposited, and filling in of springsnail habitats at the Indian Bathtub and upper Hot Creek, have likely resulted in the permanent loss of suitable habitat at the Indian Bathtub.

Bruneau hot springsnails are also vulnerable to a variety of introduced predators (Mladenka 1992). The presence of the wild populations of non-native guppies and a species of *Tilapia* in Hot Creek and many of the small geothermal springs along the Bruneau River is a threat to the Bruneau hot springsnail (Myler and Minshall 2000). The presence of these non-native fish may restrict repopulation of the Bruneau hot springsnails into Hot Creek (Varricchione and Minshall 1997, Myler and Minshall 2000) and at other geothermal spring sites. Both of these non-native fish species migrate into the Bruneau River corridor, both upstream and downstream of Hot Creek, to other spring outflows when temperatures in the Bruneau River are suitable (during the summer months). Movement of these non-native fish species into other geothermal springs occupied by the Bruneau hot springsnail will likely affect the springsnail within individual spring sites, and will likely affect the springsnail's ability to disperse to other available geothermal habitats downstream. As typical habitats, such as rockfaces with flowing water (Myler and Minshall 2000), continue to be reduced or eliminated, use of the less desirable remaining geothermal springs increases the vulnerability of the Bruneau hot springsnail to predation.

Currently, the mandates of most state resource agencies do not extend protection to invertebrate species. The Idaho Department of Water Resources can regulate water development in the Bruneau/Grandview area through a variety of administrative policies and State laws. However, under existing State laws, any conservation measures imposed by the Idaho Department of Water Resources to manage groundwater are only for the purpose of fulfilling senior water rights and not for the protection of fish and wildlife resources. The Idaho Department of Water Resources has the authority to control groundwater and can limit the development of new wells in a critical groundwater area, impose water conservation measures including the repair of leaking or uncontrolled flowing wells, and require meters on existing wells (Idaho Department of Water Resources 1992). At present, there is no specific allocation of either surface or groundwater in the Bruneau/Grandview area for the protection and conservation of fish and wildlife. The Idaho Department of Water Resources has designated the Bruneau/Grandview area a Groundwater Management Area, which allows the Idaho Department of Water Resources to hold applications for water permits until it can be demonstrated that the proposed withdrawal will not adversely impact other water rights in the Groundwater Management Area (Idaho Department of Water Resources 1992). Groundwater Management Area designations, however, are intended only to maintain sufficient groundwater to fulfill existing water rights and supply the needs of irrigation. Holding of new applications for water permits does not include new applications for domestic water use or the deepening of existing wells. An artesian well inventory conducted by the Idaho Department of Water Resources (1992) identified several surface leaking wells that might be wasting water in the subsurface due to inappropriate well construction techniques. In 1985, two water-wasting wells were repaired. However, other wells, especially those leaking at the subsurface level, have not been addressed (G. Spackman, in litt. 1993).

In summary, since 1991, the total number of springs, both occupied and unoccupied, hot springsnail densities, and groundwater levels measured at the Indian bathtub continue to decline (Tables 1 and 2). As geothermal aquifer levels

Table 2. Total number of springs, springs occupied by Bruneau hot springsnails, and water level measurements of two wells located near the Indian Bathtub spring (Myler and Minshall 1998; Mladenka and Minshall 1996; U.S. Geological Survey, in litt. 1999).

Year	**Total Number of Springs**	**Number of Occupied Springs**	**October Elevation of Well #03BDC1**	**October Elevation of Well #03BDC2**
1991	211	131	2,672.74 feet	2,672.56 feet
1993	201	128	2,672.24 feet	2,671.45 feet
1996	204	116	2,671.65 feet	2,671.39 feet
1998	155	89	2,671.57 feet	2,671.23 feet
2000	Data not available	Data not available	2,668.6 feet	2,668.9 feet

continue to decline, and the number of springs and occupied springs follow, populations of Bruneau hot springsnails are extirpated locally and face increasing risk of extinction (Figure 6).

Some groundwater conservation measures have been implemented and water savings have been achieved, but groundwater levels and associated springflows continue to decline. To recover the Bruneau hot springsnail, it is imperative that remaining springsnail habitats be preserved, and this will require a marked reduction in groundwater withdrawals from the geothermal aquifer. It is estimated that unless current rates of geothermal aquifer water withdrawal are not stabilized or reversed, Bruneau hot springsnails may become extinct by the year 2012 (Myler 2000; Figure 6).

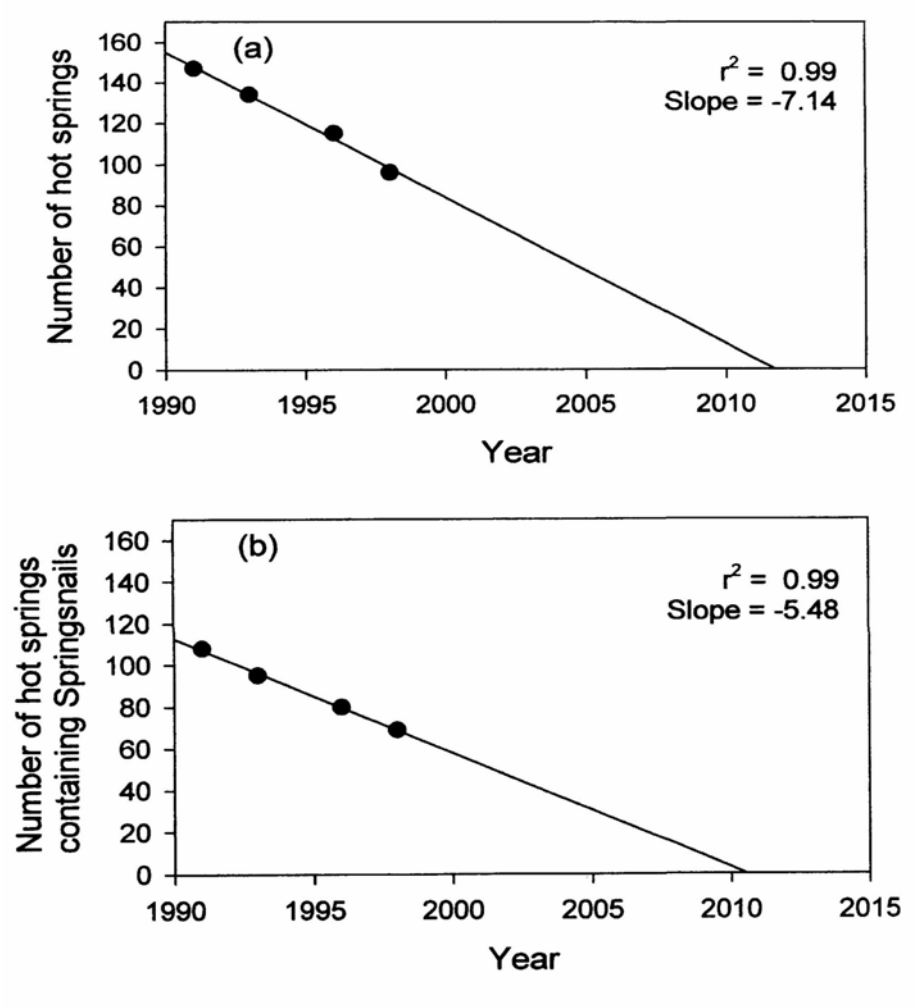

Figure 6. Simple linear regression to predict point in time when (a) number of hot springs and (b) number of hot springs containing springsnails reaches zero if the decline continues at the present rate (from Myler, 2000).

E. Conservation Measures

1. Congressional Appropriations

In 1987, approximately $800,000 was appropriated in our budget by the U.S. Congress to fund studies to be used in the development of a cooperative conservation plan to conserve and protect the Bruneau hot springsnail. Three agencies conducted these studies: the Idaho Department of Water Resources, the U.S. Geological Survey, and Idaho State University. The Idaho Department of Water Resources was funded to: 1) prepare a Geographic Information System map for the study area to provide a detailed information base from which to derive management decisions, including existing data and data to be developed by the U.S. Geological Survey and Idaho State University; 2) prepare geological maps to define the bedrock geology and record the location, elevation, flow, and temperature of area springflows; and 3) evaluate and analyze Federal and State laws applicable to a conservation plan for the Bruneau hot springsnail and assess management alternatives open to the Idaho Department of Water Resources to protect Bruneau hot springsnail habitats. The Idaho Department of Water Resources has not finalized the conservation plan. The U.S. Geological Survey was funded to develop and implement a three-phase groundwater study of the Bruneau River valley and basin. The study focused on describing the hydrology of the regional geothermal aquifer system and associated geothermal springs, with an overall goal to determine the cause of declining springflows affecting the Bruneau hot springsnail and its habitat. Finally, funds were provided to Idaho State University to study the biological, ecological, and physiological needs of the Bruneau hot springsnail.

In Fiscal Years 1999 and 2000, an additional $1 million was appropriated in our budget by Congress to aid the State of Idaho in implementing water conservation activities for the Bruneau hot springsnail. Recovery of the Bruneau hot springsnail is dependent on the State of Idaho Department of Water Resources, the Bruneau Hot Springsnail Conservation Planning Committee, and any State and Federal agency on the committee obtaining additional funding to implement groundwater conservation measures in the Bruneau-Grandview Water Management Area.

2. Programs under the Idaho Department of Water Resources

The Idaho Department of Water Resources, under the authority of State laws, regulates groundwater development in the Bruneau area. In 1982, the Idaho Department of Water Resources established the Bruneau-Grandview Groundwater Management Area, an administrative tool which allows the Idaho Department of Water Resources to continue to receive and retain without action applications for water permits until it can be demonstrated that sufficient water is available, and the withdrawal will not adversely impact other water rights within the Bruneau area (Idaho Department of Water Resources 1992). Due to declining groundwater levels in the area, no applications for withdrawal within the Groundwater Management Area, except those for domestic purposes, have been approved since 1982. The Idaho Department of Water Resources has a critical role in the conservation of the Bruneau hot springsnail as it legally manages the appropriation of water resources in the State. Some suggested conservation measures that should be considered by the State are the establishment of a "water bank" for water saved by conservation measures and protected by the State against future claims of appropriation, the transfer of abandoned or forfeited water rights to the aforementioned water bank, or the establishment of instream minimum flows in Hot Creek for the conservation of Bruneau hot springsnail habitat.

3. State of Idaho Bruneau Hot Springsnail Conservation Strategy

In 1998, the State of Idaho established a strategy planning committee, of which we are an active member. The main objective of the committee is to develop and implement a conservation strategy that will reduce the use of groundwater for irrigation. Possible activities being considered by the committee include the "rental" of groundwater rights by the State for a 15-year term and funding of water conservation projects and repair of leaking wells (at both the surface and subsurface levels). The State will use the expertise of the committee to prioritize and fund individual projects as proposals are submitted by agencies or individuals. Project priorities will be determined via the following guidelines: a) cost effectiveness/sharing; b) location or the proximity to the spring system in the Bruneau River; c)

duration; and d) total groundwater savings expected. All proposals will include some mechanism for monitoring and accounting for water savings. Previously, the strategy relied solely on Federal funds provided by Congressional appropriations for Fiscal Years 1999 and 2000. Additional funding for projects subsequent to issuance of this plan will be needed to implement this conservation strategy.

4. Programs under the Bureau of Land Management

The Bureau of Land Management manages Federal land containing Bruneau hot springsnails and their habitats along Hot Creek and the Bruneau River. The Bureau of Land Management issues permits for livestock grazing on these lands and grants authorizations for grazing and land exchange that could lead to the drilling of new wells or increased groundwater use on these lands. In 1992, the Bureau of Land Management installed fencing to protect Bruneau hot springsnail habitat from grazing impacts in the Hot Creek watershed, from above Indian Bathtub to the confluence of Hot Creek and the Bruneau River. Fencing has been installed along the canyon rim of the Bruneau River to further control livestock use of the river on Federal lands within the recovery area.

Since 1993, a Cooperative Challenge Cost Share Project with the Bureau of Land Management and Idaho State University has continued to monitor key habitat variables (Hot Creek discharge, temperature, and water chemistry), and springsnail abundance and population structure at the four study sites on a monthly basis (excluding February and December). This information has been essential for refining our understanding of springsnail population dynamics and monitoring spring outflows in Hot Creek. We were a cooperator in initiating an expanded monitoring program in Fiscal Year 2000 (see number 5 below).

5. Programs under the Fish and Wildlife Service

In late 1989, using funding provided through the Congressional appropriation described above, we contracted researchers from Idaho State University to

initiate a comprehensive ecological life history study of the Bruneau hot springsnail. The study described the life history of the springsnail, characterized the species physical habitat requirements, and examined its regional distribution in Hot Creek and nearby geothermal springs (Mladenka 1992).

In 1990, we provided funds, through the Congressional appropriation described above, to fence the Indian Bathtub, a privately-owned in-holding within the Hot Creek watershed. A conservation easement was signed between us and the landowner to continuously maintain the fencing. The current landowner continues to honor the original conservation easement.

In an effort to continue the 1991 rangewide surveys for all geothermal springs and geothermal springs occupied by Bruneau hot springsnails along the Bruneau River and Hot Creek, we have provided funding to Idaho State University every 2 to 3 years. Surveys were completed in 1993, 1996, and 1998. Results of these surveys indicate a 27 percent decline in the total number of springs since 1991; from 211 to 155. The number of geothermal springs occupied by Bruneau hot springsnails has also shown a nearly 32 percent decline since 1991; from 131 to 89.

We have provided funding every year since Fiscal Year 1993, (with the exception of 1997) to the U.S. Geological Survey to conduct groundwater, spring discharge, and annual withdrawals monitoring. Groundwater monitoring efforts have included measurements at 6 continuous groundwater level recorders, 10 monthly and 1 semiannual observation wells, 8 monthly spring discharge measurements, and computation of annual groundwater withdrawals. Beginning in 2001, the State of Idaho has agreed to fund monitoring of the 10 monthly and 1 semiannual observation wells and will continue groundwater monitoring in the future. We will continue to fund spring discharge measurements and population monitoring at 21 occupied geothermal spring sites as funding remains available (see description below).

As part of the change in monitoring responsibilities described above, we provided funding to Idaho State University in Fiscal Year 1999 for the

development of an expanded biological and habitat monitoring program within the range of the Bruneau hot springsnail. Expanded monitoring includes the 4 monitoring sites established in 1993, and an additional 17 occupied sites above and below the confluence of Hot Creek for a total number of 21 monitoring sites. The monitoring program measures spring discharge where discharge can be measured, density of springsnails present, water temperature and conductivity, and measures of flowing and wetted surface area dimensions. Photographs and site descriptions are made and each site has been labeled for ease of relocation. Monthly monitoring will commence in April or May, when water levels in the Bruneau River are low enough to allow access to all monitoring sites, and continue through October. We, in cooperation with the Bureau of Land Management and Idaho State University through the Bureau of Land Management's Challenge Cost-Share Program, have begun funding monitoring on a yearly basis.

6. Programs under the U.S. Department of Agriculture

The U. S. Department of Agriculture Natural Resources Conservation Service provides money and assistance to landowners who wish to participate in wildlife and wildland conservation through the Conservation Reserve Program, Wetlands Restoration Program, and Wildlife Habitat Incentives Program. One or more of these programs may be appropriate for landowners who wish to reduce impacts on Bruneau hot springsnails or their habitat.

The Conservation Reserve Program is a voluntary program under the Farm Service Agency, authorized under the Food Security Act of 1985, as amended, that offers rental payments, incentive payments for certain activities, and cost-share assistance to establish approved cover on eligible cropland. This program encourages farmers to plant long-term resource-conserving covers to improve soil, water, and wildlife resources. The duration of the contracts are between 10 and 15 years. As of 1999, all lands formerly enrolled in the Conservation Reserve Program in Owyhee County (approximately 2,784 hectares [6,880 acres]) were no longer participants in the program. It is unlikely that all those eligible for new Conservation Reserve Program agreements will participate due to a dramatic drop in the rental rates (from

about $20 per hectare [$50 per acre] to about $7 per hectare [$17 per acre]) currently being offered through the program. Area landowners have indicated that this drop in rental fees will not provide the necessary incentive to continue participating in the Conservation Reserve Program. The Farm Service Agency should, in cooperation with the State through the strategy, seek additional rental fees for willing participants in the program.

The Wetlands Reserve Program is a voluntary program to restore and protect wetlands on private property. The Natural Resource Conservation Service, in cooperation with the Farm Service Agency, manages the Wetlands Reserve Program. Landowners who participate can either sell a permanent conservation easement to the U. S. Department of Agriculture or enter into a cost-share agreement with the U. S. Department of Agriculture to protect and restore wetlands. The program is quite flexible and offers several options for enrollment, generally with a minimum enrollment period of 10 years in duration from the time of signing a Wetlands Reserve Program contract. Depending on the enrollment option, the U. S. Department of Agriculture will pay between 75 and 100 percent of the costs associated with the restoration activity. The Wetlands Reserve Program may or may not be applicable to the conservation of Bruneau hot springsnail habitat and may not apply to riparian areas adjacent to Hot Creek or the Bruneau River, however, it may represent a possible alternative to the Conservation Reserve Program if that program is no longer cost effective for landowner participation.

The Wildlife Habitat Incentives Program is another voluntary incentive program for people who want to improve or protect wildlife habitats on private lands. This program works by preparing cooperative wildlife conservation plans between landowners and Federal agencies that describes goals for improving wildlife habitat, a list of practices to be used in realizing those goals, and an implementation schedule for attaining those goals. Agreements generally last from 5 to 10 years with the U. S. Department of Agriculture providing technical assistance in developing plans and funding of up to 75 percent of the wildlife habitat implementation costs. As with all of the above programs, landowners, if they chose, maintain ownership of the lands participating in the program and may continue current land use practices

with relatively few restrictions. The Wildlife Habitat Incentives Program could conserve Bruneau hot springsnail habitat by drafting goals designed to reduce the amount of geothermal aquifer water used for irrigation. It is the geothermal aquifer water which ultimately creates snail habitat and, thus, warrants protection.

II. Recovery

A. Recovery Objectives and Strategy

The recovery area is defined as beginning at the point where the Bruneau River (flowing from south to north) crosses the southern boundary of Township (T) 08 South (S), Range (R) 06 East (E), Section (S) 12 and continuing downstream (including Hot Creek from the confluence of the Bruneau River to the Indian Bathtub) to the point where the Bruneau River crosses the northern boundary of T07S, R06E, S35 of Owyhee County, Idaho (all within East Boise Meridian) (Figure 3).

Recovery is contingent upon conserving the geothermal aquifer and increasing the number of geothermal spring habitats within the recovery area for Bruneau hot springsnails, while acknowledging that geothermal groundwater can continue to be managed to fulfill other beneficial uses. Strategies to achieve recovery include the following action items:

1. Implement conservation measures to increase water levels in the regional geothermal aquifer (Priority 1)[3]. Recovery will require that all available geothermal spring seeps and outflows discharging within the recovery area between an elevational range of 803.7 to 816.96 meters (2,636.9 to 2,678.54 feet) are secure. This can be accomplished by implementing conservation measures that increase water levels (or spring discharge) in the regional geothermal aquifer and prevent any further declines.

2. Implement a groundwater monitoring program to assess increases, or declines, in the geothermal aquifer (Priority 1). Continued groundwater monitoring is necessary to continue to assess the effects of groundwater withdrawals and conservation on water levels in the regional geothermal aquifer that supplies water to the geothermal springs occupied by Bruneau hot springsnails.

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[2] See Section V, Implementation Schedule, for a complete definition of priorities.

3. Monitor the survival and recovery of the Bruneau hot springsnail and its habitat (Priority 1). Concurrent with the groundwater monitoring program, continued monitoring of springsnail habitats and spring discharge is necessary to detect and evaluate trends in springsnail abundance and persistence. This information is also necessary to evaluate the effectiveness of conservation measures.

4. Develop and implement a habitat restoration program within the recovery area (Priority 2). Habitat restoration within the recovery area may allow the species to disperse to currently unoccupied geothermal spring habitat as it becomes available.

5. Develop and implement a control program for non-native fish that prey upon the Bruneau hot springsnail within the recovery area (Priority 2). Control of non-native fish that prey on Bruneau hot springsnails within the recovery area may allow the species to disperse to currently unoccupied geothermal spring habitat as non-native fish are eliminated.

6. Manage Federal lands to promote recovery of the Bruneau hot springsnail (Priority 3). The Bureau of Land Management has the responsibility to not permit any activities on Federal lands under the Bureau of Land Management's jurisdiction that would jeopardize the survival of endangered or threatened species or destroy or adversely modify their critical habitat. To that end, the Bureau of Land Management should continue to manage activities on Federal lands that may jeopardize the survival of the Bruneau hot springsnail (*e.g*. livestock grazing or off-road vehicle travel). The Bureau has installed fencing along the east and west side of the Bruneau River and the Hot Creek watershed to prevent the trampling of riparian vegetation by cattle and the subsequent erosion and siltation of Bruneau hot springsnail habitat. In addition to fencing activities, the Bureau of Land Management assesses land exchanges with private landowners that may otherwise convert rangeland to irrigated croplands that would use geothermal waters for irrigation.

7. Continue to support research on the conservation of the Bruneau Hot Springsnail (Priority 3). Develop a groundwater recharge model that will

assist in determining levels of pumping that do not result in continued decline of the geothermal aquifer. Conduct research to determine the feasibility of restoring Upper Hot Creek as suitable springsnail habitat, and translocation and establishment of additional springsnail colonies within the recovery area.

8. Seek funding for implementation of recovery tasks (Priority 1). Additional funding will be needed to continue implementation of several recovery tasks, including implementation of water conservation activities, continued groundwater monitoring, and Bruneau hot springsnail population and spring discharge monitoring.

9. Recovery Plan Assessment. The recovery plan should be updated as recovery tasks are accomplished, or revised as environmental conditions in the Bruneau/Grandview area change and as additional information becomes available.

B. Recovery Criteria

The Bruneau hot springsnail will be considered for reclassification from endangered to threatened when it is demonstrated that:

1. Groundwater and habitat management activities that provide for the protection of the Bruneau hot springsnail's geothermal habitats are implemented; and

2. Following implementation of the groundwater and habitat management activities, water levels in the geothermal aquifer (*i.e.*, spring discharge) have shown an increasing trend over a period of 10 years toward the recovery goal of at least 815 meters (2,674 feet) above sea level (as measured in October, annually, at U.S. Geological Survey well number 03BDC1, 03BDC2, and 04DCD1) and the number of geothermal springs have increased to approximately 165 seeps and are well distributed within the recovery area.

Bruneau hot springsnails will be considered for delisting when it is demonstrated that:

1. Water levels in the geothermal aquifer are being maintained at 815 meters (2,674 feet) above sea level (this value approximates the average elevation of 2,673.7 feet in October of 1990; D. George, in litt. 2001), as measured in October, annually, at the Hot Creek monitoring wells (U.S. Geological Survey well number 03BDC1, 03BDC2, and 04DCD1);

2. The geothermal springs number more than 200 in October, and are well distributed throughout the recovery area (this value approximates the 204 geothermal springs censussed in 1996; Mladenka and Minshall, 1996);

3. Greater than two-thirds of available geothermal springs (approximately 131 springs) are occupied by medium to high density populations of Bruneau hot springsnails (1,650 to 10,000 snails/ m^2) (Rugenski and Minshall 2002); and

4. Regulatory measures are adequate to permanently protect groundwater against further reductions.

III. Step-down Narrative Outline for Recovery Actions

Tasks described under number 1 below are the short-term recovery measures that are essential to prevent extinction of the Bruneau hot springsnail and halt further declines in its habitat.

1 <u>Implement conservation measures to increase water levels in the regional geothermal aquifer</u>.

To promote recovery of the Bruneau hot springsnail, water levels in the geothermal aquifer must be increased to an elevation of 815 meters (2,674 feet) within the recovery area. Water levels in the geothermal aquifer will be measured at monitoring wells located near Indian Bathtub (USGS well number 03BDC1, 03BDC2, and 04DCD1). To achieve recovery, protection of the geothermal aquifer supplying springsnail habitats (geothermal springs) must be accomplished. Several options exist to accomplish this task including, but not limited to, continued implementation of the State's Bruneau Hot Springsnail Conservation Strategy, development of a Water Management District, renewal of Conservation Reserve Program agreements, and maintenance of the Groundwater Management Area in perpetuity. The Idaho Department of Water Resources administers water rights and regulates water management in the Bruneau area. Therefore, by exercising their water management authority, the Idaho Department of Water Resources can lawfully assist efforts to conserve and increase geothermal aquifer levels essential to maintaining and increasing springsnail habitat.

1.1 <u>Continue implementation of the State of Idaho Bruneau Hot Springsnail Conservation Strategy to meet recovery objectives and criteria set forth in this recovery plan</u>.

The State of Idaho has a key role in implementing the strategy for the conservation of the Bruneau hot springsnail (see conservation measure number 2). The Idaho Department of Water Resources has the legal authority to control geothermal groundwater withdrawal rates to implement water conservation measures in the Bruneau-Grandview Water Management Area

for the purpose of recovering the Bruneau hot springsnail (see Reasons for Decline, p. 7). The strategy currently includes a monitoring component that will help determine the effectiveness of any conservation efforts applied through implementation of the strategy. The Strategy Planning Committee (Committee) should pursue additional funding and continue to review and approve proposals, based on criteria described in conservation measure number 3, and the Committee should pursue a course of action intended to permanently reduce the amount of groundwater used for irrigation. While Federal funding was provided for the first 2 years of implementation in 1999 and 2000, the Committee should address future alternative and additional funding sources to continue implementation of the strategy should Federal funding sources become unavailable. The State should use the expertise of the Committee, particularly from various agency biologists and hydrologists, to prioritize and fund individual projects as proposals are submitted by agencies or individuals. Project priorities will be determined according to the following guidelines: a) cost effectiveness/sharing; b) location or proximity to the spring system in the Bruneau River; c) duration; and most importantly d) total water savings expected. Funding should not be provided for projects proposing to shift water withdrawals from the geothermal aquifer to Hot Creek or the Bruneau River. Likewise, funding will be denied unless water savings from conservation measures will be permanently retired and protected by the State from subsequent claims to water appropriations. To be considered, all proposals should include some mechanism for monitoring and accounting for water savings for a period of at least 5 years. The strategy is being implemented using Federal funds provided by Congressional appropriation for Fiscal Years 1999 and 2000. Additional funding for projects should be sought for this project through grants, and State and Federal funds.

Activities associated with implementation of the strategy should also lead to achievement of the recovery objectives and criteria set forth in this document, including permanent protection of the geothermal aquifer with measured water levels at an elevation of 815 meters (2,674 feet) (as measured at U. S. Geological Survey monitoring wells number 03BDC1, 03BDC2, and 04DCD1). Implementation of recovery task 1.1 is necessary to ensure the continued survival and recovery of the Bruneau hot springsnail.

1.2 Implement minimum in-stream flows for Hot Creek for invertebrates and vertebrate fish and wildlife.

The Idaho Department of Water Resources has the authority to regulate water development in the Bruneau-Grandview Groundwater Management area. Currently, the Department of Water Resources does not implement conservation measures for the protection of invertebrates and vertebrate fish and wildlife. However, the Department of Water Resources has the authority to implement minimum in-stream flows and to hold applications for water permits until it has been demonstrated that the proposed withdrawal will not adversely affect other water rights within the Groundwater Management Area. Thus, by implementing minimum in-stream flows of 0.02 m^3 sec^{-1} in Hot Creek for invertebrates and vertebrate fish and wildlife, the Department of Water Resources can simultaneously hold water permits that would adversely affect those flows, meet Recovery Objective and Strategy 1, and meet the State of Idaho strategic planning committees' main goal of reducing the use of geothermal groundwater for irrigation. Implementation of recovery task 1.2 is also necessary to ensure the continued survival and recovery of the Bruneau hot springsnail.

1.3 Pursue the permanent acquisition of non-use groundwater rights.

The Bruneau hot springsnail Conservation Committee has entered into several short-term non-use agreements with groundwater rights holders to conserve geothermal aquifer water for the Bruneau hot springsnail. However, the geothermal aquifer water being saved is not protected from subsequent use by other water rights holders. The Fish and Wildlife Service, Bureau of Land Management, Idaho Department of Water Resources, and the Committee should pursue the permanent acquisition of non-use groundwater rights from current groundwater rights holders and protect them in perpetuity.

1.4 Maintain and evaluate the Groundwater Management Area.

As described in conservation measure number 1, the Idaho Department of Water Resources established the Bruneau-Grandview Groundwater

Management Area. Water levels in the geothermal aquifer have not stabilized, however, and have continued to decline. Efforts are currently underway by the Idaho Department of Water Resources to permanently establish a moratorium on all new irrigation and other large-volume consumptive uses. This moratorium, however, does not restrict the development of new geothermal wells for domestic uses, or the lowering of pumps in existing wells. The use and deepening of existing geothermal wells for domestic, human consumption, and municipal purposes should be allowed to continue. However, the construction of new wells and deepening of existing wells for irrigation or other large-volume consumptive uses should be disallowed unless it can be demonstrated that the withdrawal will not adversely affect the Bruneau hot springsnail or any federally protected aquatic species within the Bruneau-Grandview Groundwater Management Area.

1.5 Develop and implement a Water Management District for the Bruneau-Grandview area.

In 1995, the State authorized the development and supervision of Water Management Districts by the Idaho Department of Water Resources for the purpose of measuring and reporting water diversions. Activities to be performed include monitoring of geothermal groundwater levels at groundwater diversions before and during pumping activities; and immediate reporting to the Director of the Idaho Department of Water Resources any water diversions that may have been diverted without a water right or in violation of an existing water right. To date, the Bruneau-Grandview Water Management Area has not been designated as a Water Management District.

Once a Water Management District has been developed for the Bruneau-Grandview Water Management Area, implementation of monitoring and reporting activities should begin. Implementation of this task can include incorporation of groundwater monitoring tasks described under task number 2 below.

1.6 Repair leaking artesian wells.

In May 1993, the Idaho Department of Water Resources identified 13 wells leaking artesian water from the geothermal and cold-water aquifers underlaying the Bruneau area. Repairing these leaks will help conserve groundwater and maintain pressures in the geothermal aquifer.

1.7 Expand groundwater monitoring in the Bruneau, Sugar, and Little Valleys to include the effects of granting additional water rights.

Groundwater monitoring should include a review of any additional requests for new water rights (including agricultural and domestic water rights) and their potential effects on decreasing water levels in the geothermal aquifer.

1.8 Implement Programs under the authority of the United States Department of Agriculture Natural Resource Conservation Service (USDA - NRCS).

The U. S. Department of Agriculture Natural Resources Conservation Service has many programs designed to assist private landowners who wish to set aside lands for the purpose of fish and wildlife conservation and critical habitat protection. These programs can assist in the conservation of the Bruneau hot springsnail by promoting conservation measures to reduce the use of geothermal aquifer waters, protecting critical aquatic habitats, and creating conservation easements for future wildlife protection.

1.9 Improve the efficiency of existing groundwater irrigation systems to conserve the use of geothermal water.

Idaho Department of Water Resources can, through its authority to regulate groundwater development, require measurement and reporting of existing withdrawals, limit or prohibit new appropriations, or curtail or reduce diversions in order of priority to bring withdrawals into balance with the reasonably anticipated average rate of future natural recharge (Idaho code §§ 42-233a, 42-233b, and 42-237a). Compliance with any State regulations should use current best management practices to maximize the efficiency of

irrigation systems. The above mentioned best management practices, regulations, and limitations would be further detailed by Idaho Department of Water Resources in their finalized conservation plan and should not conflict with other details of this plan.

2 Groundwater monitoring.

As part of the statewide groundwater monitoring program, continued groundwater monitoring will be necessary to assess the fluctuations in levels of water in the geothermal aquifer and the effects of any efforts to conserve and increase geothermal water levels. Groundwater withdrawals (*i.e.*, pumping) can vary seasonally due to the availability of precipitation and surface water runoff, and can be regulated through management of local or regional pumping (Idaho Department of Water Resources 1992, Berenbrock 1993). The Idaho Department of Water Resources monitoring program should include: a) measuring water levels in the geothermal aquifer at several wells distributed throughout the Bruneau area, and b) computing annual groundwater pumping from an appropriate number of wells distributed throughout the area, to compare changes in water use and water availability with trends in groundwater levels and geothermal spring discharges (Berenbrock 1993).

2.1 Continue monitoring of the geothermal aquifer.

Continue to conduct groundwater monitoring as is necessary to assess the effects of water conservation actions on groundwater levels and springsnail habitats. The State currently monitors groundwater levels in the Bruneau-Grandview area and is authorized to regulate water management through development of a Water Management District (Task 1.3).

3 Monitor the survival and recovery of the Bruneau hot springsnail.

Population monitoring of the Bruneau hot springsnail has occurred since 1991. Continued monitoring will provide the additional information necessary to evaluate the status of the species, future management activities, and any recovery/conservation measures.

3.1 Continue expanded springsnail monitoring program.

The ongoing investigation by Idaho State University to monitor key habitat variables in Hot Creek and sites in the Bruneau River below the confluence of Hot Creek was expanded to include 17 additional monitoring sites along the Bruneau River canyon upstream and downstream of Hot Creek (see conservation measure number 5). Parameters that will be measured include spring discharge where discharge can be measured, estimated density of springsnails present, water temperature and conductivity, and measures of flowing and wetted surface area dimensions. All monitoring sites will be located via the Global Positioning System. We, in cooperation with the Bureau of Land Management, shall continue implementation of the expanded monitoring plan, dependent on available funding.

3.2 Continue surveys of all geothermal springs in the recovery area on a biannual or triennial basis.

Surveys to determine the total number of geothermal springs and the current distribution and population status of Bruneau hot springsnails in the recovery area have been conducted every 2 to 3 years (see conservation measure number 5). Survey parameters include Global Positioning System locations of all spring sites (occupied and unoccupied), estimation of Bruneau hot springsnail densities at occupied sites, temperature and conductivity. Continuation of the biannual surveys will provide information on whether the number of geothermal springs are increasing and whether the Bruneau hot springsnail has the ability to colonize new geothermal spring sites.

4 Develop and implement a habitat restoration program within the recovery area.

Habitat restoration in the recovery area may allow the species to disperse to currently unoccupied geothermal spring habitats as it becomes available.

4.1 Develop a habitat restoration plan to facilitate the re-colonization of lower Hot Creek by Bruneau hot springsnails.

One option for the restoration of springsnail habitat includes providing corridors for springsnail passage into lower Hot Creek, constructing fish exclosures (outlined in section 5.2), and providing large diameter substrates in Hot Creek for movement, feeding, escape from lethal temperatures, and egg laying.

4.2 Implement the habitat restoration plan to facilitate the re-colonization of Hot Creek by Bruneau hot springsnails.

Upon completion of recovery task 4.1, implement the habitat restoration measures outlined in the plan.

5 Develop and implement a non-native fish control program within the recovery area.

5.1 Evaluate the feasibility of controlling non-native fish in the recovery area.

To develop a control program for non-native fish, it will be necessary to determine what mechanisms are available that will not harm Bruneau hot springsnails and will function as an effective fish control mechanism. Also, it will be necessary to determine which parts of the recovery area are suitable for fish control mechanisms.

5.2 Develop a non-native fish control program that is not detrimental to the Bruneau hot springsnail.

Depending on the outcome of task 5.1, a control program for non-native fish should be developed, while protecting Bruneau hot springsnails. One possible, non-intrusive method is the construction of fish exclosures that prevent the passage of fish into Hot Creek but allow the passage of the very small springsnail. Alternative non-native fish control methodologies will have

to be determined for the Bruneau River as it is too large to install and maintain permanent barriers to fish passage.

5.3 Implement a non-native fish control program.

Upon completion of task 5.2, a non-native fish control program should be implemented in the Bruneau River and Hot Creek in areas considered suitable for such control mechanisms (see 5.1).

6 Manage Federal lands to promote recovery of the Bruneau hot springsnail.

The Bureau of Land Management has installed fencing along the east and west side of the Bruneau River and the Hot Creek watershed. In addition to fencing activities, the Bureau of Land Management assesses land exchanges with private landowners that may otherwise convert rangeland to irrigated croplands using geothermal waters.

6.1 Continue to monitor and assess impacts of cattle operations on Bureau of Land Management lands.

The Bureau of Land Management should conduct periodic site surveys to inspect the fencing, repair any damage to the fences, and document the recovery of the riparian corridor along the Bruneau River and Hot Creek.

6.2 Assess and regulate any Federal land exchanges within the Little, Sugar, or Bruneau Valleys.

Any Federal land exchanges, mainly on Bureau of Land Management land, should be assessed for the potential future use of the land once out of Federal ownership. Land exchanges should not occur if future uses would result in development of the geothermal aquifer.

7 **Continue to support research on the conservation of the Bruneau hot springsnail**.

Additional research should include development of a groundwater recharge model that will assist in determining levels of pumping that do not result in continued decline of the geothermal aquifer; the feasibility of restoring Upper Hot Creek as suitable springsnail habitat; and translocation and establishment of additional springsnail colonies within the recovery area.

7.1 Develop and implement a model to determine the amount of water withdrawal that can occur while maintaining geothermal spring discharge at the 815 meters (2,674 feet) elevation level.

The State of Idaho Department of Water Resources has been charged with developing a model of groundwater withdrawals using data from the current groundwater monitoring program. Information from this model could be used to determine the amount of withdrawals that can occur based on current precipitation levels and crop types, while maintaining water levels in the geothermal aquifer that allow geothermal spring discharge to occur at 815 meters (2,674 feet) of elevation.

7.1.1 Develop water withdrawal model.

A water withdrawal model should be developed to determine the amount of water that can be withdrawn from the geothermal aquifer each year, without reducing water levels below 815 meters (2,674 feet).

7.1.2 Utilize water withdrawal model.

Once task 7.1.1 has been completed, the water withdrawal model should be implemented as a tool for management of water levels in the geothermal aquifer.

7.2 Evaluate the feasibility of restoring Indian Bathtub and Hot Creek below Indian Bathtub as suitable springsnail habitat.

The effects of declining springflows coupled with periodic flash flooding and recent drought conditions have resulted in the permanent elimination of springflows and filling in of springsnail habitats at Indian Bathtub, the species type locality. Efforts could include the removal of non-native vegetation, including trees, along Hot Creek below Indian Bathtub to allow for an increase in the surface flows from the Indian Bathtub spring. Sediment removal at Indian Bathtub may also provide additional rockface habitat at the level of geothermal spring discharge.

7.3 Determine the feasibility of translocation and establishment of additional springsnail colonies along the Bruneau River.

Once water levels in the geothermal aquifer are assured, there may be unoccupied geothermal springs that may provide suitable springsnail habitat within the recovery area. Efforts could be made to determine if Bruneau hot springsnails can be translocated to these unoccupied sites.

7.3.1 Evaluate potential translocation sites.

A survey of all potential geothermal springs that are not currently occupied by Bruneau hot springsnails should be conducted within the recovery area between 787 to 816 meters (2,580 to 2,675 feet) above sea level to evaluate their suitability for translocation. Emphasis should be placed on springs which occur on public lands, although privately owned spring sites with interested and willing landowners should also be evaluated. This task will involve describing various water habitat attributes for each potential spring site, including water temperature, depth, substrate, food availability, flow, and elevation.

7.3.2 Develop a Bruneau hot springsnail translocation plan.

A translocation plan should be developed, based on springsnail life history requirements and availability of suitable translocation sites. The plan should identify viable springsnail colonies from which specimens can be obtained for translocation and should specify monitoring protocols necessary to determine the success of any transplantation efforts.

7.3.3 Implement a springsnail translocation program.

Using recommendations developed in task 7.3.2, introduce the Bruneau hot springsnail into suitable geothermal spring sites within the recovery area.

7.3.4 Monitor translocated colonies.

To determine the success of translocation, newly colonized spring sites should be monitored annually according to monitoring protocols developed in task 7.3.2.

8 Secure funding for implementation of recovery tasks.

Long term additional funding will be needed to implement the recovery tasks, including continued groundwater monitoring, Bruneau hot springsnail population monitoring, spring discharge monitoring, development of a geothermal water withdrawal model, and implementation of water conservation activities approved by the Strategic Planning Committee through implementation of the State's Bruneau Hot Springsnail Conservation Strategy.

The State of Idaho should take the lead to secure Federal funding to assure continued Bruneau hot springsnail population and spring discharge monitoring activities. The State could take the lead to secure funding, through Federal, State, or other funding sources, to assure completion of several recovery tasks, including continued groundwater monitoring, development of a geothermal water

withdrawal model, and implementation of water conservation activities through the State's Bruneau Hot Springsnail Conservation Strategy.

9 Recovery plan assessment.

The response of the Bruneau hot springsnail to conservation measures associated with recovery efforts will be determined by developing a long-term species and habitat monitoring program. Although much of this monitoring can be accomplished by on-going State and Federal programs, additional actions and monitoring may be necessary.

9.1 Biannually assess the overall success of the recovery program and revise the recovery plan on a 5-year basis, if necessary.

The recovery plan should be updated as recovery tasks are accomplished, or revised as environmental conditions in the recovery area change, and as additional information becomes available. The recovery plan assessment can be achieved formally through biannual agency review/meetings where annual monitoring reports and summaries are submitted and evaluated, or informally through distribution of annual monitoring reports and summaries submitted to us by the various agencies.

IV. Implementation Schedule

The Implementation Schedule that follows outlines actions and estimated costs for this recovery plan. It is a guide for meeting the objectives discussed in this recovery plan. This schedule describes and prioritizes tasks, provides an estimated timetable for performance of tasks, indicates responsible agencies, and estimates costs of performing tasks. These actions, when accomplished, should recover the Bruneau hot springsnail (*Pyrgulopsis bruneauensis)*.

Priorities in column 1 of the following implementation schedule are assigned as follows:

Priority 1 - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.

Priority 2 - An action that must be taken to prevent a significant decline in species' population/habitat quality, or some other significant negative impact short of extinction.

Priority 3 - All other actions necessary to provide for full recovery of the species.

Responsible parties: An asterisk (*) in the implementation schedule indicates the lead responsible party.

BLM- Bureau of Land Management, Boise Field Office
BHSSCC- Bruneau Hot Springsnail Conservation Committee
FWS- U.S. Fish and Wildlife Service, Snake River Basin Office, Boise, Idaho
IDA- Idaho Department of Agriculture
IDWR- Idaho Department of Water Resources
ISU- Idaho State University
NRCS-Natural Resources Conservation Service
PVT- Private landowners
SCD- Soil Conservation District, Owyhee County
State- State of Idaho

Implementation schedule for the recovery plan for the Bruneau hot springsnail *(Pyrgulopsis bruneauensis)*										
Task Priority	**Task Number**	**Task Description**	**Task Duration (years)**	**Responsible Parties**	**Cost Estimate (in $1,000 units)**					**Comments**
					Costs 03-13[4]	**FY 2003**	**FY 2004**	**FY 2005**	**FY 2006**	
1	1.1	Continue implementation of the State of Idaho Bruneau Hot Springsnail Conservation Strategy to meet recovery objectives and criteria set forth in this recovery plan	20	State	5,000	500	500	500	500	Implementation will be dependent on continuation of funds secured (see task 8); previous funds have been provided through Congressional Appropriation in Fiscal Years 1999 and 2000
1	1.2	Implement minimum in-stream flows for Hot Creek for invertebrates and vertebrate fish and wildlife	20	IDWR, State	0	0	0	0	0	Costs associated with recovery action 1.2 are part of the administration costs of IDWR and BHSSCC
1	1.3	Pursue the permanent acquisition of non-use groundwater rights	20	FWS, IDWR, BHSSCC	500	50	50	50	50	Costs associated with recovery action 1.3 can be estimated by IDWR and BHSSCC; remaining costs incurred subsequent to FY 2006
1	1.4	Maintain and evaluate the Groundwater Management Area	20	IDWR	0	0	0	0	0	Costs associated with recovery action 1.4 are part of the administration costs of IDWR

Implementation schedule for the recovery plan for the Bruneau hot springsnail *(Pyrgulopsis bruneauensis)*										
Task Priority	**Task Number**	**Task Description**	**Task Duration (years)**	**Responsible Parties**	**Cost Estimate (in $1,000 units)**					**Comments**
					Costs 03-13[4]	**FY 2003**	**FY 2004**	**FY 2005**	**FY 2006**	
1	1.5	Develop and implement a Water Management District (WMD)	1	IDWR	0	0	0	0	0	Costs associated with recovery action 1.5 are part of the administration costs of IDWR
1	1.6	Repair leaking artesian wells	10	IDWR, BHSSCC	0	0	0	0	0	Repair dependant upon identification of leaking wells and funding from BHSSCC
1	1.7	Expand groundwater monitoring in the Bruneau, Sugar, and Little Valleys to include the effects of granting additional water rights	20	IDWR	500	50	50	50	50	
1	1.8	Implement programs under the USDA NRCS	20	USDA - NRCS, State	0	0	0	0	0	On-going administrative costs incurred by NRCS
1	1.9	Improve the efficiency of existing groundwater irrigation systems to conserve the use of geothermal water	20	BHSSCC	0	0	0	0	0	Costs for recovery action 1.9 will be dependent on project proposals submitted to the Bruneau Hot Springsnail Conservation Committee for funding approval

Implementation schedule for the recovery plan for the Bruneau hot springsnail *(Pyrgulopsis bruneauensis)*										
Task Priority	**Task Number**	**Task Description**	**Task Duration (years)**	**Responsible Parties**	**Cost Estimate (in $1,000 units)**					**Comments**
					Costs 03-13[4]	**FY 2003**	**FY 2004**	**FY 2005**	**FY 2006**	
2	2.1	Continue monitoring of the geothermal aquifer	20	IDWR	730	70[4]	72	74	76	Remaining costs incurred subsequent to FY 2006
2	3.1	Continue expanded springsnail monitoring program	20	FWS*, BLM	207.5	20	20.6	21	21.6	Funding will be appropriated to ISU which completes the monitoring program; remaining costs incurred subsequent to FY 2006
2	3.2	Continue surveys of all geothermal springs in the recovery area on a biannual or triennial basis	20	FWS	26	5	0	5.3	0	Funding will be appropriated to ISU which completes the geothermal spring surveys; remaining costs incurred subsequent to FY 2006
2	4.1	Develop a habitat restoration plan to facilitate the re-colonization of lower Hot Creek by Bruneau hot springsnails	2	FWS, ISU, BHSSCC	50	0	0	0	25	Costs incurred will be part of FWS and BHSSCC administrative expenses, funding will be appropriated to ISU for research and development of the restoration plan; remaining costs incurred subsequent to FY 2006

[4] Costs associated with tasks 2.1, 3.1, 3.2, 8.1 include 3 percent inflation increases from one year to the next.

Implementation schedule for the recovery plan for the Bruneau hot springsnail *(Pyrgulopsis bruneauensis)*										
Task Priority	**Task Number**	**Task Description**	**Task Duration (years)**	**Responsible Parties**	**Cost Estimate (in $1,000 units)**					**Comments**
					Costs 03-13[4]	**FY 2003**	**FY 2004**	**FY 2005**	**FY 2006**	
2	4.2	Implement the habitat restoration plan to facilitate the re-colonization of lower Hot Creek by Bruneau hot springsnails	10	FWS, ISU, BHSSCC	100	0	0	0	0	All costs associated with this task will occur subsequent to FY 2006
2	5.1	Evaluate the feasibility of controlling non-native fish in the recover area	1	IDFG	0	0	0	0	0	Costs associated with recovery action 5.1 are part of the administration costs of IDFG
2	5.2	Develop a non-native fish control program that is not detrimental to the Bruneau hot springsnail	3	IDFG	30	0	10	10	10	Costs for Tasks 5.2 and 5.3 dependent upon design of non-native fish control program utilized. Subsequent costs may be needed to maintain efficacy of fish control program
2	5.3	Implement a non-native fish control program	20	IDFG	60	0	0	0	0	Will be considered complete once it is established that non-native fish are no longer breeding or surviving within the recovery area. All costs associated with this task will occur subsequent to FY 2006
2	6.1	Continue to monitor and assess impacts of cattle operations on BLM lands	20	BLM	0	0	0	0	0	Costs associated with recovery action 6.1 are part of the administration costs of BLM

Implementation schedule for the recovery plan for the Bruneau hot springsnail *(Pyrgulopsis bruneauensis)*										
Task Priority	**Task Number**	**Task Description**	**Task Duration (years)**	**Responsible Parties**	**Cost Estimate (in $1,000 units)**					**Comments**
					Costs 03-13[4]	**FY 2003**	**FY 2004**	**FY 2005**	**FY 2006**	
2	6.2	Assess and regulate any Federal land exchanges within the Little, Sugar, or Bruneau Valleys	20	BLM	0	0	0	0	0	Ongoing administrative expenses within the Bureau of Land Management
2	7.1.1	Develop water withdrawal model	1	IDWR	100	0	100	0	0	
2	7.1.2	Utilize water withdrawal model	15	IDWR	0	0	0	0	0	Upon completion of Task 6.1.1, costs part of IDWR administrative expenses
2	9.1	Biannually assess the overall success of the recovery program and revise recovery plan on a 5-year basis, if necessary	20	FWS	55	0	10	0	10.6	Remaining costs incurred subsequent to FY 2006
3	7.2	Evaluate the feasibility of restoring Indian Bathtub and the Hot Creek watershed below as suitable springsnail habitat	1	BLM*, FWS, PVT	10	0	0	0	0	All costs incurred subsequent to FY 2006, following completion of tasks 4.1 through 5.3
3	7.3.1	Evaluate potential translocation sites	1	FWS*, BLM	10	0	0	0	10	This task cannot be accomplished until higher priority tasks have been completed and water levels in the aquifer have been assured

Implementation schedule for the recovery plan for the Bruneau hot springsnail *(Pyrgulopsis bruneauensis)*										
Task Priority	**Task Number**	**Task Description**	**Task Duration (years)**	**Responsible Parties**	**Cost Estimate (in $1,000 units)**					**Comments**
					Costs 03-13[4]	**FY 2003**	**FY 2004**	**FY 2005**	**FY 2006**	
3	7.3.2	Develop a Bruneau hot springsnail translocation plan	1	FWS*, BLM	10	0	0	0	10	This task cannot be accomplished until higher priority tasks have been completed and water levels in the aquifer have been assured
3	7.3.3	Implement a springsnail translocation program	5	FWS*, BLM	100	0	0	0	0	This task cannot be accomplished until higher priority tasks have been completed and water levels in the aquifer have been assured. All costs incurred subsequent to FY 2006
3	7.3.4	Monitor translocated colonies	10	FWS*, BLM	50	0	0	0	0	This task cannot be accomplished until higher priority tasks have been completed and water levels in the aquifer have been assured. All costs incurred subsequent to FY 2006
1	8	Secure funding for implementation of recovery tasks	20	FWS*, State, IDWR, BHSSCC	0	0	0	0	0	Costs associated with recovery action 8.0 are part of the administration costs of the various agencies
Total estimated cost for the first 10 years of recovery:					approximately $7.5 million					

[4.] The estimated total cost of recovery is approximately $15 million, and is subject to change. Total costs in this column represent an estimate of the costs for the first 10 years and cannot guarantee that recovery objectives have been met.

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VI. Appendix A

Summary of agency and public comments on the draft recovery plan for the Bruneau hot springsnail

On January 9, 2001, we released the Draft Recovery Plan for the Bruneau hot springsnail for a 60 day public comment period that ended March 12, 2001, for Federal agencies, State and local governments, and members of the public. A total of eight letters were received, each with a varying number of comments.

The number of letters received by affiliation:

Federal agencies	2
State agencies	1
Academia/ professionals	1
Environmental/ conservation groups	3
Local governments	0
General public	1

Summary of significant comments and our responses:

The Service reviewed all of the comments received during the public comment period. Comments were generally constructive containing suggestions on how to improve the plan and provide greater protection for the Bruneau hot springsnail. All comments were considered and many are addressed in, or incorporated into, the body of this final Recovery Plan. The major comments communicated by more than one party and the our response to each are summarized as follows:

Comment: Increase geothermal aquifer monitoring efforts.
Response: We have increased the number of geothermal aquifer monitoring wells in the Recovery Plan from just one well, to three wells located near the Indian bathtub recreation area (see section IV - 1 in the Plan).

Comment: Specify densities of springsnail colonies to be used in recovery criteria.
Response: We have changed the Recovery Plan to explicitly define medium and high densities of Bruneau hot springsnails for the purpose of clarifying recovery criteria to be met (see section II - B in the Plan).

Comment: More springsnail habitat and population monitoring should be included in the plan.
Response: We have put in place an expanded biological monitoring program utilizing the existing relationship with the Department of Biological Sciences at Idaho State University (see section I - F 4 in the Plan).

Comment: Include more information on Federal aid for voluntary programs designed to conserve resources and protect wildlife habitat (*e.g*. Bruneau hot springsnail habitat).
Response: We have included more information in the Final Recovery Plan on government programs for private landowners who wish to conserve resources and protect wildlife habitat (see section IV - 1.6 in the Plan).

Comment: Lowering of existing wells and expansion of geothermal aquifer for domestic use should be disallowed.
Response: We have suggested that existing wells for domestic use be allowed to be deepened but that new wells and deepening of existing wells for irrigation or other large scale consumptive uses be prohibited (see section IV - 1.2 in the Plan).

Comment: Irrigation and leaking wells may contribute to aquifer changes, but it is difficult to quantify how much.
Response: We have detailed information on the rates of geothermal aquifer water withdrawals for irrigation and the associated level of the hydraulic head in the geothermal aquifer (see section I - D in the Plan) from 1990 to the present.

VII. Appendix B. Summary of Threats and Recommended Recovery Actions for the Bruneau hot springsnail.

LISTING FACTOR	THREAT	RECOVERY CRITERIA	TASK NUMBERS
A	Agricultural-related groundwater withdrawal and pumping which causes a reduction or loss of geothermal spring habitats	1, 2, 4	Implement conservation measures to increase water levels in the regional geothermal aquifer, continue monitoring of the geothermal aquifer, manage Federal lands to promote recovery, continue to support research on conservation, and secure funding (see Tasks 1.1 - 1.9, 2.1, 6.2, 7.1, 8)
C	Introduction of predatory exotic fish species (guppies and Tilapia) in Hot Creek and the Bruneau River drainage	3	Monitor survival and recovery, develop and implement a habitat restoration program, develop and implement a non-native fish control program, continue to support research on conservation, and secure funding (see Tasks 3.1, 3.2, 4.1, 4.2, 5.1, 5.2, 5.3, 7.3.1 - 7.3.4, 8)
D	The mandates of most state resource agencies do not extend protection to invertebrate species and there is no specific allocation of either surface or groundwater in the Bruneau/Grandview area for the protection and conservation of fish and wildlife	1, 2, 4	Implement conservation measures to increase water levels in the regional geothermal aquifer, continue monitoring of the geothermal aquifer, manage Federal lands to promote recovery, continue to support research on conservation, and secure funding (see Tasks 1.1 - 1.9, 2.1, 6.2, 7.1, 8)
E	Naturally occurring events (sedimentation and flash flood events)	1, 3, 4	Continue to support research on conservation (see Task 7.2)

Listing Factors:
A. The Present or Threatened Destruction, Modification, or Curtailment Of Its Habitat or Range
B. Overutilization for Commercial, Recreational, Scientific, Educational Purposes (not a factor)
C. Disease or Predation (no known diseases)
D. The Inadequacy of Existing Regulatory Mechanisms
E. Other Natural or Manmade Factors Affecting Its Continued Existence

Recovery Criteria

1. Water levels in the geothermal aquifer have increased and stabilized at 815 (2,674 feet) in elevation (as measured in October, annually, in three of the Hot Creek water monitoring wells for a period of 10 years.

2. The total number of geothermal springs discharging within the recovery area is 200 or more and are distributed within the current range of the Bruneau hot springsnail.

3. More than two-thirds of available geothermal springs within the recovery area (approximately 131 springs) are occupied by stable, medium to high density populations of the Bruneau hot springsnail.

4. Groundwater levels are permanently protected against further reductions through implementation of groundwater management activities.

APPENDIX E

RESOLUTION ADOPTING HEMINGWAY BUTTE RECREATION TRAVEL PLAN,

THE PLAN, AND

OWYHEE COUNTY COMMISSION'S LETTER OF NOTICE TO BUREAU OF LAND MANAGEMENT

RESOLUTION NO. 05-42

RESOLUTION ADOPTING RECOMMENDATION FROM RECREATION TASK FORCE, DIRECTING THE RECOMMENDATION TO THE BLM AS THE COUNTY PROPOSAL FOR HEMMINGWAY BUTTE TRAILHEAD OPEN AREA SUBMITTED IN ACCORD WITH THE COUNTY'S COORDINATE STATUS UNDER FLPMA.

Whereas, the Owyhee County Recreation Task Force, appointed by the Board of Owyhee County Commissioners, has met and discussed the safety, private property and multiple use recreation issues resulting from increased recreation use at Hemmingway Butte Trailhead Open Area,

Whereas, the Board was aware prior to appointing the Task Force, and is still aware that the increased use of the recreation area has spilled over on to private property causing trespass, vandalism and damage issues, has interfered with the grazing preference of ranchers who have allotment lands in the area, and has resulted in accidents causing personal injuries and property damage,

Whereas, being aware of these existing problems, the Task Force has recommended the actions contained in Attachment 1 to this Resolution as a means of resolving the conflicts and dangers existing in the area while at the same time allowing continued reasonable use of the area by all recreation users,

Whereas, the Sheriff of Owyhee County, as co-chair of the Task Force, has presented the recommendation to the Board and urged its adoption as the County's position under its coordinate status prescribed by FLPMA,

Whereas, the Board finds good cause for adopting the Task Force recommendation without alteration,

THEREFORE IT IS HEREBY RESOLVED that the Board of Owyhee County Commissioners does adopt the recommendation in Attachment 1 as the Owyhee County Plan for Hemmingway Butte Trailhead Open Area, to be added to the Owyhee County Natural Resources Plan Recreation Section when it is revised, to be forwarded to the Owyhee Initiative Work Group as evidence of the first of many steps necessary to continue multiple use recreation while at the same time resolving use conflicts which result from increased recreation use in the County, and to be forwarded to K. Lynn Bennett, Jerry Taylor and Ron Kay of the Bureau of Land Management for action consistent with the coordinate provisions of FLPMA.

IT IS FURTHER RESOLVED that the Board extend its thanks to the members of the Recreation Task Force for their work and effort in completing the highest priority task requested of it by the Board of Commissioners.

Dated this 12th day of December, 2005.

Attest: Charlotte Sherburn

1. The Approximate 192 acre Hemmingway Butte Trailhead Open Area shall be fenced in order to delineate the area which is designated as "open" in the Owyhee Resource management Plan. The current access opening for the use of full-sized vehicles and emergency vehicles shall be closed and relocated to a new location as stated below. Specific fence locations for the approximate 192 acres shall be as shown on the attached map. The new fencing alongside the North West side of Upper Reynolds Creek Road shall begin at the North East end of the open area at the current fence/cattle guard at approximately N 43° 19' 39" W 116° 38' 08" and continue along the North West side of Upper Reynolds Creek Road to approximately 150' South of the high voltage power lines or approximately N 43° 19' 12" W 116° 38' 46" , in order to preclude dangers associated with the electric charging of the fence which would occur from locating the fence beneath the high voltage power line. The fence would then turn and run to the existing fence to the West.
2. At a location approximately 100-200' west of the turn point of the new fence specified in paragraph 1, an OHV exit shall be provided in the fence which will allow OHV traffic to continue southbound on the west side of Upper Reynolds Creek Road along a previously existing trail. Use of the previously existing trail will eliminate the need to reroute and construct the trail at approximately N 43 19' 07" W 116 38' 49".
3. At approximately the same coordinate location as specified in paragraph 2, a short spur trail, marked as Trail 402 with a BLM sign, makes a transition path from the Upper Reynolds Creek Road to a more lengthy trail marked as Trail 400. This trail will be located south of its present location approximately 100' to a point which will allow OHV traffic to transition from the trail west of the Road to Trail 400. At the point where Road crossing is established, markings will be placed on the road as described in paragraph 4b. The site of the previously existing Trail 402 will be rehabbed.
4. Fencing on the North West side of Upper Reynolds Creek Road shall have five new openings allowing ingress and egress to the open area. Two current openings on the North West boundary shall remain.
    a. Approximate entrance to parking area. N 43° 19' 38" W 116° 38' 01". Shall be wide enough to permit vehicles pulling trailers and emergency vehicles.
    b. Approximate OHV crossing area #1. N 43° 19' 27" W.116° 38' 32". Opening on the North West side shall only be wide enough for OHV's and have a similar opening on the North East side. One foot (1') wide lines to be painted across road 6' apart indicating a passageway across the road.
    c. Approximate OHV crossing area #2. N 43° 19' 23" W 116° 38' 35". Description same as 'b' above.
    d. Approximate OHV crossing area #3 (trail marker 401) N 43° 19' 18" W 116° 38' 39". Openings on both sides of the road to be wide enough for emergency vehicles to access. Other descriptions to be the same as 'b' above. Signage on both sides of the road to indicate Emergency Vehicle and OHV access only.
    e. OHV opening 20 yards West of the South West corner of fence.

5. On the East side of Upper Reynolds Creek Road build a fence between the above described crossings (b,c,d) to control and contain the crossing traffic to a specific trail or sand wash.
6. Signs indicating "No Parking on Road" shall be placed on the Upper Reynolds Creek Road starting at the North end shall be placed every mile for both lanes of travel to the fence on the South end at the top of the grade.
7. 25 mph sign, Caution OHV crossing ahead signs shall be placed at approximately N 43° 19' 38" W 116° 38' 08".
8. 35 mph sign on South bound lane and 25 mph and Caution OHV crossing on North bound lane at approximately N 43° 19' 07" W 116° 38' 49".
9. The current trail at approximately N 43° 19' 10" W 116° 38' 48" shall be re-routed off of the Upper Reynolds Creek Road and a portion of trail shall be established in its place.
10. At approximately N 43° 18' 36" W 116° 39' 17" eliminate gate and cattle guard approximately 100 yards South West of Upper Reynolds Creek Road and rehab the road between the Upper Reynolds Creek Road and the Cattle Guard.
11. At N 43° 18' 04" W 116° 39' 19" install sign reading "No Parking and rehab the area currently used as an informal parking area. Eliminate and rehab the site of the informal parking area lying East of the Upper Reynolds Creek Road approximately 200' from the road. Eliminate and rehab the site of the spur trail which leads to this informal parking area.
12. At 43° 18' 04" W 116' 39' 30" remove gate and reinstall it on the existing fence line 200 yards South West. Install an OHV cattle guard at the site of the current gate. Install a sign reading "No Parking" and rehab the current informal parking area. Add an additional small gate suitable for equestrian use at the location of the new OHV cattleguard.
13. At Coordinates N 043 17' 55.45" W 116 39' 33.47" Leave the historic road accessible to public travel. Define a parking area and reduce the potential for expansion of the area currently used as informal parking by establishing a boundary line to the parking area with a perimeter barrier which may be constructed of rock, timbers, or other materials other than wire fencing. The area defined as parking and the materials used will also be placed in such a way as to protect the existing Windy Point water pipeline by preventing OHV access to the pipeline route. Place a sign at the new parking area encouraging its use by equestrian recreation and requesting that other users conduct activities in the area in a fashion which provides for minimized conflict between users and which minimizes safety risks to equestrians operating in this area.
14. At Coordinates N 043 16' 44.74" W116 40' 1.84" define a parking area and reduce the potential for expansion of the area currently used as informal parking by establishing a boundary to the parking area with a perimeter barrier which may be constructed of rock, timbers or other materials other than wire fencing. Place a sign on the roadway adjacent to the southbound lane of the road which notifies the public that this is the last designated and authorized parking area on the Upper Reynolds Creek Road. Place a sign at the new parking area encouraging its use by equestrian recreation and requesting that other users conduct activities in the

area in a fashion that provides for minimized conflict between users and which minimizes safety risks to equestrians operating from this area.

Owyhee County Board of Commissioners

Courthouse P.O. Box 128 • Murphy, Idaho 83650-0128
Telephone (208) 495-2421

District 1 • **Chris Salove** • 6542 Cross View Lane • Marsing Idaho 83639 • (208) 896-4162
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District 3 • **Dick Reynolds** • 28358 Mormon Blvd. • Bruneau, Idaho 83604 • (208) 845-2035

December 12, 2005

K.Lynn Bennett
Idaho State Director BLM

Jerry Taylor
Boise District Manager BLM

Ron Kay
Owyhee Resource Manager BLM

Gentlemen:

Enclosed with this letter is the Resolution and Attachment by which the Owyhee County Board of Directors has adopted an Owyhee County Plan for the Hemmingway Butte Trailhead Open Area in Owyhee County. We want to thank the BLM for its cooperation with Sheriff Gary Aman and Lahsha Johnston, co-chairs of the Recreation Task Force which has worked on this project.

This Plan is being submitted to you under the coordination provisions of FLPMA. Please advise us in writing of the process by which you will review this Plan for use by the BLM. We have been orally advised that the BLM was waiting for the County recommendation before taking action. Please advise us of the proposed use of this Plan, the timelines for such use, and any portion of the Plan which the BLM must submit to further statutory review prior to taking administrative action.

We are also submitting this Plan to the Owyhee Initiative Work Group as evidence of a preliminary step which the County firmly believes must be taken toward development of a recreation plan which will continue to provide meaningful recreation

use, but with a minimum of use conflicts and interference with private property rights and grazing preferences.

Very truly yours,

Cc Members of Task Force
Owyhee Initiative Work Group

APPENDIX F

THE UNIVERSITY OF IDAHO STUBBLE HEIGHT STUDY REPORT

PUBLISHED BY THE UNIVERSITY OF IDAHO FOREST AND RANGE

EXPERIMENTAL STATION

JULY 2004

University of Idaho
Stubble Height Study Report

By:

University of Idaho Stubble Height Review Team

July 2004

University of Idaho Forest, Wildlife and Range Experiment Station

University of Idaho
Stubble Height Study Report

Submitted to:

K Lynn Bennett, Idaho State Director
Bureau of Land Management
United States Department of Interior

and

Jack Troyer, Regional Forester
Intermountain Region, U.S. Forest Service
United States Department of Agriculture

By:

University of Idaho Stubble Height Review Team

Submitted July 1, 2004

In fulfillment of Challenge Cost Share Agreement
No. 03-CS-11046000-049

University of Idaho Forest, Wildlife and Range Experiment Station
Contribution No. 986

Foreword

Increased emphasis has been placed on the use of stubble height for monitoring livestock use of riparian areas by land management agencies in the past 15 years. In some cases, stubble height has been the only monitoring and management tool for regulating livestock use of riparian areas. The use of stubble height has not been without controversy. Livestock operators in particular have questioned the inclusion of stubble height standards in the terms and conditions of their grazing permits. Many range scientists have been critical of how, when and where stubble standards have been applied and have called on land management agencies to place their monitoring emphasis on long-term trend, rather than annual indicators. Land management agency personnel have also had concerns about the use of stubble height.

In the spring of 2003, K Lynn Bennett, Idaho State Director of the Bureau of Land Management, and Jack Troyer, Intermountain Regional Forester, U.S. Forest, mutually agreed that changes needed to be made in how stubble height was being used. At the urging of Dave Nelson, a rancher and Past-President of the Idaho Cattle Association, they contacted the Department of Rangeland Ecology and Management, University of Idaho and asked for a scientific review of the use of stubble height for monitoring and managing riparian areas in Idaho.

A team of scientists, land management agency specialists and ranchers was formed in the late summer of 2003 to review the use of stubble height and make recommendations on its use to the Bureau of Land Management and U.S. Forest Service. This is the final report of the study team to Mr. Bennett and Mr. Troyer.

The recommendations in this report apply to all riparian areas. However, the study team recognized potential concerns about any changes in the use of stubble height in relation to existing consultations that address both PACFISH/INFISH and the 1998 Biological Opinions for T & E listed species. An addendum is attached to the end of the report titled “Regional Technical Team Response to the Proposed Stubble Height Standards” to address these concerns.

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University of Idaho
Stubble Height Study Report

Introduction

In July 2003 the USDA Forest Service (FS) and the USDI Bureau of Land Management (BLM) entered into an agreement with the College of Natural Resources, University of Idaho (UOI) to study the Agencies' use of stubble height as an indicator of livestock grazing effects within riparian areas and associated fish habitat. All parties have an interest in sustainable management of rangelands and livestock grazing for ecological, social and economic reasons. The study was to respond to the following key questions provided by the BLM and the FS:

1. What Agency objectives are we trying to achieve with stubble height?
2. What is the appropriate use of this measure?
3. How are the Agencies, in fact, using it? Including biological assessments for consultation on Threatened and Endangered species.
4. What are the limitations to its use?
5. How appropriate is it to use this measure to address annual and long-term management strategies?
6. What additional research might be needed, if any, to affirm or refine this measure?
7. What other measures might be used in its place?
8. What other measures might be needed to achieve management objectives in riparian areas?
9. How much rest or change in management is needed when stubble height objectives are not achieved?
10. Can we adjust the stubble height objective if a grazing management system is in place?

The University of Idaho organized a study team in August 2003 consisting of individuals experienced in monitoring, management and/or research on riparian areas in the Pacific Northwest (list of members provided in Appendix A). William H. West and Associates was contracted to set up, facilitate and provide a written record of study team meetings. Three meetings were held in Boise: September 24-25, October 22-23 and December 10-11, 2003.

Study Process: Prior to the first meeting each team member provided the facilitator with their individual answers to the 10 questions. The facilitator summarized these answers and presented the summary at the first meeting. Following a discussion of the answers to the questions, the study team brainstormed summary answers around the question "Why use stubble height?" This resulted in the team identifying five major reasons to use stubble height:

1. As an indicator for livestock management and performance. Performance means the quantity and quality of forage for livestock (well being for the animal).
2. To meet the physiological needs of the herbaceous vegetation and as an indicator of preference for woody species (where there is potential for woody species).
3. As an indicator of bank stabilization and sediment trapping (relates primarily to the greenline).

4. As an indicator of other secondary indirect benefits or conditions.
5. It is quick, cheap, easy and anyone can do it.

The team next developed specific problem statements related to stubble height. The facilitator suggested that the study questions implied there was a problem with the use of stubble height, but there were no specific problems identified in the study charter. He also suggested that the simplest definition of a problem is a gap between a "should be" condition and the actual "as is" condition. Accepting this working definition of a problem, the team eventually developed 13 gap or issue statements in this "should be/as is" format. The facilitator suggested using a root cause analysis to develop solutions to the issues, which were developed in the next two meetings.

Tim Burton and Ron Wiley of the BLM agreed to draft a white paper on stubble height as an indicator of grazing use in riparian areas. Other team members reviewed and provided input into the final version of the paper. The white paper and stubble height issue statements, root causes and possible solutions were then used by the team to develop answers to the ten questions, a process for adaptive management and a monitoring guide that are a part of this final report.

Answers to 10 Questions

1. What agency objectives are we trying to achieve with stubble height?

Bureau of Land Management and U.S. Forest Service resource management objectives for riparian areas include maintaining proper functioning condition of streams and the development of streamside and instream characteristics beneficial to water quality, aquatic species, riparian-dependent wildlife, flood control, aesthetics and sustainable forage production for livestock. Herbivore grazing and browsing may impact stream and streamside conditions directly through mechanical alteration to streambanks and/or indirectly through altering riparian vegetation. Stubble height is an annual monitoring tool to aid in meeting those objectives.

2. What is the appropriate use of stubble height?

In riparian ecosystems, stubble height is appropriate as an annual monitoring tool or indicator for adaptive management. Stubble height has been shown to be related to two areas of concern: 1) the effect of grazing on the physiological health of the individual plant, and 2) the ability of the vegetation to provide streambank protection and to filter out and trap sediment from overbank flows. A summary of the literature (Clary and Leininger 2000) also shows how stubble heights can reflect streambank trampling and shrub (willow) browsing on the greenline. Based on limited research, Clary and Leininger (2000) proposed a 10 cm (4 in) residual stubble height as a "starting point for improved riparian grazing management." However, they acknowledged that, in some instances, 7 cm (2.75 in) may provide adequate riparian protection and that in other instances 15 to 20 cm (6 to 8 in) may be required to limit streambank trampling or to reduce willow browsing. Thus the criteria should vary depending upon local environmental variables and the timing, duration and intensity of livestock use. The linkages between stubble height and riparian functions have not been extensively

researched nor documented through long-term monitoring. Stubble height as an annual indicator of grazing use in riparian areas should only be used where existing science suggests that it is an appropriate indicator and in combination with long-term monitoring of vegetation and channel parameters.

Environmental constraints: The use of stubble height standards should be restricted to "sites near the stream edge, that is, areas that can be described as streamside, or near-stream areas of hydrophilic or potentially hydrophilic vegetation" (Clary and Leininger 2000). At this interface between vegetation and water (the greenline), riparian and stream habitats are most sensitive and dynamic. This is where moist vegetation communities are mostly likely to occur, and where erosive energy of the stream plays a major role. Because hydrophilic vegetation is often rhizomatous, heavy-rooted and tends toward complete continuity of bank cover along the channel margins, it can be very resistant to stream erosion. This resistance lends itself to channel stability and helps to create stream habitat structure and complexity favorable to aquatic organisms. It is here where stubble heights must be measured to reflect the potential effect of grazing on hydrophilic plant vigor and therefore to relate stubble height to channel stability. Because stubble height applies only to herbaceous vegetation, its use applies only where herbaceous vegetation currently controls bank stability. In summary, stubble height can be used as an annual indicator of livestock grazing in riparian areas:

- Of perennial streams or intermittent streams that support hydric vegetation on the greenline.
- Near the stream edge, or along the stream margins, commonly at the bankfull level or first perennial vegetation above the water line.
- Of hydrophilic, or potential hydrophilic vegetation (wet areas adjacent to the stream). NOT in dry vegetation types above the bankful level and at the tops of high cutbanks above the influence of water in the rooting zone of hydrophilic or potential hydrophilic vegetation. Depositional banks are more favorable to potential hydrophilic vegetation; erosional banks whose tops are above the bankful level are not favorable to potential hydrophilic vegetation.
- Where herbaceous vegetation is dominant along the stream edge and controls streambank stability. Stubble height does not apply where woody vegetation and/or rock controls bank stability.

Where these environmental conditions do not occur, direct monitoring of shrub browsing and streambank disturbance will be necessary to assess annual livestock grazing impacts.

Sampling Constraints: Stubble height sampling is quick, simple, and reasonably accurate. It can be used to monitor large areas in less time than is needed with traditional utilization study protocols. In some situations, however accuracy can be adversely affected by stand characteristics. Difficulties with stubble height arise, for example, in irregularly grazed bunchgrasses or stands of inconsistent plant composition with varying palatability. For these reasons, stubble height measurements should focus on key riparian plant species, or species groups, important to bank stability. Stubble height should be recorded and averaged by key species, not averaged across multiple species. Because plants have varying growth height potential, averaging stubble height across multiple, dissimilar species can skew the results in

favor of taller or shorter growing species that predominate in a sample area. Averaging or grouping the data should only be done among species with relatively similar growth forms.

Stubble height measurements should be derived from a population of samples statistically adequate to reflect actual grazing use. The selection of species groups, where appropriate, may reduce the total sampling requirements or may increase precision within a given sample number. The selection of monitoring sites (Designated Monitoring Areas – DMAs) should be based on the endpoint objective being monitored. Trend as well as the appropriate short-term indicators should be measured at DMA's. DMA's should reflect management impacts on all major riparian cover types of the stream/riparian area within the pasture, be representative of overall grazing use within the entire riparian area of the pasture, and occur only where livestock are using the riparian area. It should not reflect an "average" amount of use in all riparian areas of the stream reaches in the pasture. The DMA should not be located where the vegetation community type is not an important contributor to stream function or small localized areas where cattle concentrate (e.g. stream crossings). The DMA should include stream segment(s) critical to important riparian-dependant resources (e.g. spawning and early rearing segments). In summary, stubble height can be used as an annual indicator of livestock grazing in riparian areas where hydrophytic greenline vegetation is the primary streambank stabilizer and where:

- It is applied to individual key species or community types that play an important role in maintaining streambank stability and are utilized by livestock.
- It is statistically applied to individual key species or to groups of species with similar growth characteristics (restricting sampling to an individual species, unless it is dominant, may substantially increase sampling requirements).
- Enough observations are collected to reflect grazing use variability across the extent of the monitoring area. A sequential sampling method, such as described by Turner and Clary (2001) has the advantages of being rapid, avoiding skewness, and providing statistically accurate answers.

3. How are the agencies, in fact, using it? Including in biological assessments for consultation on Threatened and Endangered species?

The agencies are inappropriately using stubble height as a performance standard (grazing permit/license term or condition and/or management standard in Forest and Resource Management Plans). It has also been inappropriately used as a riparian management objective in Forest Plans, Resource Management Plans and allotment plans. In some instances it has been used as the only implementation monitoring tool in biological assessments for consultation on T & E species, and in many cases it is used as a substitute for effectiveness monitoring. Agencies have also used it on inappropriate riparian areas (See Question 2 for examples of where it should or should not be used).

4. What are the limitations of its use?

The linkages between stubble height and riparian functions have not been extensively researched nor documented through long-term monitoring. For this reason, stubble height as

an annual indicator of grazing in riparian areas should only be used where existing science suggests that it is an appropriate indicator and in combination with long-term monitoring of vegetation and channel parameters. (See Question 2 for additional limitations to its use and where it is appropriate to use it).

5. **How appropriate is it to use this measure to address annual and long-term management strategies?**

   If it is measured and used properly, it can be used as a guideline or indicator for evaluating and/or changing annual management in the Annual Operating Instructions/Plan. Stubble height, streambank disturbance, woody stem use, etc. are all short-term indicators of grazing effects on meeting long-term riparian management objectives (i.e. green-line vegetation composition, streambank stability). Each can be used in the appropriate situation as indicators of good management and as a target to achieve in the annual operating plan, with the objective of achieving the long-term riparian management goals. Stubble height is not appropriate to use as a long-term monitoring tool to determine trend. It is also inappropriate to use stubble height numeric values as the sole means to manage toward achieving the long-term objectives.

   The wording in permits/LUP's should be changed to use stubble height as a prompt to investigate and assess the resource condition and implement appropriate changes in annual management. Such changes would be made through adaptive management (*See process for adaptive management).*

6. **What additional research might be needed, if any, to affirm or refine this measure?**

   Clary and Leininger (2000) found limited research has been conducted on the relationship between stubble height and streambank trampling, sediment entrapment and shrub (willow) browsing on the greenline. They suggested research was needed in these areas: *1) The determination of where a stubble height guideline is efficient and effective and where it is not appropriate. 2) Determination of proper stubble heights in high elevation or other sites where species composition and growing conditions result in relatively low statured forage plants. 3) Evaluation of the relative preference for herbaceous vegetation and willows in different seasons, under different combinations of herbaceous and woody species, and at different forage stubble heights. 4) Documentation of the direct impacts of livestock on streambanks of different stream types, parent materials, moisture conditions, and livestock occupancy levels as guided by stubble height. 5) Increased understanding of channel evolution and how recovery processes affect the local flood plain watertable and the greenline vegetation in relation to different grazing intensities and residual stubble heights.*

   We recommend that future research should focus on the effects of grazing intensity, frequency and season of use on the physiological health of individual key riparian species, streambank stability, sediment entrapment and willow use. However, agencies should not wait for the research before making changes in how stubble height is used.

We also recommend research on the linkage of streambank alteration or disturbance to streambank stability and greenline composition. Research on shrub utilization effects on shrub regeneration is also needed. Additional research needs are identified in question 7.

7. What other measures might be used in its place?

Emphasis should be placed on long-term monitoring of trend to determine whether resource management objectives are being met or not. Stubble height should not be replaced with another annual indicator (i.e. streambank disturbance, woody stem use) in place of long-term monitoring. However, stubble height and other annual monitoring indicators can provide useful information for interpreting the cause of unsatisfactory trend and for adaptive management.

We want to emphasize that the problems we have identified with the use of stubble height apply to other short-term indicators that might be used as short-term management guides. Many streambank disturbance limitations have been included in grazing management plans without really knowing how much disturbance a local stream can recover from in one year or two years. Research is needed to determine the amount of time required for streambank recovery (via sediment deposits, vegetation growth, etc.) from different levels of disturbance for sites varying by growing season, substrate, streamflow characteristics, grazing systems and other factors. Such research would provide direct information for development of local grazing strategies. For example, if a stream is grazed in alternate years, then one should know how much bank disturbance can, on average, be healed in two years on that particular site.

8. What other measures might be needed to achieve management objectives in riparian areas?

Long-term monitoring of vegetation composition on the greenline, streambank stability and regeneration of woody species are the true measures of whether riparian management objectives are being met or not. Annual indicators, such as stubble height, are only useful for interpretation of why trend is not satisfactory and for use in adaptive management.

9. How much rest or change in management is needed when stubble height objectives are not met?

The question is, will the reduced residual vegetation height significantly affect the resource condition? The answer will vary depending on how many years the standard was not met, how severe the use was and the type of riparian area being considered. For example, one or two years of not meeting the standard in a riparian system with a cobbled or coarse substrate may well be relatively benign to stream/riparian recovery. However, there may be more reason for concern on a stream with a fine substrate. A pattern of non-compliance (i.e. 3 or more consecutive years) could severely affect the health of individual plants, leading to such effects as reduced root mass, thinning of the desired greenline plant community and/or limiting bank building. Continued non-compliance would indicate that some change in grazing strategy may be necessary. Continued non-compliance would also indicate that the allotment should be placed on a high priority for monitoring long-term trend. If riparian

conditions are not meeting resource objectives, are degraded and static or in downward trend due to livestock grazing, changes in management should be implemented and monitoring of riparian response initiated.

10. Can we adjust the stubble height objective if a grazing management system is in place?

Clary and Leininger (2000) proposed a 10 cm (4 in) residual stubble height as a "starting point for improved riparian grazing management." However, they acknowledged that in some instances, 7 cm (2.75 in) may provide adequate riparian protection and in others 15 to 20 cm (6 to 8 in) may be required to limit streambank trampling or to reduce willow browsing. The criteria could vary depending upon local environmental variables, condition and trend of the stream, species composition on the greenline and the season, frequency and duration of livestock use. Thus, stubble height criteria not only can but should be adjusted through adaptive management, based on riparian conditions and trend *(see Process for Adaptive Management).*

Linkages between stubble height and riparian functions have not been extensively researched nor documented through long-term monitoring. Research that identifies appropriate stubble height indicator values that should be associated with specific seasons of use, grazing strategies, etc. is also lacking. Caution should be used in setting stubble height indicator values until information is collected that relates the indicator value used to responses in riparian and aquatic variables (long-term trends) on the sites being monitored.

Process for Adaptive Management

Though stubble height is easy to use, it is not a resource objective and therefore inappropriate as a performance standard (see Clary and Leininger 2000, and the IIT Monitoring Module Manual 2003). Thus stubble height should not be used as a term and condition in the Grazing Permit or Standard in the Land Use Plan (LUP). It should be used as a guideline or indicator for changing annual management in the Annual Operating Instructions/Plan. The term and condition or standard should be based on trending towards or achieving riparian resource objectives. Stubble height, streambank disturbance, woody stem use, etc. are all short-term indicators of grazing effects on meeting long-term riparian management objectives (e.g. green-line vegetation composition, streambank stability). Each can be used in the appropriate situation, as indicators of good management, and as a target to achieve in the annual operating plan, with the objective of achieving the long-term riparian management goals. It is also inappropriate to use stubble height numeric values as the sole means to manage toward achieving the long-term resource objectives.

Field units should change the wording in the permits/LUPs to use stubble height as a prompt to investigate and assess the resource condition and to indicate the need to make appropriate changes in annual management. If stubble height indicates that grazing management is not achieving the desired resource values, then identify appropriate and timely action to correct the root cause. This should be accomplished through adaptive management, as described below.

Adaptive management is an interdisciplinary planning and implementation process that identifies desired riparian conditions, defines criteria for modifying grazing operations when progress towards achieving the desired conditions is not being made, and specifically defines the monitoring strategy and protocols. Monitoring can determine whether the project-level decision is being implemented as planned (implementation monitoring) and, if so, whether the objectives are being achieved in a timely manner (effectiveness monitoring). The process invites participation from rangeland users and other interested parties where feasible. The process involves several steps:

I. Define the resource objectives (riparian management objectives).
II. Develop a grazing plan to accomplish the objectives
III. Identify trigger and endpoint indicators, and the numeric criteria for these monitoring indicators used to assess success.
IV. Implement the grazing plan and monitor the indicators
V. Annually evaluate success of the grazing plan and adjust as needed

I. Resource objectives for the riparian/aquatic communities are defined at the pasture scale. Since livestock grazing primarily influences greenline ecological status, bank stability, and woody species regeneration, the objectives often focus on these three resource characteristics. Objectives for greenline ecological status and bank stability are normally quantitative, and objectives for woody species regeneration qualitative.

II. The grazing plan should be designed to accomplish achievement of the resource objectives within a reasonable period of time. The plan should be at the pasture and allotment scale and identify timing, intensity, and duration of use expected to achieve the desired objectives. Care must be taken to insure that the plan meets both riparian and upland objectives. The permittees should be a full partner in developing the grazing plan.

III. Monitoring indicators are used to gauge success of the grazing plan. *Trigger indicators* are an opportunity and responsibility of the permittees to make ongoing changes throughout the season to ensure that *endpoint indicators* (described below) are met. They define when livestock should be moved and as such are *within-season* tools, i.e., "Is it time to either ride harder to keep cows in the uplands away from the creek or move them to another area of the pasture or even completely remove them from the pasture?" They are used by permittees as indicators of allowable use in a given riparian area, and are designed to limit livestock effects to riparian vegetation and stream channels to acceptable levels. Hall and Bryant (1995) provide an excellent example of how a permittee can use stubble height as a warning of when to move livestock. Site variability ensures that a single trigger will not be appropriate in all situations.

Selection of trigger indicators is based on which one(s), will be most appropriate for a particular pasture. An Interdisciplinary Team might select three triggers to start with, and as they gain experience find that only one or two are needed. When any one of the selected triggers is reached first, the permittee should take appropriate action to meet endpoint indicators.

Endpoint indicators are the responsibility of agencies, as a means to assess resource impacts of current year's grazing. However, the permittees and, in the case of concern about listed species,

the consulting agencies need to be involved in the annual grazing assessment. The appropriate time to measure and evaluate endpoint indicators is typically after the end of the growing and grazing season for the current year, but before the next high flow event that may reach or exceed bankfull. This assessment must also be based on observations and discussions among the permittees, the action agency, and the consulting agencies. This process might involve the Level 1 Team with the permittees and action agency manager in an annual meeting and/or field review. The purpose of the assessment is to determine if the actual grazing use in the current year's grazing season left the stream and associated riparian area in a condition which is likely to result in a desired trend towards meeting management objectives. As such, endpoint indicators are *end-of-season* tools. Most appropriate endpoint indicators for stream/riparian areas center on vegetation (herbaceous and/or woody riparian species) for protection and building of streambanks, and mechanical damage that leaves streambanks vulnerable to increased energies experienced during high flows. They should include the indicators described in Appendix B (Monitoring Guidelines).

It is a relatively common practice to factor in expected re-growth when setting within-season triggers for vegetation, particularly herbaceous stubble height. In these cases, end-of-season monitoring is of critical importance to evaluate the appropriateness of the trigger. All too often expected re-growth does not materialize, either due to lower than expected precipitation or overly optimistic estimates of the actual length of the growing season. The critical point for discussing triggers is at the end of the growing season when the results are apparent. Without end-of-season monitoring, there is no timely way to verify that the established trigger is leaving the stream and associated riparian area in a condition that can be expected to result in an upward trend towards management objectives (i.e., aquatic habitat quality). While other monitoring such as greenline (protocol), channel morphology, etc., are useful in establishing trend over the mid- to long-term (at least 3–5 years and in many instances longer), endpoint indicators help with the interpretation of whether the current year's management was appropriate. This is particularly important where federally listed or sensitive aquatic species are involved.

When using both within-season triggers and endpoint indicators, allowable numeric values should be established. The monitoring strategy must not only measure and evaluate whether or not the allowable numeric value is met, but also whether the value is correct. Due to site-specific differences across the landscape, the determination of allowable numeric values must rely to a large part on professional judgment. Current research can give the manager a starting point but may not be precise enough to apply in a "cookbook fashion." The interdisciplinary team must begin with current applicable research then factor in site-specific characteristics to arrive at an allowable numeric value that is reasonable. This reinforces the value of adaptive management. At each stage of the monitoring cycle (i.e., within-season trigger, endpoint indicator, etc.) evaluations must consider whether triggers, endpoint indicators, and associated allowable numeric values are useful in making management adjustments to meet riparian objectives. The manager must continuously refine triggers, endpoint indicators, and management to achieve desired results.

IV. Implementing the grazing plan and monitoring: The monitoring guidelines and agency/ permittee responsibilities described below and in Table 1 are recommended. Stubble height is an

indicator of livestock use and potential impact, not a riparian management objective. Proper livestock management in riparian areas requires assessing livestock use and riparian response (i.e., trend). Thus monitoring should be used to evaluate intensity, duration, and timing of livestock use within the pasture to insure it is not adversely impacting the riparian-dependant resource values. In practice, monitoring evaluates whether the grazing plan meets short-term goals for vegetation use and bank disturbance (triggers and end point indicators), and whether these goals are meeting long-term riparian management objectives.

Permittee responsibilities: Permittees should take the initative in watching for, evaluating, and acting on within-season triggers. Permittees should use triggers as an early warning system for assessing the need to move livestock to another pasture or reduce use in the riparian area by herding, etc., as described by Hall and Bryant (1995). Permittees should also take an active part in the discussion and selection of DMAs and endpoint indicators and be encouraged to participate in monitoring endpoint indicators. Having the permittees as integral participants in the implementation monitoring and evaluation is advantageous to both the permittees and the agencies, as it will lead to better and more acceptable management decisions.

Agency responsibilities: Endpoint indicator monitoring and DMA selection are the overall responsibility of the action agency, however permittees and other stakeholders should be encouraged to participate. It is important that the agency use the endpoint indicator results to determine if the conditions for recovery are being met by current standards or if the standards are appropriate. Both triggers and endpoint indicators are important and must be completed.

Consulting agency responsibilities: Where appropriate, consulting agencies have the responsibility to participate in discussions on DMA selection, and endpoint indicator assessments. They may also participate in endpoint indicator monitoring.

Process for selecting indicators: When choosing triggers and endpoint indicators, consider the following elements:

1. Residual vegetation height on pre-selected key riparian-wetland species on the greenline (not the average height on all herbaceous species).
2. Riparian woody browse incidence of use on key species (trees and shrubs).
3. Streambank alteration as a result of livestock grazing (bank trampling).

A critical point must be made here. It is **inappropriate** to use endpoint indicators and their associated numeric values as the sole means to determine whether a particular grazing system is contributing to stream/riparian recovery or conversely, contributing to degradation.

- Precision of data sampling must also be taken into account. For example, samples that do not have the sensitivity to detect means within ½ inch, may not be able to differentiate between 3½ and 4 inches of stubble height. Assuming the difference between observed measurements is clearly real rather than an artifact of sampling imprecision, and that the standard is actually correct, one must then evaluate whether or not the difference does in fact translate into unacceptable impacts to the resource in question. For example, when evaluating the effect of a reduced residual vegetation height, the purpose behind using residual vegetation height must first be examined.

- Interpretation of long-term monitoring data (resource condition), including that focusing on other parameters such as greenline vegetation and bank stability, is needed before a reasonably accurate determination of the true impacts of the activity can be made.

Therefore, the question is really “will the reduced residual vegetation height significantly affect the resource condition?" The answer to this question is further complicated by the fact that it will likely vary depending on how many years the standard is not met, e.g., one year of not meeting the standard may well be relatively benign to stream/riparian recovery. However, a pattern of non-compliance (i.e. 3 or 4 consecutive years of not meeting the numeric value) could very well severely affect the health of individual plants leading to such effects as reduced root mass, thinning of the plant community and/or limit bank building. These effects must be addressed by the grazing strategy. This takes field time and communication between the members of the Interdisciplinary Team, the Line Officer, and permittees.

Other environmental factors must also be considered before making the assumption that livestock grazing is having an adverse effect on resource condition. Weather conditions, such as drought, 35 or 50 year flood events, ice damage to streambanks, etc. can adversely affect stream and streambank conditions. Heavy use by elk, moose and deer can have the same effect as heavy use by livestock. Insects, such as crickets, grasshoppers and stem/root borers can affect the vigor of plants.

The monitoring guide in Appendix B was developed to describe monitoring indicators and sample frequencies that apply to trigger, endpoint, and riparian objective monitoring .

V. Annually evaluate success of the grazing plan with the permittees: The interdisciplinary team assesses compliance with the management criteria. In cases where the criteria are not met, including the end of-season use criteria, the ID Team should make recommendations for whether changes to the grazing plan are needed and if so, what changes should be made. The ID Team will use input from the Level 1 Team where ESA is relevant to the non-compliance. The line manager and range conservationist then meets with the permittees to discuss any necessary adjustments to the annual grazing plan. Where the grazing operation is not in compliance with any portion of the permit, the manager consults with the ID Team (and Level 1 Team where ESA consultation measures are not met), and determines whether a letter of non-compliance or permit action is warranted. However, it should again be noted that the real question is will the reduced residual vegetation height significantly affect the resource condition.

Table 1. The Adaptive Management Process showing agency and permittee responsibility and participation.

ACTION	TIMING & FREQUENCY	RESPONSIBILITY	PARTICIPANTS
I. Set Riparian Objectives	During planning phase	Action Agency	Permittees and Consulting Agencies
II. Develop the Grazing Plan	During planning phase	Action Agency	Permittees and Consulting Agencies
IIIa. Selection of trigger indicators	Planning and potentially after annual management evaluations	Permittees and Action Agency	Consulting agencies
IIIb. Selection of endpoint indicators	Planning phase, or potentially after periodic evaluations	Action agency	Permittees and Consulting Agencies
IIIc. Selection of Long-Term Monitoring Indicators to assess meeting riparian objectives	Planning phase, or after riparian objective evaluations	Action agency	Permittees and Consulting Agencies
IIId. Selection of the DMA(s)	First field season and after periodic evaluations	Action Agency	Permittees and Consulting Agencies
IVa. Monitor trigger indicators	Field season annually	Permittees	Action Agency
IVb. Monitor endpoint indicators	Field season annually at end of growing season or grazing season, whichever comes last	Action Agency	Permittees and Consulting Agencies
Va. Evaluate endpoint indicators	Annually after endpoint indicator monitoring and before next bankful event	Action Agency and Permittees	Permittees and Consulting Agencies
Vb. Determine and implement management changes	Annually after endpoint indicator monitoring and before next bankful event	Action Agency and Permittees	Consulting Agencies
IVc. Monitoring Long Term indicators -riparian objectives	Once every 3 to 5 years	Action Agency	Permittees and Consulting Agencies
Vc. Evaluate Long Term indicators - riparian objectives	After riparian objectives monitoring	Action Agency	Permittees and Consulting Agencies
Vd. Determine and implement management changes resulting from riparian objectives assessment.	After riparian objectives monitoring	Action Agency	Permittees)and Consulting Agencies

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APPENDICES

Appendix A: University of Idaho Stubble Height Study Team

Appendix B: Monitoring Guide

I. "C" channel type, herbaceous vegetation dominant, potential vegetation: herbaceous or mixed herbaceous and shrubs
II. "C" channel type, herbaceous vegetation dominant, potential vegetation: mixed herbaceous and shrubs
III. "C" channel type, woody dominant, potential vegetation: shrubs and trees
IV. "E" channel type, herbaceous vegetation dominant, potential vegetation: herbaceous or mixed herbaceous and shrubs
V. "F" channel type (entrenched floodplain), herbaceous vegetation dominant, potential vegetation: herbaceous or mixed herbaceous and shrubs
VI. "G" channel type (entrenched-no floodplain), herbaceous vegetation or bare banks dominant, potential vegetation: herbaceous
VII. "B" channel type, mixed shrubs-herbaceous vegetation dominant, potential vegetation: mixed herbaceous and shrubs, or shrubs
VIII. "B" channel type, woody dominant, potential vegetation: shrubs and trees
IX. "A" channel, mixed shrubs and herbaceous, or shrubs dominant, potential vegetation: mixed shrubs and herbaceous, or shrubs. Substrate large

Appendix C: Channel type descriptions

Appendix D: Glossary

Appendix A. University of Idaho Stubble Height Study Team

Name	Title	Representing
Larry Bryant, PhD.	Rangeland Ecologist	U.S. Forest Service Washington, D.C.
Wayne Burkhardt, PhD.	Range Consultant Affiliate Professor Professor Emeritus	Ranges West University of Idaho University of Nevada
Tim Burton	Fisheries Biologist	Bureau of Land Management
Warren Clary, PhD.	Retired Range Scientist Rangeland Consultant	U.S. Forest Service
Rick Henderson	Fisheries Biologist	U.S. Forest Service
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The consulting agencies, NOAA Fisheries and U.S. Fish & Wildlife Services, have reviewed and provided comments on this report. Their comments have been incorporated into the report.

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Appendix B. Monitoring Guide

Selection of streamside monitoring methods for livestock grazing, based on channel type and greenline vegetation.

The following Guide can be used to prescribe streamside monitoring methods appropriate for various channel types (Rosgen, 1996), and existing and potential vegetative conditions along the greenline. Descriptions of the Channel Types are contained in Appendix C.

I. "C" channel type, herbaceous vegetation dominant, potential vegetation: herbaceous or mixed herbaceous and shrubs.

- **TRIGGER: Within-season trigger to move livestock, to maintain or increase vigor on key hydric stabilizers:**
    - Stubble height on key riparian species, or species groups on the greenline
    - Use compliance (livestock numbers and time in pasture).
    - Bank disturbance or alteration

- **ENDPOINT: End-of-season indicator of proper use to maintain or ensure increased composition key hydric stablizers:**
    - Stubble height on key riparian species, or species groups on the greenline
    - Bank disturbance or alteration

- **RIPARIAN OBJECTIVE: Long-term indicator of riparian condition to assess attainment of the Riparian Management Objectives**
    - Streambank stability
    - Greenline composition maintained or trend toward hydric stablizers

II. "C" channel type, mixed shrub - herbaceous vegetation dominant, potential vegetation: mixed herbaceous and shrubs, or shrubs.

- **TRIGGER: Within-season trigger to move livestock, to maintain or increase vigor on key hydric stabilizers:**
    - Stubble height on key riparian species or species groups on the greenline
    - Use compliance (livestock numbers and time in pasture).
    - Bank disturbance or alteration
    - Change in preference to woody species sprouts and young

- **ENDPOINT: End-of-season indicator of proper use to maintain or ensure increased composition key hydric stablizers:**
    - Stubble height on key riparian species or species groups on the greenline
    - Bank disturbance or alteration
    - Incidence of use on woody sprouts and young

- **RIPARIAN OBJECTIVE: Long-term indicator of riparian condition to assess attainment of the Riparian Management Objectives**
    - Streambank stability
    - Greenline composition maintained or trend toward hydric stablizers
    - Woody species regeneration – 15-20% sprouts and young, 60-70% mature, and 15-20% dead

III. "C" channel type, woody dominant, potential vegetation: shrubs and trees.

- **TRIGGER: Within-season trigger to move livestock, to maintain or increase vigor on key hydric stabilizers:**
    - Use compliance (livestock numbers and time in pasture).
    - Bank disturbance or alteration
    - Change in preference to woody species sprouts and young

- **ENDPOINT: End-of-season indicator of proper use to maintain or ensure increased composition key hydric stablizers:**
    - Bank disturbance or alteration
    - Incidence of use on woody sprouts and young

- **RIPARIAN OBJECTIVE: Long-term indicator of riparian condition to assess attainment of the Riparian Management Objectives**
    - Streambank stability
    - Woody species regeneration – 15-20% sprouts and young, 60-70% mature, and 15-20% dead

IV. "E" channel type, herbaceous vegetation dominant, potential vegetation: herbaceous or mixed herbaceous and shrubs.

- **TRIGGER: Within-season trigger to move livestock, to maintain or increase vigor on key hydric stabilizers:**
    - Stubble height on key riparian species, or species groups on the greenline.
    - Use compliance (livestock numbers and time in pasture).
    - Bank disturbance or alteration

- **ENDPOINT: End-of-season indicator of proper use to maintain or ensure increased composition key hydric stablizers:**
    - Stubble height on key riparian species, or species groups on the greenline.
    - Bank disturbance or alteration.

- **RIPARIAN OBJECTIVE: Long-term indicator of riparian condition to assess attainment of the Riparian Management Objectives**
    - Streambank stability.
    - Greenline composition maintained or trend toward hydric stablizers

V. "F" channel type (entrenched floodplain), herbaceous vegetation dominant, potential vegetation: herbaceous or mixed herbaceous and shrubs.

- **TRIGGER: Within-season trigger to move livestock, to maintain or increase vigor on key hydric stabilizers:**
    - Stubble height on key riparian specie, or species groups s on the greenline.
    - Use compliance (livestock numbers and time in pasture).
    - Bank disturbance or alteration

- **ENDPOINT: End-of-season indicator of proper use to maintain or ensure increased composition key hydric stablizers:**
    - Stubble height on key riparian species, or species groups on the greenline.
    - Bank disturbance or alteration.

- **RIPARIAN OBJECTIVE: Long-term indicator of riparian condition to assess attainment of the Riparian Management Objectives**
    - Streambank stability.
    - Greenline composition maintained or trend toward hydric stablizers

VI. "G" channel type (entrenched – no floodplain), herbaceous vegetation or bare banks dominant, potential vegetation: herbaceous.

- **TRIGGER: Within-season trigger to move livestock, to maintain or increase vigor on key hydric stabilizers:**
    - Use compliance (livestock numbers and time in pasture).
    - Bank disturbance or alteration

- **ENDPOINT: End-of-season indicator of proper use to maintain or ensure increased composition key hydric stablizers:**
    - Bank disturbance or alteration.

- **RIPARIAN OBJECTIVE: Long-term indicator of riparian condition to assess attainment of the Riparian Management Objectives**
    - Streambank stability.
    - Greenline composition maintained or trend toward hydric stablizers

VII. "B" channel type, mixed shrub - herbaceous vegetation dominant, potential vegetation: mixed herbaceous and shrubs, or shrubs.

- **TRIGGER: Within-season trigger to move livestock, to maintain or increase vigor on key hydric stabilizers:**
    - Stubble height on key riparian species, or species groups on the greenline
    - Use compliance (livestock numbers and time in pasture).
    - Bank disturbance or alteration
    - Change in preference to woody species sprouts and young

- **ENDPOINT: End-of-season indicator of proper use to maintain or ensure increased composition key hydric stablizers:**
    - Stubble height on key riparian species, or species groups on the greenline
    - Bank disturbance or alteration
    - Incidence of use on woody sprouts and young

- **RIPARIAN OBJECTIVE: Long-term indicator of riparian condition to assess attainment of the Riparian Management Objectives**
    - Streambank stability
    - Greenline composition maintained or trend toward hydric stablizers
    - Woody species regeneration – 15-20% sprouts and young, 60-70% mature, and 15-20% dead

VIII. "B" channel type, woody dominant, potential vegetation: shrubs and trees.

- **TRIGGER: Within-season trigger to move livestock, to maintain or increase vigor on key hydric stabilizers:**
    - Use compliance (livestock numbers and time in pasture).
    - Bank disturbance or alteration

- **ENDPOINT: End-of-season indicator of proper use to maintain or ensure increased composition key hydric stablizers:**
    - Bank disturbance or alteration
    - Incidence of use on woody sprouts and young

- **RIPARIAN OBJECTIVE: Long-term indicator of riparian condition to assess attainment of the Riparian Management Objectives**
    - Streambank stability
    - Woody species regeneration – 15-20% sprouts and young, 60-70% mature, and 15-20% dead

IX. "A" channel type, mixed shrubs and herbaceous, or shrubs dominant, potential vegetation: mixed shrubs and herbaceous, or shrubs, substrate large.

- **TRIGGER: Within-season trigger to move livestock, to maintain or increase vigor on key hydric stabilizers:**
    - Use compliance (livestock numbers and time in pasture).
    - Bank disturbance or alteration
    - Change in preference to woody species sprouts and young

- **ENDPOINT: End-of-season indicator of proper use to maintain or ensure increased composition key hydric stablizers:**
    - Bank disturbance or alteration
    - Incidence of use on woody sprouts and young

- **RIPARIAN OBJECTIVE: Long-term indicator of riparian condition to assess attainment of the Riparian Management Objectives**
    - Streambank stability
    - Greenline composition maintained or trend toward hydric stablizers
    - Woody species regeneration – 15-20% sprouts and young, 60-70% mature, and 15-20% dead

Appendix C. Channel type descriptions (Rosgen 1996, p. 4-5).

Channel type	Description	Entrench-ment ratio	W/D ratio	Sinuosity	Slope	Landform
C	Low gradient, meandering, point-bar, riffle/pool, alluvial channels	> 2.2	>12	>1.4	<.02	Broad valleys with terraces. Well defined meandering channels
E	Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition.	>2.2	<12	>1.5	<.02	Broad valley/meadows. Alluvial materials with floodplains. Highly sinuous. Very low width/depth ratio.
F	Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio	<1.4	>12	>1.4	<.02	Entrenched in highly weathered material. Gentle gradients with high bank erosion rates.
G	Entrenched "gully" step/pool and low width/depth ratio on moderate gradients	<1.4	<12	>1.2	.02 to .039	Gullies, step/pool morphology. Narrow valleys or deeply incised in alluvial or colluvial materials. Unstable with high bank erosion rate.
B	Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools.	1.4 to 2.2	>12	>1.2	.02 to .039	Moderate relief, colluvial deposition, and/or structural. Narrow, gently sloping valleys.
A	Steep, entrenched, cascading, step-pool streams. Very stable if bedrock or boulder dominated.	<1.4	<12	1.0 to 1.2	.04 to .10	High relief. Erosional or depositional and bedrock forms. Entrenched and confined streams with cascading reaches.

Appendix D. Glossary

Community: An assemblage of populations of plants and/or animals in a common spatial arrangement.

Composition: The proportions (percentages) of various plant species in relation to the total on a given area. It may be expressed in terms of relative cover, relative density, relative weight, etc.

Evaluation: (1) An examination and judgment concerning the worth, quality, significance, amount, degree, or condition of something; or (2) the systematic process for determining the effectiveness of on-the-ground management actions and assessing progress toward meeting management objectives.

Greenline: The first perennial vegetation that forms a lineal grouping of community types on or near the water's edge. Most often it occurs at or slightly below the bankfull stage.

Herbaceous: Vegetation growth with little or no woody component; non-woody vegetation such as graminoids and forbs.

Monitoring: The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives.

Shrub: A plant that has persistent woody stems and a relatively low growth habit, and that generally produces several basal shoots instead of a single bole. It differs from a tree by its low stature, less than 5 meters (16 feet), and non-arborescent form.

Streambank disturbance or alteration: The effect of livestock to alter the physical dimensions (e.g., increasing the bankfull width) and stream bank stability of stream channels by bank trampling and shearing.

Streambank stability: The tendency of streams to form banks resistant to the erosive energy of streamflow. This tendency toward stability has been referred to as self-stabilization (Rosgen 1996). Deep-rooted vegetation plays a key role in stabilization of most stream systems.

Stubble: The basal portion of herbaceous plants remaining after the top portion has been harvested either artificially or by grazing animals.

Stubble Height: The measure or height (in centimeters or inches) of herbage left ungrazed at any given time (USDA Forest Service, et. al, 1999, Interagency Technical Reference 1743-3).

Regional Technical Team Response to the Proposed Stubble Height Standards

The Stubble Height Review Team recognized potential implications about how residual stubble height might be used in relation to existing consultations that address both PACFISH/INFISH and the 1998 Biological Opinions. To explore these implications, it was agreed by the group and its sponsors to have two senior staff specialists familiar with these requirements as well as the stubble height issue review the information and statements in the draft report regarding the appropriate use of stubble height. These two specialists, Tim Burton, BLM and Bill Lind, NOAA Fisheries also serve on the Regional Technical Team (RTT) that provides technical expertise on ESA consultation issues to Level 1 and Level 2 Teams as well as to the Regional Executives, the Interagency Coordination Subgroup and the Interagency Implementation Team. As such, their efforts as a subset of the RTT provided a basis for addressing the concerns and making recommendations associated with Land Use Plans, Allotment Management Plans and Implementation.

The following response is included in the report to help explain and clarify these concerns.

Concerns: There is concern with the Stubble Height Study Group's statement that residual stubble height is inappropriate as a performance standard. The current broad direction, contained in both PACFISH/INFISH and the 1998 Biological Opinions makes it clear that grazing must be monitored to assure that riparian management objectives (RMOs) are achieved. This would not be possible without measurable standards, against which the monitoring data would be compared to assess need for change in management direction for the following years grazing. The absence of explicit measurable standards would preclude effective adaptive management used to make these changes. The concern is with respect to the certainty that short-term monitoring would actually maintain RMO's or that modifications would actually be made on an annual basis to move degraded conditions towards the RMO's. Under the Endangered Species Act (ESA), short-term effects are sometimes acceptable to achieve long-term benefit. However, depending upon the status of the stocks in question (e.g., endangered sockeye salmon), delays in attainment of RMO's could trigger significant risks to the status of these stocks and/or other species. Because there are no short-term standards in the study groups draft proposal, there is a concern that the proposal would de-emphasize implementation monitoring, and perhaps replace it with effectiveness monitoring, thereby creating a lag time between condition observation and management response. There is also concern that requiring effectiveness monitoring would be laborious and therefore more costly than just relying upon the less expensive implementation monitoring approach now applied in most situations. The elevation letter also recommends a greater role by Level 1 Teams in the adaptive management process. The elevation letter is attached.

Response:

A comprehensive summary of the literature on this subject evaluated the best science on stubble height as a management tool (Clary and Leininger 2000). A co-author was also a

member of the Stubble Height Study Group. Statements in this reference, and interpretations by the co-author in the draft Stubble Height Report help to clarify how stubble height should be used in grazing management and where and when stubble height criteria should be used. It is important to make it clear that stubble height can be an excellent tool for assessing a number of RMOs, such as: maintaining forage vigor, entrapping and stabilizing sediment under inundated flow, streambank stability, and diversion of willow browsing (Clary and Leininger 2000 – page 568-569). However the authors make it clear that their suggestion of using 4- to 6-inches of stubble height is "a starting point when initiating improved riparian management, one that can be changed as monitoring indicates" (Clary and Leininger 2000 – page 569). In other words, there is no set standard value for the stubble height; any local value needs local validation through monitoring.

In the Stubble Height Study Groups proposal, the stubble height standard is not eliminated, but would be used as a short-term prompt or "red flag" indicating when current season's grazing might affect long-term achievement and maintenance of the RMOs. Thus stubble height criteria would be included as part of an adaptive management process with other indicators to make informed management decisions. Stubble height would not be a long-term standard as currently used, but rather a short-term criterion to evaluate the success of current season's grazing. The adaptive management process would include changes in the grazing system needed to achieve long-term RMO's, but also include a determination of the appropriate stubble height criterion for the grazing unit (allotment or pasture) through monitoring. As the literature summary stated: "In some situations, 7 cm (2.75 inches) or even less stubble height may provide for adequate riparian ecosystem function, while under other conditions 15-20 cm (6-8 inches) of stubble height may be required to reduce willow browsing or to limit animal impact on vulnerable streambanks" (Clary and Leininger 2000 – page 569). Measured stubble heights would be compared to the condition and trend of measured RMO indicators to determine the appropriate criterion for the grazing unit. Thus, stubble height and implementation monitoring would be refined so that the suggested stubble heights in the literature would be a starting point and then adjusted site-specifically to ensure they actually reflect achievement of RMO's.

Given these observations, it was clear that a more definitive, short-term standard needs to be identified as a means of defining performance compliance. Stubble height criteria are to be developed over time, and will be only one of the short-term indicators of livestock use impacts. Site-specific standards will be adjusted through the adaptive management process itself. This approach can be achieved through a combination of Land Use Plan (LUP) and Allotment Management Plan (AMP) standards and objectives, added through plan amendment, plan revision, and/or allotment-specific section 7 consultations. The Regional Technical Team (RTT) recommends the following approach:

1. New Land Use Plan Direction:

    a. Standards/Objectives – Standards shall be developed requiring that grazing strategies be developed for each AMP. LUPs shall also describe desired

outcomes or LUP objectives for terrestrial, riparian, and aquatic resources (e.g. prominence of hydrophilic vegetation along the greenline, stable streambanks, woody species generation, etc.). The LUP shall identify broad, general resource objectives to be achieved within the planning period, and require that more-specific and measurable objectives are to be developed at the AMP level. LUP's shall also require that where ESA-listed species are involved, LUP/AMP resource objectives shall be developed in coordination with the consulting agencies.

b. Monitoring - The LUP monitoring plan shall require annual review and assessment of the grazing strategy associated with each AMP. Where ESA-listed species are relevant, include the Level 1 Team in the annual reviews and assessments. In preparation of the AMP, monitoring plans will be required to include both short-term livestock movement triggers and end-point indicators, and long-term indicators of the resource objectives (terrestrial, riparian, and aquatic). Monitoring triggers, indicators, and resource objectives will be developed according to the Stubble Height Study Group recommendations in Appendix C – Monitoring Guide.

2. Allotment Management Plan Direction:

a. General Standard – Will require that AMP's develop specific, quantifiable RMO's for each pasture. Identify the appropriate short-term movement triggers and endpoint monitoring indicators for the unique stream and channel types within each pasture. The trigger and end-point indicators shall be based upon the best available criterion for the AMP or pasture. Until site-specific metrics can be established, use the suggested criterion in the literature (Clary and Leininger 2000) as interim criteria, and adjust through time as local monitoring results indicate. Monitor the short-term indicators annually and the long-term indicators as frequently as is appropriate for the specific indicator (e.g. Winward (2000) recommends greenline vegetation be monitored on a 3 -5 year rotation). Where ESA-listed species are relevant, the Level 1 Team shall assist with the development and fine-tuning of short-term movement triggers and endpoint indicators, and shall be included in the annual review of monitoring results.

b. Monitoring - Each year, or as often as is necessary to assess trend in key riparian resource indicators, monitoring results shall be used to assess the need to make changes in timing, intensity, and/or duration of grazing, and those changes shall be required in the next year's annual grazing instructions. In other words, failure to achieve short-term move triggers or endpoint indicators will trigger required changes in the next year's annual operation instructions and could potentially result in re-initiation of consultation for the AMP. Failure to achieve the riparian resource objectives would likely result in re-initiation of consultation for the AMP. This approach should ensure no lag-time between monitoring observations and implementation of changes to the

grazing strategy. Level 1 teams shall review monitoring results annually and be able to elevate instances where AMPs are not changed or instances of recalcitrant repeat offenders occur. Annual changes may include any modifications of timing, intensity, and duration of grazing at any location(s) within the allotment. Permit performance will then be based upon compliance with those annual grazing instructions. The annual grazing instructions may include triggers defining when livestock would be moved from each pasture.

c. Monitoring Plan Standard - As recommended by the Stubble Height Study Group, the AMP monitoring plan shall require training certification of monitoring personnel. The RTT suggests the Monitoring Core Team develop a canned training program and certification for those conducting the monitoring in association with implementation of the IIT Monitoring Module. The plan shall include quality assurance measures (e.g. follow-up field checks, training, program reviews, etc.).

3. Implementation:

The RTT recommends that this process be phased in over time, and that it be field tested on a few priority grazing allotments where ESA consultation has occurred. Include the consulting agencies in the field tests through the Level 1 Teams. This would also constitute a learning experience for individual field units, therefore the field tests should be applied broadly on as many field units as possible. The RTT acknowledges the concern that requiring effectiveness monitoring would be laborious and therefore more costly than just relying upon the less expensive implementation monitoring approach now applied in most situations. However, the literature makes it clear that implementation monitoring criteria are not useful unless they are validated for achieving resource objectives, and such achievement is not possible to detect without effectiveness monitoring. If monitoring is designed to be efficient, the increases in monitoring costs can be minimal. For example, a stubble height monitoring project may require 2 hours to access the site, and 1 hour to make measurements. The addition of an assessment of bank alteration, woody use, greenline vegetation, woody regeneration, and bank stability at the same points of measurement would add approximately 1 hour to the sampling, based on recent tests in the field. A more efficient protocol that would address this need is currently being developed by BLM based upon combined parameter measurements at the same sample quadrat.

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APPENDIX G

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PRINCIPLES OF OBTAINING AND INTERPRETING UTILIZATION INFORMATION ON SOUTHWEST RANGELANDS

THE UNIVERSITY OF ARIZONA®
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PRINCIPLES OF OBTAINING AND INTERPRETING UTILIZATION DATA ON SOUTHWEST RANGELANDS

Lamar Smith[1], George Ruyle[2], Jim Maynard[3], Steve Barker[4], Walt Meyer[5], Dave Stewart[6], Bill Coulloudon[7], Stephen Williams[8] and Judith Dyess[9]

Introduction

Utilization has been an important "tool" in range management since its beginnings. On the surface the concept appears simple, referring to the percentage of current forage removed by grazing animals or the amount of residual vegetation left after grazing. In reality it is complex in concept and in practice, and there has long been controversy over its proper application. There is a large body of information published over the past 75 or more years on methods of measuring utilization and its proper interpretation in rangeland management.

In spite of all the research and discussion on the topic, there is still concern in the range profession that utilization measurement and interpretation is often done inappropriately. Scharnecchia (1999) concluded that the utilization concept is fundamentally flawed and should be discarded, although he offered no practical alternative to it. Part of the problem may be that procedures established for employing utilization data to manage livestock grazing have been extended to issues for which they are not appropriate. Another aspect may be that land management agency personnel include a wider array of disciplines than in past years, and some of these people have limited knowledge of the history and literature on utilization.

Therefore, the purpose of this paper is to set forth the fundamental principles of collecting and using utilization data for decision making on rangelands that are established and accepted by the range management profession. This discussion is not intended to justify or support utilization guidelines. Rather it is meant to clarify how and when utilization can be used in the management of southwestern rangelands for livestock grazing.

Percentage utilization will be emphasized rather than stubble height or residual measurements. While related, stubble height estimates are not necessarily a substitute for utilization and the two concepts are different ecologically (Interagency Technical Reference 1999). Stubble height may be related to two primary processes of concern. One is the effect of grazing on the physiological response of the individual plant. The other is the effect of residual vegetation in protecting the soil from wind or water erosion. Use of stubble heights in riparian areas has recently been addressed in another publication (Univ. Idaho Stubble Height Review Team 2004). Likewise, residual measurements have largely focused on soil protection and to provide the proper germination environment during the following season in California annual grasslands to maintain desirable plant species composition in the community (Bartolome et al. 2002). They are not related to the physiological response of the plants being grazed as is utilization as a measurement of individual plants on perennial grass and shrub ranges.

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Additionally, some types of residual cover guidelines (e.g. "structure" requirements or visual obstruction estimates for upland bird nesting) are neither utilization nor stubble height, and will not be addressed here. Detailed protocol for specific data collection methods will also not be addressed because a number of excellent sources exist for this purpose. The emphasis will be on use of utilization data for livestock grazing management in a multiple use framework with the objective of maintaining or improving vegetation cover and/or composition.

Background

"Utilization is the proportion of degree of current year's forage production that is consumed or destroyed by animals (including insects). Utilization may refer either to a single plant species, a group of species, or the vegetation as a whole." (Interagency Technical Reference 1999). This definition is virtually identical to that of the Society for Range Management (SRM) (Society for Range Management 1989) and is generally accepted by range professionals. However, Smith (in Western Coordinating Committee 40 and 55 1998) pointed out that this definition may not adequately address two rather different meanings of utilization that have long been recognized. Stoddart and Smith (1955, p 138) state:

> "Utilization of a range means the degree to which animals have consumed the usable forage production expressed in percentage. This production should be based on animal-months consumed compared to animal-months available when the range is correctly used. When dealing with an individual plant, however, utilization has a different usage and is defined as the degree to which animals have consumed the total current herbage production expressed as a percentage. These two uses are confusing and will require clarification whenever the term is used. It is suggested that range use might be a better term for the first meaning and percentage utilization better for the second meaning."

Neither the definition given above nor common usage makes a clear separation between the two concepts included in the term "utilization."

The history of the application of utilization in range management may shed some light on this confusion. It appears that utilization concepts were first employed on the Coconino National Forest in Arizona in about 1910 when James Jardine developed the "ocular reconnaissance" approach to range survey (Chapline and Campbell 1944). That procedure was designed to estimate carrying capacity of rangeland as a basis for adjudicating grazing on the national forests, and was later employed as the Interagency Range Survey. The procedure used to estimate the amount of useable forage on a range was based on the concepts of key species and proper use factors. A key species was a palatable and relatively abundant species upon which management was based. Proper use of the key species was the percentage of utilization of current annual production that could be used while maintaining the vigor and productivity of the species on the range. Proper use factors (PUF) were established for other species based on the relative preference or palatability of those species compared to the key species. (PUFs were originally called preference or palatability ratings). Usually PUFs for other species were lower than the key species, but some "ice cream" plants had higher PUFs than key species. This range survey procedure also provided for "utilization adjustments" to be applied to the allowable utilization for all species to reflect distance from water, slope, restricted access, etc. This range survey method, therefore, established the basis for proper use, key areas, and accounting for differences in the amount of forage available depending on animal distribution and dietary preference (as affected by season or kind of animal). However, the method did not involve measurement of utilization.

Interest in estimating utilization began in the 1930s as a means of documenting grazing intensity on grazing allotments and in grazing research. Most of the research and development of utilization measurement techniques was done by Forest Service researchers, especially in the Southwest (Ruyle 2003). Various methods were developed including visual estimates of overall use classes, clipping or weight estimates comparing grazed/ungrazed situations, measuring remaining stubble height or twig length and conversion to utilization based on height/weight relationships, relating percentage of plants or stems grazed to percentage weight removed, and others. Many variations of these methods were developed to deal with differences in vegetation and monitoring objectives. Heady (1949) provides a review of the various methods and approaches to estimate utilization and little has changed since that time. His observation that "the real problem is not the measurement of use…but the interpretation of those measurements" continues to be the crux of the issue.

Many studies were carried out to obtain actual data to establish "proper use" levels as a basis for interpretation of utilization measurements. These studies were of two general types: (1) grazing studies at different stocking rates to relate average utilization to observed trends in ground cover, plant species composition, and livestock performance, and (2) clipping studies to measure growth response of individual plants to top removal at different intensities, frequency and seasons. These types of studies have served as an empirical basis for developing general guidelines on "proper use." General conclusions about results of these studies are presented in a number of references, including Holechek, Pieper and Herbel (1998); Vavra, Laycock and Pieper (1994); and Heitschmidt and Stuth (1991). Responses at both the individual plant and pasture level vary depending on plant species and/or communities, environmental conditions, and management systems employed so that the prediction of a relationship between utilization and desired management outcomes still depends as much on professional judgment and experience as on scientific theory.

Role of Utilization in Rangeland Management

Rangeland planning involves setting resource objectives and prescribing management practices to meet those objectives. Monitoring is the collection and interpretation of data to document the implementation of the plan and progress, or lack of progress, toward meeting objectives. Re-planning, or adaptive management, occurs when acceptable progress is not occurring, objectives are changed, or conditions change that render the initial plan obsolete. Utilization is one of several tools that can be used in an adaptive management decision process. The following discussion is intended to describe the role of utilization within the context of rangeland management and decision making.

A grazing management plan describes the resource and other objectives to be achieved for the management unit. The plan outlines the practices (e.g. grazing management, physical improvements, monitoring, etc.) to be implemented in order to meet objectives. Whether or not the prescribed management will actually result in achieving objectives cannot be predicted with certainty because of specific site conditions, weather conditions or other factors. Therefore, it is necessary to collect site-specific data over time to assess whether the plan is working and, if not, to establish the reasons it is not working, and propose corrective action. Documentation by monitoring of progress toward management objectives as described in the management plan is sufficient to demonstrate compliance with the plan until the plan is revised. When monitoring indicates either no change or a change away from management objectives, the next step is to determine whether the situation is due to current grazing management and/or other factors (such as drought) in order to decide upon needed management changes.

It is usually not feasible to collect monitoring data over the entire management unit, therefore, monitoring data are collected in key areas. Key areas are those portions of the management unit that are agreed upon by knowledgeable parties to be representative of the effects of grazing management on attainment of plan objectives on a larger scale.

Data are collected to document changes that occur over time in attributes (e.g. ground cover, plant species composition, wildlife populations, etc.) that are relevant to the objectives of the plan. Observed trends in relevant attributes can then be interpreted in relation to the desired objectives and to reach conclusions regarding cause of observed trends and possible changes needed in grazing management.

Utilization guidelines are intended to indicate a level of use or desired stocking rate to be achieved over a period of years. For example, studies used by Holechek to develop utilization guidelines nearly all encompass 10-year grazing trials. Utilization levels in these studies vary depending upon both growing conditions in a particular year as well as the sampling techniques used. Utilization can be mapped over an entire management unit or observed in key areas that reflect the effects of grazing in the whole management unit. Because of this variability such guidelines are not intended as inflexible limits to use within any given year that dictate when livestock should be moved from one pasture to another or removed from seasonal ranges. Livestock utilization at the end of the grazing year that consistently exceeds utilization guidelines over a significant part of the pasture over a period of several years can indicate the need to make management corrections, or re-evaluate the guidelines, before undesirable long-term trends are identified by monitoring.

Utilization can be an important factor in influencing changes in the soil, water, animal, and vegetation resources (TR 4400-7 Rangeland Monitoring Analysis, Interpretation, and Evaluation 1985; Western Coordinating Committees 40 and 55 1998). However, the impact of a specific intensity of use on a specific plant species or plant community is highly variable depending on species composition, past and present use, period of use, duration of use, inter-specific competition, weather, availability of soil moisture for regrowth, and how these factors interact. Utilization studies are helpful in identifying key and problem areas and in mapping grazing distribution patterns. Seasonal utilization data can be used as a guideline for moving livestock within an allotment with due consideration to season, weather conditions and the availability of forage and water in pastures scheduled for use during the same grazing season. "In combination with actual use and climatic data, utilization measurements on key areas and utilization pattern mapping are useful for estimating proper stocking levels under current management" (Bureau of Land Management 1985). In summary, utilization guidelines may be used with other information to make short-term management adjustments, but they are not management objectives. For this reason, and the complexities described in this paper, strict interpretation of utilization guidelines is not recommended for regulatory standards.

Sampling Variability and Basic Assumptions

As in all range vegetation sampling, quantitative utilization measurements are subject to a high degree of variability, which must be accounted for in data collection and interpretation. Weight-based methods of measuring utilization depend on clipping or estimating herbage standing crop in grazed/ungrazed or in before and after grazing comparisons. The difference between grazed and ungrazed production is assumed to be the amount removed due to grazing. However, depending on the precision of sampling, differences could be due in part to productivity differences among the plots clipped regardless of grazing. Therefore, the calculated utilization could have either a positive or negative bias due to sampling variability. This problem would be greater in sparser vegetation than in more uniform and productive areas, such as meadows and in areas of relatively light utilization (Bork and Werner 1999). The problem can be partly addressed by selecting plots paired for

similarity in potential (i.e. site potential and vegetation) for comparisons rather than a strictly random design. It can also be helped by increasing plot size to include more within plot variation or by increasing number of plots, or both. These requirements greatly add to the time and effort required to achieve reasonable precision. In practice, it is unusual (and impractical) to locate more than one or two cages in a key area, so the "ungrazed" sample will have only a few plots, usually of small size. Even if a larger number of paired, grazed plots are selected, the error of estimation of utilization will be high unless vegetation is very uniform (Halstead, Howery and Ruyle 2000).

To increase precision, methods that involve measuring grazed and ungrazed plant heights are often employed in conjunction with weight-based methods. These methods, usually associated with grass species, must also have a sufficient number of both grazed and ungrazed plants to account for height variability. Ungrazed heights within a species are fairly uniform as long as site conditions are uniform, so a reasonable average can usually be attained with measurement of only 10-25 plants. The number of grazed plants required for a desired precision depends on the variability in height of grazed plants that in turn depends on the type of plant and the level of utilization. Variability in grazed heights would be expected to be least at very high levels of utilization. At low levels of utilization variability could be due to natural variation in plant height, which can be considerable, but would probably increase as utilization increases to moderate levels due to animal selectivity.

Both weight and height based methods also depend on a number of assumptions that are usually hard to verify. It is assumed that growth rates of both grazed and ungrazed plants are the same through the growing season. It is well-established that cages used to protect plants from grazing can affect growth, usually positively, by altering microclimate, addition of nutrients by birds perching on the cage, or other factors (Laycock in Western Coordinating Committee 40 and 55, 1998). Grazing can stimulate or slow growth compared to ungrazed plants, depending upon such items as precipitation following the grazing event or in what stage of plant development the grazing event occurred. Utilization, as usually defined, generally assumes that regrowth after grazing is insignificant. Regrowth after a grazing event may be substantial if grazing takes place early in the growing season. Regrowth may be difficult to measure, especially when any of the following situations are present: when it is substantial during the current growing season, when plants are subject to repeated grazing during a grazing period, or when the rate of disappearance of ungrazed forage due to natural weathering is rapid.

"The height- weight method is based on the premise that growth form of grasses is sufficiently constant between years, seasons, and sites to allow the use of average height-weight tables with reasonable accuracy"(Cook et al. 1962). Cook et al. (1962) say Clark (1945) found estimated errors as great as 10-25 % may occur because of differences in growth from one year to the next on the same site. They also state that Heady (1950) found variations from year to year, but differences among sites were greater than among years. Heady (1950) pointed out that much of this variation can be eliminated by using separate tables for different height classes, as is done in the utilization gage developed by the Forest Service. Schmutz (1978) concluded that although height growth varied among years and sites, the basic relationship of height to weight was similar. He stated there was usually as much variation within a site as between them, and thus, with a large sample size, this variation was averaged out and a properly developed photo guide could be used on all sites in good and bad years.

The literature suggests significant bias and/or errors in estimating utilization by a number of methods if sample size is inadequate or basic assumptions do not hold. In practice, the basic assumptions are rarely verified. We conclude that, in the absence of statistical tests of sampling variability to quantify confidence limits on utilization estimates, the confidence limits should be assumed to be relatively large. This means that differences in measured utilization levels of 5-10% (e.g. 30% utilization compared to 35 or 40%) or less should probably be interpreted as non-significant unless statistical separation is demonstrated.

Time (Season) of Measurement

Utilization guidelines cannot be employed for seasonal utilization because there is no known consistent relationship between utilization and seasonal utilization estimates. For this reason seasonal utilization estimates are not reliable for grazing compliance decisions based on utilization guidelines.

Because utilization is defined as the percentage of the current year's forage production removed by grazing, trampling, or other factors such as insects (SRM 1989, ITR 1999), utilization measurements require that the current annual production is estimated. This can only be done at the end of the growing season using weight-based methods or methods that assume a biomass relationship. Peak standing crop of vegetation reaches a maximum at the end of the growing season. Measuring standing crop before the end of the growing season does not account for subsequent growth, and measuring it after the end of the growing season reflects the loss of standing material to weathering, decay, and small animals. With height-based methods, it may be possible to measure maximum ungrazed height for some time after the end of the growing season.

Estimates of use that are not based on total annual growth, regardless of the method used, have been called "relative utilization" (Frost, Smith and Ogden 1994) or "seasonal utilization" (Interagency Technical Reference 1999); the latter term will be used in this paper. Seasonal utilization is the percentage of the forage produced in the current season, to date of measurement, removed by grazing. This percentage is different from utilization because it does not account for subsequent growth of either the ungrazed or grazed plants.

Seasonal utilization measured early in the growing season has little relation to utilization based on total production; the difference between the two measurements declines the nearer to the end of the growing season that seasonal utilization is measured (Smith in Western Regional Committee 40 and 55, 1998).

It is important for managers to be aware of use levels, residual vegetation and other grazing impacts during the period of use as well as utilization at the end of the year growing season. However, if the grazing season corresponds to the growing season interpretation of seasonal utilization data is difficult because neither the rate of growth/regrowth nor the rate of utilization can be accurately predicted during the growing season. Only sufficient experience over time can provide enough information to the decision-maker concerning the appropriate level of seasonal utilization that is acceptable and that will closely approximate the desired year-end utilization. Observations of utilization from the end of the growing season until the start of the next growing season, i.e. during the dormant season, assume no further growth and/or regrowth. Some Southwestern rangelands, especially at lower elevations, have a bimodal rainfall pattern that may support both cool-season and warm-season plant growth. This situation complicates the definition of growing season and interpretation of both utilization and seasonal utilization data. It may require identification of two or more growing seasons with an appropriate suite of plants and utilization measurement schedules for each.

Stubble height, or residual biomass, can be measured anytime of the year since there is no reference to total forage production. Stubble height estimates may be used instead of seasonal utilization measurements. However, interpretation of stubble heights measured during the growing season must be based on demonstrated relevance of observed stubble heights to the resource value and/or ecological process of interest.

Key Forage Species

The Society for Range Management (1989) defines key species as "a forage species whose use serves as an indicator to the degree of use of associated species, and because of its importance, must be considered in any management program." Therefore, for utilization estimates, a key species must be a forage species; hence the term "key forage species" has been adopted for this paper. Selection of key forage species should be tied directly to management plan objectives and should be appropriate to the primary grazing animal. Utilization guidelines for key forage species, plant species frequency, cover, precipitation and other plant community data should all be evaluated to determine if changes in current management practices are necessary.

A key forage species is usually a reasonably palatable and abundant species (or several species) upon which management decisions may be based. Measuring utilization on key forage species is based on the idea that use on key forage species will be indicative of the overall use of a management unit and the quantity of forage removed from the unit. For this reason, highly palatable forage plants, or highly unpalatable plants, are generally not selected as key forage species because use on these plants does not provide information on the overall use of the management unit. Necessary assumptions to support this concept are: (1) Utilization on the key forage species is assumed to have a definite and constant relationship to utilization on other species, either more or less palatable than the key forage species; and (2) Use on the key forage species will increase during the growing season in direct relation to the amount of AUMs utilized in the pasture (Smith 1965). Knowledge of these relationships is necessary in order to select appropriate key forage species and to maintain the presence of species considered to be "ice cream plants." Although often present in small proportions within the community, their importance must be recognized through management considerations. Key forage species are specific to kind of animal, season of use, and current vegetation composition (Vallentine 1990).

On ranges where the composition of desirable forage plants had been substantially reduced by improper grazing, drought, fire or other factors, the most desirable forage plants on a given ecological site may be sparse or missing. In such cases these plants do not meet the definition of key forage species because utilization on these species is not a good indicator of the amount of use on other forage species and is not related in a consistent way to the amount of grazing use that has occurred within a management unit. In this situation it may be necessary to select key forage species that are more abundant and less palatable than the most desirable and/or palatable species (Interagency Technical Reference, 1999, p.5) as a basis for monitoring grazing pressure. In these situations, the management objective may be to increase the composition of desirable forage species that have been reduced due to past grazing or other factors. For this to occur, it must first be verified that the area in question does, in fact, have the potential to produce the desirable species in substantial amounts, e.g. by correct identification of ecological sites. Second, it must be recognized that consideration of season of use and/or frequency of use, as managed through the duration of time plants are exposed to grazing, rather than stocking rate, will likely be the most important management consideration to achieve improved populations of these desired forage species.

"Proper use" on a key forage species has traditionally been associated with eco-physiological responses of plants to grazing and is the level of utilization that should maintain or improve the growth and reproduction of the key forage species. Proper use of key species will also indicate that other species of similar or lower palatability to the grazing animal in question will also be used at non-injurious levels. The exception to this are so-called "ice cream" plants that are more palatable and/or more sensitive to grazing, but less abundant, than the key species. These species are often minor components of the vegetation and management efforts to maintain them will necessarily depend on timing and du-

ration of grazing. Often times, management of these plants can best be conducted by providing for appropriate recovery periods following grazing, and by grazing areas containing these plants when they are less palatable relative to other available forage.

Utilization on key forage species is not the same as average utilization on all species or on all forage species. Utilization should only be averaged across species where several species have similar palatability. For example, on the Santa Rita Experimental Range in southern Arizona, researchers developed a regression model using the percentage of grazed, or ungrazed, plants to estimate utilization by weight on a combination of native perennial grasses (Roach, 1950). This empirical equation was developed for the specific vegetation types in the location and could not be used elsewhere without validation. All forage species on the site should probably be considered key forage species in cases where there are several species that contribute a major portion of the forage base. However utilization on the various species should not be averaged together without site-specific studies

Selection of the key forage species must be appropriate to the diet and habitat selection patterns of the grazing animal that is consuming the forage. "It is important to recognize that key species for one type of animal may be different than for another type due to differences in food habits" (Holechek et al. 2004). Therefore, forage available for wildlife cannot be estimated using utilization on key forage species selected for livestock unless the forage preferences and grazing distribution are the same. Reaching desired levels of use on key forage species and key areas for livestock grazing does not indicate that limits of forage availability or habitat quality for wildlife have been reached unless the distribution and diet selection are very similar.

Key Areas

The Society for Range Management (1989) defines key area as "A relatively small portion of a range selected because of its location, use or grazing value as a monitoring point for grazing. Key areas should be located within a single ecological site or plant community, be responsive to management actions and be indicative of the ecological site or plant community they are intended to represent" (Interagency Technical Reference 1999).

The key area concept is based on the premise that no range of appreciable size will be grazed uniformly (Holechek, Pieper and Herbel, 1998). When key areas are "properly" used there may be substantial areas that are used more or less than the key areas, including some that will not be used at all. Thus utilization in key areas selected for cattle grazing may not accurately reflect availability of forage or cover for other animals that use different parts of the range including critical management areas. Use pattern mapping or documentation of small impact areas may be useful for addressing this issue.

Key areas should receive substantial use, but should not be areas of heavy concentration. Key areas should not be located near watering points, roads and trails or in bedgrounds and saddles. Relatively small areas within a pasture where animals concentrate use are not key areas because they do not indicate use on the forage base as a whole. These areas are often concentration points and may or may not be critical management areas. A critical area as defined is "An area which should be treated with special consideration because of inherent site factors, size, location, condition, values, or significant potential conflicts among uses" (Interagency Technical Reference 1999). "Critical areas are areas that should be evaluated separately from the remainder of a management unit because they contain special or unique values. Critical areas could include fragile watersheds, sage grouse nesting ground, riparian areas, areas of critical environmental concern, etc." (Interagency Technical Reference 1999). Criteria for interpretation of utilization data may be different for critical areas and key areas. Utilization guidelines applied to key areas may not be representative of use in critical areas. When appropriate and based on management objectives, critical management areas may limit use in surrounding areas. This is especially true if the critical management area can not be managed independently.

More than one key area may be selected and monitored within a pasture or other management unit depending on the size of the unit, number of ecological sites, and/or management objectives. In that case, all should be considered when making management decisions. The key area receiving the heaviest use should not necessarily limit grazing in the pasture. If one key area consistently receives heavy use it may be located in an inappropriate location, or it may indicate a distribution problem. The former situation may require relocating a key area while the latter may require a change in timing, frequency, duration and/or numbers of livestock or their behavior.

Guidelines for utilization of key forage species on key areas are not the same as average use guidelines across entire pastures such as those of Holechek (1988). Holechek's "utilization guidelines for different range types" are based on conclusions from numerous research studies conducted in different conditions. They are not site-specific and are only valid as a starting point for interpreting utilization. Managers must further refine and validate utilization guidelines so they are tailored to each particular situation. Values developed on a site-specific basis can be validated through trend monitoring and consideration of all factors contributing to conditions on the site over time. Holechek's recommendations refer to a range of utilization levels over an entire pasture or management unit, not utilization on key species in key areas. The range of values is given to allow for differences in topography, water distribution, season of use, type of livestock and other factors that may affect the distribution of grazing use within the management unit. Depending on these distribution factors a given level of utilization on key species in key areas will have a different relationship to average utilization over the entire unit, i.e. the amount of forage supplied by the management unit.

Because this point seems not to be well understood, the following needs to be emphasized. The percentage utilization of key forage species is higher than the percentage utilization of all herbage production of all species, because some of the associated species will be used less than the key species and some will not be used at all. The utilization on the key forage species is intended to be an index to overall use. The percentage utilization on key forage species in key areas is not the average utilization of key forage species across the entire unit unless grazing distribution is very uniform. Grazing distribution on rangelands usually results in relatively small areas receiving more use than the key areas and a relatively large area receiving less use than key areas or no use at all. Thus, the use level on key forage species in key areas is normally higher than the average use on key forage species across the entire management unit. The total percentage of utilization on current year's production on all species across the entire management unit is always less, and usually much less, than the percentage utilization on key forage species in key areas. The important point is that achieving "proper use" of key forage species in key areas for livestock does not mean that no forage remains for other kinds of animals with different diet preferences (i.e. key species) and different distribution patterns (i.e. key areas).

Utilization Guidelines and Range Condition

While it may be intuitively sensible, setting a different proper use level for different range condition classes or seral stages is not supported by research, at least within the bounds of conservative stocking levels currently recommended on public lands. Proper use is defined as "A degree of utilization of current year's growth which, if continued, will achieve management objectives and maintain or improve the long-term productivity of the site." (Society for Range Management 1989). That definition implies that proper use on poor condition rangelands will allow for improvement. Ruyle (2003), cited Crafts (1938) and Parker and Glendening (1942) as having established higher levels of permissible use on ranges in good condition than those in poor condition. However, that recommendation was made during a period when, according to Ruyle (2003) 50% use was considered "conservative" and utilization even on the Santa Rita Experimental Range in Arizona averaged considerably higher than that. These levels of utilization are not currently recommended even on ranges in good condition. There appears to be no scientific evidence that proper use levels of 30-50% on ranges in good condition should be reduced if the range condition is poor. Poor condition ranges (depending on how range condition is defined) will likely support fewer AUMs than higher condition ranges before proper use levels are reached. However, providing for more residue to enhance soil stability may be identified as a management objective on these areas.

Shrub-Dominated or Annual Ranges

Most of the quantitative methods for measuring utilization have been developed for perennial grasses. However, in the Southwest there are many rangelands where shrubs and/or annuals comprise a major portion of the forage resource for both livestock and wildlife. Some examples include the Chihuahuan, Sonoran and Mojave Desert Scrub, the Arizona chaparral, and some formerly grassland areas invaded by shrubby species. In these situations the basic assumptions regarding proper use and the relationship between use on key forage species and total forage consumption may not hold, i.e. estimated utilization is not likely correlated with the amount of forage used unless all forage classes are considered. Additionally, usual methods to estimate use on herbaceous species may not be easily applied to browse utilization (Bonham 1989). There are techniques for measuring utilization on shrubs and annual plants. Establishing a utilization guideline where several different life forms, each with its own measurement method, are involved becomes difficult to interpret. The "Landscape Appearance Method" (Interagency Technical Reference 1999) is one of the few methods applicable to mixed life form ranges. However, it provides qualitative information that would be useful mainly for use pattern mapping, not measurement of attainment of utilization guidelines.

As described earlier, estimates of utilization on key forage species to indicate grazing intensity assume a constant relationship between use on key forage species and other species in the plant community. This assumption may be reasonable on ranges used in a limited grazing season or where most forage species have similar life forms. It breaks down when grazing occurs yearlong, or at least across different seasons, and the forage resource is comprised of diverse life forms and seasonal growth responses as in much of the Southwest. Studies have shown that livestock diet selection varies markedly depending on the growth response of different categories of plants. For example, Smith, Ogden and Gomes (1993) observed drastic changes in cattle diet preference depending on season in southern Arizona. Cattle shifted their preference among cool-season annuals, shrubs, cactus and warm-season perennial grasses from month to month depending on availability and attractiveness of each category of plants. Clearly, in this case, the percentage utilization on a perennial grass key species would have to be considered in terms of the season of use and would not be well-correlated with total forage harvest by livestock. Other examples can be cited from areas where seasonal diets may focus on winter or summer annuals, cool or warm season shrubs, and cool or warm season grasses depending on seasonal precipitation. Such variability in diet preference greatly complicates the interpretation of utilization data.

Use of utilization data estimated from perennial grasses should not be used to determine stocking rates where a substantial amount of the forage is provided by annual plants and shrubs. In these cases, estimated utilization on perennial grasses is not likely correlated with the amount of forage

used unless all forage classes are considered. In all situations management objectives must be realistic and clearly stated and utilization guidelines established consistent with objectives and resource potentials. For example, ranges that have been invaded by shrubs may have entered a different ecological state that cannot be reversed by grazing management alone. On such ranges it is unrealistic to base management solely on perennial grasses because the shrubs may contribute an important part of animal diets. Other ecological relationships may also be important and realistic management objectives should be developed to address various resource goals and objectives.

Relationship of Utilization to Ecological Processes and Resource Values

If utilization guidelines are to be used to indicate "proper use" relative to uses other than livestock grazing, i.e. other ecological processes or resource values, then there must be some demonstrated relationship between the levels of use as measured and the process or value of interest. For example, utilization on key forage species in key areas (selected for livestock) cannot be used to indicate adequate residual cover for prey species of raptors, unless a relationship between these two factors has been demonstrated.

Most utilization guidelines are based on research involving clipping of individual plants, or livestock grazing studies on plant communities. Clipping studies measure the effects of defoliation on individual plants, i.e. top growth, root growth, seed production, or total production. Grazing studies generally relate utilization to maintenance of plant species composition and productivity of the overall plant community, including indirect effects of grazing such as litter cover, trampling effects, or watershed effects. Clipping and grazing studies usually were conducted without analyzing the relationship with other resource values, therefore utilization guidelines based on such studies are only valid for the purposes for which they were developed, i.e. estimating the influence of livestock grazing on certain plant, soil and plant community attributes.

Utilization as Basis for Adjusting Livestock Management

"In the short term, utilization data are considered with actual use and climate data to determine resource use levels and to identify needed adjustments in management actions. These same data can be used in the short term as the basis for adjusting grazing use by agreement or grazing decision" (Interagency Technical Reference 1999). Utilization at the end of the grazing season has long been a tool to consider whether an increase or decrease of stocking would be desirable in the next grazing season. Long-term utilization data, considered along with other monitoring data, should be used to adjust management practices to achieve land use plan objectives or land health standards (Interagency Technical Reference 1999).

Because plant growth varies from year to year depending on the weather, a constant stocking rate will result in utilization that is inversely related to forage production. Most research on southwestern ranges indicates that conservative stocking levels, based on long term pasture averages of 35% use of average total forage production will maintain or improve vegetation condition where brush encroachment is not a problem (Holechek, Pieper and Herbel, 1998). It should be noted that this recommendation is based on averages over time, entire pastures and total forage production, concepts different than key areas and key species.

Stocking rate studies are based on average stocking rate and the utilization over a period of years. Utilization in any given year may be substantially higher or lower under the same stocking level by pasture or allotment. As Holechek et al. (1999) describe in a review of stocking rate studies, "Desert forage plants can sustain about 40% use of annual herbage production. Use in the drought years approached 55-60% while use in the wet years was near 20-25%. Recommendations derived from grazing studies are averages resulting from such variability and are intended to be met over the long term and not on a year to year basis." Holechek and Galt (2000) go on to say, "…attainment of specific use levels is nearly impossible on a year-to-year basis due to variation in climate. Instead, we believe they should be a target across 5-10-year time periods."

If utilization levels consistently exceed desired levels, even during years of average or better forage production, a change in management practices may be warranted. For example, management changes may be needed if utilization guidelines are exceeded on over 30% of the pasture or allotment for two consecutive years or in any two years out of five (Holechek et al. 1998). This recommendation, while not directly supported by research, is a reasonable rule of thumb, but needs further refinement, especially for pastures used as part of a grazing rotation where use is rotated among seasons and years. If used in conjunction with utilization pattern mapping there may be an indication of a distribution problem that needs to be addressed. This would be especially true if the 30% of the pasture, where utilization guidelines are exceeded, provides the bulk of the forage actually utilized. This is often the case in mountainous terrain with a great diversity of topography and ecological sites.

Utilization measured at the end of the grazing season may provide an "early warning" that stocking rates or other management changes are required before resource damage is documented by long-term monitoring. Measuring utilization also gives some indication of the amount of needed adjustment, up or down, in stocking rates, that trend measurements do not provide. However, it is clear that utilization data must be interpreted with due consideration to effects of weather, actual stocking and reliability of utilization data before any change in management is suggested.

Utilization as a Trigger for Moving Livestock

When utilization was first employed as a measure of grazing intensity, most ranges were used in a continuous season-long or year-long grazing system. In the past 20-30 years some type of rotational grazing has become the norm. The implementation of grazing systems led to changes and controversy in the way "utilization" has been employed for grazing management decisions.

Utilization guidelines are generally intended to indicate a level of use or desired stocking rate that would be achieved over a period of years. They are not intended as inflexible limits to use, in isolation from other data, within any given year to dictate when livestock should be moved from one pasture to another in a rotation or removed from seasonal ranges. Under some circumstances seasonal utilization may be an important factor when deciding when to move cattle out of a particular pasture and utilization levels may be the primary influence when adjusting numbers for next year. However, during drought periods, use levels may exceed those desired. This situation should not be allowed to persist over several years.

Decisions about moving livestock from one pasture to another, or about removing livestock from a grazing permit or lease, should not be based on rigid utilization guidelines. Such decisions should take into account the influences of weather and other factors on the entire management unit, including all categories of land ownership. Because most ranches in the western United States contain some mixture of private, State, and Federal lands, failure to use a coordinated, landscape level approach can often mean that decisions made by one agency only exacerbate conditions or thwart management objectives on other land ownership within the unit. Each ranch operation is unique and coordinating and collaborating amongst various land owners, ranchers, land management agencies, and others such as game and fish habitat biologists, can accommodate management objectives relevant to large landscapes and the diversity they encompass.

Seasonal use data, when evaluated with knowledge of climate patterns, previous years' actual utilization, historical impacts on the landscape, long term trend data, and sufficient experience on the landscape to understand long-term vegetation responses to variable conditions provide the range manager with the ability to read the landscape and make the management decisions to provide for stewardship of the resources. While some adjustments to livestock numbers may be advisable during a particular grazing season, the primary management adjustment to utilization levels will be over a period of years if it is shown that consistent use patterns exist over time.

There are some who maintain that "utilization" should be measured at the end of the grazing period, i.e. when livestock are moved out of a pasture. They claim that waiting to estimate use at the end of the growing season tends to obscure the impact of grazing due to regrowth. There is value to describing the level of use on a pasture at the time livestock are removed, so long as it is recognized that this use is "seasonal use", not utilization. However, the argument that grazing impact cannot be ascertained if measurement of utilization is deferred until the end of the growing season appears to lack understanding of the reason utilization is measured. Research and experience have shown that utilization of 30-50% based on total annual production, depending on whether it is defined on a key species/key area or range wide basis, will provide for continued productivity of the range. However, this level of utilization may result from grazing early in the growing season that produces "seasonal utilization" far in excess of this guideline. Obviously, the decision of whether a given pasture is "properly" grazed depends not on the "seasonal use" when it was grazed, but on the comparison of grazed/ungrazed production at the end of the growing season. Thus, a proper use guideline of 40% may be achieved by considerably higher "seasonal utilization" early in the growing season and by utilization of 40% based on season-long production.

Use Pattern Mapping/Cause and Effect

Utilization estimates can be employed to map use over a grazing allotment or pasture (Anderson and Currier, 1973). This process does not rely on quantitative estimates of utilization. Qualitative estimates of overall use in each zone (e.g. heavy, moderate, light, none) based on professional judgment reinforced by clipping or other methods to train one's eye to current growth conditions can be used to indicate relative use rates in mapped portions of the management unit. Such information can be valuable in identifying areas where livestock use may be excessive, or where changes in management or investment in range developments can improve distribution. Use pattern maps may also identify areas of potential conflict of livestock grazing with other uses, and areas where such conflicts are likely to be minimized. Use pattern mapping is a valuable tool in rangeland management planning.

Long-term trend data on ground cover, vegetation composition and the like document changes in these attributes. However, without some idea of the cause of such changes, there is no reasonable basis for decisions about needed changes in management. Consistently high livestock use over large areas associated with unfavorable trends, especially when trends are static or positive in areas with low or zero livestock use, would give a basis for concluding that livestock grazing at high levels may be contributing to undesirable trends. Conversely, positive or negative trends that do not correspond to observed livestock utilization may indicate that timing and amount of precipitation rather than grazing is the driving force in the observed trends.

Conclusions

The Interagency Technical Reference (1999) states that "Residual measurements and utilization data can be used: (1) to identify use patterns, (2) to help establish cause-and-effect interpretations of range trend data, and (3) to aid in adjusting stocking rates when combined with other monitoring data." These uses of utilization are consistent with the scientific literature, experience of the range management profession, and our analysis in this paper. The following statements summarize our additional conclusions regarding the proper use and interpretation of utilization data.

1. Utilization is a useful tool in range management decision making, but utilization guidelines should not be used as management objectives.

2. Utilization, as defined by SRM and others, is not the same thing as "seasonal utilization" measured before the end of the growing season. Utilization guidelines cannot be used for seasonal utilization.

3. Utilization of key forage species, unlike overall utilization levels in a pasture or allotment, is an indication only of livestock grazing pressure, and is not necessarily related to any other resource uses or values.

4. Key areas for livestock grazing are areas selected to indicate the general level of livestock use over a management area. Utilization in key areas does not necessarily indicate impacts on other resource values or uses.

5. Setting a different proper use level for different range condition classes is not supported by research, at least within the bounds of conservative stocking levels currently recommended on public lands. There is no known basis for establishing different utilization guidelines for different classes of "range condition."

6. Utilization guidelines and estimation procedures applicable to grass ranges may be inapplicable or difficult to employ on ranges where much of the forage supply comes from shrubs and/or annuals.

7. Use of utilization to adjust stocking rates should be based on measurement of utilization made in the fall on ranges grazed during the growing season, and in the spring on winter or year-round ranges. Excess utilization over a considerable portion of the range over a period of several years may indicate a need to reduce stocking or make other management changes. Likewise, low levels of utilization over large areas and several years may indicate an opportunity to increase stocking.

8. Seasonal utilization should not be used as a rigid standard to trigger livestock moves or removal from grazing permits. Such actions should consider the operation of the entire management unit, including all land ownerships, for the balance of the grazing year. Coordination across land ownerships can enhance management of the landscape as a whole.

9. Some adjustment to livestock numbers and duration of use, based on seasonal utilization may be necessary, for stewardship of the resources when evaluated in conjunction with other factors.

10. Mapping of use zones and estimates of utilization to provide collateral information for long-term trend monitoring both provide information that is very useful in rangeland management planning.

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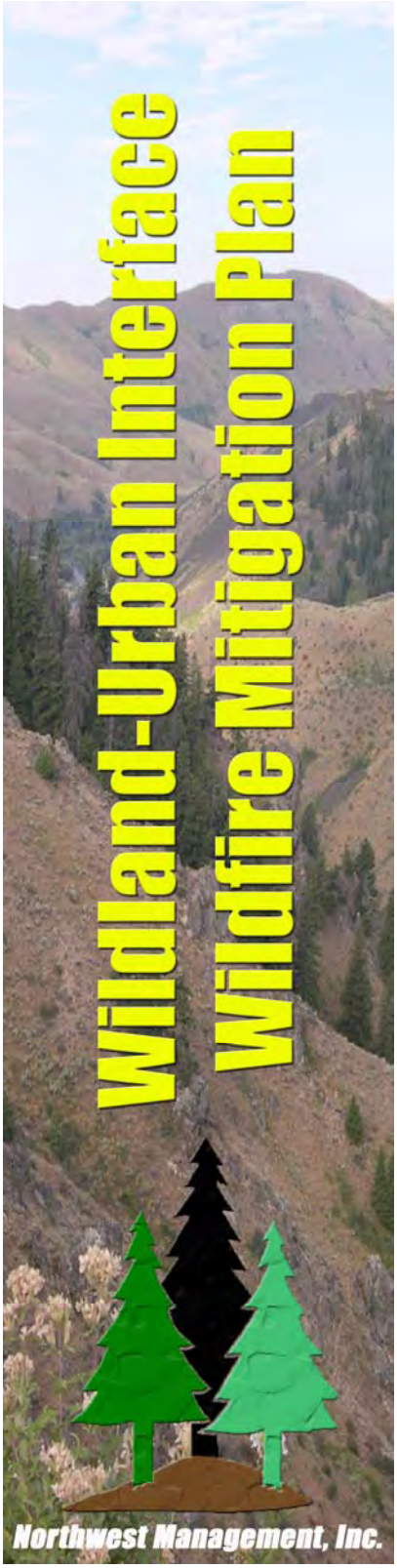
APPENDIX H-1

OWYHEE COUNTY, IDAHO

WILDLAND-URBAN INTERFACE WILDFIRE MITIGATION PLAN

MARCH 10, 2005



Owyhee County, Idaho Wildland-Urban Interface Wildfire Mitigation Plan

Main Document

March 10, 2005

Vision: *Institutionalize and promote a countywide wildfire hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Owyhee County.*

This plan was developed by the Owyhee County Wildland-Urban Interface Wildfire Mitigation Plan Committee in cooperation with Northwest Management, Inc., 233 E. Palouse River Drive, P.O. Box 9748, Moscow, Idaho 83843, Phone: (208) 883-4488, Fax: (208) 883-1098, www.Consulting-Foresters.com

Acknowledgments

This Wildland-Urban Interface Wildfire Mitigation Plan represents the commitment, efforts and cooperation of a number of organizations and agencies working together to improve suppression capabilities while the potential for destructive wildland fire.

Owyhee County Commissioners
and the employees of Owyhee County

Southwest Idaho Resource Conservation and Development Council, Inc.

USDI Bureau of Land Management

USDA Forest Service

Idaho Department of Homeland Security

Federal Emergency Management Agency

Idaho Department of Lands

Homedale Rural Fire Department
Marsing Rural Fire Department
Murphy-Reynolds-Wilson Rural Fire Department
Shoshone-Paiute Tribes Fire Management
Grand View Rural Fire Department
Bruneau Rural Fire Department
Mountain Home Air Force Base Fire Department
&
Citizens of Owyhee County

To obtain copies of this plan contact:

Owyhee County Commissioners Office
Owyhee County Courthouse
P.O. BOX 128
Murphy, ID 83650-0128
Telephone (208) 495-2421

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Chapter I: Overview of this Plan and its Development

1 Introduction

This Wildland-Urban Interface Wildland Fire Mitigation Plan for Owyhee County, Idaho, is the result of analyses, professional cooperation and collaboration, assessments of wildfire risks and other factors considered with the intent to reduce the potential for wildfires to threaten people, structures, infrastructure, and unique ecosystems in Owyhee County, Idaho. The planning team responsible for implementing this project was led by the Owyhee County Commissioners. Agencies and organizations that participated in the planning process included:

- USDI Bureau of Land Management
- Idaho Department of Lands
- Southwest Idaho Resource Conservation and Development Council
- Shoshone-Paiute Tribes
- Homedale Rural Fire Department
- Marsing Rural Fire Department
- Murphy-Reynolds-Wilson Rural Fire Department
- Grand View Rural Fire Department
- Bruneau Rural Fire Department
- Mountain Home Air Force Base Fire Department
- Owyhee County Assessors Office
- Owyhee County Natural Resource Committee
- Owyhee County Sheriffs Office
- Northwest Management, Inc.

The Owyhee County Commissioners selected Northwest Management, Inc., to provide the service of leading the assessment and writing the **Owyhee County Wildland-Urban Interface Wildland Fire Mitigation Plan**. Northwest Management, Inc., is a professional natural resources consulting firm located in Moscow, Idaho. Established in 1984 NMI provides natural resource management services across the USA. The Project Manager from Northwest Management, Inc. was Dr. William E. Schlosser, a professional forester and regional planner.

1.1 Goals and Guiding Principles

1.1.1 Federal Emergency Management Agency Philosophy

Effective November 1, 2004, a Local Hazard Mitigation Plan approved by the Federal Emergency Management Agency (FEMA) is required for Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM) eligibility. The HMGP and PDM program provides funding, through state emergency management agencies, to support local mitigation planning and projects to reduce potential disaster damages.

The new local hazard mitigation plan requirements for HMGP and PDM eligibility are based on the Disaster Mitigation Act of 2000, which amended the Stafford Disaster Relief Act to promote and integrated, cost effective approach to mitigation. Local hazard mitigation plans must meet the minimum requirements of the Stafford Act-Section 322, as outlined in the criteria contained in 44 CFR Part 201. The plan criteria cover the planning process, risk assessment, mitigation strategy, plan maintenance, and adoption requirements.

FEMA will only review a local hazard mitigation plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). Draft versions of local hazard mitigation plans will not be reviewed by FEMA. FEMA will review the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA will be unable to approve it prior to adoption. In Idaho the SHMO is:

Idaho Department of Homeland Security
4040 Guard Street, Bldg 600
Boise, ID 83705
Jonathan Perry, 208-334-2336 Ext. 271

A FEMA designed plan will be evaluated on its adherence to a variety of criteria.

- Adoption by the Local Governing Body
- Multi-jurisdictional Plan Adoption
- Multi-jurisdictional Planning Participation
- Documentation of Planning Process
- Identifying Hazards
- Profiling Hazard Events
- Assessing Vulnerability: Identifying Assets
- Assessing Vulnerability: Estimating Potential Losses
- Assessing Vulnerability: Analyzing Development Trends
- Multi-Jurisdictional Risk Assessment
- Local Hazard Mitigation Goals
- Identification and Analysis of Mitigation Measures
- Implementation of Mitigation Measures
- Multi-Jurisdictional Mitigation Strategy
- Monitoring, Evaluating, and Updating the Plan
- Implementation Through Existing Programs
- Continued Public Involvement

1.1.2 Additional State and Federal Guidelines Adopted

The Wildland-Urban Interface Wildfire Mitigation Plan component of this All Hazards Mitigation Plan will include compatibility with FEMA requirements while also adhering to the guidelines proposed in the National Fire Plan, the Idaho Statewide Implementation Plan, and the Healthy Forests Restoration Act (2004). This Wildland-Urban Interface Wildland Fire Mitigation Plan has been prepared in compliance with:

- The National Fire Plan; A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan–May 2002.
- The Idaho Statewide Implementation Strategy for the National Fire Plan–July 2002.
- Healthy Forests Restoration Act (2004)

- The Federal Emergency Management Agency's Region 10 guidelines for a Local Hazard Mitigation Plan as defined in 44 CFR parts 201 and 206, and as related to a fire mitigation plan chapter of a Natural Hazards Mitigation Plan.

> ***"When implemented, the 10-Year Comprehensive Strategy will contribute to reducing the risks of wildfire to communities and the environment by building collaboration at all levels of government."***
> **- The NFP 10-Year Comprehensive Strategy August 2001**

The objective of combining these four complimentary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Owyhee County while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

1.1.2.1 National Fire Plan

The goals of this Wildland-Urban Interface Fire Mitigation Plan include:

1. Improve Fire Prevention and Suppression
2. Reduce Hazardous Fuels
3. Restore Fire-Adapted Ecosystems
4. Promote Community Assistance

Its three guiding principles are:

1. Priority setting that emphasizes the protection of communities and other high-priority watersheds at-risk.
2. Collaboration among governments and broadly representative stakeholders.
3. Accountability through performance measures and monitoring for results.

This Wildland-Urban Interface Fire Mitigation Plan fulfills the National Fire Plan's 10-Year Comprehensive Strategy and the Idaho Statewide Implementation Strategy for the National Fire Plan. The projects and activities recommended under this plan are in addition to other Federal, state, and private/corporate forest and rangeland management activities. The implementation plan does not alter, diminish, or expand the existing jurisdiction, statutory and regulatory responsibilities and authorities or budget processes of participating Federal, State, local, and tribal agencies.

By endorsing this implementation plan, all signed parties agree that reducing the threat of wildland fire to people, communities, and ecosystems will require:

- Firefighter and public safety continuing as the highest priority.
- A sustained, long-term and cost-effective investment of resources by all public and private parties, recognizing overall budget parameters affecting Federal, State, Tribal, and local governments.
- A unified effort to implement the collaborative framework called for in the Strategy in a manner that ensures timely decisions at each level.
- Accountability for measuring and monitoring performance and outcomes, and a commitment to factoring findings into future decision making activities.

- The achievement of national goals through action at the local level with particular attention on the unique needs of cross-boundary efforts and the importance of funding on-the-ground activities.
- Communities and individuals in the wildland-urban interface to initiate personal stewardship and volunteer actions that will reduce wildland fire risks.
- Management activities, both in the wildland-urban interface and in at-risk areas across the broader landscape.
- Active forestland and rangeland management, including thinning that produces commercial or pre-commercial products, biomass removal and utilization, prescribed fire and other fuels reduction tools to simultaneously meet long-term ecological, economic, and community objectives.

The National Fire Plan identifies a three-tiered organization structure including 1) the local level, 2) state/regional and tribal level, and 3) the national level. This plan adheres to the collaboration and outcomes consistent with a local level plan. Local level collaboration involves participants with direct responsibility for management decisions affecting public and/or private land and resources, fire protection responsibilities, or good working knowledge and interest in local resources. Participants in this planning process include Tribal representatives, local representatives from Federal and State agencies, local governments, landowners and other stakeholders, and community-based groups with a demonstrated commitment to achieving the strategy's four goals. Existing resource advisory committees, watershed councils, or other collaborative entities may serve to achieve coordination at this level. Local involvement, expected to be broadly representative, is a primary source of planning, project prioritization, and resource allocation and coordination at the local level. The role of the private citizen is not to be under estimated, as their input and contribution to all phases of risk assessments, mitigation activities, and project implementation is greatly facilitated by their involvement.

1.1.2.2 Idaho Statewide Implementation Strategy

The Strategy adopted by the State of Idaho is to provide a framework for an organized and coordinated approach to the implementation of the National Fire Plan, specifically the national "10-Year Comprehensive Strategy Implementation Plan".

Emphasis is on a collaborative approach at the following levels:

- County
- State

Within the State of Idaho, the counties, with the assistance of state and federal agencies and local expert advice, will develop a risk assessment and mitigation plan to identify local vulnerabilities to wildland fire. A statewide group will provide oversight and prioritization as needed on a statewide scale.

This strategy is not intended to circumvent any work done to date and individual counties should not delay implementing any National Fire Plan projects to develop this county plan. Rather, Counties are encouraged to identify priority needs quickly and begin whatever actions necessary to mitigate those vulnerabilities.

It is recognized that implementation activities such as; hazardous fuel treatment, equipment purchases, training, home owner education, community wildland fire mitigation planning, and other activities, will be occurring concurrently with this county wide planning effort.

1.1.2.2.1 County Wildland Fire Interagency Group

Each county within the state has been requested to write a Wildland Fire Mitigation Plan. These plans should contain at least the following five elements:

1) Documentation of the process used to develop the mitigation plan. How the plan was developed, who was involved and how the public was involved.
2) A risk assessment to identify vulnerabilities to wildfire in the wildland-urban interface (WUI).
3) A prioritized mitigation strategy that addresses each of the risks. Examples of these strategies could be: training for fire departments, public education, hazardous fuel treatments, equipment, communications, additional planning, new facilities, infrastructure improvements, code and/or ordinance revision, volunteer efforts, evacuation plans, etc.
4) A process for maintenance of the plan which will include monitoring and evaluation of mitigation activities
5) Documentation that the plan has been formally adopted by the involved agencies. Basically a signature page of all involved officials.

This five-element plan is an abbreviated version of the FEMA mitigation plan and will begin to meet the requirements for that plan. To develop these plans each county should bring together a selection, as appropriate for the specific county, of representatives from the below listed groups to make up the County Wildland Fire Interagency Group. It is important that this group has representation from agencies with wildland fire suppression responsibilities:

- County Commissioners (Lead)
- Local Fire Chiefs
- Idaho Department of Lands representative
- USDA Forest Service representative
- USDI Bureau of Land Management representative
- US Fish and Wildlife representative
- Bureau of Indian Affairs
- Local Tribal leaders
- Bureau of Homeland Security
- LEPC Chairperson
- Resource Conservation and Development representative
- State Fish and Game representative
- Interested citizens and community leaders as appropriate
- Other officials as appropriate

Role of Resource Conservation and Development Councils (RC&D): If requested by the County Commissioners, the local RC&D's may be available to assist the county commissioners in evaluating each county within their council area to determine if there is a wildland fire mitigation plan in place, or if a plan is currently in the development phase. If no plan is in place, the RC&D's, if requested, could be available to assist the commissioners with the formation of the

County Wildland Fire Interagency Group and/or to facilitate the development of wildland fire mitigation plan.

If a plan has been previously completed, the commissioners will determine if the recommended five elements have been addressed. The counties will provide a copy of the completed mitigation plan to the Idaho Department of Lands National Fire Plan Coordinator, which will include a contact list of individuals that developed the plan.

1.1.2.3 National Association of State Foresters

1.1.2.3.1 Identifying and Prioritizing Communities at Risk

This plan is written with the intent to provide the information necessary for decision makers (elected officials) to make informed decisions in order to prioritize projects across the entire county. The decision authority regarding projects rests with the body designated to make such decisions under the Idaho Code. If the proposed project is within the county, then the Board of County Commissioners is the deciding entity, except for those projects within the area controlled by a city council, fire district, or separate road district commissioners. Recommendations made by ad hoc groups with expertise in the subject in question are generally carefully considered; however, the final decision must be made by the entity authorized by the Idaho Code.

It is not necessary to rank projects numerically, although that is one approach, rather it may be possible to rank them categorically (high priority set, medium priority set, and so forth) and still accomplish the goals and objectives set forth in this planning document.

The following was prepared by the National Association of State Foresters (NASF), June 27, 2003, and is included here as a reference for the identification of prioritizing treatments between communities.

Purpose: To provide national, uniform guidance for implementing the provisions of the "Collaborative Fuels Treatment" MOU, and to satisfy the requirements of Task e, Goal 4 of the Implementation Plan for the 10-Year Comprehensive Strategy.

Intent: The intent is to establish broad, nationally compatible standards for identifying and prioritizing communities at risk, while allowing for maximum flexibility at the state and regional level. Three basic premises are:

- Include all lands and all ownerships.
- Use a collaborative process that is consistent with the complexity of land ownership patterns, resource management issues, and the number of interested stakeholders.
- Set priorities by evaluating projects, not by ranking communities.

The National Association of State Foresters (NASF) set forth the following guidelines in the Final Draft Concept Paper; Communities at Risk, December 2, 2002.

Task: Develop a definition for "communities at risk" and a process for prioritizing them, per the Implementation Plan for the 10-Year Comprehensive Strategy (Goal 4.e.). In addition, this definition will form the foundation for the NASF commitment to annually identify priority fuels reduction and ecosystem restoration projects in the proposed MOU with the federal agencies (section C.2 (b)).

1.1.2.3.2 Conceptual Approach

1. NASF fully supports the definition of the Wildland Urban Interface (WUI) previously published in the Federal Register. Further, proximity to federal lands should not be a consideration. The WUI is a set of conditions that exists on, or near, areas of wildland fuels nation-wide, regardless of land ownership.
2. Communities at risk (or, alternately, landscapes of similar risk) should be identified on a state-by-state basis with the involvement of all agencies with wildland fire protection responsibilities: state, local, tribal, and federal.
3. It is neither reasonable nor feasible to attempt to prioritize communities on a rank order basis. Rather, communities (or landscapes) should be sorted into three, broad categories or zones of risk: high, medium, and low. Each state, in collaboration with its local partners, will develop the specific criteria it will use to sort communities or landscapes into the three categories. NASF recommends using the publication "Wildland/Urban Interface Fire Hazard Assessment Methodology" developed by the National Wildland/Urban Interface Fire Protection Program (circa 1998) as a reference guide. (This program, which has since evolved into the Firewise Program, is under the oversight of the National Wildfire Coordinating Group (NWCG)). At minimum, states should consider the following factors when assessing the relative degree of exposure each community (landscape) faces.
    - **Risk:** Using historic fire occurrence records and other factors, assess the anticipated probability of a wildfire ignition.
    - **Hazard:** Assess the fuel conditions surrounding the community using a methodology such as fire condition class, or [other] process.
    - **Values Protected:** Evaluate the human values associated with the community or landscape, such as homes, businesses, and community infrastructure (e.g. water systems, utilities, transportation systems, critical care facilities, schools, manufacturing and industrial sites, and high value commercial timber lands or rangelands).
    - **Protection Capabilities:** Assess the wildland fire protection capabilities of the agencies and local fire departments with jurisdiction.
4. Prioritize by project not by community. Annually prioritize projects within each state using the collaborative process defined in the national, interagency MOU "For the Development of a Collaborative Fuels Treatment Program". Assign the highest priorities to projects that will provide the greatest benefits either on the landscape or to communities. Attempt to properly sequence treatments on the landscape by working first around and within communities, and then moving further out into the surrounding landscape. This will require:
    - First, focus on the zone of highest overall risk but consider projects in all zones. Identify a set of projects that will effectively reduce the level of risk to communities within the zone.
    - Second, determining the community's willingness and readiness to actively participate in an identified project.
    - Third, determining the willingness and ability of the owner of the surrounding land to undertake, and maintain, a complementary project.

- Last, set priorities by looking for projects that best meet the three criteria above. It is important to note that projects with the greatest potential to reduce risk to communities and the landscape may not be those in the highest risk zone, particularly if either the community or the surrounding landowner is not willing or able to actively participate.

5. It is important, and necessary, that we be able to demonstrate a level of accomplishment that justifies to Congress the value of continuing the current level of appropriations for the National Fire Plan. Although appealing to appropriators and others, it is not likely that many communities (if any) will ever be removed from the list of communities at risk. Even after treatment, all communities will remain at some, albeit reduced, level of risk. However, by using a science-based system for measuring relative risk, we can likely show that, after treatment (or a series of treatments), communities are at "*reduced risk*".

Similarly, scattered, individual homes that complete projects to create defensible space could be "counted" as "households at reduced risk". This would be a way to report progress in reducing risk to scattered homes in areas of low priority for large-scale fuels treatment projects.

Using the concept described above, the NASF believes it is possible to accurately assess the relative risk that communities face from wildland fire. Recognizing that the condition of the vegetation (fuel) on the landscape is dynamic, assessments and re-assessments must be done on a state-by-state basis, using a process that allows for the integration of local knowledge, conditions, and circumstances, with science-based national guidelines. We must remember that it is not only important to lower the risk to communities, but once the risk has been reduced, to maintain those communities at a reduced risk.

Further, it is essential that both the assessment process and the prioritization of projects be done collaboratively, with all local agencies with fire protection jurisdiction – federal, state, local, and tribal – taking an active role.

1.1.2.4 Healthy Forests Restoration Act

On December 3, 2003, President Bush signed into law the Healthy Forests Restoration Act of 2003 to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. The legislation is based on sound science and helps further the President's Healthy Forests Initiative pledge to care for America's forests and rangelands, reduce the risk of catastrophic fire to communities, help save the lives of firefighters and citizens, and protect threatened and endangered species.

Among other things the Healthy Forests Restoration Act (HFRA):

- Strengthens public participation in developing high priority projects;
- Reduces the complexity of environmental analysis allowing federal land agencies to use the best science available to actively manage land under their protection;
- Creates a pre-decisional objections process encouraging early public participation in project planning; and
- Issues clear guidance for court action challenging HFRA projects.

The Owyhee County Wildland-Urban Interface Wildfire Mitigation Plan is developed to adhere to the principles of the HFRA while providing recommendations consistent with the policy document which should assist the federal land management agencies (Bureau of Land Management, US Bureau of Reclamation, and US Fish and Wildlife Service) with implementing

wildfire mitigation projects in Owyhee County that incorporate public involvement and the input from a wide spectrum of fire and emergency services providers in the region.

1.1.3 Local Guidelines and Integration with Other Efforts

1.1.3.1 Sage Grouse Management Plan

Adopted in June 2000 and amended and updated in August 2004, the Owyhee County Sage Grouse Management Plan was developed by a local working group with extensive knowledge of the local area and the localized threats to the species. The plan was developed to serve as a long-term collaborative management plan to utilize local input and knowledge to develop a long-term collaborative management plan which would provide the framework for sage grouse management in conjunction with federal, state and Owyhee County land management plans and actions. This plan provides guidance to resource and land management agencies as well as to Owyhee County on dealing with issues that directly or indirectly affects the Local Working Group's goal of conserving and properly managing Sage Grouse within Owyhee County. While the initial version proposed a number of action items, its primary emphasis was to acquire sound scientific data on sage grouse and sage grouse habitat in Owyhee County. Through the August 2004 amendment and update, the local working group modified the plan to ensure it was PECE (Policy for Evaluating Conservation Efforts) compliant as the PECE conditions had not been in existence at the time of development of the original plan. The update was also used to ensure that the emphasis of the plan's action projects was appropriately balanced between conservation projects and the continuation of needed research into sage grouse populations and habitat.

Fire is the greatest single factor responsible for the loss of Sage Grouse habitat in southeastern Owyhee County. Many of the fires occurred in the more arid Wyoming big-sagebrush habitat type, covered large areas and were often followed by increases in annual grasses, especially cheatgrass. There is very limited opportunity to restore these areas to their former state and they essentially represent a stable state that will not change without substantial human intervention. The increase in fine fuel in the form of cheatgrass has made these habitats more prone to fire and increased fire frequencies that result in loss of shrubs, especially sagebrush. Sagebrush seed is wind-dispersed and 95% is deposited within 30 feet of the parent plant, which largely precludes natural reseeding of large complete burns.

At the same time, areas that have not had wildfire recurrence for 15 to 20 years typically show substantial sagebrush recruitment, especially at the higher elevation range for Wyoming big-sagebrush and natural Mountain big-sagebrush communities. In addition, Mountain big-sagebrush typically re-established rather rapidly and such habitats may be fully occupied by big-sagebrush in 20 to 30 years.

Action plan activities identified in the Sage Grouse Management plan include:

1. **Grazing Management**. Sage grouse habitat condition will be assessed through quantitative assessments conducted in accordance with the SAGE GROUSE HABITAT INVENTORY ACTION PLAN on state and private land.
2. **Develop maps that identify sage grouse habitat for high priority protection from wildfire**. Using current information, provide maps to the fire management staff of all groups that fight fires in Owyhee County outlining critical sage grouse habitat in the county. Initial maps will be developed for the 2000 fire season and updated annually thereafter. (Lead: BLM). (Initial maps completed in 2001 and updates are ongoing).

3. **Fire Rehabilitation**. The sites of all future wildfires in high priority sage grouse habitat identified in Section C will, regardless of potential for natural recovery, be reseeded with sagebrush and, when needed, grasses and forbs best adapted to the site to hasten recovery of the habitat. This policy should be instituted immediately. (Lead: Appropriate land management agency or private landowner). (The action has been carried out since 2000 and is ongoing).
4. **Sagebrush Restoration**. Implement sagebrush restoration projects in historic sage grouse habitat where historic fires have removed sagebrush cover. A minimum of 1,000 acres of combined federal, state, and private lands shall be targeted for restoration annually with seed mixtures that are best for sage grouse and adapted to the site. (Lead: Appropriate land management agency or private landowner) (One project has been proposed and is being pursued but none completed).
5. **Juniper Encroachment**. Using the maps created by the Habitat Inventory Action Plan, identify existing and potential loss of sage grouse habitat due to juniper encroachment. The areas of greatest benefit to sage grouse will be prioritized so that juniper control activities can be scheduled. Suitable methods of juniper eradication such as prescribed burning, chemical control, woodland harvest, chaining, and other mechanical means should be evaluated and employed where appropriate. Treat and eradicate juniper on a minimum of 500 acres of state land (IDL Plan) and 12,000 acres of federal land (Owyhee RMP) annually to enhance sage grouse habitat by restoring healthy sagebrush-grassland communities. (Lead: Appropriate land management agency/authority). (Two projects have been completed and planning is in progress throughout the Juniper encroachment zone)

The Owyhee County Sage Grouse Management Plan has been adopted by the Sage Grouse Local Work Group and represents the guiding policy for the County in relationship to the management of Sage Grouse and impacted land management activities. This Wildland-Urban Interface Wildfire Mitigation Plan adopts, and will adhere to, the policies and intentions of the Sage Grouse Management Plan during its implementation to insure the listed goals and action plans are consistent and targeted at uniform implementation.

1.1.3.2 Owyhee County Comprehensive Growth and Development Plan

The Owyhee County Comprehensive Growth and Development Plan (February 11, 2002) is a guide that establishes goals and objectives to help the County grow and develop. The Owyhee County Comprehensive Plan includes a forecast of conditions that are anticipated to occur within the next twenty-five-year period, 2000 to 2025. The Plan addresses and includes all 14 comprehensive planning components of the "Idaho Local Planning Act of 1975" as supplemented and amended.

Planning is an ongoing process. Conditions and priorities change; consequently the plan will be reviewed regularly and revised when necessary. The 14 planning components included in the Owyhee County Comprehensive Growth and Development Plan include:

1. Population
2. Private Property Rights
3. School Facilities and Transportation
4. Economic Development
5. Land Use
6. Transportation
7. Public Services, Facilities, and Utilities
8. Housing

9. Recreation and Tourism
10. Natural Resources
11. Hazardous Areas
12. Special Areas or Sites
13. Community Design
14. Implementation

Within each chapter of the comprehensive plan are goals and objectives, which help establish development guidelines and public policy. Goals are defined as statements, which indicate a general aim or purpose to be achieved. Goals reflect countywide values. Objectives are defined as guidelines, which establish a definite course to guide present and future decisions. The Owyhee County Comprehensive Plan is directed toward all land within the county including federal, state, public and private lands.

This Wildland-Urban Interface Wildfire Mitigation Plan will "dove-tail" with the County's Comprehensive Plan during its development and implementation to insure that the goals and objectives of each are integrated together. In many sections of this document, direct reference will be made to specific recommendations of the county plan that are amplified or enhanced in this document.

1.1.3.3 Owyhee County Code and Zoning Ordinance

The lands within Owyhee County which produce the natural resources vital to the local economy are either managed by federal or state agencies or are critically affected by lands managed by such agencies. All private property and county or municipally owned property lying within the County is effected by federal and/or state management practices. Such practices have the potential to, and often do, adversely impact the continuation of the culture, custom and economic stability of the County. By resolution, the Owyhee County Board of Commissioners has previously established a land use planning committee which has served as an advisory committee to the Board regarding planning for and implementation of plans for the federally and state managed lands lying within Owyhee County. That committee has assisted the Board with the development of a land use plan for the federally and state managed lands, and it has become clear that the planning process for such lands must be a long-term undertaking if the custom, culture and economic stability of Owyhee County is to be preserved. The purpose of the Zoning Ordinance is to provide for the land use committee as a standing advisory committee to continue advising the Board regarding the management of the federally and state managed lands lying within Owyhee County and the relationship of that management to continuation of the custom, culture and economic stability of the County.

This Ordinance is authorized by Article 12, Section 2 of the Idaho Constitution, Idaho Code Section §31-714, 31-828, 31-4408, and 31-4504 and is mandated by Idaho Code Section §67-6511 which provides that each board of county commissioners "shall" establish a land use district or districts within the unincorporated area of the county. This zoning ordinance is designed to, and enacted to, protect the public health, safety and welfare by implementing the Owyhee County Comprehensive Plan, and accomplish the following purposes:

- Protect and conserve the historic customs, traditions and way of life unique to Owyhee County, consistent with a reasonable and orderly rate of growth and development and protection of private property rights;
- Protect and conserve the agricultural and range uses which form the primary base of the County's economy;

- Provide for reasonable and sound land development, a safe and healthy environment, and a successful economic climate;
- Require the coordination by the Planning and Zoning Commission with the Owyhee County Natural Resources Committee to achieve coordinated planning for the entire County and protection of private property rights which are critical to economic stability of the County and to the maintenance of a healthy environment;
- Protect and enhance private property rights and property values consistent with the County's responsibility to protect public health, safety and welfare;
- Minimize infiltration into agricultural land areas of those elements of urban development which will adversely impact agricultural operations;
- Provide a process for negotiating and developing Areas of City Impact.
- Designate land use districts (zoning districts) appropriate for uses that meet the needs of the County's citizens by providing for growth compatible with protection of soil, water, air, wildlife and other natural environmental and scientific qualities;
- Preserve the recreational, archeological, architectural and cultural history of the County and its historic resources;
- Protect and conserve the natural resources in the County by considering the impact on such resources of proposed land uses;
- Maintain, protect, and enhance the County's transportation system;
- Provide a means for administering the land use planning process in a manner which can assist school districts to maintain, protect and enhance school facilities and school transportation systems;
- Provide a means for administering the land use planning process in a manner that can assist providing public services at reasonable cost and avoid adverse impact of land use growth on the County's taxpayers;
- Provide an administrative process to effectively implement the Comprehensive Plan and this implementing ordinance.

1.1.3.4 Owyhee County Land Use and Management Plan for Federal and State Managed Lands

This Plan provides a positive guide for the Land Use Committee and the Board to coordinate their efforts with federal and state land management agencies in the development and implementation of land use plans and management actions which are compatible with the best interests of Owyhee County and its citizens. The Plan is designed to facilitate continued and revitalized multiple use of federally and state managed lands in the County.

The Land Use Committee, the Board, and the citizens of Owyhee County recognize that federal law mandates multiple use of federally managed lands and they positively support multiple use. Maintenance of such multiple use necessarily includes continued maintenance of the historic and traditional economic uses which have been made of federally managed and state managed lands in the County. It is therefore the policy of Owyhee County that the Land Use Committee and the Board work constantly to assure that federal and state agencies shall inform the Board of all pending or proposed actions affecting local communities and citizens and coordinate with the Board in the planning and implementation of those actions.

Owyhee County has previously developed its Comprehensive Plan related to privately owned lands in the County. This Land Use Plan is now directed toward management of federally and state managed lands. With adoption of this Plan the County puts in place a "Comprehensive Plan" which includes "all land within the jurisdiction of the governing Board" as directed by the legislature. Idaho Code § 67-6528 provides that "the state of Idaho, and all its agencies, Boards, departments, institutions, and local special purpose districts, shall comply with all plans and ordinances adopted under the Local Planning Act." These statements of purpose, of duty to plan, and duties of state agencies to comply with plans adopted under the Local Planning Act certainly contemplate coordination by state agencies of their planning efforts with the local planning efforts of Owyhee County.

Through the land use planning process Owyhee County commits itself to attempting to assure that all natural resource decisions affecting the County shall be guided by the principles of maintaining and revitalizing multiple use of federally managed and state managed lands, protection of private property rights and private property interests including investment backed expectations, protection of local historical custom and culture, protection of the traditional economic structures in the County which form the base for economic stability for the County, the opening of new economic opportunities through reliance on free markets, and protection of the right of the enjoyment of the natural resources of the County by all citizens of the County and those communities utilizing those natural resources within the County. Owyhee County is convinced that resource and land use management decisions made in a coordinated manner by federal management agencies, state management agencies and county officials will not only firmly maintain and revitalize multiple use of federally and state managed lands in Owyhee County but will enhance environmental quality throughout the County.

1.1.3.5 Owyhee Resource Management Plan

The Owyhee Resource Management Plan (RMP) was prepared to provide the Bureau of Land Management, Lower Snake River District with a comprehensive framework for managing public lands administered by the Owyhee Resource Area. The purpose of the RMP is to ensure public land use is planned for and managed on the basis of multiple-use and sustained yield in accordance with the Federal Land Policy and Management Act of 1976 (FLPMA).

The Owyhee Resource Area encompasses 1,779,492 acres. This total includes the following:

1,320,032 acres administered by BLM, Idaho
136,936 acres administered by the State of Idaho
319,777 acres of private lands
2,747 acres of water, primarily the Snake River

The area is bounded on the west by Oregon, on the south by Nevada, on the north by the Snake River and on the east by Castle Creek, Deep Creek, the Owyhee River, and the Duck Valley Indian Reservation. Most of the public lands are contiguous with only a few scattered or isolated parcels.

The resource area contains the northern extent of the Owyhee Mountain Range and lies within what is often referred to as the Columbia Plateau. The Columbia Plateau is an elevated plateau with mountains which are separated by canyons draining to the Pacific Ocean via the Snake and Columbia Rivers. This broad regional landform and vegetative classification is known as the Intermountain Sagebrush Province/Sagebrush Steppe Ecosystem.

The Sagebrush Steppe Ecosystem is widespread over much of southern Idaho, eastern Oregon and Washington, and portions of northern Nevada, California, and Utah. This ecosystem contains a large diversity in landform and vegetation types ranging from vast expanses of flat

sagebrush covered plateaus to rugged mountains blanketed with juniper woodlands and grasslands.

BLM has three primary levels of land use planning decisions; the RMP level, the activity level and the site specific level. This RMP focuses mostly on broad resource objectives and direction. However, it also provides some activity level guidance and includes some site specific decisions. Several existing activity level plans are referenced in this RMP. They will be updated or modified, as necessary, to include current information and be in conformance with the RMP. These plans include, but are not limited to, the Owyhee Off-Road Vehicle Management Plan, the Wild Horse Herd Management Plan, the Lower Snake River District Fire Management Plan, the Owyhee Juniper Woodland Harvest Management Plan, the Snake River Birds of Prey National Conservation Area Management Plan, the Owyhee River Recreation Management Plan and several livestock grazing allotment management plans. Subsequent activity level and site specific level planning processes will include appropriate public participation opportunities and NEPA compliance.

1.1.3.6 Owyhee County Fire Mitigation Planning Effort and Philosophy

The goals of this planning process include the integration of the National Fire Plan, the Idaho Statewide Implementation Strategy, the Healthy Forests Restoration Act, and the requirements of FEMA for a county-wide Fire Mitigation Plan; a component of the County's All Hazards Mitigation Plan. This effort will utilize the best and most appropriate science from all partners, the integration of local and regional knowledge about wildfire risks and fire behavior, while meeting the needs of local citizens, the regional economy, the significance of this region to the rest of Idaho and the Inland West.

1.1.3.6.1 Mission Statement

To make Owyhee County residents, communities, state agencies, local governments, and businesses less vulnerable to the negative effects of wildland fires through the effective administration of wildfire hazard mitigation grant programs, hazard risk assessments, wise and efficient fuels treatments, and a coordinated approach to mitigation policy through federal, state, regional, and local planning efforts. Our combined prioritization will be the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.

1.1.3.6.2 Vision Statement

Institutionalize and promote a countywide wildfire hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Owyhee County.

1.1.3.6.3 Goals

- To reduce the area of WUI land burned and losses experienced because of wildfires where these fires threaten communities in the wildland-urban interface
- Prioritize the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy
- Educate communities about the unique challenges of wildfire in the wildland-urban interface (WUI)
- Establish mitigation priorities and develop mitigation strategies in Owyhee County

- Strategically locate and plan fuel reduction projects
- Provide recommendations for alternative treatment methods, such as modifying forest stand density, herbicide treatments, fuel reduction techniques, and disposal or removal of treated slash
- Meet or exceed the requirements of the National Fire Plan and FEMA for a County level Fire Mitigation Plan

Chapter 2: Planning Process

2 Documenting the Planning Process

Documentation of the planning process, including public involvement, is required to meet FEMA's DMA 2000 (44CFR§201.4(c)(1) and §201.6(c)(1)). This section includes a description of the planning process used to develop this plan, including how it was prepared, who was involved in the process, and how all of the involved agencies participated.

2.1.1 Description of the Planning Process

The Owyhee County Wildland-Urban Interface Wildfire Mitigation Plan was developed through a collaborative process involving all of the organizations and agencies detailed in Section 1.0 of this document. The County's local coordinator contacted these organizations directly to invite their participation and schedule meetings of the planning committee. The planning process included 5 distinct phases which were in some cases sequential (step 1 then step 2) and in some cases intermixed (step 4 completed though out the process):

1. **Collection of Data** about the extent and periodicity of wildfires in and around Owyhee County. This included an area encompassing Ada, Canyon, Elmore, and Twin Falls to insure a robust dataset for making inferences about fires in Owyhee County specifically; this included a wildfire extent and ignition profile.
2. **Field Observations and Estimations** about wildfire risks including fuels assessments, juxtaposition of structures and infrastructure to wildland fuels, access, and potential treatments by trained wildfire specialists.
3. **Mapping** of data relevant to wildfire control and treatments, structures, resource values, infrastructure, fire prone landscapes, and related data.
4. **Facilitation of Public Involvement** from the formation of the planning committee, to a public mail survey, news releases, public meetings, public review of draft documents, and acceptance of the final plan by the signatory representatives.
5. **Analysis and Drafting of the Report** to integrate the results of the planning process, providing ample review and integration of committee and public input, followed by acceptance of the final document.

Planning efforts were led by the Project Director, Dr. William E. Schlosser, of Northwest Management, Inc. Dr. Schlosser holds 4 degrees in natural resource management (A.S. geology; B.S. forest and range management; M.S. natural resource economic & finance; Ph.D. environmental science and regional planning). Project Leader, Mr. Toby R. Brown, holds a B.S. degree in natural resource management. Together, they led a team of resource professionals that included fire mitigation specialists, wildfire control specialists, resource management professionals, and hazard mitigation experts.

They were the point-people for team members to share data and information with during the plan's development. They and the planning team met with many residents of the county during the inspections of communities, infrastructure, and hazard abatement assessments. This methodology, when coupled with the other approaches in this process, worked effectively to integrate a wide spectrum of observations and interpretations about the project.

The planning philosophy employed in this project included the open and free sharing of information with interested parties. Information from federal and state agencies was integrated

into the database of knowledge used in this project. Meetings with the committee were held throughout the planning process to facilitate a sharing of information between cooperators.

When the public meetings were held, many of the committee members were in attendance and shared their support and experiences with the planning process and their interpretations of the results.

2.2 Public Involvement

Public involvement in this plan was made a priority from the inception of the project. There were a number of ways that public involvement was sought and facilitated. In some cases this led to members of the public providing information and seeking an active role in protecting their own homes and businesses, while in other cases it led to the public becoming more aware of the process without becoming directly involved in the planning process.

2.2.1 News Releases

Under the auspices of the Owyhee County Wildland-Urban Interface Wildfire Mitigation Planning Committee, news releases were submitted to area news papers.

2.2.1.1 Newspaper Articles

Committee and public meeting announcements were published in the local newspaper ahead of each meeting. The following is an example of one of the newspaper announcements that ran in the local newspaper.

Owyhee County Plans to Mitigate Wildfire Risk

The Owyhee County Commissioners have created a Wildfire Mitigation Plan Committee to complete a Wildfire Mitigation Plan for Owyhee County as part of the National Fire Plan authorized by Congress and the Whitehouse. The Owyhee County Wildfire Mitigation Plans will include risk analysis at the community level with predictive models for where fires are likely to ignite and where they are likely to spread rapidly once ignited. Northwest Management, Inc. has been retained by Owyhee County to provide wildfire risk assessments, mapping, field inspections, and interviews, and to collaborate with the committee to prepare the plan. The committee includes rural and wildland fire districts, land managers, elected officials, agency representatives, and others. Northwest Management, Inc. specialists are conducting analyses of fire prone landscapes and making recommendations for potential treatments. Specific activities for homes, structures, infrastructure, and resource capabilities will be proposed as part of the analysis.

One of the most important steps in gathering information about fire risk in Owyhee County is to conduct a homeowner's survey. Northwest Management, Inc., in cooperation with local fire officials, will mail a brief survey to randomly selected homeowners in the county seeking details about home construction materials, proximity to water sources, and other risk factors surrounding homes. This survey is very important to the success of the plan. Those homes that receive a survey are asked to please take the time to complete it, thereby benefiting the community overall.

The planning team will be conducting Public Meetings to discuss preliminary findings and to seek public involvement in the planning process in October. A notice on the date

and location of these meetings will be posted in local newspapers.

For more information on the Fire Mitigation Plan projects in Owyhee County contact your County Commissioner, or William Schlosser at the Northwest Management, Inc. office in Moscow, Idaho at 208-883-4488.

2.2.2 Public Mail Survey

In order to collect a broad base of perceptions about wildland fire and individual risk factors to homeowners in Owyhee County, a mail survey was conducted. Using a state and county database of landowners in Owyhee County, homeowners from the Wildland-Urban Interface surrounding each community were identified. In order to be included in the database, individuals were selected that own property and have a dwelling in Owyhee County, as well as a mailing address in Owyhee County. This database created a list of 1,874 unique names to which were affixed a random number that contributed to the probability of being selected for the public mail survey. A total of 244 residents meeting the above criteria were selected.

The public mail survey developed for this project has been used in the past by Northwest Management, Inc., during the execution of other WUI Wildfire Mitigation Plans. The survey used The Total Design Method (Dillman 1978) as a model to schedule the timing and content of letters sent to the selected recipients. Copies of each cover letter, mail survey, and communication are included in Appendix IV.

The first in the series of mailing was sent September 21, 2004, and included a cover letter, a survey, and an offer of receiving a custom GIS map of the area of their selection in Owyhee County if they would complete and return the survey. The free map incentive was tied into assisting their community and helping their interests by participating in this process. Each letter also informed residents about the planning process. A return self-addressed enveloped was included in each packet. A postcard reminder was sent to the non-respondents on October 2, 2004, encouraging their response. A final mailing, with a revised cover letter pleading with them to participate, was sent to non-respondents on October 19, 2004.

Surveys were returned during the months of September, October, and November. A total of 71 residents responded to the survey out of 244. No surveys were returned as undeliverable. The effective response rate for this survey was 34%. Statistically, this response rate allows the interpretation of all of the response variables significantly at the 95% confidence level. This data will be updated until the final plan.

2.2.2.1 Survey Results

A summary of the survey's results will be presented here and then referred back to during the ensuing discussions on the need for various treatments, education, and other information.

All of the respondents to the survey have a home in Owyhee County, and 97% consider this their primary residence. About 33% of the respondents were from the Homedale area, 32% were from the Marsing area, 14% were from the Bruneau area, 6% from Murphy, 4% from Oreana, 1% from Eagle View with the remainder from other areas in the County.

Only 91% of the respondents identified that they have emergency telephone 911 services in their area. The entire county is covered with 911 service so almost 1 in 10 residents did not know they had 911 service. Their ability to correctly identify if they are covered by a rural fire district was 94%. Of the respondents, 98% correctly identified they live in an area protected by a rural or city fire district. Only 2% responded they do not have a fire district covering their home,

when in fact they do. Approximately 4% of the respondents indicated that they were inside of a fire protection district when in reality they are outside of a protection district.

Respondents were asked to indicate the type of roofing material covering the main structure of their home. Approximately 63% of respondents indicated their homes were covered with a composite material (asphalt shingles). About 21% indicated their home were covered with a metal (eg., aluminum, tin) roofing material. Roughly 16% of the respondents indicated they have a wooden roofing material such as shakes or shingles. The remaining 5% of respondents had a variety of combustible and non-combustible materials indicated.

Residents were asked to evaluate the height of vegetation within certain distances of their homes. Often, the height and type of vegetation around a home is an indicator of increased fire risk. The results are presented in Table 2.1

Table 2.1. Vegetation characteristics around homes.

Height of Vegetation	Within 75 feet of your home
None	16%
0-2 feet	36%
2-5 feet	16%
Greater than 5 feet	33%

Approximately 83% of those returning the survey indicated they have a lawn surrounding their home. Of these individual homesites, 98% indicated they keep this lawn green through the fire season. 42% of respondents indicated that they had brush within 75 feet of their homes and 59% had some kind of tree or trees within 75 feet of their home.

The average driveway length of the respondents was approximately 974 feet long (.18 mile), from their main road to their parking area. The longest reported driveway was 3 miles long. Only 39% of the driveways had turnouts allowing two vehicles to pass each other in the case of an emergency. 14% of the driveways were of native dirt, 77% were graveled or rocked and 9% paved. Respondents were asked if they had an alternative vehicle escape route from their property, 67% indicated that they did, with 37% having no alternative escape route.

Roughly 14% of the respondents in Owyhee County indicated they have someone in their household trained in wildland fire fighting. Approximately 19% indicated someone in the household had been trained in structural fire fighting. Roughly 18% had Emergency Medical Technician training and 71 % basic CPR/First Aid training. However, it is important to note that these questions did not specify a standard nor did it refer to how long ago the training was received.

A series of questions was asked regarding the availability of a variety of fire fighting resources that were around the respondents property; 97% had hand tools appropriate for fighting wildfire, 12% had a portable water tank and 9% had a stationary water tank, while 39% had a pond, lake or stream on their property. The ability to pump water was on 13% of the properties and 33% had some type of mechanical equipment that could be used to fight wildland fires.

Respondents were asked to complete a fuel hazard rating worksheet to assess their home's fire risk rating. An additional column titled "results" has been added to the table, showing the percent of respondents circling each rating (Table 2.2).

Circle the ratings in each category that best describes your home.

Table 2.2. Fuel Hazard Rating Worksheet		Rating	Results
Fuel Hazard	Small, light fuels (grasses, forbs, weeds, shrubs)	1	86%
	Medium size fuels (brush, large shrubs, small trees)	2	13%
	Heavy, large fuels (woodlands, timber, heavy brush)	3	1%
Slope Hazard	Mild slopes (0-5%)	1	83%
	Moderate slope (6-20%)	2	13%
	Steep Slopes (21-40%)	3	4%
	Extreme slopes (41% and greater)	4	0%
Structure Hazard	Noncombustible roof and noncombustible siding materials	1	23%
	Noncombustible roof and combustible siding material	3	20%
	Combustible roof and noncombustible siding material	7	17%
	Combustible roof and combustible siding materials	10	40%
Additional Factors	Rough topography that contains several steep canyons or ridges	+2	Average -2.3 pts
	Areas having history of higher than average fire occurrence	+3	
	Areas exposed to severe fire weather and strong winds	+4	
	Areas with existing fuel modifications or usable fire breaks	-3	
	Areas with local facilities (water systems, rural fire districts, dozers)	-3	

Calculating your risk

Values below are the average response value to each question.

Fuel hazard	1.6	x Slope Hazard	1.2	= 2.11
Structural hazard		+	6.3	
Additional factors		(+ or -)	-2.3	
Total Hazard Points		=	6.11	

Table 2.3. Percent of respondents in each risk category as determined by the survey respondents.
00% – Extreme Risk = 26 + points
03% – High Risk = 16–25 points
35% – Moderate Risk = 6–15 points
62% – Low Risk = 6 or less points

Maximum household rating score was 17 points, as assessed by the homeowners. These numbers were compared to observations made by field crews trained in wildland fire fighting. These results indicate that for the most part, these indications are only slightly lower than the risk rating assigned by the “professionals”. Anecdotal evidence would indicate that Owyhee County landowners involved in this survey have a more realistic view of wildfire risk than the landowners in other Idaho counties where these questions have been asked.

Finally, respondents were asked “if offered in your area, would members of your household attend a free, or low cost, one-day training seminar designed to teach homeowners in the wildland–urban interface how to improve the defensible space surrounding your home and

adjacent outbuildings?" 42% of the respondents indicated a desire to participate in this type of training.

Homeowners were also asked, "How do you feel Wildland-Urban Interface Fire Mitigation projects should be funded in the areas surrounding homes, communities, and infrastructure such as power lines and major roads?" Responses are summarized in Table 2.5.

Table 2.4. Public Opinion of Wildfire Mitigation Funding Preferences.

	Mark the box that best applies to your preference		
	100% Public Funding	**Cost-Share (Public & Private)**	**Privately Funded (Owner or Company)**
Home Defensibility Projects	26%	21%	53%
Community Defensibility Projects	45%	45%	10%
Infrastructure Projects Roads, Bridges, Power Lines, Etc.	62%	21%	16%

2.2.3 Committee Meetings

The following list of people who participated in the planning committee meetings, volunteered time, or responded to elements of the Owyhee County Wildland-Urban Interface Wildfire Mitigation Plan's preparation.

- Jim Desmond — Owyhee County Natural Resources Committee Director
- Andy Ogden — Idaho Dept Fish and Game
- Brett Endicott — Owyhee County Assessor
- Richard Freund — Owyhee County Sheriffs office
- Kay Kelly — Owyhee County Planning and Zoning
- Kevin Staebler — Mountain Home AFB Fire Chief
- Carrie Bilbao — BLM Fire Investigation
- Joe-Riley Epps — BLM Fire Management Officer
- Toby R. Brown — Northwest Management Inc.
- William Schlosser — Northwest Management Inc.
- Brent Hunter — Sho-Pai Fire Management
- Jerry Hoagland — Owyhee County Natural Resource Committee
- Larry Howard — County Emergency Management Coordinator
- Shirley Fuchs — Owyhee County Assessors Office
- Rosey Thomas — Bureau of Land Management
- Tom Benson — Fire District Commissioner MRW

Committee Meetings were scheduled and held on the following dates:

September 21, 2004

Bill Schlosser began by giving the committee an introductory presentation of what was expected of each party and what materials they would need to provide in order to make a successful plan. He went over each of the major points of the final document to make sure the committee understood the scope of the project. He also provided some background information on NMI and the history of the fire mitigation program. Several preliminary maps were displayed showing some of the fire-related characteristics in the county.

After the presentation, the committee had a general discussion about some of the major issues in the county including the Silver City area, the sage grouse, juniper encroachment, current treatments, and past fires.

Bill discussed the draft document of the community assessments and asked the committee if there were any additional communities they would like included. Dynamac Corporation has already completed an assessment and mitigation plan for the Silver City area and the committee would like this document used in addition to NMI's assessments.

The committee discussed the different fire districts within the county at length including the Jordan Valley Department, which crosses the county border. A fire department has also been proposed in Silver City.

A tentative schedule was discussed. The committee would like the public meetings on November 3rd and 4th in Marsing, Grandview, and Murphy.

October 13, 2004

The committee began the meeting by reviewing the maps provided by Northwest Management, Inc. Toby handed out the draft version of the community assessments for the committee members to review and provide comments to at the next meeting or via email. Toby also went over the information needed to complete the assessments for the final document. Public meeting dates were set for November 3rd, 4th, and 5th.

The committee also discussed potential mitigation activities for the Silver City area, which is one of the county's higher risk areas. Suggestions included: water storage tanks at the town site, bigger waterlines, and a helipad.

November 29, 2004

A short committee meeting was held to go deliver the draft document and go over any changes. Members were asked to review the draft and email or fax any changes to NMI.

2.2.4 Public Meetings

Public meetings were an integral component to the planning process. It was the desire of the planning committee, and the Owyhee County Commissioners to integrate the public's input to the development of the fire mitigation plan.

Formal public meetings were scheduled on November 3 & 4, 2004, in Grandview, Marsing, and Murphy, Idaho. The purpose of the meetings was to share information on the planning process with a broadly representative cross section of Owyhee County landowners. The meetings had wall maps posted in the meeting rooms with many of the analysis results summarized specifically for the risk assessments, location of structures, fire protection, and related information. The formal portion of the presentations included a PowerPoint presentation made by Project Co-Leader, Toby R. Brown. During his presentation, comments from committee members, fire chiefs, and others were encouraged in an effort to engage the audience in a discussion.

It was made clear to all in attendance that their input was welcome and encouraged, as specific treatments had not yet been decided, nor had the risk assessment been completed. Attendees were told that they could provide oral comment during the meetings, they could provide written comments, or they could request more information in person to discuss the plan. In addition, attendees were told they would have an opportunity to review the draft plan prior to its completion to further facilitate their comments and input.

The formal presentations lasted approximately 1 hour and included many questions and comments from the audience. Following the meeting, many discussions continued with the committee members and the general public discussing specific areas, potential treatments, the risk analysis, and other topics.

Committee meetings were scheduled and held on the following dates:

November 3, 2004 – Marsing

Toby Brown of Northwest Management, Inc. made the presentation and then opened the floor for discussion. Topics discussed included:

- There are some additional areas within the county that need to be covered by a rural fire district.
- Need wildfire training to come to the firefighters during their regular training times.
- Need more wildfire education throughout the county.
- Need minimum road specifications for private roads and driveways. Also need a method of enforcement.
- There needs to be a way for the BLM to notify fire districts when fires enter their jurisdiction.
- Need to incorporate islands of non-coverage into local fire districts.

November 4, 2004 – Murphy

Toby Brown of Northwest Management, Inc. made the presentation and then opened the floor for discussion. Topics discussed included:

- Silver City would be trapped in the event of a wildfire; thus, the back road out of the area needs improvement.
- Grazing in the valley and along roads has been beneficial.
- Need to address the juniper encroachment issue.
- Need to improve communication capabilities, structures, and training for fire districts.
- Need to fill in gaps between fire districts.
- Need to upgrade to narrow band radios and alleviate communication dead spots throughout the county.
- BLM field stations to place fire crews throughout the county would improve response.
- Create new district for the Pleasant Valley and Cliffs area.
- Need to map and locate water sources including drafting sites.
- Need to rock roads in WUI due to dust problems.
- Develop a safety zone near Silver City.

November 3, 2004 – Grandview

There was no presentation in Grandview because no one attended.

2.2.4.1 Meeting Notices

Public notices of these meetings were printed in the **Idaho Press and Owyhee Avalanche** the week of October 24, 2004.

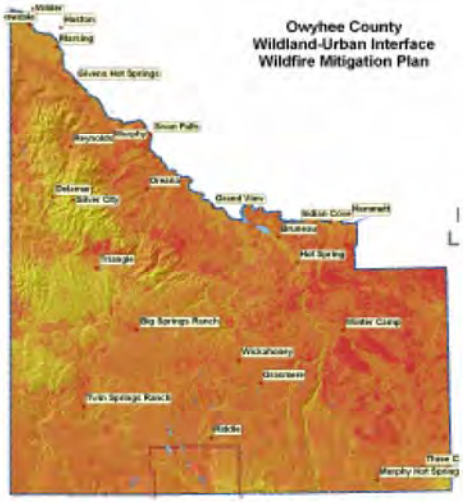
Owyhee County, Idaho Wildland-Urban Interface Wildfire Mitigation Plan

Southwest Idaho RC&D

Public Meetings!

- **Marsing:** November 3rd, at 12:00 noon at the Marsing Community Center, 126 N. Bruneau Hwy
- **Grandview:** November 3rd, at 7:00 PM at the Eastern Owyhee County Library, 520 Boise Ave
- **Murphy:** November 4th, at 7:00 pm at the Courthouse, Highway 78

Public meetings are scheduled in Marsing, Grandview, and Murphy, November 3 & 4, to address Wildfire risks around our communities. These meetings are open to the public and will include presentations from wildfire mitigation specialists working on the Owyhee County Wildfire Mitigation Plan. Public input is being sought in order to better frame the County's efforts of fuels treatments, fire fighting resource enhancements, and public land management.



Learn about the assessments of risk (Fire Prone Landscapes - above, left) and the Wildland-Urban Interface of Owyhee County (above, right). Discuss YOUR priorities for how Owyhee County can best mitigate wildland fire risks around your community. ***JOIN US!***

Each meeting will last for approximately 1.5 hours and include refreshments, a slideshow, information on the planning process, and schedules for completion.

For more information on Wildfire Mitigation Plan projects in Owyhee County, contact your County Commissioners, Bill Moore with the Southwest Idaho RC&D office at 208-888-1890 ext. 4, or Dr. William Schlosser at the Northwest Management, Inc. office in Moscow, Idaho at 208-883-4488.

2.3 Review of the WUI Wildfire Mitigation Plan

Review of sections of this document was conducted by the planning committee during the planning process as maps, summaries, and written assessments were completed. These planning committee members included fire mitigation specialists, fire fighters, planners, elected officials, and others involved in the coordination process. Preliminary findings were discussed at the public meetings, where comments were collected and facilitated.

The results of these formal and informal reviews were integrated into a DRAFT Wildland-Urban Interface Wildfire Mitigation Plan. This plan was given to members of the planning committee on November 29, 2004. The committee review process lasted from November 29 through December 31, 2004. Once changes were made, a public review version of the plan was posted at local libraries, the county courthouse, and other locations (accompanied by a press release detailing the public review process and plan availability). The public review period was open from January 15, 2005, through February 25, 2005.

Comments from the public review process were integrated into the final plan and submitted to the County Commissioners for a final review. Adoption of the plan by the county and local municipalities was completed in March 2005.

Chapter 3: County Characteristics & Risk Assessment

3 Background and Area Description

3.1 Demographics

Owyhee County experienced a total population increase from 8,392 in 1990 to 10,644 in 2000 with approximately 4,452 housing units. Owyhee County has three incorporated communities, Grand View (pop. 461), Marsing (pop. 915), and Homedale (pop. 2,552). The total land area of the county is roughly 7,696.71 square miles (4,925,894.4 acres).

Table 3.1 summarizes some relevant demographic statistics for Owyhee County.

Table 3.1 Selected demographic statistics for Owyhee County, Idaho from Census 2000.

Subject	Number	Percent
Total population	**10,644**	**100.0**
SEX AND AGE		
Male	5,588	52.5
Female	5,056	47.5
Under 5 years	816	7.7
5 to 9 years	934	8.8
10 to 14 years	1,013	9.5
15 to 19 years	874	8.2
20 to 24 years	635	6.0
25 to 34 years	1,276	12.0
35 to 44 years	1,557	14.6
45 to 54 years	1,285	12.1
55 to 59 years	476	4.5
60 to 64 years	466	4.4
65 to 74 years	718	6.7
75 to 84 years	455	4.3
85 years and over	139	1.3
Median age (years)	33.5	(X)
18 years and over	7,309	68.7
Male	3,817	35.9
Female	3,492	32.8
21 years and over	6,904	64.9
62 years and over	1,549	14.6
65 years and over	1,312	12.3
Male	608	5.7
Female	704	6.6
RELATIONSHIP		

Table 3.1 Selected demographic statistics for Owyhee County, Idaho from Census 2000.

Subject	Number	Percent
Population	**10,644**	**100.0**
In households	10,575	99.4
Householder	3,736	35.1
Spouse	2,346	22.0
Child	3,630	34.1
Own child under 18 years	3,065	28.8
Other relatives	547	5.1
Under 18 years	232	2.2
Nonrelatives	316	3.0
Unmarried partner	117	1.1
In group quarters	69	0.6
Institutionalized population	61	0.6
Noninstitutionalized population	8	0.1
HOUSEHOLDS BY TYPE		
Households	**3,736**	**100.0**
Family households (families)	2,789	74.7
With own children under 18 years	1,426	38.2
Married-couple family	2,367	63.4
With own children under 18 years	1,163	31.1
Female householder, no husband present	281	7.5
With own children under 18 years	184	4.9
Nonfamily households	947	25.3
Householder living alone	818	21.9
Householder 65 years and over	361	9.7
Households with individuals under 18 years	1,551	41.5
Households with individuals 65 years and over	1,273	34.1
Average household size	2.83	(X)
Average family size	3.34	(X)
HOUSING TENURE		
Occupied housing units	**3,710**	**100.0**
Owner-occupied housing units	2,585	69.7
Renter-occupied housing units	1,125	30.3
Average household size of owner-occupied unit	2.85	(X)
Average household size of renter-occupied unit	2.84	(X)

(X) Not applicable
[1] Other Asian alone, or two or more Asian categories.
[2] Other Pacific Islander alone, or two or more Native Hawaiian and Other Pacific Islander categories.
[3] In combination with one or more other races listed. The six numbers may add to more than the total population and the six percentages may add to more than 100 percent because individuals may report more than one race.
Source: U.S. Census Bureau, Census 2000 Summary File 1, Matrices P1, P3, P4, P8, P9, P12, P13, P,17, P18, P19, P20, P23, P27, P28, P33, PCT5, PCT8, PCT11, PCT15, H1, H3, H4, H5, H11, and H12.

3.2 Socioeconomics

Owyhee County had a total of 4,452 housing units (3,710 occupied) and a population density of 1.4 persons per square mile reported in the 2000 Census. Ethnicity in Owyhee County is distributed: white 76.9%, black or African American 0.2%, American Indian or Alaskan Native 3.2 %, Asian 0.5%, Hispanic or Latino 23.1%, and some other race 16.5%.

Specific economic data for individual communities is collected by the US Census; in Owyhee County this includes Grand View, Marsing, and Homedale. Grand View households earn a median income of $21,417 annually, Marsing has a median income of $27,639, and Homedale reported a median income of $24,196, all of which compares to the Owyhee County median income during the same period of $28,339. Table 3.2 shows the dispersal of households in various income categories in Owyhee County.

Table 3.2 Income in 1999.	**Owyhee County**	
	Number	**Percent**
Households	3,736	100.0
Less than $10,000	435	11.6
$10,000 to $14,999	406	10.9
$15,000 to $24,999	771	20.6
$25,000 to $34,999	632	16.9
$35,000 to $49,999	665	17.8
$50,000 to $74,999	471	12.6
$75,000 to $99,999	181	4.8
$100,000 to $149,999	115	3.1
$150,000 to $199,999	30	0.8
$200,000 or more	30	0.8
Median household income (dollars)	28,339	(X)

(Census 2000)

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, directs federal agencies to identify and address any disproportionately high adverse human health or environmental effects of its projects on minority or low-income populations. In Owyhee County, a significant number, 14.2%, of families are at or below the poverty level (Table 3.3).

Table 3.3 Poverty status in 1999 (below poverty level).	**Owyhee County**	
	Number	**Percent**
Families	395	(X)
Percent below poverty level	(X)	14.2
With related children under 18 years	296	(X)
Percent below poverty level	(X)	19.3
With related children under 5 years	151	(X)
Percent below poverty level	(X)	25.2
Families with female householder, no husband present	106	(X)
Percent below poverty level	(X)	37.7
With related children under 18 years	77	(X)
Percent below poverty level	(X)	35.0
With related children under 5 years	33	(X)
Percent below poverty level	(X)	54.1

Table 3.3 Poverty status in 1999 (below poverty level).	Owyhee County	
	Number	Percent
Individuals	1,781	(X)
Percent below poverty level	(X)	16.9
18 years and over	1,083	(X)
Percent below poverty level	(X)	14.9
65 years and over	154	(X)
Percent below poverty level	(X)	12.1
Related children under 18 years	687	(X)
Percent below poverty level	(X)	20.8
Related children 5 to 17 years	473	(X)
Percent below poverty level	(X)	19.0
Unrelated individuals 15 years and over	331	(X)
Percent below poverty level	(X)	26.4

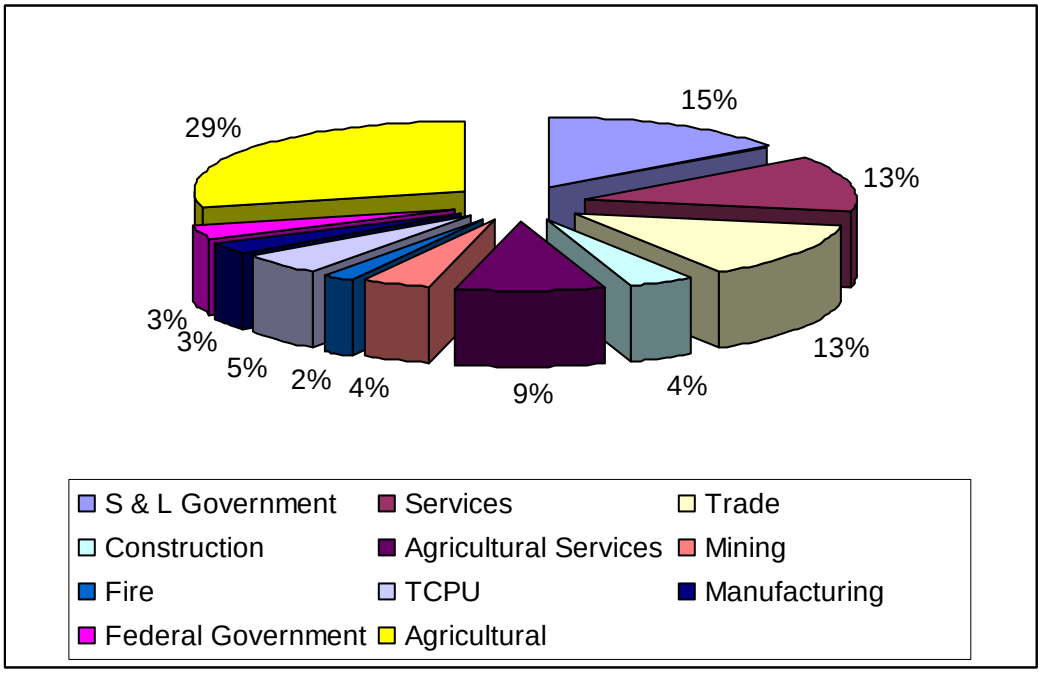
(Census 2000)

The unemployment rate was 4.2% in Owyhee County in 1999, compared to 4.4% nationally during the same period. Approximately 25.5% of the Owyhee County employed population worked in natural resources, with much of the indirect employment relying on the employment created through these natural resource occupations; Table 3.4 (Regional Economic Impact Model of Owyhee County, Idaho and the Four County Area Including Ada, Canyon, Elmore, and Owyhee Counties 2003).

Table 3.4 Output, Employment, and Personal Income in 2000.

	Sector	Employment	Output	Personal Income
1	Dairy Farm Products	76	$23,194,383	$4,010,796
2	Misc. Livestock	28	$2,784,633	$458,498
3	Range Cattle	235	$23,308,481	$5,429,547
4	Cattle Feedlots	20	$7,715,005	$2,210,728
5	Grains	51	$5,964,599	$984,891
6	Forage Crops	494	$26,895,789	$4,572,562
7	Misc. Crops	151	$17,511,735	$5,250,088
8	Sugar Beets	63	$7,167,485	$1,250,225
9	Ag Services	227	$6,501,637	$2,836,301
10	Mining	4	$479,972	$82,029
11	Construction	251	$28,547,230	$12,293,300
12	Manufacturing	156	$45,730,615	$6,626,364
13	Transportation and Communication	120	$12,261,124	$2,277,678
14	Gas and Electric Services	15	$10,485,643	$1,381,683
15	Irrigation, Sanitation, and Water Serv.	72	$18,896,515	$3,466,995
16	Wholesale Trade	48	$3,080,621	$1,257,856
17	Retail Trade	76	$1,667,722	$741,160
18	Food Stores	156	$7,324,724	$3,937,894
19	Automotive Dealers & Service Stations	69	$2,877,000	$1,160,671

Figure 3.1. Employment by Sector, 1995.



Source: 1998 Bureau of Economic Analysis, U.S. Department of Commerce

Approximately 70.7% of Owyhee County's employed persons are private wage and salary workers, while around 14.5% are government workers (Table 3.5).

Table 3.5 Class of worker.	**Owyhee County**	
	Number	**Percent**
Private wage and salary workers	3,101	70.7
Government workers	637	14.5
Self-employed workers in own not incorporated business	612	13.9
Unpaid family workers	39	0.9

(Census 2000)

3.2.1 European Settlement of Owyhee County

Information summarized from http://owyheecounty.net/profile/ .

On December 31, 1863, Owyhee became the first county created by the newly-formed Idaho territorial legislature. Owyhee is the second largest county in Idaho.

The name, Owyhee, comes from early fur trappers. In 1819, three natives from Hawaii, part of Donald McKenzie's fur-trapping expedition, were sent to trap a large stream that emptied into the Snake River. When they did not return, McKenzie investigated and found one man murdered in camp and no sign of the others. The stream was named in their honor. "Owyhee" is an early spelling for the word Hawaii.

The Oregon Trail, the earliest road in the area, was used by emigrants for over 30 years on their long trip to the Oregon country. The part of the Trail in Owyhee County was known as the South Alternate Route or "dry route". The Owyhee road was shorter but much harder than the main trail.

Gold was discovered in rich placer deposits in the Owyhee Mountains in May, 1863. A search for the source of the gold led to quartz ledges on War Eagle Mountain. Before the fall of 1863 several hard-rock mines were being developed. Three towns grew to supply the miner's needs.

Booneville, Ruby City and Silver City were the first three settlements in the county. Only Silver City still stands, its well-preserved buildings a silent testimonial to the lively mining days. The beautiful ruby silver ore and the wealth of gold taken from the mountains made the mining district world famous.

While Ruby City was named the first county seat, its population and businesses soon moved to a better location two miles upstream on February 1, 1867. Silver City was closer to most of the mining operations and had a better winter location. In 1934, after the decline of mining, the county government was moved to Murphy, more central to the livestock and agricultural sections of the country. The first large cattle drive into Idaho came into the Bruneau Valley in Owyhee County in the fall of 1869. It took almost a year for several Owyhee County men to bring 1,400 head of Texas cattle up from the Brazos. These Durham cattle along with a few Texas Longhorns formed the nucleus of the County's beef industry. At one time 100,000 head roamed the Owyhee hills.

About the first day of May, 1863, a party of 29 men led by Michael Jordan left Placerville on a prospecting tour of the tributaries of the Owyhee and Snake Rivers. They crossed the Snake River at the mouth of the Boise River. A stream near their first camp was named Reynolds Creek to honor the party's "laziest man." While camped at Reynolds Creek, two of the men climbed the divide southwest of camp on a tour of observation. On the other side they discovered a large stream surrounded by timber-covered hills.

The next morning the entire group headed in the direction of the reported stream. They reached it late in the afternoon of May 18th, at a point they named Discovery Bar about ten miles below the later site of Dewey.

Dr. Rudd, not waiting to unpack his mule, took his shovel and scooped some loose gravel from the creek bank. He "panned it out," recovering about a hundred "colors." Each man followed suit, finding prospects of 25¢ to 50¢ to a pan. The excitement that followed can be better imagined than described.

3.3 Description of Owyhee County

Owyhee County lies in the southwestern corner of Idaho and is the second largest county in the state. It is bounded on the north by Canyon, Ada, and Elmore Counties, on the west by Oregon State, on the south by Nevada State, and on the east by Twin Falls County.

Owyhee is a large county covering approximately 7,700 square miles. Eighty-four percent of that land is federally owned with the majority managed by the BLM. There are currently 190,500 total acres (4% of the total area of the County) used for agricultural production.

The topography generally slopes from the southwest to the Snake River in the northeast. The greatest elevations occur in the Owyhee Mountains with Hayden Peak at 8,401 feet being the highest point. The lowest elevations are found along the Snake with Homedale at 2,210 feet and Marsing 2,230 feet. The geographic center of Owyhee County averages about 5,000 feet with Grasmere and Triangle at 5,126 feet and 5,280 feet, respectively.

Owyhee County has a semi-arid, mild climate; rainfall varies from four to eighteen inches a year. Farming is almost exclusively through irrigation. Approximately 80,000 acres receive one or more irrigations per year. The climate and soil conditions are suitable for the production of a

variety of crops, including alfalfa seed, hay, sugar beets, potatoes, onions, corn and mixed grain.

The core of the Owyhee County economy is the cattle industry. The majority of the crops grown in Owyhee County are located near the river systems due to the xeric climate and include sugar beets, alfalfa seed, grains, hay, onions, and a few orchard crops. There are several feedlots operating in the county and three large dairies that have recently moved into the area.

3.3.1 Highways

The main highways weaving through the county are U.S. 95 and State Routes 51 and 78. U.S. Highway 95 bisects the northwestern corner Owyhee County near Homedale and Marsing. U.S. 95 is the sole route connecting northern and southern Idaho. State highways serve to connect the more rural areas to main transportation routes in neighboring counties. Highways 78 and 55 are also the only paved routes connecting the small rural communities in the eastern and southern portions of the county to more populated areas to the northwest. Heavy recreational and large truck traffic is particularly intense during the summer and fall and the harvest season.

3.3.2 Rivers

The three major rivers in the county are the Snake River, the Bruneau River, and the Owyhee River. These waterways were historically, and are still today, important aspects of the farming and ranching operations which are the most significant elements in the County economy. Other important bodies of water of importance to agriculture and ranching in the county are C.J. Strike Reservoir and numerous canals and ditches, all of which provide water for agricultural purposes. In addition to the agricultural value of the waters in C.J. Strike, the waters there also serve in the production of electric power via a generating plant operated by Idaho Power.

3.3.3 Recreation

The federally and state managed lands within the county allow for a wide variety of recreational activities ranging from jet boating to remote area camping to off-highway vehicle activities. Hunting and fishing are also popular on the lands and waters of the county. The Silver City Historic District is popular for both recreational activities as well as for the historical experience of visiting the preserved townsite. While recreational activity in Owyhee County is producing some economic benefits to the state economy, it is, unfortunately, not benefiting the economy of Owyhee County.

The lands and waters in Owyhee County are dangerous and unforgiving of the unprepared or careless. Because of the large land area and sparse population, help is not nearly as readily available as it would be in many other southern Idaho counties. Caution should be exercised by anyone recreating and adventuring in Owyhee County.

3.3.3.1 Boating

Rafting and kayaking are popular activities on the Bruneau River and Owyhee River drainages. Jet boating is also enjoyed, particularly on the Snake River. There are several boat ramps or put-in areas along both waterways; however, some of these sites present difficult or hazardous conditions. Tight corners, swift water, and lack of immediately accessible tie-up locations could lead to a potentially unsafe situation.

3.3.3.2 Camping

Camping is another popular activity enjoyed by the residents of Owyhee County. There are several developed sites along the Snake River as well as one near Silver City. The North Fork Owyhee River Crossing campground is also very popular recreation destination. There are also many undeveloped sites suited primarily for tent or small trailer camping.

3.3.3.3 Fishing and Hunting

Fishing and hunting is important to Owyhee County both from a recreational standpoint and as an economic resource. There are several sportsman access sites along the Snake River that allow for fishing, hunting, and wildlife viewing access. Wild birds, such as pheasant, quail, partridge, chukar, grouse, wild duck, geese, and doves, are found in abundance. Fishing on both the Snake River and the Bruneau River has become a very popular pastime for residents and tourists alike. Big game hunting is also popular across Owyhee County, particularly the Owyhee Mountains. The C.J. Strike Wildlife Management Area near Bruneau also allows regulated hunting.

3.3.4 Resource Dependency

Owyhee County's economy depends mainly on agriculture and grazing. Low commodity and cattle prices coupled with increased costs of production have placed a strain on the economic conditions of the producers and of the county. When these conditions will improve is entirely speculative. The closure of the Kinross Delamar Mine has affected employment and tax revenues in the county. Environmental regulations, particularly water quality regulations, may have an impact on irrigated agriculture and dairy operations. More CAFO's may seek to locate in Owyhee County but there may be problems associated with sufficient quality and quantity of water, waste disposal and conflict with residential uses. County Planning and Zoning rules and regulations currently in place adequately address these issues.

There will be continued interest in rural residential development as people who work in Ada and Canyon Counties seek a rural lifestyle. Property values on land suitable for residential development will probably gradually increase. Changing commodity prices and increases in development pressures will place additional pressure on farmers to consider subdividing their farms.

The new Middle School at Homedale may also tend to draw more people to the area from Canyon County. Retail opportunities may increase in Homedale and Marsing. Homedale will have a new retail building products store associated with the lumber products mill.

The communities of Owyhee County have been evaluated by the University of Idaho College of Natural Resources Policy Analysis Group (PAG) for the degree of natural resource dependency each community experiences.

Idaho communities with more than 10% employment in resource-based sectors (wood products, travel & tourism, agriculture, and mining) were evaluated by Harris *et al.* (2003). Their findings indicate the following results (Harris *et al.* 2000):

- Grand View .....Agriculture Only
- Marsing .....Agriculture Only
- Homedale.....Agriculture and Mining

Harris *et al.* (2003) further evaluated Idaho communities based on their level of direct employment in several industrial sectors. Their findings for communities in Owyhee County are summarized in Table 3.6.

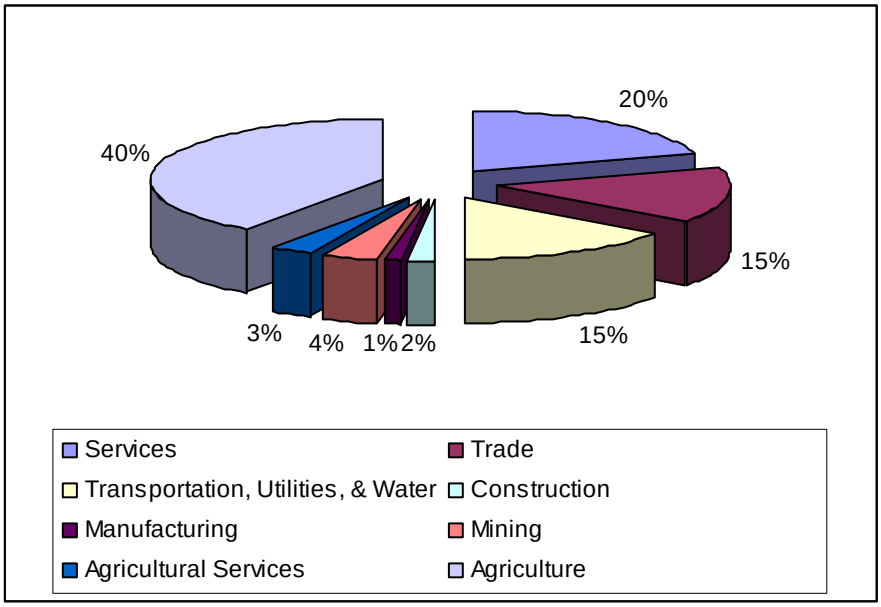
Table 3.6. Levels of direct employment by industrial sector

Community	Economic Diversity Index	Agriculture	Timber	Travel and Tourism	State / Local Gov.	Federal Gov.	Mining and Minerals
Grand View	Med. Low	High	Low	Med. Low	Med. High	Med. Low	Low
Marsing	Med. High	High	Low	Low	Med. High	Med. Low	Low
Homedale	High	Med. High	Low	Low	Med. High	Low	Med. High

A "low" level of direct employment represents 5% or less of total employment in a given sector; "med. low," 6 to 10%; "med. high" 11 to 19%; and "high" 20% or more of total employment in a given sector.

Source: Harris *et al.* 2000

Figure 3.2. Owyhee County Economy Value Added 1995.



Source: UI Owyhee County Economic Model

3.4 Cultural Resources

Cultural resource impacts were qualitatively assessed through a presence/absence determination of significant cultural resources and mitigation measures to be employed during potential fire mitigation activities such as thinning and prescribed fire.

The United States has a unique legal relationship with Indian tribal governments defined in history, the U.S. Constitution, treaties, statutes, Executive Orders, and court decisions. Since the formation of the union, the United States has recognized Indian tribes as domestic dependant nations under its protection. The Federal Government has enacted numerous regulations that establish and define a trust relationship with Indian tribes.

The relationship between Federal agencies and sovereign tribes is defined by several laws and regulations addressing the requirement of Federal agencies to notify or consult with Native

American groups or otherwise consider their interests when planning and implementing Federal undertakings, among these are:

- **EO 13175, November 6, 2000**, Consultation and Coordination with Indian Tribal Governments.
- **Presidential Memorandum, April, 1994**. Government-Government relations with Tribal Governments (Supplements EO 13175). Agencies must consult with federally recognized tribes in the development of federal policies that have tribal implications.
- **EO 13007, Sacred sites, May 24, 1996**. Requires that in managing Federal lands, agencies must accommodate access and ceremonial use of sacred sites and must avoid adversely affecting the physical integrity of these sites.
- **EO 12875, Enhancing Intergovernmental Partnerships, October 26, 1993**. Mainly concerned with unfunded mandates caused by agency regulations. Also states the intention of establishing "regular and meaningful consultation and collaboration with state, local and tribal governments on matters that significantly or uniquely affect their communities."
- **Native American Graves Protection and Repatriation Act (NAGPRA) of 1989**. Specifies that an agency must take reasonable steps to determine whether a planned activity may result in the excavation of human remains, funerary objects, sacred objects and items of cultural patrimony from Federal lands. NAGPRA also has specified requirements for notifying and consulting tribes.
- **Archaeological Resources Protection Act (ARPA), 1979**. Requires that Federal permits be obtained before cultural resource investigations begin on Federal land. It also requires that investigators consult with the appropriate Native American tribe prior to initiating archaeological studies on sites of Native American origin.
- **American Indian Religious Freedom Act (AIRFA), 1978**. Sets the policy of the US to protect and preserve for Native Americans their inherent rights of freedom to believe, express, and exercise the traditional religions of the American Indian . . . including, but not limited to access to sacred sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites.
- **National Environmental Policy Act (NEPA), 1969**. Lead agency shall invite participation of affected Federal, State, and local agencies and any affected Indian Tribe(s).
- **National Historic Preservation Act (NHPA), 1966**. Requires agencies to consult with Native American tribes if a proposed Federal action may affect properties to which they attach religious and cultural significance. (Bulletin 38 of the act, identification of TCPs, this can only be done by tribes.)
- Treaties (supreme law of the land) in which tribes were reserved certain rights for hunting, fishing and gathering and other stipulations of the treaty.
- Unsettled aboriginal title to the land, un-extinguished rights of tribes.

The Duck Valley Indian Reservation is home to the Shoshone and Paiute Tribes. The Duck Valley Indian Reservation is partially located in Owyhee County, and partially in Nevada. The Duck Valley Reservation Wildland-Urban Interface Wildfire Management Plan was completed in 2004 and provides guidance for fire management activities on the Reservation.

3.4.1 National Register of Historic Places

The National Park Service maintains the National Register of Historical Places as a repository of information on significant cultural locale. These may be buildings, roads or trails, places where historical events took place, or other noteworthy sites. The NPS has recorded sites in its database. These sites are summarized in Tables 3.8.

Table 3.7. National Register of Historic Places in Owyhee County, Idaho.

Item	Resource Name	Address	City	Listed	Architect or Builder
1	Bernard's Ferry	N of Murphy off ID 78	Murphy	1978	
2	Bruneau Episcopal Church	Off ID 51	Bruneau	1982	Tourtellotte & Hummel
3	Camas and Pole Creeks Archeological District		Wagon Box Basin	1986	
4	Camp Lyon Site	1 mi. E of U.S. 95	Jordan Valley	1972	
5	Camp Three Forks	S of Jordan Valley	Silver City	1972	
6	Delamar Historic District	6 mi. W of Silver City	Silver City	1976	
7	Guffey Butte--Black Butte Archeological District			1978	
8	Gusman, James E., and Emma, Ranch	South Mountain Rd	Jordan Valley	1999	
9	Noble Horse Barn	Reynolds Cr. 12 mi. SW of Murphy	Murphy	1991	
10	Our Lady, Queen of Heaven Church		Oreana	1980	Pierson,John, Kelly,Jim
11	Owyhee County Courthouse	ID 78	Murphy	1982	Tourtellotte & Hummel
12	Poison Creek Stage Station	S of Homedale off Jump Creek Rd	Homedale	1978	Proud,Matt C.
13	Silver City Historic District	Silver City and its environs	Silver City	1972	
14	Wickahoney Post Office and Stage Station	Wickahoney Creek	Wickahoney	1982	Dunning, Dow

(NRHP 2003)

Fire mitigation activities in and around these sites has the potential to affect historic places. In all cases, the fire mitigation work will be intended to reduce the potential of damaging the site due to wildfire. Areas where ground disturbance will occur will need to be inventoried depending on the location. Such actions may include, but are not limited to, constructed firelines (handline, mechanical line, etc.), new roads to creeks to fill water tankers, mechanical treatments, etc. Only those burn acres that may impact cultural resources that are sensitive to burning (i.e., buildings, peeled bark trees, etc.) would be examined. Burns over lithic sites are not expected to have an impact on those sites, as long as the fire is of low intensity and short duration. Some areas with heavy vegetation may need to be examined after the burn to locate and record any cultural resources although this is expected to be minimal. Traditional Cultural Properties (TCPs) will also need to be identified. Potential impact to TCPs will depend on what values make the property important and will be assessed on an individual basis.

3.5 Transportation

The primary access route connecting rural communities in Owyhee County is State Route 78. This is a two lane highway that enters the county near Indian Cove on the eastern side, travels through the communities of Indian Cove, Bruneau, Grand View, Murphy, Guffy, Wilson, Givens Hot Springs, and Marsing. US Highway 95, a two-lane route, bisects the northwestern corner of the county before crossing into Oregon. This access is the only primary route connecting north and south Idaho. State Highway 51 serves as a connection route between Mountain Home in neighboring Elmore County and Nevada. All major roadways in Owyhee County are relatively level and well-maintained with good width and access and exit points.

Smaller roads maintained by the County and the BLM, or private entities provide access to the adjoining areas within the county, including recreational areas and rural agricultural hubs. A variety of unimproved roads are found throughout the publicly owned BLM lands.

Almost all of the roads in the county were originally built to facilitate farming and ranching activities. As such, these roads can support harvesting equipment, trucks, and fire fighting equipment referenced in this document. However, many of the new roads have been built for homesite access, especially for new sub-divisions. In most cases, these roads are adequate to facilitate firefighting equipment as they adhere to County Building Codes. County building codes for new developments should be adhered to closely to insure this tendency continues.

The Land Use Planning Act located in Title 67, requires Idaho Counties to address transportation in the individual Comprehensive Plans. It requires an analysis, prepared in coordination with the local jurisdiction(s) having authority over the public highways and streets, showing the general locations and traffic ways, and of streets and the recommended treatment thereof. This component may also make recommendations on building line setbacks, control or access, street naming and numbering, and proposes a system of public and other transit lines and related facilities including rights-of-ways, terminals, future corridors, viaducts and grade separations. The component may also include port, harbor, aviation and other related transportation facilities.

3.6 Vegetation & Climate

Vegetation in Owyhee County is a mix of rangeland, agriculture, and forestland ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the vegetation of the area. The full extent of the county was evaluated for cover type as determined from Landsat 7 ETM+ imagery in tabular format, Table 3.9.

The most represented vegetated cover type is a Basin & Wyoming Big Sagebrush type at approximately 48% of the County's total area (2.3 million acres). The next most common vegetation cover type represented is Perennial Grassland, at 11% of the total area. Low Sagebrush is the third most common plant cover type at just under 11% of the total area (Table 3.8).

Table 3.8. Cover Types in Owyhee County

	Acres	Percent of County's Total Area
Basin & Wyoming Big Sagebrush	2,373,941	48.2%
Perennial Grassland	547,044	11.1%
Low Sagebrush	533,170	10.8%
Western Juniper	408,399	8.3%
Salt-desert Shrub	290,419	5.9%

Table 3.8. Cover Types in Owyhee County	Acres	Percent of County's Total Area
Shrub/Steppe Annual Grass-Forb	221,488	4.5%
Agricultural Land	190,500	3.9%
Bitterbrush	71,335	1.4%
Mountain Big Sagebrush	67,236	1.4%
Warm Mesic Shrubs	48,172	1.0%
Curlleaf Mountain Mahogany	46,617	0.9%
Douglas-fir	23,595	0.5%
Shrub Dominated Riparian	22,375	0.5%
Rabbitbrush	19,552	0.4%
Water	10,003	0.2%
Perennial Grass Slope	8,970	0.2%
Aspen	6,910	0.1%
Foothills Grassland	5,988	0.1%
Broadleaf Dominated Riparian	4,579	0.1%
Exposed Rock	3,780	0.1%
Vegetated Sand Dune	3,721	0.1%
Shallow Marsh	2,879	0.1%
Mixed Barren Land	1,853	0.0%
Graminiod or Forb Dominated Riparian	1,616	0.0%
Deep Marsh	1,296	0.0%
Subalpine Fir	1,168	0.0%
High Intensity Urban	1,054	0.0%
Sand Dune	656	0.0%
Disturbed, Low	640	0.0%
Low Intensity Urban	470	0.0%
Mountain Low Sagebrush	401	0.0%
Needleleaf Dominated Riparian	279	0.0%
Disturbed, High	115	0.0%
Total Area	**4,920,220**	

Vegetative communities within the county follow the strong moisture and temperature gradient related to the major river drainages. Limited precipitation and soil conditions result in a relatively arid environment.

3.6.1 Monthly Climate Summaries In or Near Owyhee County

3.6.1.1 Reynolds, Idaho

Period of Record Monthly Climate Summary
Period of Record : 12/1/1961 to 6/30/2004

Table 3.9 Climate records for Reynolds, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	38.7	43.7	51.0	58.3	67.6	76.5	86.1	85.4	75.4	63.6	48.6	39.6	61.2
Average Min.	20.2	23.6	27.8	32.5	39.6	46.2	52.3	51.2	42.4	33.0	25.9	19.9	34.6

Table 3.9 Climate records for Reynolds, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature (F)													
Average Total Precipitation (in.)	1.20	0.78	0.96	0.99	1.21	1.12	0.34	0.51	0.52	0.74	1.10	1.12	10.59
Average Total SnowFall (in.)	2.6	2.3	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.2	0.9	2.5	10.1
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record. Max. Temp.: 98.6% Min. Temp.: 98.6% Precipitation: 98.9% Snowfall: 90.6% Snow Depth: 88.3%

3.6.1.2 Silver City, Idaho

Period of Record Monthly Climate Summary
Period of Record : 11/1/1978 to 6/30/2004

Table 3.10 Climate records for Silver City, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	35.7	37.8	45.0	52.1	61.0	70.2	80.3	80.1	70.6	58.3	41.7	35.6	55.7
Average Min. Temperature (F)	20.3	20.8	26.9	31.4	40.3	46.6	55.1	54.8	46.2	37.0	25.3	20.2	35.4
Average Total Precipitation (in.)	3.04	2.19	2.24	2.33	2.28	1.32	0.63	0.55	0.83	1.33	2.18	2.02	20.93
Average Total SnowFall (in.)	21.1	12.9	10.3	5.7	2.1	0.1	0.0	0.0	0.2	2.1	11.1	15.4	80.9
Average Snow Depth (in.)	22	27	20	6	0	0	0	0	0	0	3	13	7

Percent of possible observations for period of record. Max. Temp.: 86.8% Min. Temp.: 86.3% Precipitation: 89.6% Snowfall: 90.3% Snow Depth: 82%

3.6.1.3 Grand View, Idaho

Period of Record Monthly Climate Summary
Period of Record : 4/ 1/1933 to 6/30/2004

Table 3.11 Climate records for Grand View, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	39.7	48.1	58.4	67.6	76.5	84.6	94.2	92.4	81.8	68.6	51.7	41.3	67.1
Average Min. Temperature (F)	20.4	25.0	29.6	36.5	44.2	51.3	56.4	53.6	44.1	34.9	26.8	21.7	37.0
Average Total Precipitation (in.)	0.71	0.53	0.70	0.67	0.89	0.78	0.20	0.20	0.42	0.45	0.70	0.61	6.86
Average Total SnowFall (in.)	2.6	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.9	5.6
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record. Max. Temp.: 95.4% Min. Temp.: 95% Precipitation: 93.6% Snowfall: 92.8% Snow Depth: 86.6%

3.6.1.4 Bruneau, Idaho

Period of Record Monthly Climate Summary
Period of Record : 6/ 1/1962 to 6/30/2004

Table 3.12 Climate records for Bruneau, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	40.5	48.3	58.2	66.1	75.5	84.6	93.3	91.8	81.6	68.7	51.6	40.5	66.7
Average Min. Temperature (F)	23.2	26.6	31.1	36.5	44.3	51.5	56.8	55.1	45.9	36.7	29.5	22.9	38.3
Average Total Precipitation (in.)	0.87	0.53	0.68	0.73	0.72	0.78	0.17	0.26	0.46	0.47	0.96	0.73	7.37
Average Total SnowFall (in.)	1.6	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.3	4.3
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record. Max. Temp.: 97% Min. Temp.: 95.8% Precipitation: 96.2% Snowfall: 92.5% Snow Depth: 88.2%

3.7 Wildfire Hazard Profiles

3.7.1 Wildfire Ignition & Extent Profile

In Mountain big-sagebrush habitats, normal fire frequency is estimated to have been estimated to be 15 to 25 years in southwest Idaho (in some instances as short as 3 to 7 years), and 12 to 15 years in south central Oregon. In Wyoming big-sagebrush habitats fire return intervals have been estimated at 50 to 120 years. Because of increased fine fuel from exotic annual grasses and more human-caused wildfires, fire frequencies are now as little as 5 years in some low-elevation habitats. Management strategies to decrease wildfire in these areas include increased fire suppression efforts, focused protection of key habitat areas during a wildfire, aggressive reseeding of sagebrush and where needed perennial grasses in burned areas, and developing greenstrips (strips of fire-resistant vegetation planted to slow wildfires) and other fuel breaks.

Detailed records of fire ignition and extent have been compiled by the USDI Bureau of Land Management. Using this data on past fire extents and fire ignition data, the occurrence of wildland fires in the region of Owyhee County has been evaluated. Many fires have burned in the region of Owyhee County. Figure 3.3 summarizes wildfire ignitions and acres burned each year from 1957 through 2002 with projections for the 1950s and the remainder of the 2000 decade based on current trends. Approximately 38,800 acres burn annually in Owyhee County based on this data, Figure 3.3. Each decade approximately 350,000 acres burn in wildfire events in Owyhee County. The most acres burned in any one decade was the 1980's when approximately 622,000 acres burned (Figure 3.3).

Unfortunately, detailed records on fire cause have not been maintained for wildfires in Owyhee County. In other counties of Idaho, wildfire occurrence is recorded by a variety of sources, including the Idaho Department of Lands. The IDL database of wildfire ignitions lacks the GIS association allowing analysts to map their ignition data, but it does contain detailed information on fire cause, costs, and other relevant information. The database analyzed for this planning effort contained detailed information on fire extent and included a GIS element allowing mapping of this data. It is strongly recommended that the BLM and Owyhee County cooperate on collecting additional data on ignition cause as well as current extent mapping as time goes on.

Figure 3.3. Owyhee County Wildfire Extent Profile

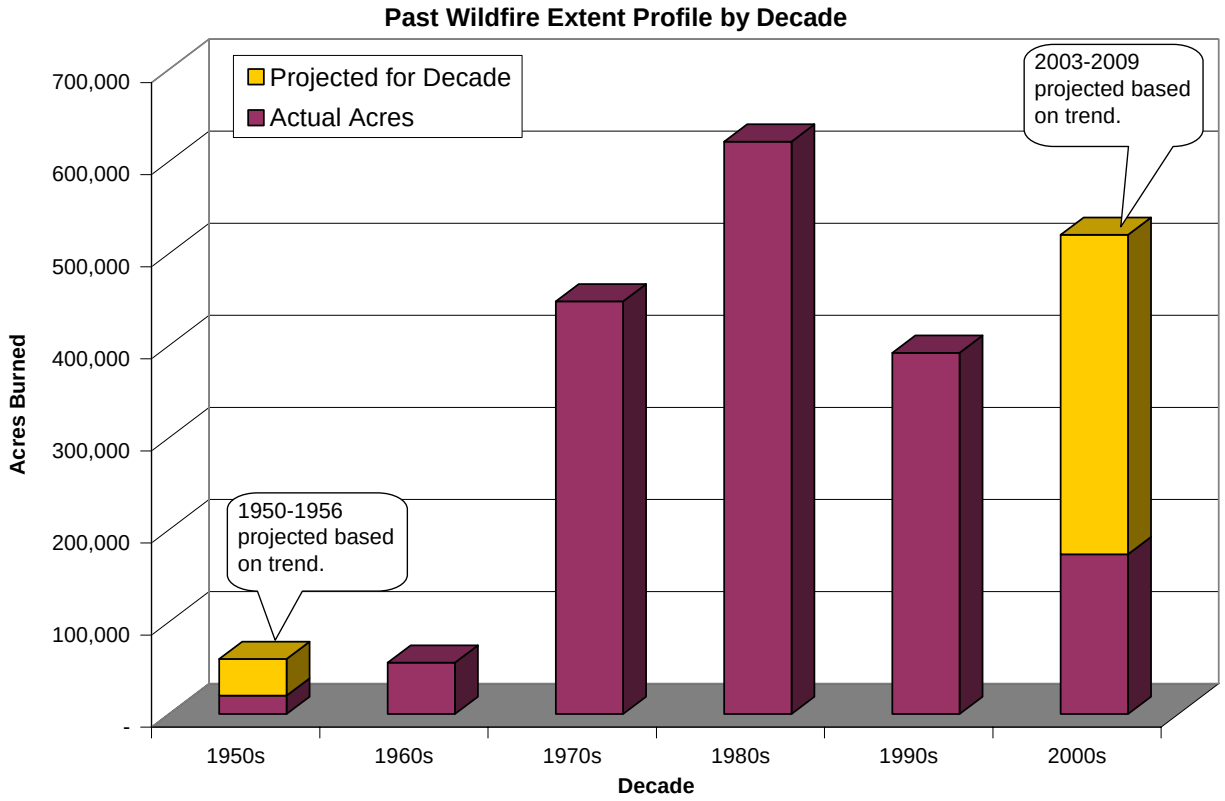


Table 3.13. Wildfire Extent Profile in Owyhee County.

Decade	Acres burned each decade
1950s	59,938
1960s	55,808
1970s	448,218
1980s	621,712
1990s	392,286
2000s	520,464

3.7.2 Wildfire Extent on the Saylor Creek Range

The Mountain Home Air Force Base manages the Saylor Creek Range located within the Northeast corner of Owyhee County. The Air Force uses the range as a training area, primarily as a bombing range. The detonation of explosives and use of various training aids are often the source points for fire ignitions. The Air Force provided records going back to 1996 regarding the number, cause and extent of fires on the Saylor Creek Range. Table 3.14 summarize the information provided.

Table 3.14. Wildfire Extents on the Saylor Creek Firing Range.

Month and Year	Size (ac)	Cause	Month and Year	Size(ac)	Cause
6-96	75	Bomb	6-96	300	Controlled Burn
6-96	50	Not Listed	6-96	50	Smokey SAM
8-96	1	Smokey SAM	10-96	2	Smokey SAM
10-96	.5	Smokey SAM	6-97	1	Not Listed
6-97	1	Not Listed	6-97	1	Not Listed
6-97	50	Controlled Burn	6-97	3	Not Listed
6-97	10	Not Listed	6-97	1	Smokey SAM
6-97	1	Smokey SAM	6-97	20	Controlled Burn
6-97	50	Controlled Burn	6-97	10	Not Listed
6-97	50	Controlled Burn	6-97	15	Not Listed
7-97	1	Smokey SAM	7-97	1	Smokey SAM
7-97	2	Not Listed	8-97	1	Smokey SAM
8-97	1	Smokey SAM	8-97	2	Smokey SAM
8-97	1	Smokey SAM	8-97	1	Smokey SAM
8-97	1	Smokey SAM	8-97	.5	Smokey SAM
8-97	.5	Smokey SAM	8-97	1	Smokey SAM
8-97	.5	Smokey SAM	8-97	.5	Smokey SAM
8-97	1	Smokey SAM	6-98	.5	BDU-33
6-98	.5	BDU-33	6-98	.5	BDU-33
6-98	6	BDU-33	6-98	1	BDU-33
6-98	.5	BDU-33	6-98	.25	BDU-33
6-98	.25	BDU-33	6-98	1	BDU-33
6-98	4	BDU-33	6-98	3	BDU-33
7-98	1	BDU-33	7-98	5	BDU-33
7-98	10	BDU-33	7-98	25	BDU-33
7-98	2	BDU-33	7-98	.5	BDU-33
7-98	20	Smokey SAM	7-98	2	BDU-33
7-98	.25	Smokey SAM	7-98	.5	Smokey SAM
7-98	1	Smokey SAM	9-98	1	Smokey SAM
9-98	2	Smokey SAM	5-99	5	Bomb
5-99	4	Bomb	5-99	9	Bomb
5-99	1	Bomb	5-99	1	Bomb
6-99	5	Bomb	6-99	2	Bomb
6-99	1	Bomb	6-99	2	Bomb
6-99	75	Controlled Burn	6-99	50	Controlled Burn
6-99	1	Controlled Burn	6-99	1	Controlled Burn
7-99	4	Smokey SAM	7-99	5	Bomb
7-99	10	Bomb	7-99	2	Smokey SAM
8-99	15	Bomb	9-99	3	Smokey SAM
10-99	2	Bomb	10-99	2	Bomb
10-99	4	Bomb	10-99	2	Bomb
5-00	.15	BDU-33	5-00	.15	BDU-33
5-00	20	BDU-33	5-00	.5	BDU-33
5-00	250	BDU-33	5-00	.15	BDU-33

Table 3.14. Wildfire Extents on the Saylor Creek Firing Range.

Month and Year	Size (ac)	Cause	Month and Year	Size(ac)	Cause
5-00	1	BDU-33	5-00	10	BDU-33
5-00	.15	BDU-33	5-00	.25	BDU-33
5-00	20	BDU-33	5-00	5	BDU-33
6-00	250	BDU-33	6-00	150	BDU-33
6-00	225	BDU-33	6-00	15	BDU-33
6-00	25	BDU-33	6-00	300	BDU-33
6-00	300	BDU-33	6-00	5	BDU-33
6-00	5	BDU-33	6-00	20	BDU-33
6-00	2	BDU-33	6-00	2	BDU-33
6-00	150	BDU-33	7-00	2	BDU-33
7-00	.25	Smokey SAM	7-00	.25	Smokey SAM
9-00	25	BDU-33	9-00	2	BDU-33
9-00	2	Smokey SAM	9-00	4	BDU-33
9-00	1	Smokey SAM	9-00	20	BDU-33
5-01	.15	Smokey Sam	5-01	3	Bomb
5-01	.07	Smokey SAM	5-01	1	Bomb
5-01	.25	Smokey SAM	5-01	.25	Bomb
5-01	5	Bomb	5-01	.07	Bomb
5-01	500	Unknown	6-01	100	Bomb
6-01	250	Smokey SAM	6-01	175	Bomb
6-01	100	Bomb	6-01	5	Bomb
6-01	400	Bomb	6-01	100	Bomb/Flare
6-01	150	Bomb	6-01	20	Flare
6-01	.25	Smokey SAM	6-01	1000	Bomb
6-01	500	Bomb	6-01	200	Bomb
7-01	20	Bomb	7-01	150	Bomb
7-01	50	Bomb	7-01	3	Smokey SAM
7-01	1	Smokey Gun	7-01	1	Smokey Gun
8-01	.5	Smokey Gun	8-01	1000	Smokey Gun
9-01	.07	Smokey Gun	10-01	1	Bomb
10-01	1	Bomb	10-01	1	Bomb
2-02	.5	Smokey SAM	4-02	.5	Smokey SAM
6-02	1	BDU-33	6-02	2	BDU-33
7-02	3	Smokey SAM	8-02	2	BDU-33
9-02	1	BDU-33	9-02	1	BDU-33
9-02	2	BDU-33	10-02	1	BDU-33
5-03	.5	Bomb	5-03	.25	Smokey Gun
5-03	4	Bomb	5-03	2	Bomb
6-03	7	Bomb	6-03	.5	Smokey Gun
6-03	.5	Bomb	6-03	.5	Bomb
6-03	.5	Smokey Gun	6-03	.5	Bomb
6-03	.5	Bomb	6-03	.5	Bomb
6-03	1	Bomb	6-03	.5	Bomb
6-03	3	Bomb	6-03	4	Bomb

Table 3.14. Wildfire Extents on the Saylor Creek Firing Range.

Month and Year	Size (ac)	Cause	Month and Year	Size(ac)	Cause
6-03	1	Bomb	6-03	3	Bomb
6-03	4	Bomb	7-03	2	Bomb
9-03	.5	Bomb	9-03	.5	Bomb
9-03	1	Bomb	9-03	1	Bomb
10-03	1	Bomb	10-03	.5	Bomb
10-03	.5	Bomb	10-03	.5	Bomb
10-03	.5	Bomb	6-04	2	Bomb
6-04	2	Bomb	6-04	.5	Bomb
6-04	.5	Bomb	6-04	.07	Bomb
6-04	.07	Smokey SAM	7-04	10	EOD
7-04	150	Bomb	7-04	250	Bomb
7-04	.25	Bomb	7-04	.25	Bomb

3.7.3 Regional and National Wildfire Profile

Across the west, wildfires have been increasing in extent and cost of control. The National Interagency Fire Center (2003) reports nearly 88,500 wildfires in 2002 burned a total of nearly 7 million acres and cost $1.6 billion (Table 3.15). By most informed accounts, the 2003 totals will be significantly higher in terms of acres burned and cost.

Table 3.15. National Fire Season 2002 Summary

Number of Fires (2002 final)	88,458
10-year Average (1992-2001)	103,112
Acres Burned (2002 final)	*** 6,937,584**
10-year Average (1992-2001)	4,215,089
Structures Burned (835 primary residences, 46 Commercial buildings, 1500 outbuildings)	2,381
Estimated Cost of Fire Suppression (Federal agencies only)	$ 1.6 billion

- *This figure differs from the 7,184,712 acres burned estimate provided by the National Interagency Coordination Center (NICC). The NICC estimate is based on information contained in geographic area and incident situation reports prepared at the time fires occurred. The 6,937,584 estimate is based on agency end-of-year reports.*

The National Interagency Fire Center, located in Boise, Idaho, maintains records of fire costs, extent, and related data for the entire nation. Tables 3.16 and 3.17 summarize some of the relevant wildland fire data for the nation, and some trends that are likely to continue into the future unless targeted fire mitigation efforts are implemented and maintained in areas like Owyhee County.

Table 3.16. Total Fires and Acres 1960 - 2002 Nationally.

Year	Fires	Acres	Year	Fires	Acres
2002	88,458	*** 6,937,584**	1980	234,892	5,260,825
2001	84,079	3,555,138	1979	163,196	2,986,826
2000	122,827	8,422,237	1978	218,842	3,910,913
1999	93,702	5,661,976	1977	173,998	3,152,644
1998	81,043	2,329,709	1976	241,699	5,109,926

Table 3.16. Total Fires and Acres 1960 - 2002 Nationally.

Year	Fires	Acres	Year	Fires	Acres
1997	89,517	3,672,616	1975	134,872	1,791,327
1996	115,025	6,701,390	1974	145,868	2,879,095
1995	130,019	2,315,730	1973	117,957	1,915,273
1994	114,049	4,724,014	1972	124,554	2,641,166
1993	97,031	2,310,420	1971	108,398	4,278,472
1992	103,830	2,457,665	1970	121,736	3,278,565
1991	116,953	2,237,714	1969	113,351	6,689,081
1990	122,763	5,452,874	1968	125,371	4,231,996
1989	121,714	3,261,732	1967	125,025	4,658,586
1988	154,573	7,398,889	1966	122,500	4,574,389
1987	143,877	4,152,575	1965	113,684	2,652,112
1986	139,980	3,308,133	1964	116,358	4,197,309
1985	133,840	4,434,748	1963	164,183	7,120,768
1984	118,636	2,266,134	1962	115,345	4,078,894
1983	161,649	5,080,553	1961	98,517	3,036,219
1982	174,755	2,382,036	1960	103,387	4,478,188
1981	249,370	4,814,206			

(National Interagency Fire Center 2003)

Table 3.17. Suppression Costs for Federal Agencies Nationally.

Year	Bureau of Land Management	Bureau of Indian Affairs	Fish and Wildlife Service	National Park Service	USDA Forest Service	Totals
1994	$98,417,000	$49,202,000	$3,281,000	$16,362,000	$678,000,000	**$845,262,000**
1995	$56,600,000	$36,219,000	$1,675,000	$21,256,000	$224,300,000	**$340,050,000**
1996	$96,854,000	$40,779,000	$2,600	$19,832,000	$521,700,000	**$679,167,600**
1997	$62,470,000	$30,916,000	$2,000	$6,844,000	$155,768,000	**$256,000,000**
1998	$63,177,000	$27,366,000	$3,800,000	$19,183,000	$215,000,000	**$328,526,000**
1999	$85,724,000	$42,183,000	$4,500,000	$30,061,000	$361,000,000	**$523,468,000**
2000	$180,567,000	$93,042,000	$9,417,000	$53,341,000	$1,026,000,000	**$1,362,367,000**
2001	$192,115,00	$63,200,000	$7,160,000	$48,092,000	$607,233,000	**$917,800,000**
2002	$204,666,000	$109,035,000	$15,245,000	$66,094,000	$1,266,274,000	**$1,661,314,000**

(National Interagency Fire Center 2003)

Although many very large fires, growing to over 250,000 acres have burned in the Southwest Idaho Region, which Owyhee County is a part, actual fires in this county have usually been controlled at smaller extents. This is not to imply that wildfires are not a concern in this county, but to point to the aggressive and professional manner to which the wildland and rural fire districts cooperate in controlling these blazes. The Bureau of Land Management provides primary wildfire protection in Owyhee County. Rural and city fire districts augment these services with home protection and related services.

3.8 Analysis Tools and Techniques to Assess Fire Risk

Owyhee County and the adjacent counties of Ada, Canyon and Elmore, were analyzed using a variety of techniques, managed on a GIS system (ArcGIS 8.2). Physical features of the region were represented by data layers including roads, streams, soils, elevation, and remotely sensed images from the Landsat 7 ETM+ satellite. Field visits were conducted by specialists from Northwest Management, Inc., and others. Discussions with area residents and fire control specialists augmented field visits and provided insights to rangeland and forest health issues and treatment options.

This information was analyzed and combined to develop an assessment of wildland fire risk in the region.

3.8.1 Fire Prone Landscapes

Schlosser *et al.* 2002, developed a methodology to assess the location of fire prone landscapes on forested and non-forested ecosystems in the western US. Working under an agreement with the Clearwater Resource Conservation and Development Council, Inc., (RC&D), Northwest Management, Inc., completed a similar assessment for five counties in the north central Idaho area including Clearwater County, Idaho County, Latah County, Lewis County, and Nez Perce County. In a separate project, also funded by the Bureau of Land Management working in cooperation with Ada, Canyon, and Elmore Counties, through the Southwest Idaho RC&D Area, Northwest Management, Inc., completed a Fire Prone Landscapes assessments on those listed areas. Additional assessments of Fire Prone Landscapes were completed for approximately 20 additional counties in Montana and Idaho.

The goal of developing the Fire Prone Landscapes analysis is to make inferences about the relative risk factors across large geographical regions (multiple counties) for wildfire spread. This analysis uses the extent and occurrence of past fires as an indicator of characteristics for a specific area and their propensity to burn in the future. Concisely, if a certain combination of vegetation cover type, canopy closure, aspect, slope, stream and road density have burned with a high occurrence and frequently in the past, then it is reasonable to extrapolate that they will have the same tendency in the future, unless mitigation activities are conducted to reduce this potential.

The analysis for determining those landscapes prone to wildfire utilized a variety of sources.

Digital Elevation: Digital elevation models (DEM) for the project used USGS 10 meter DEM data provided at quarter-quadrangle extents. These were merged together to create a continuous elevation model of the analysis area.

The merged DEM file was used to create two derivative data layers; aspect and slope. Both were created using the spatial analyst extension in ArcGIS 8.2. Aspect data values retained one decimal point accuracy representing the cardinal direction of direct solar radiation, represented in degrees. Slope was recorded in percent and also retained one decimal point accuracy.

Remotely Sensed Images: Landsat 7 Enhanced Thematic Mapper (ETM+) images were used to assess plant cover information and percent of canopy cover. The Landsat ETM+ instrument is an eight-band multi-spectral scanning radiometer capable of providing high-resolution image information of the Earth's surface. It detects spectrally-filtered radiation at visible, near-infrared, short-wave, and thermal infrared frequency bands from the sun-lit Earth. Nominal ground sample distances or "pixel" sizes are 15 meters in the panchromatic band; 30 meters in the 6 visible, near and short-wave infrared bands; and 60 meters in the thermal infrared band.

The satellite orbits the Earth at an altitude of approximately 705 kilometers with a sun-synchronous 98-degree inclination and a descending equatorial crossing time of 10 a.m. daily.

Image spectrometry has great application for monitoring vegetation and biophysical characteristics. Vegetation reflectance often contains information on the vegetation chlorophyll absorption bands in the visible region and the near infrared region. Plant water absorption is easily identified in the middle infrared bands. In addition, exposed soil, rock, and non-vegetative surfaces are easily separated from vegetation through standard hyper-spectral analysis procedures.

Two Landsat 7 ETM images were obtained to conduct hyper-spectral analysis for this project. The first was obtained in 1998 and the second in 2002. Hyper-spectral analysis procedures followed the conventions used by the Idaho Vegetation and Land Cover Classification System, modified from Redmond (1997) and Homer (1998).

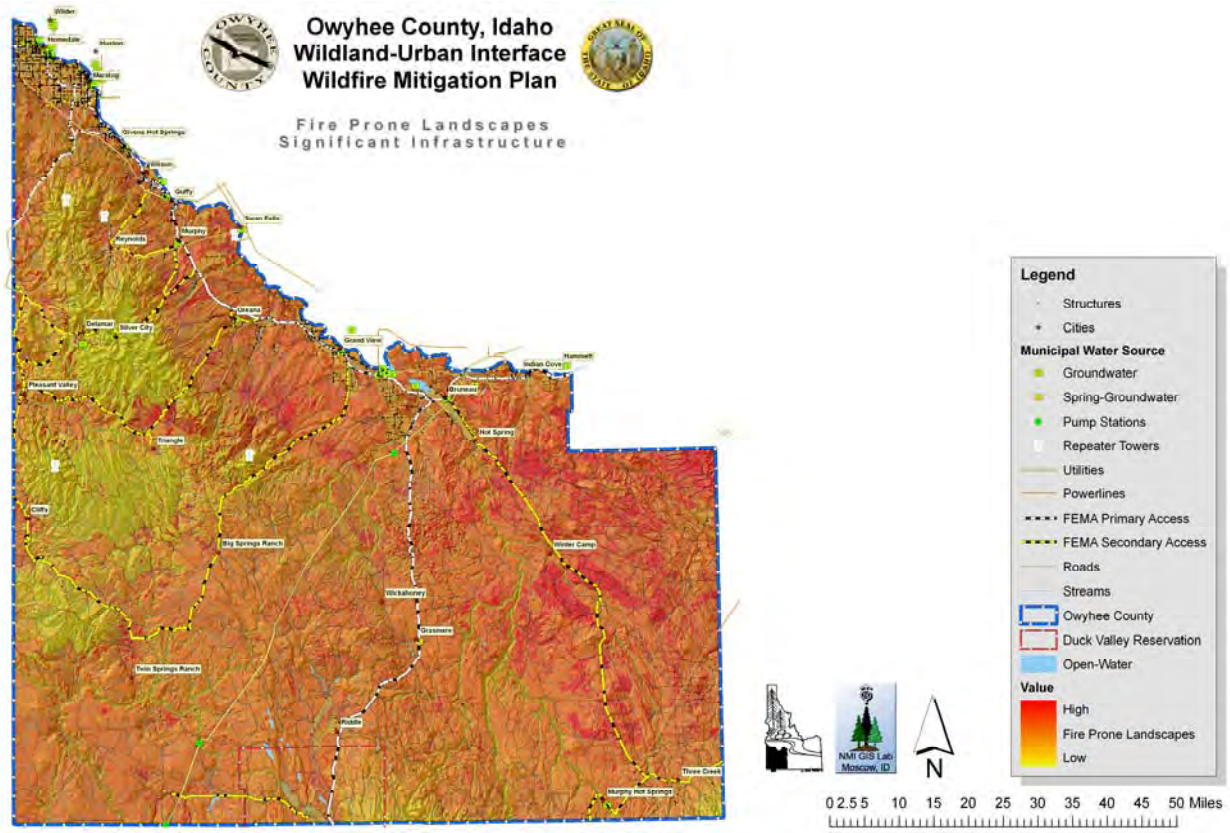
Riparian Zones: Riparian zones were derived from stream layers created during the Interior Columbia Basin Ecosystem Management Project (Quigley *et al.* 2001).

Wind Direction: Wind direction and speed data detailed by monthly averages was used in this project to better ascertain certain fire behavior characteristics common to large fire events. These data are spatially gridded Average Monthly Wind Directions in Idaho. The coverage was created from data summarized from the Interior Columbia Basin Ecosystem Management Project (Quigley *et al.* 2001).

Past Fires: Past fire extents represent those locations on the landscape that have previously burned during a wildfire. Past fire extent maps were obtained from a variety of sources for the south west Idaho area including the Bureau of Land Management.

Fire Prone Landscapes: Using the methodology developed by Schlosser *et al.* (2002), and refined for this project, the factors detailed above were used to assess the potential for the landscape to burn during the fire season in the case of fire ignition. Specifically, the entire region was evaluated at a resolution of 10 meters (meaning each pixel on the screen represented a 10 meter square on the ground) to determine the propensity for a particular area (pixel) to burn in the case of a wildfire. The analysis involved creating a linear regression analysis within the GIS program structure to assign a value to each significant variable, pixel-by-pixel. The analysis ranked factors from 0 (little to no risk) to 100 (extremely high risk) based on past fire occurrence. In fact, the maximum rating score for Owyhee County was 90 with a low of 8.

Figure 3.4. Fire Prone Landscapes in Owyhee County.



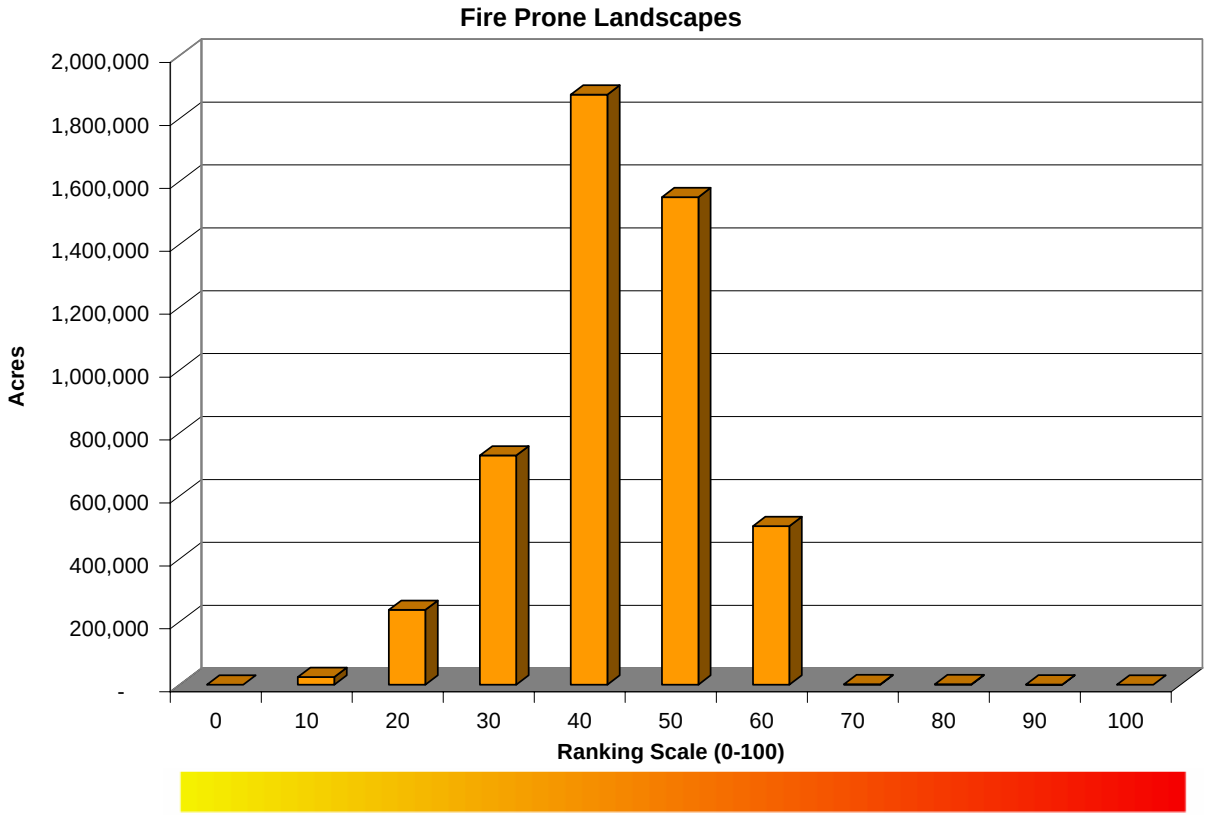
This map is presented for reference in this section of the plan. This map, and additional maps are detailed in Appendix I.

The maps depicting these risk categories display yellow as the lowest risk and red as the highest with values between a constant gradient from yellow to orange to red (Table 3.18). While large maps (12 square feet) have been provided as part of this analysis, smaller size maps are presented in Appendix I.

Table 3.18. Fire Prone Landscape rankings and associated acres in each category for Owyhee County.

Color Code	Value	Total	Percent of Total Area
	0	7	0%
	10	24,083	0%
	20	237,515	5%
	30	728,263	15%
	40	1,875,965	38%
	50	1,549,590	31%
	60	503,764	10%
	70	1,093	0%
	80	986	0%
	90	392	0%
	100	-	0%

Figure 3.5. Distribution of area by Fire Prone Landscape Class.



The risk category values developed in this analysis should be considered **ordinal data**, that is, while the values presented have a meaningful ranking, they neither have a true zero point nor scale between numbers. Rating in the “40” range is not necessarily twice as “risky” as rating in the “20” range. These category values also do not correspond to a rate of fire spread, a fuel loading indicator, or measurable potential fire intensity. Each of those scales is greatly influenced by weather, seasonal and daily variations in moisture (relative humidity), solar radiation, and other factors. The risk rating presented here serves to identify where certain constant variables are present, aiding in identifying where fires typically spread into the largest fires across the landscape.

3.8.2 Historic Fire Regime

In the fire-adapted ecosystems of Idaho, fire is undoubtedly the dominant process in terrestrial systems that constrains vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand historical fire regimes (that is, fire frequency and fire severity prior to settlement by Euro-Americans) to be able to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historical fire regimes vary across the landscape.

Many ecological assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary from site to site; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect the ecosystems of today and the future. Obviously, historical fire regimes are a critical component for characterizing the historical range of variability in the fire-adapted

ecosystems of Idaho. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

A database of fire history studies in the region was used to develop modeling rules for predicting historical fire regimes (HFRs). Tabular fire-history data and spatial data was stratified into ecoregions, potential natural vegetation types (PNVs), slope classes, and aspect classes to derive rule sets which were then modeled spatially. Expert opinion was substituted for a stratum when empirical data was not available.

Fire is the dominant disturbance process that manipulates vegetation patterns in Idaho. The HFR data were prepared to supplement other data necessary to assess integrated risks and opportunities at regional and subregional scales. The HFR theme was derived specifically to estimate an index of the relative change of a disturbance process, and the subsequent patterns of vegetation composition and structure.

3.8.2.1 General Limitations

These data were derived using fire history data from a variety of different sources. These data were designed to characterize broad scale patterns of historical fire regimes for use in regional and subregional assessments. Any decisions based on these data should be supported with field verification, especially at scales finer than 1:100,000. Although the resolution of the HFR theme is 30 meter cell size, the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres (for example, assessments that typically require 1:24,000 data).

Figure 3.6. Natural Historic Fire Regimes in Owyhee County, Idaho.

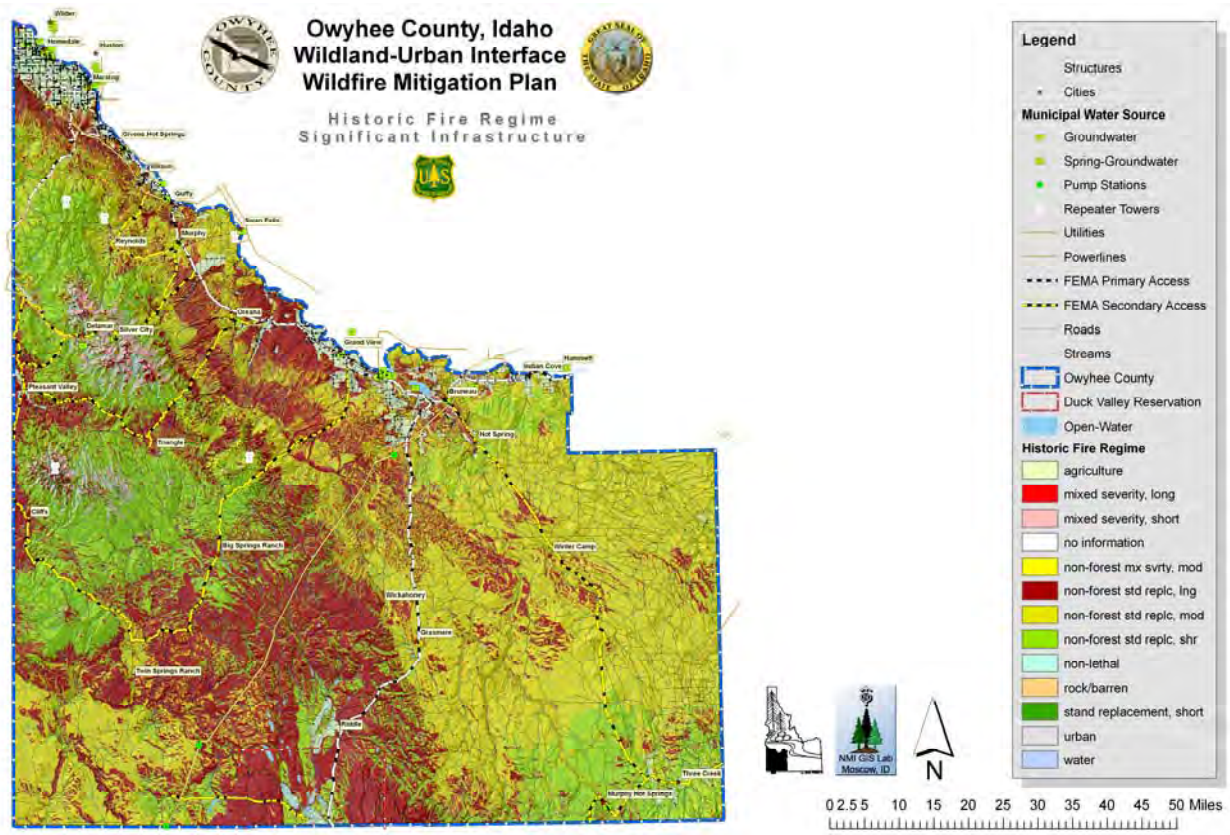


Table 3.19. Natural Historic Fire Regimes in Owyhee County, Idaho.

Natural Historic Fire Regime	Acres	Percent of Area
Non-lethal Fires	36,941	1%
Mixed severity, short return interval	53,231	1%
Mixed severity, long return interval	11,717	0%
Stand replacement, short return interval	8,893	0%
Non-forest stand replacement, short return interval	1,171,533	24%
Non-forest mixed severity, moderate return interval	34,159	1%
Non-forest stand replacement, moderate return interval	1,946,605	40%
Non-forest stand replacement, long return interval	1,463,458	30%
Agriculture	158,625	3%
Rock / barren	10,985	0%
Urban	1,095	0%
Water	10,388	0%
No Information	11,529	0%

3.8.3 Fire Regime Condition Class

The US Forest Service has provided their assessment of Fire Regime Condition Class for the lands of Owyhee County to this WUI Fire Mitigation Plan analysis. These measures of vegetative conditions are the standard method of analysis for the USDA Forest Service.

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy *et al.* (2001) and Schmidt *et al.* (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:

> I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced);
>
> II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
>
> III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced);
>
> IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
>
> V – 200+ year frequency and high (stand replacement) severity.

As scale of application becomes finer these five classes may be defined with more detail, or any one class may be split into finer classes, but the hierarchy to the coarse scale definitions should be retained.

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). Coarse-scale FRCC classes have been defined and mapped by Hardy *et al.* (2001) and Schmidt *et al.* (2001). They include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and diseased mortality, grazing, and drought). There are no wildland vegetation and fuel conditions or wildland fire situations that do not fit within one of the three classes.

The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime (Hann and Bunnell 2001, Hardy *et al.* 2001, Schmidt *et al.* 2002). The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural (historical) fire regime. Uncharacteristic conditions are considered to be those that did not occur within the natural (historical) fire regime, such as invasive species (e.g. weeds, insects, and diseases), “high graded” forest composition and structure (e.g. large trees removed in a frequent surface fire regime), or repeated annual grazing that maintains grassy fuels across relatively large areas at levels that will not carry a surface fire. Determination of the amount of departure is based on comparison of a composite measure of fire regime attributes (vegetation characteristics; fuel composition; fire frequency, severity and pattern) to the central tendency of the natural (historical) fire regime. The amount of departure is then classified to determine the

fire regime condition class. A simplified description of the fire regime condition classes and associated potential risks are presented in Table 3.20. Maps depicting Fire Regime and Condition Class are presented in Appendix I.

Table 3.20. Fire Regime Condition Class Definitions.

Fire Regime Condition Class	Description	Potential Risks
Condition Class 1	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) is low.
Condition Class 2	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate. Risk of loss of key ecosystem components is moderate.
Condition Class 3	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components is high.

An analysis of Fire Regime Condition Class in Owyhee County shows that approximately 81% of the County is in Condition Class 2 (moderate departure), just about 9% is in Condition Class 3 (high departure), with the remaining area in Condition Class 1-low departure (Table 3.21).

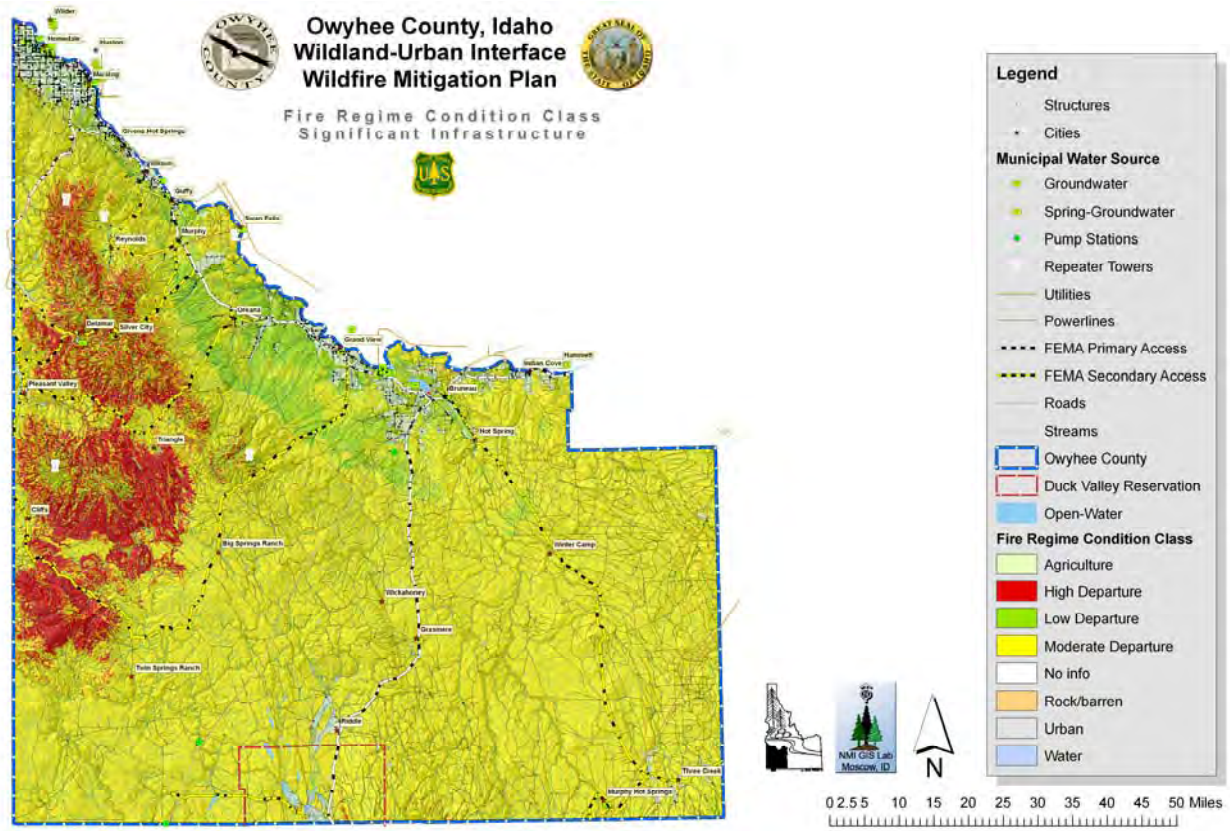
Table 3.21. Fire Regime Condition Class by area in Owyhee County.

	Condition Class	Acres	Percent of Area
1	Low departure	335,805	7%
2	Moderate departure	3,965,170	81%
3	High departure	425,562	9%
4	Agriculture	158,625	3%
5	Rock / barren	10,985	0%

Table 3.21. Fire Regime Condition Class by area in Owyhee County.			
	Condition Class	**Acres**	**Percent of Area**
7	Urban	1,095	0%
8	Water	10,388	0%
9	No info	11,529	0%

See Appendix I for maps of Fire Regime and Condition Class.

Figure 3.7. Fire Regime Condition Class in Owyhee County, Idaho.



3.8.4 Predicted Fire Severity

Current fire severity (CFS) is an estimate of the relative fire severity if a fire were to burn a site under its current state of vegetation. In other words, how much of the overstory would be removed if a fire were to burn today. The US Forest Service (Flathead National Forest) did not attempt to model absolute values of fire severity, as there are too many variables that influence fire effects at any given time (for example, temperature, humidity, fuel moisture, slope, wind speed, wind direction).

The characterization of likely fire severity was based upon historic fire regimes, potential natural vegetation, cover type, size class, and canopy cover with respect to slope and aspect. Each cover type was assigned a qualitative rating of fire tolerance based upon likely species composition and the relative resistance of each species to fire. The US Forest Service researchers defined 3 broad classes of fire tolerance: high tolerance (<20 percent post-fire mortality); moderate tolerance (20 to 80 percent mortality); and low tolerance (>80 percent

mortality). We would expect that fires would be less severe within cover types comprised by species that have a high tolerance to fire. Conversely, fires would likely burn more severely within cover types comprised by species having a low tolerance to fire. Data assignments were based upon collective experience in the field, as well as stand structure characteristics reported in the fire-history literature. For example, if they estimated that a fire would remove less than 20 percent of the overstory, the current fire severity would be assigned to the non-lethal class (that is, NL). However, if they expected fire to remove more than 80 percent of the overstory, the current fire severity was assigned to a stand replacement class (that is, SR or SR3).

3.8.4.1 Purpose

Fire is a dominant disturbance process in the Southwest Idaho. The likely effect of fire upon vegetation (i.e., current fire severity) is critical information for understanding the subsequent fire effects upon wildlife habitats, water quality, and the timing of runoff. There have been many reports of how fire suppression and timber harvest has affected vegetation patterns, fuels, and fire behavior. The US Forest Service researchers from the Flathead National Forest, derived the current fire severity theme explicitly to compare with the historical fire regime theme to evaluate how fire severity has changed since Euro-American settlement (that is, to derive fire-regime condition class).

3.8.4.2 General Limitations

These data were designed to characterize broad scale patterns of estimated fire severity for use in regional and subregional assessments. Any decisions based on these data should be supported with field verification, especially at scales finer than 1:100,000. Although the resolution of the CFS theme is 90 meter cell size, the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres (for example, assessments that typically require 1:24,000 data).

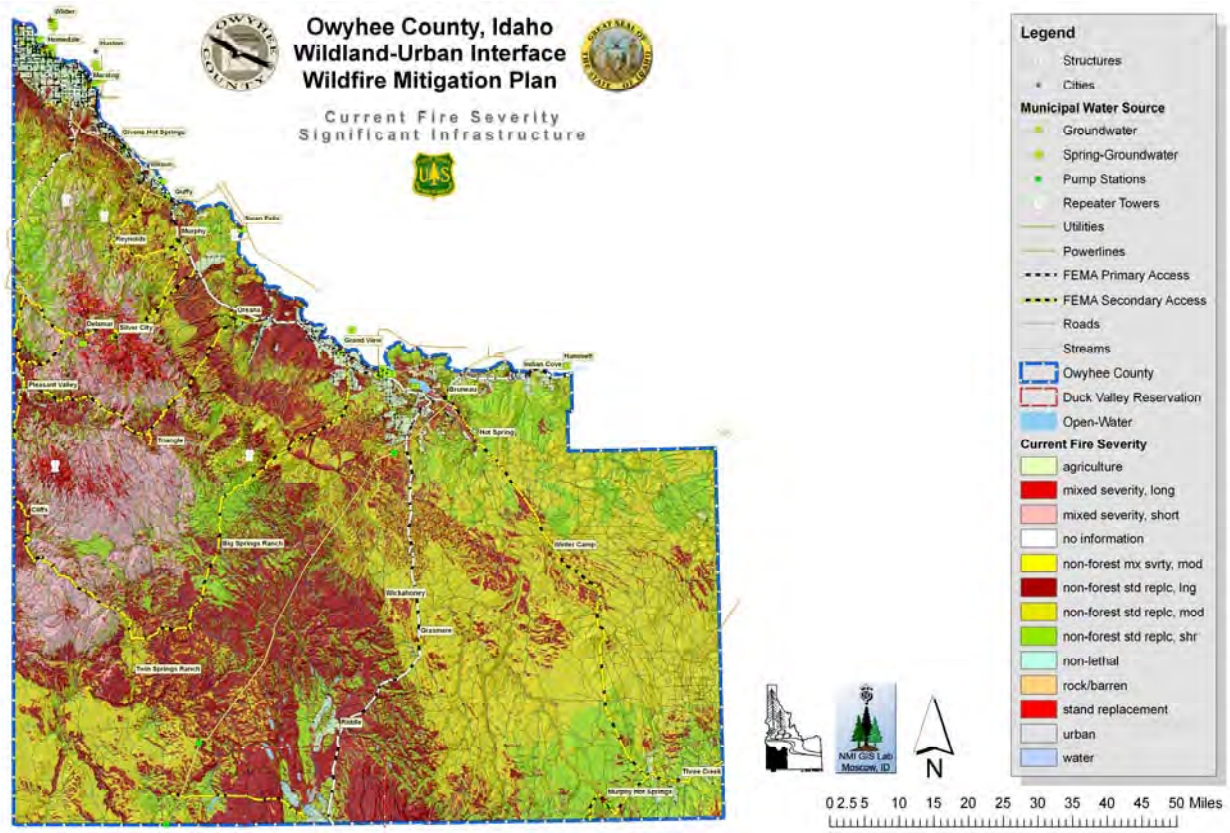
Current fire severity rule-set was developed for an "average burn day" for the specific vegetation types in our area. Any user of these data should familiarize themselves with the rule sets to better understand our estimate of current fire severity.

Table 3.22. Predicted Fire Severity by area in Owyhee County.

	Predicted Fire Severity	Acres	Percent of Area
1	Non-lethal	12,910	0%
2	Mixed severity, short return interval	401,758	8%
3	Mixed severity, long return interval	56,524	1%
5	Stand replacement fire	23,792	0%
6	Non-forest stand replacement, short return interval	1,005,260	20%
7	Non-forest mixed severity, moderate return interval	34,159	1%
8	Non-forest stand replacement, moderate return interval	1,731,980	35%
9	Non-forest stand replacement, long return interval	1,460,153	30%
10	Agriculture	158,625	3%
11	Rock / barren	10,985	0%
13	Urban	1,095	0%
14	Water	10,388	0%
15	No information	11,529	0%

See Appendix I for a map of Predicted Fire Severity.

Figure 3.8. Current Fire Severity in Owyhee County, Idaho.



3.8.5 On-Site Evaluations

Fire control and evaluation specialists as well as hazard mitigation consultants evaluated the communities of Owyhee County to determine, first-hand, the extent of risk and characteristics of hazardous fuels in the Wildland-Urban Interface. The on-site evaluations have been summarized in written narratives and are accompanied by photographs taken during the site visits. These evaluations included the estimation of fuel models as established by Anderson (1982). These fuel models are described in the following section of this document.

In addition, field personnel completed FEMA's Fire Hazard Severity Forms and Fire Hazard Rating Criteria Worksheets. These worksheets and standardized rating criteria allow comparisons to be made between all of the counties in the country using the same benchmarks. The FEMA rating forms are summarized for each community in Appendix II.

3.8.6 Fuel Model Descriptions

Anderson (1982) developed a categorical guide for determining fuel models to facilitate the linkage between fuels and fire behavior. These 13 fuel models, grouped into 4 basic groups: grass, chaparral and shrub, timber, and slash, provide the basis for communicating fuel conditions and evaluating fire risk. There are a number of ways to estimate fuel models in forest and rangeland conditions. The field personnel from Northwest Management, Inc., that evaluated communities and other areas of Owyhee County have all been intricately involved in wildland fire fighting and the incident command system. They made ocular estimates of fuel models they observed. In an intense evaluation, actual sampling would have been employed to determine

fuel models and fuel loading. The estimations presented in this document (Chapter 3) are estimates based on observations to better understand the conditions observed.

Fuel Model 0- This type consists of non-flammable sites, such as exposed mineral soil and rock outcrops. Other lands are also identified in this type.

3.8.6.1 Grass Group

3.8.6.1.1 Fire Behavior Fuel Model 1

Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally less than one-third of the area.

Grasslands and savanna are represented along with stubble, grass-tundra, and grass-shrub combinations that met the above area constraint. Annual and perennial grasses are included in this fuel model.

This fuel model correlates to 1978 NFDRS fuel models A, L, and S.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and alive, tons/acre 0.74
Dead fuel load, ¼-inch, tons/acre 0.74
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 1.0

3.8.6.1.2 Fire Behavior Fuel Model 2

Fire is spread primarily through the fine herbaceous fuels, either curing or dead. These are surface fires where the herbaceous material, in addition to litter and dead-down stemwood from the open shrub or timber overstory, contribute to the fire intensity. Open shrub lands and pine stands or scrub oak stands that cover one-third to two-thirds of the area may generally fit this model; such stands may include clumps of fuels that generate higher intensities an that may produce firebrands. Some pinyon-juniper may be in this model.

This fuel model correlates to 1978 NFDRS fuel models C and T.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and alive, tons/acre 4.0
Dead fuel load, ¼-inch, tons/acre 2.0
Live fuel load, foliage, tons/acre 0.5
Fuel bed depth, feet 1.0

3.8.6.1.3 Fire Behavior Fuel Model 3

Fires in this fuel are the most intense of the grass group and display high rates of spread under the influence of wind. Wind may drive fire into the upper heights of the grass and across standing water. Stands are tall, averaging about 3 feet (1 m), but considerable variation may occur. Approximately one-third or more of the stand is considered dead or cured and maintains the fire. Wild or cultivated grains that have not been harvested can be considered similar to tall prairie and marshland grasses.

This fuel correlates to 1978 NFDRS fuel model N.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre 3.0
Dead fuel load, ¼-inch, tons/acre 3.0
Live fuel load, foliage tons/acre 0
Fuel bed depth, feet 2.5

3.8.6.2 Shrub Group

3.8.6.2.1 Fire Behavior Fuel Model 4

Fire intensity and fast-spreading fires involve the foliage and live and dead fine woody material in the crowns of a nearly continuous secondary overstory. Stands of mature shrubs, 6 or more feet tall, such as California mixed chaparral, the high pocosin along the east coast, the pinebarrens of New Jersey, or the closed jack pine stands of the north-central States are typical candidates. Besides flammable foliage, dead woody material in the stands significantly contributes to the fire intensity. Height of stand qualifying for this model depends on local conditions. A deep litter layer may also hamper suppression efforts.

This fuel model represents 1978 NFDRS fuel models B and O; fire behavior estimates are more severe than obtained by Models B or O.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acre 13.0
Dead fuel load, ¼-inch, tons/acre 5.0
Live fuel load, foliage, tons/acre 5.0
Fuel bed depth, feet 6.0

3.8.6.2.2 Fire Behavior Fuel Model 5

Fire is generally carried in the surface fuels that are made up of litter cast by the shrubs and the grasses or forbs in the understory. The fires are generally not very intense because surface fuel loads are light, the shrubs are young with little dead material, and the foliage contains little volatile material. Usually shrubs are short and almost totally cover the area. Young, green stands with no dead wood would qualify: laurel, vine maple, alder, or even chaparral, manzanita, or chamise.

No 1978 NFDRS fuel model is represented, but model 5 can be considered as second choice for NFDRS model D or as third choice for NFDRS model T. Young green stands may be up to 6 feet (2m) high but have poor burning properties because of live vegetation.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acre 3.5
Dead fuel load, ¼-inch, tons/acre 1.0
Live fuel load, foliage, tons/acre 2.0
Fuel bed depth, feet 2.0

3.8.6.2.3 Fire Behavior Fuel Model 6

Fires carry through the shrub layer where the foliage is more flammable than fuel model 5, but this requires moderate winds, greater than 8 mi/h (13 km/h) at mid-flame height. Fire will drop to

the ground at low wind speeds or at openings in the stand. The shrubs are older, but not as tall as shrub types of model 4, nor do they contain as much fuel as model 4. A broad range of shrub conditions is covered by this model. Fuel situations to be considered include intermediate stands of chamise, chaparral, oak brush, low pocosin, Alaskan spruce taiga, and shrub tundra. Even hardwood slash that has cured can be considered. Pinyon-juniper shrublands may be represented but may over-predict rate of spread except at high winds, like 20 mi/h (32 km/h) at the 20-foot level.

The 1978 NFDRS fuel models F and Q are represented by this fuel model. It can be considered a second choice for models T and D and a third choice for model S.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acres..... 6.0
Dead fuel load, 1/4 –inch, tons/acre 1.5
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet..... 2.5

3.8.6.2.4 Fire Behavior Fuel Model 7

Fires burn through the surface and shrub strata with equal ease and can occur at higher dead fuel moisture contents because of the flammability of live foliage and other live material. Stands of shrubs are generally between 2 and 6 feet (0.6 and 1.8 m(high. Palmetto-gallberry understory-pine overstory sites are typical and low pocosins may be represented. Black spruce-shrub combinations in Alaska may also be represented.

This fuel model correlates with 1978 NFDRS model D and can be a second choice for model Q.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acre 4.9
Dead fuel load, ¼-inch, tons/acre 1.1
Live fuel load, foliage, tons/acre 0.4
Fuel bed depth, feet..... 2.5

3.8.6.3 Timber Group

3.8.6.3.1 Fire Behavior Fuel Model 8

Slow-burning ground fires with low flame lengths are generally the case, although the fire may encounter an occasional “jackpot” or heavy fuel concentration that can flare up. Only under severe weather conditions involving high temperatures, low humilities, and high winds do the fuels pose fire hazards. Closed canopy stands of short-needle conifers or hardwoods that have leafed out support fire in the compact litter layer. This layer is mainly needles, leaves, and occasionally twigs because little undergrowth is present in the stand. Representative conifer types are white pine, and lodgepole pine, spruce, fire and larch

This model can be used for 1978 NFDRS fuel models H and R.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch, dead and live, tons/acre 5.0
Dead fuel load, ¼-inch, tons/acre 1.5
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet..... 0.2

3.8.6.3.2 Fire Behavior Fuel Model 9

Fires run through the surface litter faster than model 8 and have longer flame height. Both long-needle conifer stands and hardwood stands, especially the oak-hickory types, are typical. Fall fires in hardwoods are predictable, but high winds will actually cause higher rates of spread than predicted because of spotting caused by rolling and blowing leaves. Closed stands of long-needled pine like ponderosa, Jeffrey, and red pines, or southern pine plantations are grouped in this model. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning.

NFDRS fuel models E, P, and U are represented by this model. It is also a second choice for models C and S.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acre 3.5
Dead fuel load, ¼-inch, tons/acre 2.9
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 0.2

3.8.6.3.3 Fire Behavior Fuel Model 10

The fires burn in the surface and ground fuels with greater fire intensity than the other timber little models. Dead-down fuels include greater quantities of 3-inch (7.6 cm) or larger limbwood, resulting from overmaturity or natural events that create a large load of dead material on the forest floor. Crowning out, spotting, and torching of individual trees are more frequent in this fuel situation, leading to potential fire control difficulties. Any forest type may be considered if heavy down material is present; examples are insect- or disease-ridden stands, wind-thrown stands, overmature situations with dead fall, and aged light thinning or partial-cut slash.

The 1978 NFDRS fuel model G is represented.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre 12.0
Dead fuel load, ¼-inch, tons/acre 3.0
Live fuel load, foliage, tons/acre 2.0
Fuel bed depth, feet 1.0

The fire intensities and spread rates of these timber litter fuel models are indicated by the following values when the dead fuel moisture content is 8 percent, live fuel moisture is 100 percent, and the effective windspeed at mid-flame height is 5 mi/h (8 km/h):

Table 3.23. Comparative Fire Intensities and Rates of Spread in Timber Fuel Models.

Fuel Model	Rate of Spread Chains/hour	Flame length Feet
8	1.6	1.0
9	7.5	2.6
10	7.9	4.8

Fires such as above in model 10 are at the upper limit of control by direct attack. More wind or drier conditions could lead to an escaped fire.

3.8.6.4 Logging Slash Group

3.8.6.4.1 Fire Behavior Fuel Model 11

Fires are fairly active in the slash and herbaceous material intermixed with the slash. The spacing of the rather light fuel load, shading from overstory, or the aging of the fine fuels can contribute to limiting the fire potential. Light partial cuts or thinning operations in mixed conifer stands, hardwood stands, and southern pine harvests are considered. Clearcut operations generally produce more slash than represented here. The less-than-3-inch (7.6-cm) material load is less than 12 tons per acre (5.4 t/ha). The greater-than-3-inch (7.6-cm) is represented by not more than 10 pieces, 4 inches (10.2 cm) in diameter, along a 50-foot (15 m) transect.

The 1978 NFDRS fuel model K is represented by this model.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch, dead and live, tons/acre 11.5
Dead fuel load, ¼-inch, tons/acre 1.5
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 1.0

3.8.6.4.2 Fire Behavior Fuel Model 12

Rapidly spreading fires with high intensities capable of generating firebrands can occur. When fire starts, it is generally sustained until a fuel break or change in fuels is encountered. The visual impression is dominated by slash and much of it is less than 3 inches (7.6 cm) in diameter. The fuels total less than 35 tons per acres (15.6 t/ha) and seem well distributed. Heavily thinned conifer stands, clearcuts, and medium or heavy partial cuts are represented. The material larger than 3 inches (7.6 cm) is represented by encountering 11 pieces, 6 inches (15.3 cm) in diameter, along a 50-foot (15-m) transect.

This model depicts 1978 NFDRS model J and may overrate slash areas when the needles have dropped and the limbwood has settled. However, in areas where limbwood breakup and general weathering have started, the fire potential can increase.

Fuel model values fore estimating fire behavior

Total fuel load, < 3-inch, dead and live, tons/acre 34.6
Dead fuel load, ¼-inch, tons/acre 4.0
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 2.3

3.8.6.4.3 Fire Behavior Fuel Model 13

Fire is generally carried across the area by a continuous layer of slash. Large quantities of material larger than 3 inches (7.6 cm) are present. Fires spread quickly through the fine fuels and intensity builds up more slowly as the large fuels start burning. Active flaming is sustained for long periods and a wide variety of firebrands can be generated. These contribute to spotting problems as the weather conditions become more severe. Clearcuts and heavy partial-cuts in mature and overmature stands are depicted where the slash load is dominated by the greater-tayhn-3-inch (7.6-cm) diameter material. The total load may exceed 200 tons per acre (89.2 t/ha) but fuel less than 3 inches (7.6 cm_ is generally only 10 percent of the total load. Situations where the slash still has “red’ needles attached but the total load is lighter, more like model 12, can be represented because of the earlier high intensity and quicker area involvement.

The 1978 NFDRS fuel model I is represented. Areas most commonly fitting his model are old-growth stands west of the Cascade and Sierra Nevada Mountains. More efficient utilization standards are decreasing the amount of large material left in the field.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre 58.1
Dead fuel load, ¼-inch, tons/acre 7.0
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 3.0

For other slash situations:

Hardwood slash .....Model 6
Heavy "red" slash.....Model 4
Overgrown slash .....Model 10
Southern pine clearcut slash.....Model 12

The comparative rates of spread and flame lengths for the slash models at 8 percent dead fuel moisture content and a 5 mi/h (8 km/h) mid-flame wind are presented in Table 3.24.

Table 3.24. Comparative Fire Intensities and Rates of Spread in Slash Fuel Models.

Fuel Model	Rate of Spread Chains/hour	Flame length Feet
11	6.0	3.5
12	13.0	8.0
13	13.5	10.5

3.9 Wildland-Urban Interface

3.9.1 People and Structures

A key component in meeting the underlying need is the protection and treatment of fire hazard in the wildland-urban interface. The wildland-urban interface refers to areas where wildland vegetation meets urban developments, or where forest fuels meet urban fuels (such as houses). These areas encompass not only the interface (areas immediately adjacent to urban development), but also the continuous slopes and fuels that lead directly to a risk to urban developments. Reducing the fire hazard in the wildland urban interface requires the efforts of federal, state, local agencies, and private individuals (Norton 2002). "The role of [most] federal agencies in the wildland urban interface includes wildland fire fighting, hazard fuels reduction, cooperative prevention and education and technical experience. Structural fire protection [during a wildfire] in the wildland urban interface is [largely] the responsibility of tribal, state, federal, and local governments" (USFS 2001). Property owners share a responsibility to protect their residences and businesses and minimize fire danger by creating defensible areas around them and taking other measures to minimize the fire risks to their structures (USFS 2001). With treatment, a wildland-urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities. In addition, a wildland urban interface that is properly thinned will be less likely to sustain a crown fire that enters or originates within it (Norton 2002).

By reducing hazardous fuel loads and creating new and reinforcing defensible space, landowners would protect the wildland-urban interface, the biological resources of the management area, and adjacent property owners by:

- minimizing the potential of high-intensity fires entering or leaving the area;
- reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior (McCoy *et al.* 2001 as cited in Norton 2002);
- improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Four wildland/urban conditions have been identified for use in the wildland urban interface (Norton 2002). These include the Interface Condition, Intermix Condition, Occluded Condition, and Rural Condition. Descriptions of each are as follows:

- **Interface Condition** – a situation where structures abut wildland fuels. There is a clear line of demarcation between the structures and the wildland fuels along roads or back fences. The development density for an interface condition is usually 3+ structures per acre;
- **Intermix Condition** – a situation where structures are scattered throughout a wildland area. There is no clear line of demarcation, the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres;
- **Occluded Condition** – a situation, normally within a city, where structures abut an island of wildland fuels (park or open space). There is a clear line of demarcation between the structures and the wildland fuels along roads and fences. The development density for an occluded condition is usually similar to that found in the interface condition and the occluded area is usually less than 1,000 acres in size; and
- **Rural Condition** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.

The location of structures in Owyhee County has been mapped and are presented on a variety of maps in this analysis document; specifically in Appendix I. The location of all structures was determined by examining two sets of remotely sensed images. The more detailed information was garnered from digital ortho-photos at a resolution of 1 meter (from 1998). For those areas not covered by the 1 meter DOQQ images, SPOT satellite imagery at a resolution of 10 meters was used (from 2002). These records were augmented with data collected on hand-held GPS receivers to record the location of structures, especially in areas where new housing developments were seen.

All structures are represented by a “dot” on the map. No differentiation is made between a garage and a home, or a business and a storage building. The density of structures and their specific locations in this management area are critical in defining where the potential exists for casualty loss in the event of a wildfire in the region.

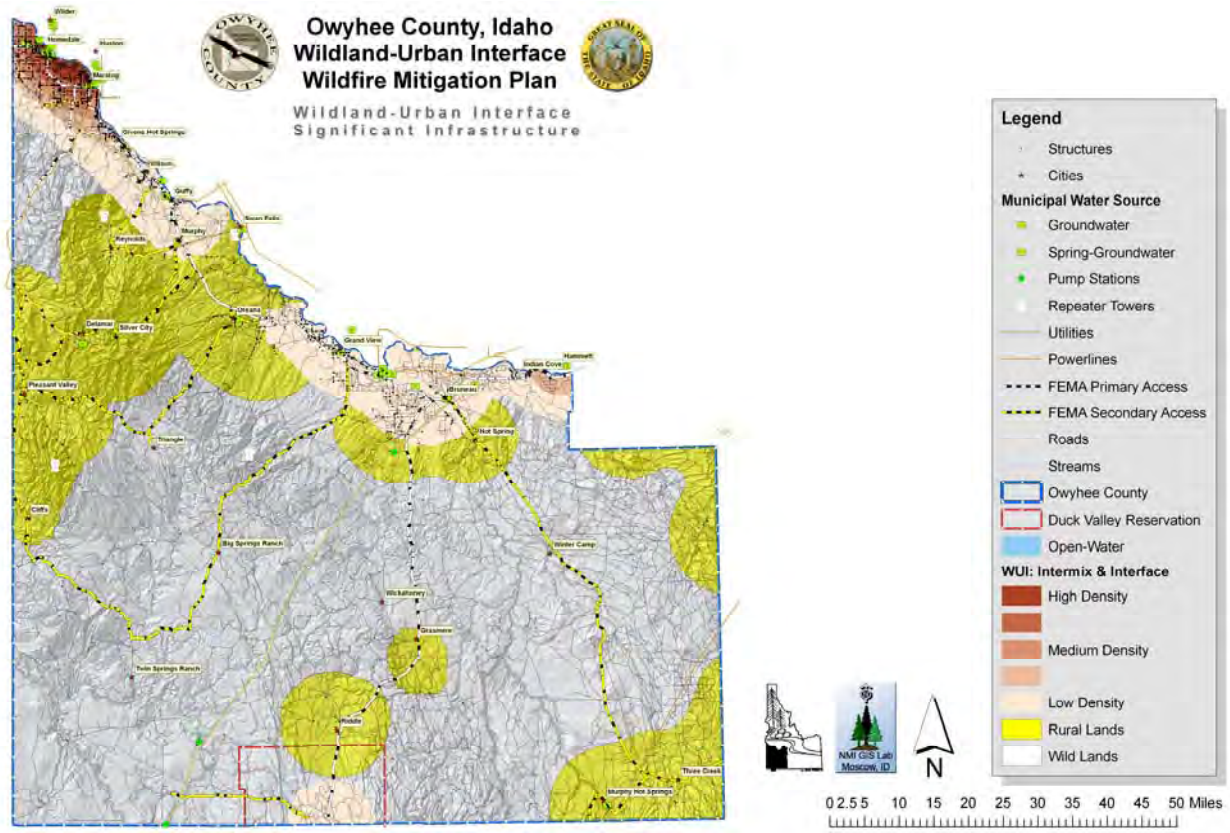
By evaluating this structure density, we can define WUI areas on maps by using mathematical formulae and population density indexes to define the WUI based on where structures are located. The resulting population density indexes create concentric circles showing high density

areas of Interface and Intermix WUI, as well as Rural WUI. This portion of the analysis allows us to “see” where the highest concentrations of structures are located in reference to high risk landscapes, limiting infrastructure, and other points of concern.

It is critical to understand that in the protection of people, structures, infrastructure, and unique ecosystems, this portion of the analysis only serves to identify structures and by some extension the people that inhabit them. It does not define the location of infrastructure and unique ecosystems. Other analysis tools will be used for those items.

The WUI interface areas as defined here are presented in map form in Appendix I.

Figure 3.9. Wildland-Urban Interface of Owyhee County.



This map is presented for reference in this section of the plan. This map and additional maps are detailed in Appendix I.

3.9.2 Infrastructure

Owyhee County has both significant infrastructure and unique ecosystems within its boundaries. Of note for this WUI Fire Mitigation Plan is the existence of highway routes (eg., State Highways 51 and 78 and U.S. 95), and the presence of high tension power lines and pipe lines supplying surrounding counties. These resources will be considered in the protection of infrastructural resources for Owyhee County and to the larger extent of this region, and the rest of Idaho.

High Tension Power Lines have been mapped and are presented in Appendix I. Protection of these lines from loss during a wildfire is paramount in as much as the electrical power they provide serves not only the communities of Owyhee County but of surrounding counties and nearby communities in Oregon. The protection of these lines allows for community

sustainability, support of the economic viability of Owyhee County, and the protection of people who rely on that power. Fuels mitigation under power lines has received considerable attention in forested ecosystems as timber is thinned and heavy accumulations of brush are managed. This practice should be mandated into the future. However, the importance of management of rangeland ecosystems under high tension power lines should not be overlooked. Brush intermixed with grasses and other species, during extreme fire weather events, coupled with steep slopes can produce considerable heat and particulate matter. When this occurs under power lines, the result can be arching between lines and even failure of the electrical media itself. Fuel mitigation treatments in high risk areas, especially where multiple lines are co-located, will be recommended.

3.9.3 Ecosystems

Owyhee County contains many diverse ecosystems with a complex array of vegetation, wildlife, and fisheries that have developed with, and adapted to fire as a natural disturbance process. A century of wildland fire suppression coupled with past land-use practices (primarily agriculture and livestock grazing) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. In some cases this has resulted in lower fuel loads, grazing/agriculture, and in others an increase in fuel loads, juniper encroachment. As a result of juniper encroachment, rangelands in Owyhee County have become more susceptible to large-scale, high intensity fires posing a threat to life, property, and natural resources including wildlife and special status plant populations. High-intensity fires have the potential to seriously damage soils and native vegetation. In addition, an increase in the number of large high intensity fires throughout the nation's rangelands, has resulted in significant safety risks to firefighters and higher costs for fire suppression (House of Representatives, Committee on Agriculture, Washington, DC, 1997).

Juniper invasion of the shrub-steppe and aspen ecosystems in Owyhee County has become a major concern. Fire exclusion in these areas has led to widespread expansion of western juniper, and subsequent loss of shrub-steppe and aspen communities. Active management of the encroaching juniper through prescribed burning and other treatments will increase the shrub and herbaceous plant communities, which will help maintain watershed function and stability, and reduce erosion potential. In addition, re-establishment of the native ecosystem will improve habitat for sagegrouse, pygmy rabbits, elk, mule deer, antelope, migratory birds, small mammals, amphibians, and reptiles by creating and maintaining vegetative mosaics.

The creation of the Reynolds Creek Experimental Watershed by the Reynolds Creek USDA_ARS Unit has allowed researchers to conduct prescribed fire studies in order to learn more about the effects of fire on the ecosystem. Reintroducing low intensity fires to rangeland ecosystems typically helps reduce the occurrence and expansion of invasive species and maintain the healthy growth of native species. If projects on the Reynolds Creek Experimental Watershed show positive results, controlled burning may be reintroduced elsewhere in Owyhee County.

3.10 Soils

Our soil resource is an extremely important component for maintaining a healthy ecosystem and economy. Fire can play an intricate role in this process, if it occurs under normal conditions of light fuels associated with low intensity underburns. However, the buildup of fuels and consequently high severity fires can cause soils to become water repellent (hydrophobic), and thus greatly increases the potential for overland flow during intense rains. Soils in degraded conditions does not function normally, and will not be able to sustain water quality, water yield,

or plant communities that have normal structure, composition, and function. Fire is also strongly correlated with the carbon-nutrient cycles and the hydrologic cycle. Fire frequency, extent, and severity are controlled to a large degree by the availability of carbon, as well as the moisture regime (Quigley & Arbelbide 1997).

Soils were evaluated for their propensity to become hydrophobic during and after a fire as evidenced by the presence of clay and clay derivatives (e.g., clay loam, cobbly clay) in the upper soil layers. In addition, their permeability and tendency to allow runoff to infiltrate the soil rapidly was evaluated.

The Owyhee soils tend to be calcareous and alkaline, well drained and have salt and water problems in the lower valleys. However, some areas adjacent to the Snake River are very sandy with a high level of permeability and without layers of clay or other substrata which would protect the aquifer from agricultural or animal nutrients.

The Snake River soils are generally silty and clayey with somewhat restricted subsoil and substrata permeability formed in stratified sediments on terraces, basins and hilly uplands.

The Owyhee Mountains, Owyhee Range and highland area of the County have soils which are generally silty, formed in materials mired with rocky residuum-colluvium from basic rock types on plateaus, canyons and mountains.

Low to moderate intensity fires would be not be expected to damage soil characteristics in the region, especially if the hotter fires in this range were limited to small extents associated with jackpots of cured fuels. Hot fires providing heat to the Bt horizon substrate depth have the potential to create hydrophobic characteristics in that layer. This can result in increased overland flow during heavy rains, following wildfire events, potentially leading to mass wasting. Rocky and gravelly characteristics in the A horizon layer would be expected to be displaced, while the sandy and loamy fines in these soils may experience an erosion and displacement potential. These soils will experience the greatest potential impacts resulting from hot fires that burn for prolonged periods (especially on steep slopes).

The National Resource Conservation Service (NRCS) has mapped a large portion of Owyhee County in detail. Please refer the Owyhee County NRCS Soil Survey Report to view each soil unit in the County and the associated characteristics relating to the effects of wildland fire.

3.10.1 Fire Mitigation Practices to Maintain Soil Processes

Firelines constructed by hand or with the use of machinery will have varying impacts, depending upon construction techniques. If only the surface litter is removed in the fireline construction, minor increases to soil erosion may occur. If trenches are dug which channelize runoff down steep slopes, heavy rilling or gullying could occur depending upon rock content of surface layers exposed. Jackpot burning and, to a greater extent, pile burning would result in greater soil heating and localized impacts. Loss of soil carbon, nitrogen, sulphur, phosphorus, potassium, and soil organisms would be high in the soil surface layer. Soil physical structure could be altered thereby creating hydrophobic soils, especially where clay content is moderate or high.

Indirect effects of prescribed burning to slope stability are highly variable in the soil types found in Owyhee County. Vegetation structure, including root strength after burning, is maintained from three to fifteen years following low to moderate intensity burns and therefore soil saturation potential is not greatly altered. Re-vegetation of burned areas within this time frame will be a critical component to maintaining soil resources and pre-empting noxious weeds and invasive species from occupying the site. Locale experiencing high intensity burns will need to be evaluated immediately for mechanical erosion control followed by re-vegetation efforts. Holding

soils in place will be a difficult challenge in many locations, especially on moderate to steep slopes.

Where heavy grazing has occurred in the past, there is also a possibility that soil productivity has been reduced. This is especially true in riparian areas where animal concentrations have historically been the greatest. These areas generally have easily compacted soils, and are where cattle tend to linger if not managed well. Grazing across Owyhee County was observed to be maintained in a sustainable manner without the overgrazing found in other areas of the region.

Severe fires in the past have consumed surface organics and volatilized nitrogen into the air. On some sites, however, these severe burns are a natural process, and therefore the inherent soil productivity may not be reduced. On other sites, however, where low intensity underburns typically occurred, high intensity wildland fires have consumed amounts of soil organics in excess of the historic patterns. Furthermore, excessive soil heating in these intense fires likely resulted in creation of water repellent soils, and therefore increased overland flow and soil erosion. In these cases, it can be assumed that wildland fires have reduced long-term soil productivity. Soil compaction damage typically is persistent in the area; several decades of rest from further compactive forces are needed until adequate soil recovery occurs. Loss of organics due to displacement and severe fire also requires decades to recuperate. This slow recovery from soil damage makes cumulative effects to soil productivity and soil hydrologic function a major concern.

To avoid potential impacts, wherever possible firelines should be located outside of highly erosive areas, steep slopes, intermittent streams, and riparian and other sensitive areas. Following prescribed fire or fire suppression activities, firelines should be rehabilitated.

3.11 Hydrology

The Idaho Water Resource Board is charged with the development of the Idaho Comprehensive State Water Plan. Included in the State Water Plan are the statewide water policy plan, and component basin and water body plans which cover specific geographic areas of the state (IDEQ 2003). The Idaho Department of Water Resources has prepared General Lithologies of the Major Ground Water Flow Systems in Idaho.

The state may assign or designate beneficial uses for particular Idaho water bodies to support. These beneficial uses are identified in sections 3.35 and 100.01 - .05 of the Idaho water quality standards (WQS). These uses include:

- **Aquatic Life Support:** cold water biota, seasonal cold water biota, warm water biota, and salmonid spawning;
- **Contact Recreation:** primary (swimming) and secondary (boating);
- **Water Supply:** domestic, agricultural, and industrial; and
- **Wildlife Habitat and Aesthetics**.

While there may be competing beneficial uses in streams, federal law requires DEQ to protect the most sensitive of these beneficial uses (IDEQ 2003).

The geology and soils of this region lead to rapid to moderate moisture infiltration. Slopes are moderate to steep, however, headwater characteristics of the watersheds in the south end of the county lead to a high degree of infiltration as opposed to a propensity for overland flow. Thus sediment delivery efficiency of first and third order streams is fairly low. The bedrock is typically well fractured and moderately soft. This fracturing allows excessive soil moisture to

rapidly infiltrate into the rock and thus surface runoff is rare. Natural mass stability hazards associated with slides are low. Natural sediment yields are low for these watersheds. However, disrupted vegetation patterns from farming along the Snake River (soil compaction) and wildland fire (especially hot fires that increase soil hydrophobic characteristics), can lead to increased surface runoff and debris flow to stream channels.

A correlation to mass wasting due to the removal of vegetation caused by high intensity wildland fire has been documented. Burned vegetation can result in changes in soil moisture and loss of rooting strength that can result in slope instability, especially on slopes greater than 30%. The greatest watershed impacts from increased sediment will be in the lower gradient, depositional stream reaches.

The Owyhee County Comprehensive Plan addresses Streams, Rivers, and Wetland pollution issues specifically. The following is an excerpt from that planning process:

> "Safeguards should be considered and implemented to protect against soil, silt, stream, river and ground water pollutions. Pollution could be chemical, biological, sediment or any known substance which could be of risk to health or environment."

Of critical importance to Owyhee County will be the maintenance of the domestic watershed supplies.

3.11.1 Fire Mitigation Practices to Maintain Hydrologic Processes

The effects of wildland fire and prescribed burning on water quality are variable. The removal of the vegetative canopy will tend to reduce transpiration and increase water yield, especially during the growing season and immediately afterwards (MacDonald *et al.* 1991). Prescribed burning is used to maintain a healthy, dynamic ecosystem while meeting land management objectives. Prescribed burning objectives include reduction of natural fuels, assuring current and future habitat conditions for native plants and animals and enhancement, protection, and maintenance of old growth and riparian areas. In rangeland ecosystems, prescribed fire will have variable impacts dependant on burn intensity and proximity to streams. Stream buffering (low intensity to no burn around streams) has been shown to preserve most if not all normal sediment filtering functions.

In Owyhee County, juniper invasion of the shrub-steppe and aspen ecosystems has become a major concern. Fire exclusion in these areas has led to wide spread expansion of western juniper, and subsequent loss of shrub-steppe and aspen communities. Active management of the encroaching juniper through prescribed burning will increase the shrub and diverse herbaceous plant communities, which will help maintain watershed function and stability, and reduce accelerated erosion. Prescribed burning will also help reduce the severe fire potential by reducing hazardous fuel loads and returning the landscape to a more natural state.

A large, high intensity fire could have negative effects on watershed conditions, thus affecting both fish and habitat in streams. Prescribed burning is not designed to consume all vegetation within project areas. Each treatment will leave a mosaic of burned and unburned areas. Once the target fuels and the risk of fire carrying from one tributary to another have been reduced, hand ignition may be considered on a site-specific basis.

The effects on sediment yield vary according to the intensity of fire; degree of soil disturbance; steepness of the slope and drainage network; the size of the area burned; and the extent to which the vegetation controls the movement and storage of sediment. Fire also increases surface erosion and sediment delivery rates by removing the litter layer and organic debris that traps sediment both on slopes and in the stream channel (MacDonald *et al.* 1991). The

magnitude of these effects will depend on the geomorphic sensitivity of the landscape, which is largely a function of slope steepness and parent material (Swanson 1978).

Fire can greatly increase surface erosion by temporarily creating a hydrophobic soil layer. Soils within the project area are generally at moderate risk for hydrophobic conditions due to their fine-grained textures and clay content. In addition, the relatively low burn intensity of the prescribed fires will also help prevent the formation of hydrophobic soils.

The effects of wildland fire or prescribed fire are generally considered in terms of potential short-term, negative effects and long-term benefits of fuels reduction, which will result in a decreased risk of high intensity, stand-replacing fire. Potential short-term effects to streams and fish include increased risk of landslides, mass movement and debris torrents, increases in surface sediment erosion, possible reduction in streamside vegetation resulting in changes within management areas, and possible increases in water yield depending on the amount and severity of the vegetation burned. Long-term effects include increases in nutrient delivery, possible increases in woody debris in streams, and possible increases in stream temperature if shading is significantly reduced. The design criteria described above minimizes the risk that landslides, mass movement, significant increases in surface sediment yield, and significant changes in water yield will occur.

Reduction of vegetation will mostly be limited to creeping ground fires, which will reduce understory vegetation, but will not affect mature trees or result in significant mortality to the overstory. Spring burning often results in minimal riparian vegetation burned because streamside areas have higher humidity and live plant moisture. Fall burning will more likely result in understory vegetation removal, with a possibility of some tree and large shrub mortality, especially outside of riparian zones where live plant moisture is less.

Riparian buffer strips will be maintained, thereby preserving canopy cover for shading, sediment filtering, and streambank and floodplain stability (PACFISH guidelines). Areas not burned will provide significant protection from adverse water quality impacts associated with wildland fire and prescribed burning. Therefore, effects to fish and habitat in these streams from increased water yield are unlikely. The area has been roaded from past management activities. Therefore, increased road densities from road construction are not expected to be of a magnitude to increase sedimentation to affected drainages, provided adequate planning for new road construction is implemented. Forest practices in the area will be conducted to meet the standards of the Idaho Forest Practices Act. These rules are designed to use best management practices that are adapted to and take account of the specific factors influencing water quality, water quality objectives, on-site conditions, and other factors applicable to the site where a forest practice occurs.

3.12 Air Quality

The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides (USDA Forest Service 2000).

Smoke emissions from fires potentially affect an area and the airsheds that surround it. Climatic conditions affecting air quality in the Southwest Idaho are governed by a combination of factors. Large-scale influences include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. At a smaller scale, topography and vegetation cover also affect air movement patterns. In Owyhee County, winds are predominantly from the southwest but occasionally blow from the west to northwest. Air quality in the area and surrounding airshed is generally good to excellent. However, locally adverse conditions can result from occasional wildland fires in the

summer and fall, and prescribed fire and agricultural burning in the spring and fall. All major river drainages are subject to temperature inversions which trap smoke and affect dispersion, causing local air quality problems. This occurs most often during the summer and fall months and would potentially affect all communities in Owyhee County.

Smoke management in Owyhee County is managed by the Idaho/Montana Airshed Group. Much of the county is in Airshed Units 22 and 23. The Boise Impact Zone is lies directly north of Owyhee County near the Oregon border (Levinson 2002). An airshed is a geographical area which is characterized by similar topography and weather patterns (or in which atmospheric characteristics are similar, e.g., mixing height and transport winds). The USDA Forest Service, Bureau of Land Management, and the Idaho Department of Lands are all members of the Montana/Idaho State Airshed Group, which is responsible for coordinating burning activities to minimize or prevent impacts from smoke emissions. Prescribed burning must be coordinated through the Missoula Monitoring Unit, which coordinates burn information, provides smoke forecasting, and establishes air quality restrictions for the Montana/Idaho Airshed Group. The Monitoring Unit issues daily decisions which may restrict burning when atmospheric conditions are not conducive to good smoke dispersion. Burning restrictions are issued for airsheds, impact zones, and specific projects. The monitoring unit is active March through November. Each Airshed Group member is also responsible for smoke management all year.

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority governing air resource management. The act established a process for designation of Class I and Class II areas for air quality management. Class I areas receive the highest level of protection and numerical thresholds for pollutants are most restrictive for this Class. The Hell's Canyon, Sawtooth, and Craters of the Moon Class I areas may be affected by burning in Owyhee County.

All of the communities within Owyhee County could be affected by smoke or regional haze from burning activities in the region. Idaho Department of Environmental Quality maintains Air Pollution Monitoring Sites throughout Idaho. The Air Pollution Monitoring program monitors all of the six criteria pollutants. Measurements are taken to assess areas where there may be a problem, and to monitor areas that already have problems. The goal of this program is to control areas where problems exist and to try to keep other areas from becoming problem air pollution areas (Louks 2001). There are no monitoring sites within the county. The nearest monitoring sites are in the Canyon and Ada counties to the north.

The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, OAQPS (Organization for Air Quality Protection Standards) is responsible for setting standards, also known as national ambient air quality standards (NAAQS), for pollutants which are considered harmful to people and the environment. OAQPS is also responsible for ensuring these air quality standards are met, or attained (in cooperation with state, Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources (Louks 2001).

3.12.1 Fire Mitigation Practices to Maintain Air Quality

Smoke consists of dispersed airborne solids and liquid particles, called particulates, which can remain suspended in the atmosphere for a few days to several months. Particulates can reduce visibility and contribute to respiratory problems. Very small particulates can travel great distances and add to regional haze problems. Regional haze can sometimes result from multiple burn days and/or multiple owners burning within an airshed over too short a period of time to allow for dispersion.

For prescribed fires, there are three principle strategies to manage smoke and reduce air quality effects. They include:

1. **Avoidance -** This strategy relies on monitoring meteorological conditions when scheduling prescribed fires to prevent smoke from drifting into sensitive receptors, or suspending burning until favorable weather (wind) conditions exist. Sensitive receptors can be human-related (e.g. campgrounds, schools, churches, and retirement homes) or wildlife-related (threatened and endangered species and their critical habitats);
2. **Dilution –** This strategy ensures proper smoke dispersion in smoke sensitive areas by controlling the rate of smoke emissions or scheduling prescribed fires when weather systems are unstable, not under conditions when a stable high-pressure area is forming with an associated subsidence inversion. An inversion would trap smoke near the ground; and
3. **Emission Reduction –** This strategy utilizes techniques to minimize the smoke output per unit area treated. Smoke emission is affected by the number of acres burned at one time, pre-burn fuel loadings, fuel consumption, and the emission factor. Reducing the number of acres burned at one time would reduce the amount of emissions generated by that burn. Reducing the fuel beforehand reduces the amount of fuel available. Prescribed burning when fuel moistures are high can reduce fuel consumption. Emission factors can be reduced by pile burning or by using certain firing techniques such as mass ignition.

If weather conditions changed unexpectedly during a prescribed burn, and there was a potential for violating air quality standards or for adverse smoke impacts on sensitive receptors (schools, churches, hospitals, retirement homes, campgrounds, wilderness areas, and species of threatened or endangered wildlife), the management organization may implement a contingency plan, including the option for immediate suppression. Considering 1) the proposed action would result in prescribed fire on a relatively small number of acres, 2) burning as part of this mitigation plan's implementation in the County will most likely occur over a 5-year or 10-year period at a minimum, and 3) the County will adhere to Montana/Idaho Airshed Group advisories and management strategies to minimize smoke emissions, prescribed fire activities would not violate national or state emission standards and would cause very minor and temporary air quality impacts. The greatest threat to air quality would be smoke impacts on sensitive receptors; however, the relative scarcity of sensitive receptors within the County minimizes this potential air quality impact.

In studies conducted through the Interior Columbia Basin Management Project, smoke emissions were simulated across the Basin to assess relative differences among historical, current, and future management scenarios. In assessing the whole Upper Columbia Basin, there was a 43 percent reduction in smoke emissions between the historical and current periods (Quigley and Arbelbide 1997). The projected smoke emissions varied substantially with the vastly different management scenarios. The consumptive demand and passive management scenarios were projected to substantially increase smoke emissions above current levels. The active management scenarios were projected to result in a decrease of current levels.

Although prescribed fire smoke would occur more frequently than wildland fire smoke, since prescribed fires are scheduled during the year, the effects of wildland fire smoke on visibility are more acute. Prescribed fires produce less smoke than wildland fires for comparatively shorter periods, because they are conducted under weather conditions that provide for better smoke dispersion. In a study conducted by Holsapple and Snell (1996), wildland fire and prescribed fire scenarios for the Columbia Basin were modeled. In conclusion, the prescribed fire scenarios did not exceed the EPA particulate matter (PM 10) standard in a 24-hour period. Similar projections

were observed for a PM 2.5 threshold. Conversely, all wildland fire scenarios exceeded air quality standards. Similar responses were reported by Huff *et al.* (1995) and Ottmar *et al.* (1996) when they compared the effects of wildland fire to prescribed fire on air quality. The impacts of wildland fire and management ignited prescribed fire on air quality vary because of the differences in distribution of acres burned, the amount of fuel consumed per acre (due to fuel moisture differences), and the weather conditions in which typical spring and fall prescribed burns occur. This analysis reveals wildland fire impacts on air quality may be significantly greater in magnitude than emissions from prescribed burns. This may be attributable, in part, to the fact that several states within the project area have smoke management plans requiring favorable weather conditions for smoke dispersion prior to igniting wildland fires (Quigley and Arbelbide 1997).

Chapter 4: Summaries of Risk and Preparedness

4 Overview

4.1 Wildland Fire Characteristics

An informed discussion of fire mitigation is not complete until basic concepts that govern fire behavior are understood. In the broadest sense, wildland fire behavior describes how fires burn; the manner in which fuels ignite, how flames develop and how fire spreads across the landscape. The three major physical components that determine fire behavior are the fuels supporting the fire, the topography in which the fire is burning, and the weather and atmospheric conditions during a fire event. At the landscape level, both topography and weather are beyond our control. We are powerless to control winds, temperature, relative humidity, atmospheric instability, slope, aspect, elevation, and landforms. It is beyond our control to alter these conditions, and thus impossible to alter fire behavior through their manipulation. When we attempt to alter how fires burn, we are left with manipulating the third component of the fire environment, the fuels which support the fire. By altering fuel loading and fuel continuity across the landscape, we have the best opportunity to determine how fires burn.

A brief description of each of the fire environment elements follows in order to illustrate their effect on fire behavior.

4.1.1 Weather

Weather conditions are ultimately responsible for determining fire behavior. Moisture, temperature, and relative humidity determine the rates at which fuels dry and vegetation cures, and whether fuel conditions become dry enough to sustain an ignition. Once conditions are capable of sustaining a fire, atmospheric stability and wind speed and direction can have a significant affect on fire behavior. Winds fan fires with oxygen, increasing the rate at which fire spreads across the landscape. Weather is the most unpredictable component governing fire behavior, constantly changing in time and across the landscape.

4.1.2 Topography

Fires burning in similar fuel conditions burn dramatically different under different topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influence vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. Generally speaking, north slopes tend to be cooler, wetter, more productive sites. This can lead to heavy fuel accumulations, with high fuel moistures, later curing of fuels, and lower rates of spread. The combination of light fuels and dry sites lead to fires that typically display the highest rates of spread. In contrast, south and west slopes tend to receive more direct sun, and thus have the highest temperatures, lowest soil and fuel moistures, and lightest fuels. These slopes also tend to be on the windward side of mountains. Thus these slopes tend to be “available to burn” a greater portion of the year.

Slope also plays a significant roll in fire spread, by allowing preheating of fuels upslope of the burning fire. As slope increases, rate of spread and flame lengths tend to increase. Therefore, we can expect the fastest rates of spread on steep, warm south and west slopes with fuels that are exposed to the wind.

4.1.3 Fuels

Fuel is any material that can ignite and burn. Fuels describe any organic material, dead or alive, found in the fire environment. Grasses, brush, branches, logs, logging slash, forest floor litter, conifer needles, and homesites (the structures) are all examples. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size and shape, moisture content and continuity and arrangement all have an affect on fire behavior. Generally speaking, the smaller and finer the fuels, the faster the potential rate of fire spread. Small fuels such as grass, needle litter and other fuels less than a quarter inch in diameter are most responsible for fire spread. In fact, “fine” fuels, with high surface to volume ratios, are considered the primary carriers of surface fire. This is apparent to anyone who has ever witnessed the speed at which grass fires burn. As fuel size increases, the rate of spread tends to decrease, as surface to volume ratio decreases. Fires in large fuels generally burn at a slower rate, but release much more energy, and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control. Thus, it is much easier to control a fire burning in grass than to control a fire burning in timber.

When burning under a forest canopy, the increased intensities can lead to torching (single trees becoming completely involved) and potentially development of crown fire. That is, they release much more energy. Fuels are found in combinations of types, amounts, sizes, shapes, and arrangements. It is the unique combination of these factors, along with the topography and weather, which determine how fires will burn.

The study of fire behavior recognizes the dramatic and often-unexpected affect small changes in any single component has on how fires burn. It is impossible to speak in specific terms when predicting how a fire will burn under any given set of conditions. However, through countless observations and repeated research, the some of the principles that govern fire behavior have been identified and are recognized.

4.2 Owyhee County Conditions

Owyhee County is characterized by relatively mild winters and hot, dry summers. Although infrequent, fires in the rangeland fuel types present much of the County with the potential of large, intense and damaging fires. Forest type fuels in the Owyhee Mountains also present a significant wildland fire hazard; however, there are fewer structures or permanent residents in these remote mountainous areas.

Owyhee County has been experiencing steady growth, particularly around the communities in the northwestern corner of the county (Owyhee County Comprehensive Plan 2002). At the same time, the number and value of resources at risk is on the increase, as more and more homes are built in the midst of fire prone fuels. Human use is strongly correlated with fire frequency, with increasing numbers of fires as use increases. The combination of frequent ignitions and flammable vegetation has greatly increased the probability that incendiary devices will find a receptive fuel bed, resulting in increased fire frequency. Discarded cigarettes, tire fires, hot catalytic converters, careless use of fireworks, and debris burning have all contributed to the potential ignition sources in the area.

Fire departments within Owyhee County have reported a general increase in the number of fires within the county. Although there have been few homes lost to wildland fires in the recent past, the potential is growing. Fire departments feel as though pure luck has been on the side of many homeowners, as more and more fires seem to be controlled at the doorstep of residents’ homes. It is quite probable that homes will eventually be lost to wildland fire. However, there are

a number of actions that can be taken now that can decrease the probability that these events will occur.

4.2.1 County Wide Potential Mitigation Activities

There are four basic opportunities for reducing the loss of homes and lives to fires. There are many single actions that can be taken, but in general they can be lumped into one of the following categories:

- Prevention
- Education/ Mitigation
- Readiness
- Building Codes

4.2.1.1 Prevention

The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can be quite effective. Prevention campaigns can take many forms. Traditional "Smokey Bear" type campaigns that spread the message passively through signage can be quite effective. Signs that remind folks of the dangers of careless use of fireworks, burning when windy, and leaving unattended campfires can be quite effective. It's impossible to say just how effective such efforts actually are, however the low costs associated with posting of a few signs is inconsequential compared to the potential cost of fighting a fire.

Slightly more active prevention techniques may involve mass media, such as radio or the local newspaper. Fire districts in other counties have contributed the reduction in human-caused ignitions by running a weekly "run blotter," similar to a police blotter, each week in the paper. The blotter briefly describes the runs of the week and is followed by a weekly "tip of the week" to reduce the threat from wildland and structure fires. The federal government has been a champion of prevention, and could provide ideas for such tips. When fire conditions become high, brief public service messages could warn of the hazards of misuse of fire or any other incendiary devise. Such a campaign would require coordination and cooperation with local media outlets. However, the effort is likely to be worth the efforts, costs and risks associated with fighting unwanted fires.

Fire Reporting: Fires cannot be suppressed until they are detected and reported. As the number and popularity of cellular phones has increased, expansion of the #FIRE program throughout Idaho may provide an effective means for turning the passing motorist into a detection resource.

Burn Permits: The state of Idaho recognizes a closed burning season between May 10 and October 20, during which, anyone wishing to burn slash, stubble, yard waste, or other debris must obtain a burn permit. Idaho Code 38-115 states: *"During the closed season it shall be unlawful for any person to set or cause to be set a fire in any slashing area, or a fire to any stump or stumps, log or logs, down or standing timber or to set or cause to be set, a fire on any forest or range lands (bold emphasis added by me) or dangerously near thereto, or in any field in any forest protective district, without having first procured a permit from the fire warden of the district…"*

The Fire Warden for the Southwest Idaho Supervisory Area, Southwest Idaho Forest Protective District ican be reached at: Idaho Department of Lands, 8355 West State Street, Boise, ID 83703, phone: 208 334-3488.

The burning permit specified in Idaho Code 38-115 and the Uniform Fire Code shall be used to protect public health, safety, and welfare. The permit shall be subject to the following conditions:

a. Permits issued for open fires shall be required from May 10 to October 20, inclusive, of each year and be limited to that period of time needed to accomplish the permitted burning; provided, however, in no event shall such permit be issued to cover a period of more than ten (10) days.
b. This permit does not relieve permittee form responsibility of fire damage and suppression costs as a result of fire escaping from prepared permit area."

(From Idaho Code 38-115) "It shall be the duty of the director of the department of lands to prepare the proper form of permit to be used in carrying out the provisions of the section. The fire wardens shall at all times have authority to refuse permits and/or to revoke the same and to postpone their use when issued, when they shall deem it necessary to do in the interest of public safety…"

4.2.1.2 Education

Once a fire has started and is moving toward home or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event.

The majority of the uncultivated vegetation in Owyhee County is comprised of rangelands. These fuels tend to be very flammable and can support very fast moving and intense fires. In many cases, homes can easily be protected by following a few simple guidelines that reduce the ignitability of the home. There are multiple programs such as FIREWISE that detail precautions that should be taken in order to reduce the threat to homes, such as clearing timber or cured grass and weeds away from structures and establishing a green zone around the home.

However, knowledge is no good unless acted upon. Education needs to be followed up by action. Any education programs should include an implementation plan. Ideally, funds would be made available to financially assist the landowner making the necessary changes to the home. The survey of the public conducted during the preparation of this WUI Fire Mitigation Plan indicated that approximately 59% of the respondents are interested in participating in this type of an activity.

4.2.1.3 Readiness

Once a fire has started, how much and how large it burns is often dependent on the availability of suppression resources. In most cases, rural fire departments are the first to respond and have the best opportunity to halt the spread of a wildland fire. For many districts, the ability to reach these suppression objectives is largely dependent on the availability of functional resources and trained individuals. Increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

In order to assure a quick and efficient response to an event, emergency responders need to know specifically where emergency services are needed. Continued improvement and updating of the rural addressing system is necessary to maximize the effectiveness of a response.

4.2.1.4 Building Codes

The most effective, albeit contentious, solution to some fire problems is the adoption of building codes in order to assure emergency vehicle access and home construction that does not "invite" a fast and intense house fire. Codes that establish minimum road construction standards and access standards for emergency vehicles are an effective means of assuring public and firefighter safety, as well as increasing the potential for home survivability. Some of these issues have already been addressed in the Owyhee County Comprehensive Plan (2002) and Owyhee County Code (2003). Additional codes or changes to the code are periodically considered by the County.

4.3 Owyhee County's Wildland-Urban Interface

Individual community assessments have been completed for all of the populated places in the county. The following summaries include these descriptions and observations. Local place names identified during this plan's development include:

Table 4.1. Owyhee County Communities

Community Name	Planning Description	Vegetative Community	National Register Community At Risk?[1]
Bruneau	Community	Rangeland	Yes
Cliffs	Community	Rangeland	No
Givens Hot Springs	Community	Rangeland	Yes
Grand View	Community	Rangeland	Yes
Grasmere	Community	Rangeland	Yes
Guffy	Community	Rangeland	No
Homedale	Community	Rangeland	Yes
Hot Springs	Community	Rangeland	No
Indian Cove	Community	Rangeland	No
Marsing	Community	Rangeland	Yes
Murphy	Community	Rangeland	Yes
Murphy Hot Springs	Community	Rangeland	No
Oreana	Community	Rangeland	Yes
Pleasant Valley	Community	Rangeland	No
Reynolds	Community	Rangeland	Yes
Riddle	Community	Rangeland	Yes
Silver City	Community	Forestland	Yes
Three Creek	Community	Rangeland	Yes
Triangle	Community	Forestland	Yes
Wilson	Community	Rangeland	No

[1]Those communities with a "Yes" in the National Register Community at Risk column are included in the Federal Register, Vol. 66, Number 160, Friday, August 17, 2001, as "Urban Wildland Interface Communities within the vicinity of Federal Lands that are at high risk from wildfires". All of these communities have been evaluated as part of this plan's assessment.

Site evaluations on these communities are included in subsequent sections. The results of FEMA Hazard Severity Forms for each community are presented in Appendix II.

4.3.1 Mitigation Activities Applicable to all Communities

4.3.1.1 Homesite Evaluations and Creation of Defensible Space

Individual homesite evaluations can increase homeowners' awareness and improve the survivability of structures in the event of a wildfire. Maintaining a lean, clean, green zone within at least 100 feet of structures to reduce the potential loss of life and property is highly recommended. Assessing individual homes in the outlying areas can address the issue of escape routes and home defensibility characteristics. Educating the homeowners in techniques for protecting their homes is critical in these environments.

4.3.1.2 Travel Corridor Fire Breaks

Ignition points are likely to continue to be concentrated along the roads and highways that run through the county. These travel routes have historically served as the primary source of human-caused ignitions. In areas with high concentrations of resource values along these corridors, fire lines may be considered in order to provide a fire break in the event of a roadside ignition. Access route mitigation can provide an adequate control line under normal fire conditions. Alternatively, permanent fuel breaks can be established in order to reduce the potential for ignitions originating from the main travel roads to spread into the surrounding lands.

4.3.1.3 Power Line Corridor Fire Breaks

The treatment opportunities specified for travel corridor fire breaks apply equally for power line corridors. The obvious difference between the two is that the focus area is not an area parallel to and adjacent to the road, but instead focuses on the area immediately below the infrastructure element. Protection under the high tension power lines is strongly recommended. This may be an opportunity for intensive livestock grazing practices as a tool for reducing fine fuels around significant infrastructure.

4.4 Communities in Owyhee County

4.4.1 Vegetative Associations

The vast majority of land within the valley bottoms has been converted to irrigated cropland, with few patches of native vegetation remaining. One notable exception is the C.J. Strike Wildlife Management Area, near Bruneau. This area is managed to sustain a native vegetative ecosystem for the preservation of wildlife.

Agricultural practices have created a patchwork of green, lush vegetation and cured rangeland. This patchwork helps to break the continuity of fuels that are available to burn. Damaging fires in agricultural lands are infrequent; however, these fuel types could potentially support a very fast-moving albeit, low intensity, fire. Under dry and windy conditions, fires in these vegetative types can burn thousands of acres in a single burning period.

In contrast, the Owyhee Mountains in the western portion of the county are characterized by scattered juniper woodlands with patches of Douglas-fir and quaking aspen. These fuels are capable of supporting large and intense wildland fires. The xeric vegetation and hot, dry and windy conditions as well as steeper slopes increase the potential for severe fires.

The last few decades has seen the proliferation of Cheatgrass throughout the county, an exotic grass species that is able to out compete native bunchgrasses. Cheatgrass responds well to soil disturbance and is found in abundance along roadsides, driveways, new construction areas,

and in recently burned areas. Over time, vegetative species composition in unmanaged or non-irrigated land has shifted toward fire prone species, particularly in high use areas where disturbance is common. Under dry and windy conditions, fires in these vegetative types can burn thousands of acres in a single burning period.

4.4.2 Overall Fuels Assessment

Fuels throughout the upland areas of Owyhee County are quite consistent, dominated by grasslands and sage. Areas dominated by grass with scattered sage can be described as Fuel Models 1 and 2 (FM1 and FM2). Fires in these fuel types tend to be spread rapidly, but burn at relatively low intensity. Where grasses become less consistent, wind is needed to push fires through the bunchgrass. Sage-dominated fuel complexes can be described as FM6. Typically, fires in this fuel type require a moderate wind in order to push the fire through the fuels. Without wind, the fire will drop to the ground. In the absence of fine fuels, fire spread will stop. However, wind driven fires in any of these fuel types can burn significant acreage in a short period of time. During an August day with 20 mile an hour winds, fires in these fuel types can burn over 3,000 acres in a single hour, with flame lengths of over 20 feet.

Fires in juniper/Douglas-fir forest habitat types generally occur very infrequently, but are typically stand replacing. Low branches can act as ladder fuels, which may lead to extensive torching or crown fires. Slow buildup of fuels in the understory is common due to extremely slow rates of decomposition in the arid environment. Due to the patchiness of this fuel type, wildland fire in one stand would not likely result in destruction of the entire forest community. However, they could act as a catalyst for fire spread. Quaking aspen communities are less prone to fire because of their preference for cool, moist draws. Fires in these stands would be very slow burning under normal weather conditions. Nevertheless, aspen communities are dependent on periodic low intensity fires to invigorate new stands.

Over time, vegetative species composition in unmanaged or non-irrigated land has shifted toward fire prone species, particularly in high use areas where disturbance is common. Cheatgrass invasion has been prolific throughout many areas within the Great Basin. Cheatgrass is an exotic grass species that is able to out compete native bunchgrasses. Under dry and windy conditions, fires in these vegetative types can burn thousands of acres in a single burning period. The fine structure and its ability to completely dominate disturbed sites provide a dry, consistent fuel bed for fire. Where the exotic has encroached in sagebrush stands, it now provides a consistent bed of fine fuels that actively carries fire without the effect wind. Because of these characteristics, cheatgrass will support fire during times of the year and under conditions which native vegetation would not sustain a wildland fire. After fire disturbance, native species are often replaced by monocultures of cheatgrass. Because of the grasses ability to dominate disturbed sites and its propensity to burn, cheatgrass has the ability to remain dominant once a site is disturbed.

4.4.2.1 Ignition Sources

Natural ignition sources from summertime lightning storms are quite common in Owyhee County. Lightning strikes in light grass fuels such as those in the eastern and southern portions of the county are quickly extinguished if any precipitation accompanies the storm. Natural ignitions are more common in areas with abundant sage, where woody fuels are able to sustain fire during precipitation events, emerging when surface fuels dry. However during dry lightning events, storm cells can ignite dozens of fires throughout wildland areas.

Human caused fires contribute to the probability of fires in this area. Residential living and recreational use in the area present innumerable ignition sources. Debris burning, discarded

cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area. Power line fires resulting from tree contact can also spark fires, especially during windy conditions.

The abundance of human and natural ignition sources and the dry nature of fuels in the area increase the probability of wildland fire. Fire characteristics will depend on fuels type and fuel moisture as well as on weather conditions at the time of ignition. Fires during periods of drought with high temperatures, low humidity and strong winds can quickly lead to fast-moving, destructive wildfires in any fuel type.

4.4.3 Overall Community Assessments

The majority of homes and structures within Owyhee County are at low risk of loss to wildland fire. The prevalence of irrigated cropland throughout the Snake River and Bruneau River valleys bottom effectively reduce the potential for loss to wildland fire in the majority of areas.

Homes within the light grass and sage fuels are at an increased risk to wildland fire, as fire typically spreads very rapidly, leaving little time to prepare a home in advance of a fire. There are a number of individual homes that are at significant risk to wildland fire loss in the area, largely due to use of highly ignitable materials in home construction, or by lack of defensible space surrounding the home. Considering the high spread rates typical in these fuel types, homes need to be protected prior to fire ignitions, as there is little time to defend a home in advance of a grass and range fire.

Homes and other structures surrounded by the forest type fuels in the Owyhee Mountains, have a moderate to high fire risk. Fires in these fuels tend to be much more intense with higher flame lengths increasing the potential for torching or crowning. Home and landowners in these areas should take considerable precautions to protect their property from wildfire. Using fire-resistant building materials and maintaining a defensible space will drastically increase survivability. Access into these more remote areas is also an issue. The lack of a safe alternate escape routes increases the potential for entrapment.

The greatest resources threatened in Owyhee County are the range resources on the private and public lands in the upland areas of the county. Owyhee County supports a significant ranching economy that is dependant on grazing of these arid lands. Large fires can significantly impact grazing resources; thus, having a significant detrimental effect on the local cattle industry.

4.4.3.1 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving a passing fire front is largely dependent on the structural and landscaping characteristics of the home. Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes survivability can be greatly enhanced by following a few simple guidelines that reduce the ignitability of the home.

“Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space. Residents of Owyhee County should be encouraged to work with local fire departments and fire management

agencies within the county to complete individual homesite evaluations. Home defensibility steps should be enacted based on the results of these evaluations.

4.4.4 Individual Community Assessments

4.4.4.1 Bruneau and Hot Springs Area

The community of Bruneau is situated between the Bruneau Sand Dunes and the southeastern end of the C. J. Strike Reservoir approximately 4 miles south of the Snake River and Owyhee-Elmore County line. The community center and many Bruneau residents are located in the more fertile flatlands known as the Bruneau Valley. This watershed drains the Bruneau River along with a multitude of smaller tributaries and springs. Near the southern end of the Bruneau Valley is the small population center of Hot Springs. Residents of Hot Springs are primarily farmers and ranchers from the surrounding area. The Bruneau Valley and much of the area on the southeastern end of the C.J. Strike Reservoir has been developed for irrigated pastureland or crops. Extensive irrigation systems have been developed to provide irrigation to the valley and upland areas around Bruneau. These systems are dependent upon a steady electrical power source that is brought to the pumps via overhead power lines. The vegetation along the rim of the valley and beyond consists of sagebrush and other vegetation typical of the xeric climatic conditions.

The southeastern extent of the Bruneau River arm of the C. J. Strike Reservoir lies within 2 miles of Bruneau. The landscape surrounding the Reservoir is highly valued for its excellent fishing, boating, camping, hunting, and other recreational opportunities. Much of the area surrounding the Reservoir is administered by the Bureau of Land Management, Idaho Fish and Game, or Idaho Power.

4.4.4.1.1 Fire Potential

Fuels Assessment

Fuels surrounding Bruneau, the Bruneau Valley, and Hot Springs are primarily dominated by grass and sagebrush plant communities. Agriculture and ranching activities are dominant within the Bruneau Valley resulting in a discontinuous pattern of native fuels. A wind-driven fire in the dry native fuel complexes would produce a rapidly advancing, but variable intensity fire. In areas dominated by mature sage stands, larger flame lengths and increased intensities would be expected. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Nevertheless, many homeowners maintain groomed yards or are surrounded by agricultural fields; thus, decreasing the risk of a wildland fire threatening structures. Grazing on BLM public lands surrounding the communities helps decrease build up of fine fuel loads. Livestock grazing can be an effective tool to reduce the fine, flashy fuel component of sagebrush-steppe ecosystem.

Ignition Profile

Although lightning events are common in Owyhee County, the communities of Bruneau and Hot Springs are more prone to man-caused ignitions than lightning strikes due to the flatter topography and agricultural development. Residential living and recreational use in the area present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Stubble fires seldom escape landowner's boundaries; however, there are a few incidents throughout the County each year. These fires are generally easily suppressed by modifying the vegetation and homes are rarely threatened. Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Grain trucks, ATV's, and pick ups are used regularly for recreational purposes and farming operations. Campfires are typically restricted in recreational areas during high fire risk seasons; however, the potential for escape is significant due to the xeric climate and flammability of fuels. High tension power lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.1.2 Ingress-Egress

The primary access into Bruneau is via either State Highway 51 from the north and south or State Highway 78 from the northeast. Both roadways are well-maintained, paved, two lane highways. Hot Springs can be accessed from the north via either Hot Springs Road or Hot Creek Road. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural fields. There are also large areas void of any vegetation where sand and rock abut the roadway. These access routes are not at significant risk of closure due to wildland fire.

Other potential escape routes, including Clover-Three Creek Road, Grasmere Road and the Oregon Trail Road, are located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels.

4.4.4.1.3 Infrastructure

Residents of Bruneau and Hot Springs are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

High tension power lines pass within one mile of the Bruneau community center. These and the other public transmission lines strung to homes throughout the Bruneau Valley and Hot Springs area are at low to moderate risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is some potential for ignition.

4.4.4.1.4 Fire Protection

The Bruneau Rural Fire Department provides structural fire protection for the communities of Bruneau and Hot Springs. They also have a mutual aid agreement with the community of Grand View. Additionally, the Bureau of Land Management and the Idaho Fish and Game provide wildland fire protection. Developed access to drafting or dipping sites along the Bruneau River or at the C. J. Strike Reservoir significantly increase the ability of emergency response to effectively control a wildland fire.

4.4.4.1.5 Community Risk Assessment

Residents of Bruneau and Hot Springs have low to moderate risk of experiencing a wildland fire due to the communities' location in a valley bottom and their nearby access to water resources. However, intense recreational activities throughout the area increase the risk of a man-caused

wildfire spreading to the communities. The receptive nature of fuels increases the likelihood of a fire start. In the event of wildfire, the dry fuels would likely support a very fast-moving rangeland fire. Therefore, it is important that homeowners implement fire mitigation measures to protect their structures and families prior to such an event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds. Community defensible space is also maintained by livestock grazing. A planned, integrated grazing system around the community could help enhance the fire reduction benefits derived from grazing.

4.4.4.1.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

For the community as a whole, a reduction in fuel loads and development of fuel breaks and access to water for firefighting would enhance the survivability of the community.

4.4.4.2 Givens Hot Springs

The community of Givens Hot Springs lies on the southern bank of the Snake River between Wilson and Marsing along State Highway 78. Much of this area is relatively flat; however, the foothills of the Owyhee Mountains begin to rise along the southwestern edge of the community. The flatlands between the Owyhees and the Snake River have been heavily developed as irrigated farms and ranches. Native vegetation including sagebrush and sparse grasses dominate the lower slopes of the Owyhee Mountains and non-irrigated areas. The economy in Givens Hot Springs is based primarily on agriculture interspersed with commercial uses and cottage industry.

4.4.4.2.1 Fire Potential

Fuels Assessment

The fuels surrounding the community of Givens Hot Springs are dominated by irrigated crops or pastureland. Native fuels are typically sparse grasses and scattered sagebrush, but this type of vegetation is limited to non-irrigated or undeveloped areas and the open rangelands of the lower Owyhee Mountains. More densely vegetated areas near the Snake River or along other waterways may burn more intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk

agricultural land. Grazing on BLM public lands south of the community helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Givens Hot Springs is more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. Residential living and recreational use in the area present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.2.2 Ingress-Egress

The primary access into Givens Hot Springs is State Highway 78. This is a paved, well-maintained, two-lane route. This travel corridor is typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. There are also a few areas void of any vegetation where sand and rock abut the roadway. State Highway 78 near Givens Hot Springs is not at significant risk of closure due to wildland fire.

Most of the secondary roads in the Givens Hot Springs area are privately owned and typically dead end; therefore, there is a limited access to alternate escape routes. Loop roads off Highway 78 or other thru roads should be signed as potential escape routes.

4.4.4.2.3 Infrastructure

Residents of Givens Hot Springs are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.2.4 Fire Protection

The Murphy/Reynolds/Wilson Fire District provides structural fire protection for the community of Givens Hot Springs; however, there is no fire fighting equipment currently located in Givens Hot Springs. The Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites along the Snake River or other waterways would be crucial in the event of a fire.

4.4.4.2.5 Community Risk Assessment

Residents of Givens Hot Springs are at low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational and agricultural activities throughout the area, particularly in the nearby Owyhee

Mountains, increase the risk of a man-caused wildfire spreading to the community. Additionally, the lack of readily available alternate escape routes increases the risk to residents in the event of a wildland fire. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.2.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Land has been purchased for the development of a fire house in Givens Hot Springs. In order for the local fire district to save money and become more efficient, a joint ownership of the facility with the Bureau of Land Management is being discussed. Currently, BLM fire resources must travel from Boise to fight incidents occurring in western Owyhee County including the Silver City area. Having both the local structural and wildland fire equipment and resources housed at the same facility saves both entities money and increases the effectiveness of the response.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation. It is also important for alternative escape routes to be well signed and maintained for emergency use in the event that Highway 78 becomes compromised.

4.4.4.3 Grand View

The community of Grand View lies on the southern bank of the Snake River near the junction of the State Highway 67 (from Mountain Home) and State Highway 78. This area is characterized by sparse xeric climate vegetation including sagebrush and low growing grasses. Additionally, there is an abundance of both native and non-native trees and shrubs along the riverbank and scattered throughout the community. Soils in this area have a high sand content, which limits water retention and therefore the establishment of larger vegetation or abundant grass. Much of the area has been converted to pasture or agricultural crops as a result of the extensive development of irrigation canals.

4.4.4.3.1 Fire Potential

Fuels Assessment

The fuels surrounding the community of Grand View are typically sparse grasses and scattered sagebrush broken by irrigated pasture or cropland. Due to the sandy soils and discontinuous fuel bed, wind would likely be needed to spread fire throughout the area. More densely vegetated areas near the Snake River or along other waterways may burn more intensely. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands surrounding the community helps decrease build up of fine fuel loads and therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Grand View is more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. Residential living and recreational use in the area present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.3.2 Ingress-Egress

The primary access into Grand View is via State Highway 78. This is a paved, well-maintained two-lane route. State Highway 67 from Mountain Home offers an alternative paved escape route. The bridge spanning the Snake River between Grand View and the Chattin Hills area is at low fire risk due to the urban development and lack of wildland fuels. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses. There are also large areas void of any vegetation where sand and rock abut the roadway. These access routes are not at significant risk of closure due to wildland fire.

Other potential escape routes, including River Road and Mud Flat Road, are located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels.

4.4.4.3.3 Infrastructure

Residents of Grand View are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.3.4 Fire Protection

The Grand View City Fire Department provides structural fire protection for the community of Grand View. The Grand View Rural Fire Department provides structural fire protection for the greater Grand View area and residents of the Chattin Hills area in Elmore County. The rural department also has mutual aid agreements with the communities of Bruneau and Mountain Home. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites along the Snake River or in other waterways would be crucial in the event of a fire.

4.4.4.3.5 Community Risk Assessment

Residents of Grand View have low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational activities throughout the area increase the risk of a man-caused wildfire spreading to the community. The Grand View area also experiences frequent winds, which generally increase the rate of fire spread and intensity of rangeland fires. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.3.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.4 Homedale

The community of Homedale lies on the southern bank of the Snake River at the junction of U.S. Highway 95 and State Highway 19. This area is relatively flat and well irrigated by resources drawn from the Snake River and the Owyhee River. A few rolling hills and gullies are created by the numerous streams and canals crisscrossing the landscape. Native vegetation including sagebrush and sparse grasses can be found in non-irrigated pastures, on untillable hillsides, empty lots, and along roadways. The economy in Homedale is based on agriculture.

4.4.4.4.1 Fire Potential

Fuels Assessment

The fuels surrounding the community of Homedale are dominated by irrigated crops or pastureland. Native fuels are typically sparse grasses and scattered sagebrush, but this type of vegetation is limited to non-irrigated areas and distant rangelands. More densely vegetated areas near the Snake River or along other waterways may burn more intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands south of the community helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Homedale is more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. Residential living and recreational use in the area present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.4.2 Ingress-Egress

The primary access into Homedale is either State Highway 19 from the west or U.S. Highway 95 from the north or south. These are both paved, well-maintained, two-lane routes. The bridge spanning the Snake River at Homedale is at very little risk of becoming impassable due to a fire on either side of the river due to the agricultural and urban development. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. There are also a few areas void of any vegetation where sand and rock abut the roadway. These access routes are not at significant risk of closure due to wildland fire.

Other potential escape routes, including Homedale Road and Johnstone Road, are also located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels.

4.4.4.4.3 Infrastructure

Residents of Homedale are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources would not likely be seriously affected by a rangeland fire.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.4.4 Fire Protection

The Homedale City Fire Department provides structural fire protection for residents within the Homedale city limits. The Homedale Rural Fire District provides structural fire protection for the greater Homedale area. The rural department also has mutual aid agreements with the communities of Caldwell, Wilder, and Marsing. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites along the Snake River or other waterways would be crucial in the event of a fire.

4.4.4.4.5 Community Risk Assessment

Residents of Homedale have a low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational and agricultural activities throughout the area increase the risk of a man-caused wildfire spreading to the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.4.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.5 Indian Cove

The small community of Indian Cove lies on the southern bank of the Snake River east of Bruneau along State Highway 78. This area is relatively flat and well irrigated by resources drawn from the Snake River. A few rolling hills and gullies are created by Browns Creek and the numerous other streams crisscrossing the landscape. Native vegetation including sagebrush and sparse grasses can be found in non-irrigated areas and along roadways. The Saylor Creek Air Force Range lies only about 3 miles to the south of the community center.

4.4.4.5.1 Fire Potential

Fuels Assessment

Native fuels in the Indian Cove area are typically very sparse grasses and scattered sagebrush broken by relatively small expanses of irrigated agricultural fields. Due to the sandy soils, discontinuous fuel bed, and primarily gentle topography, strong winds would likely be needed to spread fire throughout the area. Homeowners generally maintain an adequate defensible space around structures.

Ignition Profile

Although lightning events are common in Owyhee County, residents of Indian Cove are more prone to man-caused ignitions than lightning strikes due to the gentle topography and lack of hazardous vegetation. Residential living and agricultural activities present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area. Activities and off-road vehicle use on the Saylor Creek Air Force Range may be a potential cause of an ignition.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.5.2 Ingress-Egress

The primary route through the Indian Cove area is State Highway 78. This is a well-maintained, paved, two-lane road. There are only a few alternate secondary routes throughout the area, most of which travel into the higher risk rangeland areas to the south or access private property. Although the community would benefit from an additional alternate escape route, Highway 78 is at low risk of wildfire due to the lack of fuels bordering the roadway and the abundance of nearby water resources.

4.4.4.5.3 Infrastructure

Residents of Indian Cove have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.5.4 Fire Protection

Currently, there is no formal structural fire protection for residents of Indian Cove. Wildland fire protection is provided by the Bureau of Land Management. The availability of drafting sites or dipping sites on the Snake River may become imperative in the event of a wildland fire.

4.4.4.5.5 Community Risk Assessment

Residents of Indian Cove have a low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational, military, and agricultural activities throughout the area increase the risk of a man-caused wildfire spreading to the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds. The lack of a safe alternate escape route heightens the risk to residents in the event that a wildfire threatens the community.

4.4.4.5.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation. It is also important for alternative escape routes to be developed, maintained, and signed for emergency use in the event that Highway 78 becomes compromised.

4.4.4.6 Marsing

The community of Marsing lies on the southern bank of the Snake River near the junction of State Highway 78 and State Highway 55. This area is relatively flat and well irrigated by resources drawn from the Snake River and the Owyhee River. A few rolling hills and gullies are created by the numerous streams and canals crisscrossing the landscape. Native vegetation including sagebrush and sparse grasses can be found in non-irrigated pastures, on untillable hillsides, empty lots, and along roadways. The economy in Marsing is based on agriculture.

4.4.4.6.1 Fire Potential

Fuels Assessment

The fuels surrounding the community of Marsing are dominated by irrigated crops or pastureland. Native fuels are typically sparse grasses and scattered sagebrush, but this type of vegetation is limited to non-irrigated or undeveloped areas and distant rangelands. More densely vegetated areas near the Snake River or along other waterways may burn more

intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands south of the community helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Marsing is more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. Residential living and recreational use in the area present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.6.2 Ingress-Egress

The primary access into Marsing is either State Highway 55 or State Highway 78. These are both paved, well-maintained, two-lane routes. The bridge spanning the Snake River at Marsing is at very little risk of becoming impassable due to a fire on either side of the river due to the agricultural and urban development. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. There are also a few areas void of any vegetation where sand and rock abut the roadway. These access routes are not at significant risk of closure due to wildland fire.

Other potential escape routes, including Marsing Road, Edison Road, and Pershall Road, are also located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels.

4.4.4.6.3 Infrastructure

Residents of Marsing are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.6.4 Fire Protection

The Marsing City Fire Department provides structural fire protection for residents within the Marsing city limits. The Marsing Rural Fire Department provides structural fire protection for the greater Marsing area. The rural department also has a mutual aid agreement set up with the Murphy/Reynolds/Wilson Fire District and the communities of Caldwell and Homedale. Additionally, the Bureau of Land Management provides wildland fire protection. The availability

of drafting or dipping sites along the Snake River or other waterways would be crucial in the event of a fire.

4.4.4.6.5 Community Risk Assessment

Residents of Marsing have a low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational and agricultural activities throughout the area increase the risk of a man-caused wildfire spreading to the community. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.6.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.7 Murphy

Murphy, the county seat of Owyhee County, is located at the junction of the Reynolds Creek Stage Road and State Highway 78 approximately 6 miles south of the Owyhee-Canyon County border and the Snake River. Much of the area is characterized by gently rolling lowlands defined by what is known as Striker Basin. A low rising plateau extends along the length of the basin to the east of the community. Sagebrush dominates the vegetative community for several miles surrounding the town site. There is very little occurrence of grass or other native species, except in yards or other developed areas. Although there is evidence of past irrigation attempts, current agricultural development is very limited.

4.4.4.7.1 Fire Potential

Fuels Assessment

The native fuels surrounding the community of Murphy are primarily limited to sagebrush with varying densities depending on the availability of soil, topography, and the amount of

development. Due to the high sand content in the soils, fire spread in more sparsely vegetated areas would be limited. In mature, more dense stands of sagebrush larger flame lengths and higher intensity fires would be expected. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Grazing on BLM public lands surrounding the community helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Murphy is more prone to man-caused ignitions than lightning strikes due to the gentle topography and lack of continuous fuel bed. Residential living presents innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, and roadway fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.7.2 Ingress-Egress

The primary access to Murphy is via State Highway 78. This is a paved, well-maintained two-lane route. The Rabbit Creek Road from the small community of Reynolds offers an alternative escape route; however, this path is not a direct route out of the high fire risk area. Both of these routes are bordered by sparse desert climate vegetation. There are also large areas void of any vegetation where sand and rock abut the roadway. These access routes can be affected by wildland fire. The Rabbit Creek Fire affected traffic flow between Reynolds and Murphy in 1997.

4.4.4.7.3 Infrastructure

Residents of Murphy are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.7.4 Fire Protection

The Murphy/Reynolds/Wilson Volunteer Fire Department provides structural fire protection for the community of Murphy. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of developed drafting or dipping sites along the Snake River or in other waterways would be crucial in the event of a fire. In areas farther away from the rivers and waterways, local station houses, canals, impoundments and perennial streams are important water sources. The Guffy subdivision several miles northwest of Murphy has several well houses that are capable of replenishing district fire trucks.

4.4.4.7.5 Community Risk Assessment

Residents of Murphy have low risk of experiencing a wildland fire due to the lack of heavy fuels surrounding most structures and their nearby access to water resources. Nevertheless, the Murphy area experiences frequent winds, which generally increase the rate of fire spread and intensity of rangeland fires. Most homeowners maintain an adequate defensible space around structures. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event.

The Eagle View subdivision, located northwest of Murphy off State Route 78, has moderate risk of experiencing a wildfire. Fuels in this area are sparse and would likely need strong winds to carry a fire; however, the subdivision has other problems that may hinder fire fighting capabilities. Wells in the area frequently run dry; thus, immediate access to water resources from hydrants or other sources may be delayed. Access roads were also poorly planned with several dead ends and narrow turn around areas.

4.4.4.7.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

The Eagle View subdivision would benefit from the development of deeper wells to service fire hydrants and other fire-related water resources. Also, continuing construction on access roads to create loops or larger diameter culdesacs would improve the effectiveness and safety of fire response personnel. Implementing county-wide building codes to prevent the development of subdivisions that impede fire response capabilities would reduce the fire risk to residents.

4.4.4.8 Murphy Hot Springs

The primarily seasonal community of Murphy Hot Springs sits at the bottom of the steep sided and narrow canyon created by the East Fork of Jarbridge River. Homes in Murphy Hot Springs are packed fairly tightly into the small floodplain of the river. The canyon walls are very steep and rocky. Sagebrush and sparse grasses are dominant on the slopes and the canyon rim; however, black cottonwood and other hardwoods grow along the river bottom.

4.4.4.8.1 Fire Potential

Fuels Assessment

Native fuels in the Murphy Hot Springs area are typically very sparse grasses and scattered sagebrush broken by rock outcroppings along the canyon slopes. Although possible, it is unlikely that a fire would be able to back down these steep slopes and enter the community from above. However, a fire down canyon would likely funnel hot gases, fumes, and smoke directly towards the community. The increased density of vegetation along the river would support a higher intensity and rapidly moving wildfire that could easily ignite fuels on both sides of the canyon.

Ignition Profile

Although lightning events are common in Owyhee County, residents of Murphy Hot Springs are more prone to man-caused ignitions than lightning strikes due to its location in the canyon and the abundance of recreational activities in the area. Residential living and recreational activities present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry rangeland vegetation or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.8.2 Ingress-Egress

The only route in and out of Murphy Hot Springs is Three Creek Road. This is a one lane dirt and gravel road. Three Creek Road traveling up and out of the canyon to the east involves a short, but steep climb up a narrow grade to the flatter rangelands above. This road continues along the canyon bottom about 15 miles to Jarbridge, Nevada. This route is very narrow and would not facilitate safe emergency travel.

4.4.4.8.3 Infrastructure

Residents of Murphy Hot Springs have drilled domestic wells. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.8.4 Fire Protection

There is no structural fire protection for residents of Murphy Hot Springs. Wildland fire protection is provided by the Bureau of Land Management. The availability of drafting sites or an alternative source of water may become imperative in the event of a wildland fire.

4.4.4.8.5 Community Risk Assessment

Residents of Murphy Hot Springs have a moderate to high risk of wildland fire due its location in the canyon amongst heavier riparian fuels. Additionally, the remoteness of the community will

significantly increase the response times of emergency personnel and fire suppression equipment, which may exacerbate the situation. Access into the community may also create problems not only for evacuation purposes, but it may also be dangerous for firefighters to enter the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Currently, there is very little defensible space between homes. The lack of a safe alternate escape route greatly heightens the risk to residents in the event that a wildfire threatens the community. There are also very few places within the town in which a large vehicle could be turned around easily.

4.4.4.8.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. Homes' survivability in Murphy Hot Springs can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning the main road through town and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation. It is also important for alternative escape routes to be developed, maintained, and signed for emergency use in the event that Three Creek Road becomes compromised.

4.4.4.9 Oreana

The community of Oreana is located on Oreana Road approximately one mile south of State Highway 78. Although an old church marks the community center, there are currently only a few larger ranches and scattered homes remaining in the area. Much of the area is characterized by very sandy soils and exposed rock and sand plateaus both of which lack viable vegetation. Scattered sagebrush and sparse grasses are found intermittently throughout the area, particularly in shallow drainages. There are several small streams stemming from the foothills of the Silver City Range southwest of Oreana; however, these channels carry very little water during the summer months.

4.4.4.9.1 Fire Potential

Fuels Assessment

Native fuels in the Oreana area are typically very sparse grasses and scattered sagebrush broken by expanses of pure sand and rock. Due to the sandy soils, discontinuous fuel bed, and primarily gentle topography, strong winds would likely be needed to spread fire throughout the area. Under extreme weather conditions, particularly high winds, there is a high potential for a

rapidly advancing rangeland fire. Homeowners in the area generally maintain an adequate defensible space around structures. Grazing is an integral part of the economic basis of Oreana. Livestock grazing results in lower fine fuel loads, which decreases the fire potential throughout the area.

Ignition Profile

Although lightning events are common in Owyhee County, residents of Oreana are more prone to man-caused ignitions than lightning strikes due to the gentle topography and lack of vegetation. Residential living presents innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.9.2 Ingress-Egress

The primary route through the Oreana area is the Short Cut Road and Oreana Loop Road and the Bachman Grade Road, which connects on both ends to State Highway 78. The loop road is a paved, mostly one-lane access route. There are several secondary routes that can also be used to reach Highway 78 in an emergency situation. For the most part, these travel corridors are bordered by low risk xeric climate vegetation or sand and rock; however, there are a few sections along the loop road that exhibit slightly more dense riparian-type vegetation, particularly near the site of Foremans Reservoir, that may elevate the fire risk somewhat.

4.4.4.9.3 Infrastructure

Residents of Oreana are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.9.4 Fire Protection

There are only a few permanent residents of Oreana; thus, there is no significant need for an organized fire department; however, many ranchers have water trucks and pumps to combat wildfire in an emergency situation. Wildland fire protection is provided by the Bureau of Land Management. The availability of drafting sites or an alternative source of water may become imperative in the event of a wildland fire.

4.4.4.9.5 Community Risk Assessment

Residents of Oreana have a low risk of experiencing a wildland fire due to the lack of vegetation surrounding most structures. Nevertheless, the Grand View area experiences frequent winds, which generally increase the rate of fire spread and intensity of rangeland fires. Most

homeowners maintain an adequate defensible space around structures. The lack of a readily available water source during the summer fire season may reduce the ability of fire suppression services to effectively fight a wildland fire.

4.4.4.9.6 Mitigation Activities

Oreana residence should remain aware of the potential for wildland fire in this xeric environment. Maintaining a defensible space is imperative to the survival of the structure. Creating drafting sites or an alternative water resource such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.10 Pleasant Valley and Cliffs

The communities of Pleasant Valley and Cliffs are small agriculturally based population centers. Pleasant Valley refers to the valley created by the Jordan Creek drainage and is located just east of the Idaho-Oregon border near Jordan Valley, Oregon. Irrigated fields and pasture dominate the flatter valley, but native rangeland fuels including sagebrush and grasses are found along the valley rim and beyond. The Owyhee Mountains lie to the east. Cliffs is located along Juniper Mountain Road south of Pleasant Valley between Dougal Reservoir and Forster Reservoir. There are only a few residents in this area, many of which are large ranch and farm owners. Small flatland areas have been irrigated to provide feed for livestock, but much of the landscape is dominated by sagebrush and native grasses. Juniper is rapidly invading the Owyhee Mountains to the east.

4.4.4.10.1 Fire Potential

Fuels Assessment

The fuels surrounding the Pleasant Valley and Cliffs areas are dominated by native rangeland fuels intermixed with irrigated pasture and cropland. Native fuels are typically grasses and scattered sagebrush that would be expected to burn at variable intensities and move very quickly. More densely vegetated areas along creek beds and canals may burn more intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands surrounding both communities helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Pleasant Valley and Cliffs are at risk from both natural and man-caused fire ignitions. Lightning events are common throughout the Owyhee Mountains. Ignitions due to lightning strikes could occur within or spread to the lower elevations under severe weather conditions; however, it is more likely that fire spread would be predominantly upslope to the east due to the prevailing winds. The communities of Pleasant Valley and Cliffs are also prone to man-caused ignitions due to the relatively high density of recreational and agricultural activity. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential

ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.10.2 Ingress-Egress

The primary access into Pleasant Valley is Pleasant Valley Road. Pleasant Valley Road is partially paved through much of the valley, but turns to a well-maintained two lane gravel route near the south end. Cliffs is reached via Juniper Mountain Road from either the north or the south. This is also a one or two lane gravel route. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. These roads are at moderate fire risk; however, it is unlikely that fuels along these routes would sustain a fire for a significant amount of time.

There are a few other potential escape routes into Jordan Valley from Pleasant Valley. These are typically one-lane, gravel roads that are at low to moderate fire risk. Residents of Cliffs lack an alternative escape route; thus, it is important that either another road be constructed for this purpose or fuel treatments and regular maintenance occur annually along Juniper Mountain Road to insure this escape route is not compromised by wildfire.

4.4.4.10.3 Infrastructure

Residents of Pleasant Valley and Cliffs have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the Pleasant Valley area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition. Cliffs and more remote ranches and farms rely on propane for heat, cooking, and lights.

4.4.4.10.4 Fire Protection

The Jordan Valley Fire Department provides structural fire protection for the communities of Pleasant Valley and Cliffs. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites at Dougal Reservoir or along streams or irrigation canals would be crucial in the event of a fire.

4.4.4.10.5 Community Risk Assessment

Residents of Pleasant Valley and Cliffs have a moderate risk of experiencing a wildland fire. Due to their remote location, response time by emergency and fire suppression vehicles will be greatly extended. Additionally, there is an abundance of native fuels intermixed throughout the patches of irrigated vegetation. Although this breaks up the continuity of wildland fuels and may slow the spread, it also provides a pathway to structures or other valued resources. Nevertheless, the nearby water resources, particularly the Dougal Reservoir and Jordan Creek, will allow more effective and efficient fire suppression operations. Recreational and agricultural activities throughout the area, particularly in the nearby Owyhee Mountains, increase the risk of a man-caused wildfire spreading to the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most

homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.10.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

The Jordan Valley Fire Department responds to fire emergencies in the Pleasant Valley and Cliffs area; however, this area is not within their jurisdiction. Additionally, they do not receive compensation for the services they provide to these residents. Due to the small population in this area, constructing a fire department and obtaining the necessary equipment is not fiscally possible. However, legally forming a fire district and contracting the services of the Jordan Valley Fire Department may be more within the residents’ means.

4.4.4.11 Reynolds

The small community of Reynolds lies in the Reynolds Creek valley between two major ridges of the Owyhee Mountains. Black Mountain, Rooster Comb Peak, and Whiskey Mountain overlook the basin. The majority of the permanent residents of Reynolds are ranchers and their associated employees or supporting businesses.

Several smaller tributaries drain into Reynolds Creek, which flows directly through the community. Small marshes and ponds have been established in lower areas. A large portion of the valley bottom is dominated by thick grasses, willows, wildflowers, and a multitude of other riparian vegetation. The slopes of the surrounding mountains are primarily administered by the Bureau of Land Management and are typically blanketed by sagebrush. The greater Reynolds area, especially towards Silver City, has a rich mining history, the remains of which attract many curious recreators each year. There are several nearby trails that are open to foot traffic or off-road vehicles.

4.4.4.11.1 Fire Potential

Fuels Assessment

Fuels near Reynolds Creek or one of its tributaries are primarily dominated by medium to tall grasses, brush species, and forbs. Due to the availability of moisture, these fuels are less likely to burn; however, if ignited, flames would spread very rapidly and burn with relatively high intensities and large flame lengths. Many of the structures in this area are surrounded by yards or pastureland, which serves to break the continuity of the fuels and create a defensible space.

The expansive sagebrush stands extending to the north and east from the more fertile basin are more prone to wildland fire. There is very little grass or other understory vegetation; thus, fire spread may be limited to areas with a continuous fuel bed. Under the influence of wind, fires in this type of fuels have the potential to move very rapidly; however actual burn time may be short. Grazing on private lands and BLM public lands surrounding the community helps decrease build up of fine fuel loads. Livestock grazing can be an effective tool to reduce the primary fuel load component of the sagebrush-steppe ecosystem.

Douglas-fir stands, juniper and mountain mahogany woodlands, aspen, and mountain shrub communities are the more dominant on the higher elevation slopes to the south and west of Reynolds. Western juniper and curlleaf mountain mahogany are common on the dryer mid-elevation slopes, with Douglas-fir, subalpine fir and aspen at the higher elevations. Aspen, choke cherry, and other riparian species also occur draws and other more mesic sites. Mountain shrubs, such as mountain big sagebrush, snowbrush ceanothus, and snowberry are also common.

Ignition Profile

The higher ridges defining the Reynolds Creek drainage are of particular concern for lightning caused ignitions near the community of Reynolds. The receptive nature of the desert fuels could easily carry a rapidly advancing rangeland fire to the community. Residential living and recreational use in the area present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving on unimproved trails. Campfires are typically restricted in recreational areas during high fire risk seasons; however, the potential for escape is significant due to the xeric climate and flammability of fuels. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.11.2 Ingress-Egress

The primary access into the Reynolds is via either the Rabbit Creek Road from Murphy or the Reynolds Creek Road from the State Highway 78-State Highway 45 junction. The Reynolds Creek Road is primarily a paved, one lane road, while the Rabbit Creek Road is a well-maintained, one-lane, graveled route. Both of these roads are bordered by fairly low risk sagebrush. There are also large sections where sand and rock, void of vegetation, abut the roadway. These access routes are not at significant risk of closure due to wildland fire; however, the windiness and sheer distance to the community may impede the response of additional fire suppression resources.

There are no other direct routes accessing the area; therefore, it is imperative that Rabbit Creek Road and Reynolds Creek Road remain in good condition and clear of hazardous fuels in order to function as safe evacuation routes.

4.4.4.11.3 Infrastructure

Residents of Reynolds have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources would not likely be seriously affected by a rangeland fire.

Public transmission lines strung to homes throughout the area are at low to moderate risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is some potential for ignition.

4.4.4.11.4 Fire Protection

The Murphy/Reynolds/Wilson Fire District provides structural fire protection for the community and outlying area. A 1,000 gallon, year-around tank is located in the Reynolds fire station. A 10,000 gallon tank is available during the fire season at the local USDA station. The ZX Ranch has installed a 10,000 gallon underground tank that is also available to the fire district. Additionally, the Bureau of Land Management provides wildland fire protection. Developed access to drafting sites along Reynolds Creek would significantly increase the ability of emergency response to effectively control a wildland fire. Reynolds Creek often goes dry in the summer months, thus, drafting sites would have to be of sufficient depth to access the subsurface flow.

4.4.4.11.5 Community Risk Assessment

Residents of Reynolds have moderate risk of experiencing a wildland fire due to the community's location in a valley bottom and their nearby access to water resources. However, intense recreational activities throughout the area increase the risk of a man-caused wildfire spreading to the community. The receptive nature of fuels increases the likelihood of a fire start. In the event of wildfire, the dry fuels would likely support a very fast-moving rangeland fire. Therefore, it is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to such an event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.11.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Creating drafting sites or an alternative water resource in addition to the all season firehouse tank, and available ponds, such as underground tanks near the community, will increase the effectiveness and efficiency of emergency response in a wildfire situation. It may also be advantageous to set up a prearranged mutual aid agreement with the Orendorf Ranch for use of the ponds during an emergency fire situation.

4.4.4.12 Silver City

The community of Silver City is located at the confluence of the Long Gulch stream and Jordan Creek approximately 26 miles southwest of Murphy, Idaho, in Owyhee County. The elevation of the town site is 6,100 feet above sea level and is situated in a scenic mountainous valley. The topography slopes gently upward on the east and west before rising sharply to War Eagle Mountain to the east and Florida Mountain to the west.

Silver City is a historic mining town dating back to the 1860's, when gold was discovered in the Owyhee Mountains of southwestern Idaho. Historic buildings, mine shafts, and mining structures characterize the historical mining district. Silver City is composed of approximately 71 historic structures that include homes, a hotel, a church, cemeteries, and a school. The structures are privately owned and many of the owners reside in Silver City during the summer and fall months. During the winter, Silver City Property Owners, Inc. hires a watch person to care for the town. The Deed Covenants and Owyhee County Silver City Preservation Ordinance requires that all structures be maintained to be as historically authentic as possible.

4.4.4.12.1 Fire Potential

Fuels Assessment

The diverse vegetation types throughout the Silver City area provide valuable wildlife cover and habitat. Currently, Douglas-fir stands, juniper and mountain mahogany woodlands, aspen, and mountain shrub communities are the dominant vegetation types. Western juniper and curlleaf mountain mahogany are common on the dryer lower elevation slopes, with Douglas-fir, subalpine fir and aspen at the higher elevations. Aspen, choke cherry, and other riparian species occur along the creeks and on mesic sites. Mountain shrubs, such as mountain big sagebrush, snowbrush ceanothus, and snowberry are also common.

Forest health issues in the Silver City area increase the fire risk. Many of the aspen stands are being invaded with late seral Douglas-fir, which is more prone to higher intensity fires. In addition, Douglas-fir and subalpine fir stands throughout the area are dying from tussock moth and bark beetle infestations. The dying trees are widespread and pose a significant fire hazard by increasing the amount of fuels readily available to burn. Dead or dying debris increases forest fuel loads, which not only can create vertical and horizontal continuity of fuels leading to rapid spread and/or torching and crowning, but it can also result in a much higher intensity fire.

Structures within and around Silver City are almost exclusively constructed with wood products gleaned from the surrounding woodlands; thus, many structures have a very high fire risk. Additionally, most of the in-town structures were built in close proximity to one another making the risk of fire jumping from structure to structure more eminent. The contiguous riparian vegetation in the Jordan Creek drainage, which splits the town site nearly in half, has a higher risk of carrying a fire due to the increased fuel loading in the stream bed. Black cottonwoods and other riparian vegetation will support a higher intensity fire than surrounding vegetation. The risk of a fire threatening the community via the Jordan Creek drainage is considerable.

Particularly under the influence of wind, fires in these fuel types have the potential to move very rapidly; however, intensities may be variable depending on the availability of fuel. Grazing on

private lands and BLM public lands surrounding the community helps decrease the build up of fine fuel loads.

Ignition Profile

The likelihood of lightning caused ignitions near the community of Silver City is great. The receptive nature of the fuels could easily carry a rapidly advancing wildland fire to the community. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Due to the remoteness and availability of unimproved roads and trails, Silver City attracts recreators and off-roaders from all disciplines. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving on unimproved trails. Campfires are typically restricted in recreational areas during high fire risk seasons; however, the potential for escape is significant due to the xeric climate and flammability of fuels.

4.4.4.12.2 Ingress-Egress

The primary access into Silver City is via the Silver City Road from Murphy. The majority of this route is a relatively well-maintained one to two-lane gravel road. The Jordan Creek Road from Jordan Valley, Oregon serves as an alternate escape route; however, the section between Delamar and Silver City is limited to vehicles with high ground clearance (four wheel drive would also be necessary during adverse weather conditions. Both of these roads travel through rangeland and timbered areas that are at higher risk of becoming threatened by wildfire. These access routes are at significant risk of closure due to wildland fire. Additionally, the windiness and sheer distance to the community may impede the response of fire suppression resources.

4.4.4.12.3 Infrastructure

Residents of Silver City rely on a community spring and gravity for their water resources. Residents of Silver City have considered augmenting the town water supply with resources from Florida Mountain or other possible sources. The Silver City Property Owners (SCPO) are currently in negotiations concerning water rights in order to improve the community's water supply. Repairs to the Silver City water storage tank or installation of additional storage tanks would increase the city's water holding capacity.

4.4.4.12.4 Fire Protection

There is currently no organized fire district encompassing Silver City. However, the Bureau of Land Management provides wildland fire protection and also parks a fire truck within the community during the fire season. Developed access to drafting sites along Jordan Creek would significantly increase the ability of emergency response to effectively control a wildland fire and protect the historic structures. Other developed water resources, such as water storage tanks or holding ponds, would also be improve firefighting capabilities.

4.4.4.12.5 Community Risk Assessment

Property owners and seasonal residents of Silver City have moderate to high risk of experiencing a wildland fire due to the community's remote location and lack of safe access routes and surplus water resources. Furthermore, intense recreational activities throughout the area increase the risk of a man-caused wildfire spreading to the community. The receptive

nature of fuels increases the likelihood of a fire start. In the event of wildfire, the dry fuels would likely support a very fast-moving fire. Therefore, it is imperative property homeowners implement fire mitigation measures to protect their structures and families prior to such an event. Few property owners maintain an adequate defensible space around structures, which heightens the fire risk.

4.4.4.12.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate property owners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the community to emergency apparatus. If the town site cannot be protected safely, firefighting resources will not jeopardize lives to protect the structures. Thus, the fate of the community will largely be determined by property owner actions prior to the event. In many cases, structures' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning roadways and creating turnaround areas for large vehicles. Stationing a BLM fire engine and crew in the Silver City area would reduce response rates and address some of the access issues as well as improve fire protection of citizens.

Creating drafting sites or an alternative water resource such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation. Feasibility studies and cost analyses for different alternative water resources would help the community get on the right track to developing these sites. Potential solutions include, but are not limited to: installing a generator in Jordan Creek to pump water into the town water system, pumping water contained in old mine shafts to the town site for use during emergencies, repairing the “Ice Pond” reservoir on Jordan Creek, and developing helicopter dipping sites on Jordan Creek.

Addressing the forest health issues abundant in the Owyhee Mountains surrounding Silver City will also decrease the fire risk. Removing the invasive Douglas-fir trees from the native aspen stands will maintain the valuable aspen component and significantly reduce their fire risk. Thinning dead and dying trees in the Douglas-fir and subalpine fir communities will also drastically reduce the fire potential associated with overcrowded and diseased forest stands. The Bureau of Land Management is addressing this issue by planning and implementing (as funding becomes available) several fuels reduction projects aimed at improved forest health and reduced fire risk in the Silver City area.

4.4.4.13 Three Creek

The small, primarily ranching community of Three Creek is located at the junction of Three Creek Road and Three Creek in the southeastern corner of Owyhee County. Three Creek residents are typically larger ranch owners scattered throughout the small, flat valleys created by Three Creek, Big Flat Creek, and a few other drainages. This area is characterized by gently rolling hills dominated by scattered sagebrush and grasses. A few landowners have developed irrigated hayfields and pasture for livestock.

4.4.4.13.1 Fire Potential

Fuels Assessment

Native fuels in the Three Creek area are typically very sparse grasses and scattered sagebrush broken by relatively small expanses of irrigated agricultural fields. Due to the sandy soils, discontinuous fuel bed, and primarily gentle topography, strong winds would likely be needed to spread fire throughout the area. Homeowners generally maintain an adequate defensible space around structures.

Ignition Profile

Although lightning events are common in Owyhee County, residents of Three Creek are more prone to man-caused ignitions than lightning strikes due to the gentle topography and lack of hazardous vegetation. Residential living and agricultural activities present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.13.2 Ingress-Egress

The primary route through the Three Creek area is Three Creek Road. This is a well-maintained, two-lane road from Rogerson in Twin Falls County to the east. Three Creek Road west of Three Creek slowly deteriorates into a one-lane dirt road, which access Murphy Hot Springs and continues on to Jarbridge, Nevada. There are only a few secondary routes throughout the area, most of which loop back to Three Creek Road or access private property. The Clover Three Creek Road about 4 miles west of the Three Creek town site is a relatively well-traveled dirt road traveling north to Bruneau. For the most part, these travel corridors are bordered by low risk xeric climate vegetation, sand and rock, or agriculture fields.

4.4.4.13.3 Infrastructure

Residents of Three Creek have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.13.4 Fire Protection

There are only a few permanent residents of Three Creek; thus, there is no significant need for an organized fire department. Wildland fire protection is provided by the Bureau of Land Management. The availability of drafting sites or an alternative source of water may become imperative in the event of a wildland fire.

4.4.4.13.5 Community Risk Assessment

Residents of Three Creek have a low risk of experiencing a wildland fire due to the lack of continuous vegetation surrounding most structures. Additionally, most homeowners maintain an adequate defensible space around structures. Due to the remoteness of the community, response time by emergency personnel and fire suppression equipment will be significantly increased, which may exacerbate the situation. The lack of a readily available water source during the summer fire season may reduce the ability of fire suppression services to effectively fight a wildland fire.

4.4.4.13.6 Mitigation Activities

Three Creek residents should remain aware of the potential for wildland fire in this xeric environment. Maintaining a defensible space is imperative to the survival of the structure. Creating drafting sites or an alternative water resource such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.14 Wilson and Guffy

The communities of Wilson and Guffy are small agriculturally based population centers. Both lie along the southern bank of the Snake River between Givens Hot Springs and Murphy along State Highway 78. Much of this area is relatively flat; however, the foothills of the Owyhee Mountains begin to rise along the southwestern and western edges of the community. The flatlands between the Owyhees and the Snake River have been heavily developed as irrigated farms and ranches. Other than the Snake River, there are also many small streams and canals that provide additional water resources for irrigation purposes. Native vegetation including sagebrush and sparse grasses dominate the lower slopes of the Owyhee Mountains and non-irrigated areas.

4.4.4.14.1 Fire Potential

Fuels Assessment

The fuels surrounding the Wilson and Guffy areas are dominated by irrigated crops or pastureland. Native fuels are typically sparse grasses and scattered sagebrush, but this type of vegetation is limited to non-irrigated or undeveloped areas and the open rangelands of the lower Owyhee Mountains. More densely vegetated areas near the Snake River or along other waterways may burn more intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands to the south helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the communities of Wilson and Guffy are more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. Residential living and recreational use in the area present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. The Hemmingway Butte Trailhead is a very popular motorized recreation area and; thus, should be of particular concern. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.14.2 Ingress-Egress

The primary access into both Wilson and Guffy is State Highway 78. Both Highways 78 and 45 are paved, well-maintained, two-lane routes. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. The bridge spanning the Snake River at Walters Ferry is at very little risk of becoming impassable due to a fire on either side of the river due to the agricultural and urban development. There are also a few areas void of any vegetation where sand and rock abut the roadway. State Highways 78 and 45 are not at significant risk of closure due to wildland fire.

Other potential escape routes, including Wilson Creek Road and Reynolds Creek Road, are located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels; however, these roads are not direct routes leading out of the area.

4.4.4.14.3 Infrastructure

Residents of Wilson and Guffy have drilled domestic wells. Supplementary wells have also been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.14.4 Fire Protection

The Murphy/Reynolds/Wilson Fire District provides structural fire protection for the communities of Wilson and Guffy. The Wilson Fire Station in Wilson is capable of filling fire trucks and other mobile storage tanks with water. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites along the Snake River or other waterways would be crucial in the event of a fire.

4.4.4.14.5 Community Risk Assessment

Residents of Wilson and Guffy have a low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational and agricultural activities throughout the area, particularly in the nearby Owyhee Mountains, increase the risk of a man-caused wildfire spreading to the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.14.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.5 Fire Fighting Resources and Capabilities

The Fire Fighting Resources and Capabilities information provided in this section is a summary of information provided by the Rural Fire Chiefs or Representatives of the Wildland Fire Fighting Agencies listed. Each organization completed a survey with written responses. Their answers to a variety of questions are summarized here. ***In an effort to correctly portray their observations, little editing to their responses has occurred.*** These summaries indicate their perceptions and information summaries.

4.5.1 Wildland Fire Protection

4.5.1.1 Bureau of Land Management

4.5.1.1.1 Twin Falls District

Shoshone	Duty Location	400 West F Street	83352
Bellevue	Duty Location	11053 Highway 75	83313
Carey	Duty Location	20548 North Main	83320

Boundary Description of Twin Falls District:

The east boundary of the District starts at the Utah border and goes north along the Range/Township line dividing Range 28 and Range 29; stair steps around the Sublett Division of the Sawtooth Forest and the Sublett Range to the boundary of Cassia and Power County; goes due west for approximately 8 miles along the county line; turns due north to the Snake River; follows the Snake River to approximately one mile southwest of the city of American Falls; turns due north for three miles along the Township/Range line dividing Range 30 and 31; turns due west on the southern border of Sections 24, 23, 22, 21, 20 and 19 of Township 8S, Range 30E; the southern border of Sections 24, 23, 22, and 21 of Township 8S, Range 29E;

where the line, meeting BLM administered ground turns north and stair steps to Highway 93, approximately 7 miles northeast of the Craters of the Moon National Monument and Preserve.

The north boundary starts at this point and stair steps in a southwest direction to the northwest corner of the Craters of the Moon National Monument and Preserve; turns to a westerly direction and ties to the Blaine County boundary line just east of Blizzard Mountain; follows the Blaine County line north and then west to where the Blaine County line meets the Elmore County line.

The west boundary starts at this point and continues to follow the Elmore County line in a southern direction to the southwest corner of Section 31 of Township 2N, Range 12E; turns east for five miles; stair steps in south west direction to southwest corner of Section 6 of Township 1S, Range 10E; follows the Township/Range line due south to King Hill Creek; follows King Hill Creek to it's confluence with the Snake River; follows the Snake River to the west until it meets the Township/Range line between Range 8E and Range 7E: turns south along the Township/Range line to the border of the Saylor Creek Air Force Range; turns west following the boundary of the Saylor Creek Air Force Range; turns south for two miles along the boundary; turns to the west and ties into the Bruneau River; follows the Bruneau River south across the Nevada border to the boundary of Humboldt National Forest.

The south boundary starts at this point and continues to the east along the Forest boundary until it meets the Idaho state line; follows the Idaho/Nevada and Idaho/Utah state lines until it meets the east boundary of the District.

There is approximately 3.9 million acres of ground administered by the BLM within the defined boundary of the District. Sage grouse and sage grouse habitat is a primary issue for the District. Lepidium is also a major issue but is concentrated in a small area of the Jarbidge resource area.

Personnel: The fire program staff totals 212 individuals, including 29 permanent employees, 35 career-seasonal employees who work up to nine months each year, and 148 seasonal employees on staff from roughly June to September. These are all paid staff members trained in wildland fire, but not in structure protection.

Apparatus List:

Shoshone

Table 4.2. Twin Falls District List: Shoshone.

Identifier	Description	Make	Water Capacity	Pump GPM
E403	Type 4 Engine	International 4070	900	100
E405	Type 4 Engine	International 4070	875	90
E408	Type 4 Engine	International 4070	875	90
E411	Type 4 Engine	Freightliner FL70	875	160
E420	Type 4 Engine	International 4070	850	160
E421	Type 4 Engine	International 4070	850	100
E422	Type 4 Engine	International 4070	850	145
E423	Type 4 Engine	Freightliner FL70	900	100
E682	Type 6 Engine	Ford F-550	290	80
E685	Type 6 Engine	Ford F-550	290	85
E690	Type 6 Engine	Ford F-550	280	80
E692	Type 6 Engine	Ford F-550	290	80
E694	Type 6 Engine	Ford-450 SD	295	80
E695	Type 6 Engine	Ford-450 SD	295	90

Table 4.2. Twin Falls District List: Shoshone.

Identifier	Description	Make	Water Capacity	Pump GPM
W24	Type 2 Tender	Freightliner F9000	3500	750
Contract Dozer	Type 2 Dozer	Varies	N/A	N/A

Bellevue

Table 4.3. Twin Falls District List: Bellevue.

Identifier	Description	Make	Water Capacity	Pump GPM
E415	Type 4 Engine	Freightliner Fl70	875	90
E418	Type 4 Engine	International 4070	875	100
E684	Type 6 Engine	Ford F-550	290	85
W21	Type 2 Tender	Ford F9000	3000	450

Carey

Table 4.4. Twin Falls District List: Carey.

Identifier	Description	Make	Water Capacity	Pump GPM
E402	Type 4 Engine	International 4070	900	95
E414	Type 4 Engine	Freightliner FL70	875	90
E683	Type 6 Engine	Ford F550	290	85
Contract Dozer	Type 2 Dozer	Varies	N/A	N/A

Burley

Table 4.5. Twin Falls District List: Burley.

Identifier	Description	Make	Water Capacity	Pump GPM
E419	Type 4 Engine	International 4070	900	95
E416	Type 4 Engine	Freightliner FL70	875	90
E678	Type 6 Engine	Ford F550	290	85
W22	Type 2 Tender	Ford F9000	3000	450
E404	Type 4 Engine	International 4070	900	95
E410	Type 4 Engine	Freightliner FL70	875	90
E681	Type 6 Engine	Ford F550	290	85

Malta/Almo

Table 4.6. Twin Falls District List: Alomo.

Identifier	Description	Make	Water Capacity	Pump GPM
E417	Type 4 Engine	International 4070	900	95
E412	Type 4 Engine	Freightliner FL70	875	90

Kimama

Table 4.7. Twin Falls District List: Kimima.

Identifier	Description	Make	Water Capacity	Pump GPM
E406	Type 4 Engine	International 4070	900	95
E413	Type 4 Engine	Freightliner FL70	875	90
E688	Type 6 Engine	Ford F550	290	85

Rogerson

Table 4.8. Twin Falls District List: Rogerson.

Identifier	Description	Make	Water Capacity	Pump GPM
E424	Type 4 Engine	International 4070	900	95
E407	Type 4 Engine	Freightliner FL70	875	90
E693	Type 6 Engine	Ford F550	290	85
W23	Water Tender	Ford F9000	3000	450

Air Resources:

Helicopter: The district has an A-Star medium helicopter capable of carrying 130 gallons of water on contract from June to October with a 10 member helitack crew. U.S. Forest Service Helitack crews are stationed at Hailey and are available for assistance if needed. Additionally, there are other helicopter resources equipped for fire missions that are available on a aircraft-rental-agreement (ARA) basis.

Fixed-Wing: The district has an AeroCommander 500S fixed-wing aircraft, staffed by a pilot and the air attack supervisor. The air attack supervisor coordinates aerial firefighting resources and serves as an observation and communications platform for firefighters on the ground.

Tanker Base: The district's Tanker Base consists of 4 contract personnel, 1 Aviation Manager, 1 Tanker Manager, 2 Single Engine Air tanker (SEATS) managers. This base is located in Twin Falls but has the capability of setting up 5 remote bases throughout the district at any time. This base is also capable of serving Type 1 heavy air takers when needed.

Air Tankers: There are typically 2 SEATS (Air Tracker 802F) on contract in Twin Falls capable of carrying 800 gallons of retardant during the fire season. There are also 2 SEATS (Air Tracker 802) located in Boise and Pocatello.Mountain Home Air Force Base Saylor Creek Range

Fire Suppression Capabilities:

Suppression equipment on SCR includes tow grades to cut in fire lines, one CASE 256 HP tractor that tows a 20-foot-wide disc, one2.5-ton pumper truck with a 1,200-gallon tank, two 1-ton trucks with 250-gallon and 350-gallon slip-on tanks, respectively, one 10,000-gallon stationary water tank, one 3,000-gallon mobile water tank, hand tools, and various smaller backpack water sprayers.

Suppression equipment on JBR consists of one 1,200-gallon pumper truck, two 250-gallon slip-ons, one 3,000-gallon tanker truck, one CASE 200-hp tractor that tows a 20-foot wide disc, and one 50,000-gallon water tank at the maintenance facility.

The Air Forces monitors and responds to all fires on the SCR and JBR. Yearly pre-mitigation work is conducted on the range to reduce the number of fire starts. Pre-mitigation work has included controlled burns, spraying to kill vegetation before reseeding (fire prone weeds), mechanical treatment (disking) of fuels, and creation of fire breaks around the ranges.

The Air Force has a very good record of keeping fires limited to the two ranges and of responding quickly and with sufficient equipment and personnel to handle the fires on the ranges.

4.5.1.1.2 Boise District

- Boise BLM Fire Office, 3948 Development Ave., Boise, 83705; 208-394-3400

- Hammett Guard Station, north of Exit 112 on Interstate 84, 208-366-7722
- Bruneau Guard Station, Hot Creek Road, Bruneau, 208-845-2011
- Wild West Guard Station, Exit 13 off I-84, 208-454-0613

The Department of Interior, BLM, provided funding for this Wildland-Urban Interface Wildfire Mitigation Plan. The Boise District BLM has been involved in Owyhee County through assistance to rural fire districts and national fire prevention programs; however, the only wildland fire resources housed within Owyhee County is at the Bruneau Guard Station in Bruneau. Initial attack response for the Jarbridge Resource Area will be shared with the Twin Falls District through an agreement that will allow IA by closest resources. The rest of Owyhee County, the Bruneau Resource Area and the Owyhee Resource Area, are covered by the crews station in Bruneau, Hammett, Boise, and Wild West.

The Boise District BLM encompasses approximately 3.9 million acres of BLM-managed land in southwest Idaho. Through agreements with the Idaho Department of Land and the National Forest Service, the BLM also provides support on IDL and FS lands in some areas within the district boundary. The border of the district extends north from the Nevada border following the Bruneau River fairly closely before heading east along the Saylor Creek Air Force Range boundary to the Elmore County line. Then, it heads north to the confluence of the Snake River. The border follows the Snake River east to the community of King Hill before turning north again following the King Hill Creek drainage to the Township 1S, Range 10E line, where it heads due north to the southwest corner of Section 6. The border, then, stairsteps in a northeasterly direction just past the Elmore County line to the Township 2N, Range 12E line; then heads five miles due west to the Elmore County line. The eastern boundary follows the Elmore County line to where it meets the Blaine County line. The District boundary, then, follows the foothills west and north across the Boise Front; up Highway 55 and includes some scattered areas into the Crouch area; then jogs in a northwesterly direction to the Oregon border west of New Meadows.

Special features within the district include the 485,000-acre Snake River Birds of Prey National Conservation Area; the Owyhee Canyonlands; portions of the north and south fork Payette River corridors; the Owyhee Mountains, including the historic Silver City area; the Bruneau River canyon; and several popular recreation areas and wildland-urban interface areas.

The district's primary station is located in Boise, where 3 crews, with 3 engines per crew are based, along with both helicopter and fixed-wing aircraft resources. One of the three Boise crews is stationed during the day at Boise Fire Station #2 at the base of the foothills. Additional day-use stations are available in Kuna, Hidden Springs, and Eagle.

Additionally, the district has out stations at Bruneau, Hammett, and Wild West (at Exit 13 on Interstate 84). Each facility is staffed by one crew, with two to three engines (depending on fire activity and yearly budget), on a 8-hour day, 5-day per week basis (on call 24/7) from mid June to mid September. Bruneau and Hammett will have different days off to provide 7 day coverage between the two guard stations. A dozer also is typically based at Hammett.

Wild West Guard Station is going to be demolished this spring with plans to build a new station. In the meantime, Wild West will be stationed at the Middleton Fire Department in downtown Middleton.

BLM crews are neither trained nor equipped for structure suppression. Primary protection responsibilities are on public land throughout southwest Idaho and the BLM responds to fires originating on public lands and those on private land that threaten public land. Additionally, through mutual aid agreements with local fire departments, the BLM will provide assistance when requested on wildland fires.

The BLM does not provide formal EMT services. The crews are trained in first-aid, and some staff members have EMT and first-responder training, but this is not a service the BLM provides as part of our organization.

Personnel: The fire program staff totals 110-135 individuals, including 20 permanent employees, 40 career-seasonal employees who work up to nine months each year, and 75 seasonal employees on staff from roughly June to September. These are all paid staff members trained in wildland fire, but not in structure protection.

Mutual Aid Agreements: The BLM has an interagency working relationship with the US Forest Service (Boise National Forest and Payette National Forest) and the Idaho Department of Lands and the crews are dispatched on a closest-forces concept to public lands. Additionally, the BLM has mutual aid agreements with approximately 42 community fire departments.

Top Resource Priorities:

- **Training:** Increasing the amount and level of training for and with partner community fire departments .
- **Communications:** Using the Rural Fire Assistance Program to allow departments to purchase radios to facilitate communication, coordination, and safety at the fire scene.

The district encompasses a broad spectrum of resources at risk, including recreation sites, power lines, wildlife habitat, wilderness study areas, wild horse management areas, historic districts, cultural and archaeological sites, and a range of vegetation types, from rare plant species to sagebrush and timber resources.

Table 4.9 summarizes available equipment.

Table 4.9 Boise District Equipment List for Wildland Fire Protection

Assigned Station	Make/ Model	Capacity (gallons)	Pump capacity (GPM)	Type
Duck Valley	Internat'l	Heavy 800 – 1000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Hammett	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Hammett	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Hammett	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Bruneau	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Bruneau	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Bruneau	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Wild West (exit 13, I-84)	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Wild West (exit 13, I-84)	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Wild West (exit 13, I-84)	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland

Table 4.9 Boise District Equipment List for Wildland Fire Protection

Assigned Station	Make/ Model	Capacity (gallons)	Pump capacity (GPM)	Type
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Ford	Light 300	120 GPM	Wildland

- The LSRD has 3 dozers, one of which is stationed in Hammett (may change in 2005); and two in Boise
- The LSRD also has 3, 3500 gallon water tenders.
- There are 4 Fire Lookouts, one on Squaw Butte, north of Emmett; one on South Mountain, southeast of Jordan Valley; one on Danskin Peak, north of Mountain Home; and one on Bennett Mountain, northeast of Mountain Home.

Additionally, suppression resources include:

- **Helicopter:** The district has an new compact for 2005 helicopter on contract from June to October and an 11 member helitack crew. U.S. Forest Service helitack crews stationed at Lucky Peak and Garden Valley are available for assistance if needed and if they are not assigned elsewhere. Additionally, there are other helicopter resources equipped for fire missions that are available on a call-when-needed (CWN) basis.
- **Fixed-Wing:** The district has a contract AeroCommander 500S fixed-wing aircraft, staffed by a pilot and the air attack supervisor. The air attack supervisor coordinates aerial firefighting resources and serves as an observation and communications platform for firefighters on the ground.
- **Air Tankers:** There are typically two air tankers (fire retardant planes) on contract in Boise during the fire season. However, these aircraft are considered national resources and are assigned where they're needed at any particular time. These tankers have recently been grounded and may or may not be available for use in the future. Other, nearby, air tankers are located in McCall and various locations in Nevada and Oregon. There are also contract single-engine air tankers (SEATS) located in Oregon and Twin Falls, Idaho.

The primary operational challenges facing the district include:

- Continued development of wildland-urban interface areas across the district.
- Communications and coordination with current, new, and developing community fire departments and working with them to stay abreast of communication and technological developments so that we can continue and improve working together effectively at the fire scene.
- Internally, an operational challenge is to have sufficient and appropriate staff available throughout the year to foster partnerships with local departments and facilitate continued and improved coordination, training, communications, and other joint efforts with our partners across the district.

Our effectiveness in addressing these challenges will largely hinge on funding available for the fire program and its various elements.

4.5.1.2 Mountain Home Air Force Base Saylor Creek Range

Fire Suppression Capabilities. Suppression equipment on SCR includes tow grades to cut in fire lines, one CASE 256 HP tractor that tows a 20-foot-wide disc, one2.5-ton pumper truck with a 1,200-gallon tank, two 1-ton trucks with 250-gallon and 350-gallon slip-on tanks, respectively, one 10,000-gallon stationary water tank, one 3,000-gallon mobile water tank, hand tools, and various smaller backpack water sprayers.

Suppression equipment on JBR consists of one 1,200-gallon pumper truck, two 250-gallon slip-ons, one 3,000-gallon tanker truck, one CASE 200-hp tractor that tows a 20-foot wide disc, and one 50,000-gallon water tank at the maintenance facility.

The Air Forces monitors and responds to all fires on the SCR and JBR. Yearly pre-mitigation work is conducted on the range to reduce the number of fire starts. Pre-mitigation work has included controlled burns, spraying to kill vegetation before reseeding (fire prone weeds), mechanical treatment (disking) of fuels, and creation of fire breaks around the ranges.

The Air Force has a very good record of keeping fires limited to the two ranges and of responding quickly and with sufficient equipment and personnel to handle the fires on the ranges.

4.5.2 City & Rural Fire Districts

4.5.2.1 Grand View Rural Fire Protection

P.O. Box 54
Grand View ID
Cfireman1@wmconnect.com
208-834-2380

Grand View Rural Fire Protection District encompasses 111 sq. miles, including potions of Owyhee County, Elmore County, and the city of Grand View. The department responds to wildland, structural and agricultural fire. Grand View has mutual aid agreements with the surrounding fire protection districts, as well as with the BLM

Personnel: Grand View has a total of ten volunteer positions, including the chief and assistant.

Fire Station: The fire station is a single level, five bay facility.

Equipment:

Wildland Engines

- 1994 Ford F-350, 300 gallon.
- 1995 GMC 3500, 275 gallon with foam capabilities.
- 1978 Ford F-7000, 1,000 gallon.

Structural Engines

- 1961 Howe International, 500 gallon

Water Tenders

- 1984 Kenworth, 3,000 gallons (will be operational in the summer of 2004).

First Aid: Grand View provides Basic Life Support (BLS)

Resource Concerns within the district: In addition to protection of life and homes, Grandview RFD has significant economic resources that are potentially threatened by fire. The majority of

the district within Elmore County is owned by Simplot. Much of this land is cultivated hay. Historically, the ridge above the feed lot has experienced a high number of fires, potentially due to the presence of power transmission lines. The hay resources are seen to be at some risk to loss from fires originating from this or some other ignition source.

4.5.2.2 Bruneau Rural Fire Department

PO Box 276
Bruneau, ID 83604
Dispatch: 208-845-2790
Fax: 208-845-2750
Dick Strickland – Chief
Robert Lemieux – Assistant Chief Phone: 208-845-2150

Equipment/personnel/other:

- 1982 GMC 3500 4X4, 250 gal
- 1978 Ford F-700, 450 gal
- 10 personnel
- assist in approximately 10 Federal fires per year
- no local or interagency prevention program participation
- active in RFA

4.5.2.3 Homedale Rural Fire Department

PO Box 608
Homedale, ID 83628
208-337-3000
Scott Salutrequi – Chief Phone: 208-337-3498
Fax: 208-337-3450

4.5.2.4 Marsing Rural Fire Department

308 Main St
Marsing, ID 83639
Dispatch: 208-896-4444
Roman Usabel – Chief Phone: 208-896-4571

Table 4.10. Fire Apparatus for Marsing Rural Fire Department.

Type	Year	Size	Tank Size (gal)	Pump Flow (gpm)
Pumper	2002	5 ton	1250	1250
Tanker	1996	5 ton	3250	500
Pumper	1963	3 ton	800	1000
Pumper	1974	3 ton	1000	1000
Tanker	1972	2 ton	1350	350
Brush truck	1982	1 ton	300	250
Brush truck	1979	2 ton	500	500

4.5.2.5 Murphy-Reynolds-Wilson Fire District

PO Box 82
Murphy, ID 83650
Owyhee County Sheriff: 208-495-1154
Kenneth Good – Chief Phone: 208-495-1267
Cell: 208-890-1170
Fax: 208-495-9822

Murphy Station

Tanker – 3,400 gallon, 300 GPM transfer pump, 3,000 gallon portable tank, 8'' dump valve, self-priming refill pump with suction and transfer hoses

Class A pumper – 1,250 GPM 2-stage pump, 500 gallon tank, 1,500 gallon portable tank, 1,100 foot of 5" supply line, 500' 1 ¾ " fire hose, foam inducer and nozzle, 3 - 1 ¾" fire fighting nozzles, 2 - 2 ½" fire fighting nozzles, miscellaneous 2 ½" to 1 ¾" "Y" valves, fire extinguishers, SCBA equipment, spare tanks, booster line with 200' 1" hard line on rewind reel

Reynolds Station

Tanker-Pumper – 1,200 gallon, 300 GPM pump, 300' 1 ½" fire hose, 200' 3" supply line, booster line on rewind reel, 200' 1" hard line and all other pertinent apparatus to be fully operational

Wilson Station

Pumper-Tanker – 1,300 gallons, 300 GPM pump, booster reel, rewind with 200' 1" hard line, 500' 1 ½" fire hose, 200' 3" transfer hose, and all nozzles and miscellaneous equipment to be fully operational

Forest Service Wildland Truck – 4x4, 200 gallons, rewind reel with 200' ¾" fire hose, 100 GPM engine driven pump, 100' 1 ½" fire hose with nozzle (fully equipped)

Givens Hot Springs (Sky Park)

BLM Heavy Pumper-Tanker Wildland Truck – 1,000 gallon tank with 100 GPM pump (fully equipped)

Pumper-Tanker – 1,200 gallon, 300 GPM pump (fully equipped)

Currently the Sky Park residents are housing the BLM truck and a 1,200 gallon pumper-tanker in their personal buildings. The Murphy-Reynolds-Wilson Fire Department would like to build a station in Givens Hot Springs large enough to accommodate a BLM satellite wildland crew and equipment.

The Murphy-Reynolds-Wilson Fire Department has three wildfire tank with pumper trailers with hoses and nozzles and additional miscellaneous pumps, hoses, protective clothing, helmets, etc. We also have another Class A pumper under repair and hope to have it on line by late summer of 2005. The MRW Fire Department would also like to enlarge the 3 existing stations.

4.6 Issues Facing Owyhee County Fire Protection

4.6.1 Lack of protection district in Oreana, Indian Cove, Cliffs and Pleasant Valley

The communities of Oreana, Indian Cove, Cliffs and Pleasant Valley do not currently have formal structural protection. Structural fire protection has been provided to these areas on an ad hoc basis by adjoining fire districts. These communities would be better served if they were incorporated into adjoining fire protection districts or looked at forming their own.

4.6.2 Water Supply in the WUI

As growth continues along the edges of the established communities, water for wildland firefighting and structure protection is increasingly difficult to access. Across the county additional accessible water sources are needed.

4.7 Current Wildfire Mitigation Activities in Owyhee County

4.7.1 Mountain Home Air Force Base Saylor Creek Firing Range and Juniper Butte Firing Range

The US Air Force utilizes the Saylor Creek bombing range located in the Northeast corner of the county. The Air Force through the Mountain Home Air Force Base Fire Department actively monitors and suppresses all fires on the Saylor Creek and Juniper Butte bombing range. The majority of fire starts on the range are caused by the activities of the Air Force. They have been very successful in responding to the fires on the range. They have an active program to control vegetation on the range utilizing a variety of methods, spraying, controlled burns, mechanical treatment to reduce the threat of fires. The Mountain Home Air Force Base Fire Department has been very successful in keeping fires contained to the Saylor Bombing Range . Continued active management and vigilance on the part of the Air Force will aid the county in keeping the fire danger in the vicinity of the Saylor bombing range at a minimum.

4.7.2 Grazing

Livestock Grazing in and around the communities of Owyhee County can reduce fine fuels to various levels and have done so in recent times. Domestic livestock graze on grasses, forbs, and certain shrubs in the area. During grazing related activities, some trampling effects may occur at various levels on certain fine fuels in the area. Ranchers tending their herds, or other resource professional in the field may observe wildfire ignition or potentially risk-related activities in and around the communities of the county. Livestock grazing in this region should be considered into the future as a low-cost, positive tool of wildfire mitigation for the wildland-urban interface in this area.

It is the intention of this planning process to make all of the land resource management tools available to resource managers in the management of wildland fire. Livestock grazing and management, coupled with astute land management have the potential to mitigate wildland fires in Owyhee County, as it has done in the past.

4.7.3 Bureau of Land Management

4.7.3.1 Silver City

The BLM has been working in coordination with Silver City community members on fuels reduction projects around the city since July of 2002. One project known as the Silver City Annual Cleanup Day will continue on a yearly basis to assist the citizens in decreasing the threat of wildfire caused by hazardous fuels within the town. The clean up day is also a great tool used to educate the public about Wildland Urban Interface while creating a Firewise community.

Silver City has a moderate to high risk of experiencing a wildland fire due to the community's remote location, lack of safe access routes, and surplus water resources. The Silver City Town Cutting Treatment began in July 2004 by the Boise District BLM and will continue through 2005. The idea is to reduce the fire hazard by reducing the amount and continuity of hazardous fuels in and near town; provide safe travel corridors to the public and emergency vehicles in the event of a wildfire; and maintain and restore the historic native sagebrush steppe, mountain mahogany, mountain shrub, and aspen communities which are being lost to conifer expansion.

Future fuels reduction treatments in Silver City are expected to begin in 2005 and are expected to continue for the next ten years. These treatments will reduce the potential of crown fires by thinning crowed stands and removing encroaching conifers out which will, in turn, provide survivable space for residents and improve the long-term health of the forest. This may also provide economic opportunities to the community through timber sales and mechanical treatments.

Additionally, the Ten Year Comprehensive Strategy in Idaho identifies training as a need in Silver City to give local citizens fire suppression experience and the knowledge to use fire suppression equipment.

4.7.3.2 Research – Reynolds Creek Experimental Watershed

The USDA Agricultural Service Northwest Watershed Research Center has been conducting hydraulic and rangeland research at the Reynolds Creek Experimental Watershed (RCEW) since1960. One of the largest research watersheds in the United States, the Reynolds Creek Experimental Watershed is located approximately 50 miles southwest of Boise in the Owyhee Mountains above the community of Reynolds Creek. Four projects have been identified, two of which have been completed, and that will contribute to a longer-term research and management plan under development by NWRD for assessing prescribed fire impacts in the RCEW.

Information gathered through this research could be used for planning future prescribed fire projects and to add to the knowledge base of using prescribed fire to manage intermountain rangelands. Juniper encroachment has become an issue for resource managers who are looking for ways to improve fire prone landscapes and restore fire adapted ecosystems. Historical studies of the area suggest that the natural role of the fire cycle has been interrupted, facilitating juniper encroachment into these sites. Prescribed fire projects have been identified through 2007 after which future projects could occur.

4.7.3.3 Juniper Mountain

Juniper Mountain is located approximately 45 miles southeast of Jordan Valley, Oregon. The desired sagebrush steppe, mountain mahogany, mountain shrub and aspen communities are gradually being lost to juniper expansion. The Juniper Mountain Restoration Project will begin in

2006 and is expected to continue for ten years to follow with various prescribed fire and mechanical treatments to control seral juniper. The object of this project is to restore the natural fire regime sustaining multiple stages of healthy native plant communities for wildlife habitat, livestock forage, and other values provided by these native communities.

4.7.3.4 General Projects

Education

- As the corridor between Marsing and Murphy *(actually that could apply to all new structures throughout Owyhee County)* becomes more developed, there will be a need for more outreach programs to educate homeowners about Firewise which could include distribution of literature door-to-door, personal home assessments, community presentations, more community clean-up days, etc.
- Propose introducing building codes or suggestions on Firewise building materials to use for new construction of homes located with in the identified WUI areas.
- The BLM has been active in posting signs in recreational use areas to promote fire prevention activities such as the spark arrestor requirements for off-road motorized dirt bikes, campfire restrictions, and the general "Prevent Range Fires" signs posted along the main highways and roads.
- Continue to provide Public Service Announcements that support fire prevention.
- Maintain patrols in high use recreational areas and provide prevention information as needed.
- Continue to educate the public about the risk of starting fires by using steel and tracer ammunition in popular target practice sites such as Elephant Butte, south of Marsing, and Hemingway Butte, on the road to Reynolds Creek.

Training

- Continue to work with rural fire departments on wildland fire fighter training and notify members of those departments when training opportunities arise.

Rural Fire Assistance

- Continue to work with rural fire departments to improve their own fire fighting capabilities.
- Encourage and support the formation of new fire departments in communities identified in this plan such as Oreana, Indian Valley, Cliffs, and Pleasant Valley.

Infrastructure

- Work with the county and communities to identify and secure adequate water sources
- Support road improvement projects where needed to provide appropriate access and egress to communities and land owners

The Owyhee and Bruneau field offices current projects and descriptions are listed below.

Table 4.11. Owyhee and Bruneau Field Offices Project Development and Implementation Timeframes.

Project name	Planning Time Frame	Implementation Timeframe
Owyhee Field Office		
ARS Reynolds Cr. Research Rx Burns	EA and Decision Record signed in 2002	The Breaks burned in '02, Whiskey Hill burned in '04, Upper Sheep Cr. scheduled for '05, Johnston Draw scheduled for '07. Other future burns may occur within the Reynolds Cr. Watershed.

Table 4.11. Owyhee and Bruneau Field Offices Project Development and Implementation Timeframes.

Project name	Planning Time Frame	Implementation Timeframe
West Antelope Juniper Cut & Rx Burns	EA and Decision Record signed in 2003	Cutting began in July 2004. Rx burn Chimney Sp. Pasture in 2006, Rx burn 2N Pasture in 2007
Indian Meadows Rx burns	EA and Decision Record signed in 2003	Noon Cr. Scheduled to Rx burn in 2006 Williams Cr. Scheduled for burning in 2007
Boone Peak Juniper Cut	EA and Decision Record signed in 2004	Cutting will begin in 2005
Hart Cr./Box T Juniper Cut & Burns	EA and Decision Record expected in 2005	Cutting will begin in 2005, Rx burns starting in 2006
Flint juniper cutting treatments	Categorical Exclusion expected in 2005	Implementation expected in 2006
Silver City Town Cutting Treatments	Categorical Exclusion signed 2004	Implementation began in July 2004 and will continue in 2005.
Silver City Annual Cleanup Day	Categorical Exclusion signed 2002	Annual event which first occurred in July 2002.
Silver City Area Fuels Reduction Trts.	EA & ROD expected in early 2005	Begin work in mid 2005. Treatments expected for the next 10 years.
Juniper Mountain Restoration Project	EA & Decision Record signed 2005	Begin Rx and mechanical treatments in 2006. Treatments expected for the next 10 years.
Bruneau Field Office		
Flat Broke Reseeding	EA & Decision Record signed 2000	Reseeded in 2003
Pixley Basin Rx Burn & Juniper Cut	EA & Decision Record signed 2002	Cut and burned in 2003. Complete cutting in 2005
Battle Creek Juniper Cut	EA & Decision Record signed 1999	Implementation began in June 2002. Completion expected in 2005
Long Tom Juniper Cut and Rx Burn	EA or Categorical Exclusion expected in 2005	Begin cutting in 2005, burn in 2006

Table 4.12. Field Office Project Descriptions.

Project	Summary (Purpose and Need)	Benefits to the Community	Location	Description	Acres
Owyhee Field Office Project Descriptions					
ARS Reynolds Creek Research Rx Burns.	Allow ARS to conduct fire related research needed for addressing soil and watershed issues related to juniper expansion and prescribed fire.	Fire and watershed related research beneficial in planning future prescribed fires.	Public and private lands within the Reynolds Creek Experimental Watershed	Conduct four and possibly more prescribed burns within the watershed.	The Breaks 166 ac Whiskey Hill 897 ac U. Sheep Cr. 64 ac Johnston Draw 451 ac
Juniper Mountain Restoration Project	The sagebrush steppe, mt. shrub, mt. mahogany, & aspen communities are gradually being lost to juniper expansion.	A restored fire regime sustaining multiple seral stages of healthy native plant communities throughout the landscape for wildlife habitat, livestock forage, wildflowers, and other values provided by these native communities.	Juniper Mountain Area	Various prescribed fire and mechanical treatments to control seral juniper over the next 10 years.	Burn up to 12,000 ac per year and mechanically treat up to 2,000 acres per year over the next 10 years within the 280,00 acre project area.
W. Antelope Juniper Cut & Rx Burns		Maintained and restored sagebrush steppe, mt. shrub, mt. mahogany, & aspen communities for wildlife habitat, livestock forage, wildflowers, and other values provided by these native plant communities. Economic opportunities for using juniper wood products.	Public and private land W. Antelope Allotment	Rx burn the Chimney Sp. Pasture. Cut portions of 2N Pasture followed by Rx burn.	ChimneySp.Past 780 ac 2N Pasture 1,500 ac
Indian Meadows Rx burns			Public and state land in the Noon Cr. & Williams Cr. Pastures of the Indian Meadows Allotment. (08S04W33 08S05W03)		Noon Cr. 9,744 ac Williams Cr. 2,442 ac
Boone Peak Juniper Cut			Boone Peak Allotment (05S02W 22)	Thin dense seral juniper stands.	4,212 ac
Hart Cr./Box T Juniper Treatments			Hart Cr. & Box T Allotments (05S01W17)	Various mechanical trts. & Rx burns.	10,000 ac

Table 4.12. Field Office Project Descriptions.

Project	Summary (Purpose and Need)	Benefits to the Community	Location	Description	Acres
Flint juniper cutting treatments	Dense stands of juniper and Douglas fir pose a crown fire threat to the historic mining district of Flint. Additionally, aspen & mountain shrub stands are being replaced by encroaching conifers.	Decreased wild fire threat to life, property and the historic structures, and restoration of aspen and mountain shrub communities in the area.	The historic Flint Mining District (06S04W11)	Mechanically remove seral juniper, <8“ DBH fir trees and prune larger trees.	982 ac
Silver City Town Cutting Treatments	Reduce the fire hazard to the Silver City area by reducing the amount and continuity of hazardous fuels in and near the town. Provide safe travel corridors to the public and emergency vehicles in the event of wildfire. Maintain & restore the historic native sagebrush steppe, mt. mahogany, mt. shrub, & aspen communities which are being lost to conifer expansion.	Decreased threat to life, property and the historic mining town.	Public and private lands surrounding the town of Silver City (05S03W06).	Mechanically remove seral juniper, <8“ DBH fir trees and prune larger trees.	729 ac
Silver City Annual Cleanup Day	Assist the citizens in decreasing the threat of wildfire caused by hazardous fuels within the town.	Decreased threat of fire originating within the town.	Public and private lands within the town of Silver City (05S03W06).	Remove and haul flammable debris away from town to a burn site.	20 ac

Table 4.12. Field Office Project Descriptions.

Project	Summary (Purpose and Need)	Benefits to the Community	Location	Description	Acres
Silver City Area Fuels Reduction Treatments	Reduce crown fire potential by thinning crowded stands and removing encroaching conifers out of the aspen woodlands. Provide defensible space, safe travel corridors, and safety zones for fire fighters, residents, and visitors. Improve the long-term health of the forest to reduce the risk of catastrophic wildfire. Retain a scenic landscape for the town.	Decrease the risk of a wildland fire burning structures or forest resources. Provide economic opportunities through timber sale/mechanical treatments.	Jordan Creek Watershed (05S03W06)	Reduce crown fire potential iby reducing the amount and continuity of the hazardous fuels.	1800 ac
Bruneau Field Office Project Descriptions.					
Flat Broke Reseeding	Convert a flammable cheatgrass dominated site to perennial grasses and shrubs in order to restore resource values and reduce the fire frequency.	Stabilized soil, decreased fire frequency, improved wildlife habitat, and more consistent winter forage for livestock and big game.	Flat Broke Located 10 miles SE of Bruneau	Drill seed perennial grasses & shrubs on a failed fire rehab seeding.	850 ac
Pixley Basin Prescribed Burn & Juniper Cut	Sagebrush steppe, mt. shrub, & aspen communities are being lost to juniper expansion.	Maintain & restore these important native shrub communities which provide important wildlife habitat and forage for grazing animals.	Pixley Basin Pasture of the West Castle Creek Allotment located 12 miles SW of Grandview.	Prescribe burn and cut encroaching juniper.	7,000 ac
Long Tom Juniper Cut and Rx Burn			Mahogany pasture of the West Castle Cr. Allotment, located 25 miles SW of Granview.	Cut dense seral juniper to increase fuel loading, then burn. Remove juniper from mahogany stands.	3,507 ac

Table 4.12. Field Office Project Descriptions.

Project	Summary (Purpose and Need)	Benefits to the Community	Location	Description	Acres
Battle Creek Juniper Cut	Scattered juniper is expanding into the scenic mt. mahogany savannas and will eventually out compete the mahogany if left untreated.	Maintenance of scenic mt. mahogany savanna and the important wildlife habitat it provides.	Summer Pasture of the Battle Cr. Allotment located approx. 30 miles SW of Grandview.	Cut the scattered juniper out of the mahogany stands.	30,000 ac

Chapter 5: Treatment Recommendations

5 Overview

Critical to the implementation of this Wildfire Mitigation Plan will be the identification of, and implementation of, an integrated schedule of treatments targeted at achieving an elimination of the lives lost, and reduction in structures destroyed, infrastructure compromised, and unique ecosystems damaged that serve to sustain the way-of-life and economy of Owyhee County and the region. Since there are many land management agencies and hundreds of private landowners in Owyhee County, it is reasonable to expect that differing schedules of adoption will be made and varying degrees of compliance will be observed across all ownerships.

Owyhee County encourages the philosophy of instilling disaster resistance in normal day-to-day operations. By implementing plan activities through existing programs and resources, the cost of mitigation is often a small portion of the overall cost of a project's design or program.

The federal land management agencies in Owyhee County, specifically the Bureau of Land Management, the Mountain Home Air Force Base, the Bureau of Reclamation, the U.S. Fish and Wildlife Service, and the state land management agency, the Idaho Department of Lands, are participants in this planning process and have contributed to its development. The Forest Service does not manage any federal property in Owyhee County. The BLM has management responsibility for most federal land in Owyhee County. Where available, their schedule of WUI treatments has been summarized in this chapter to better facilitate a correlation between their identified planning efforts and the efforts of Owyhee County.

All risk assessments were made based on the conditions existing during 2004-05, thus, the recommendations in this section have been made in light of those conditions. However, the components of risk and the preparedness of the county's resources are not static. It will be necessary to fine-tune this plan's recommendations annually to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

As part of the Policy of Owyhee County in relation to this planning document, this entire **Wildfire Mitigation Plan** should be reviewed annually at a special meeting of the Owyhee County Commissioners, open to the public and involving all municipalities/jurisdictions, where action items, priorities, budgets, and modifications can be made or confirmed. A written review of the plan should be prepared (or arranged) by the Chairman of the County Commissioners, detailing plans for the year's activities, and made available to the general public ahead of the meeting (in accord with the Idaho Open Public Meeting Laws). Amendments to the plan should be detailed at this meeting, documented, and attached to the formal plan as an amendment to the Wildfire Mitigation Plan. Re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following.

5.1 Annual Prioritization of Activities

The annual prioritization process will include a special emphasis on cost-benefit analysis review. The process will reflect that a key component in funding decision is a determination that the project will provide an equivalent or more in benefits over the life of the project when compared with the costs. Projects will be administered by local jurisdictions with overall coordination provided by the Owyhee County Emergency Management Coordinator.

Owyhee County Commissioners and the elected officials of all jurisdictions will evaluate opportunities and establish their own unique priorities to accomplish mitigation activities where

existing funds and resources are available and there is community interest in implementing mitigation measures. If no federal funding is used in these situations, the prioritization process may be less formal and not tied to a strict benefit-cost model, but rather to a willingness to simply implement hazard mitigation. Often the types of projects that Owyhee County can afford to do on their own are in relation to improved codes and standards, department planning and preparedness, and education. These types of projects may not meet the traditional project model, selection criteria, and benefit-cost model. Owyhee County will consider all pre-disaster mitigation proposals brought before the county commissioners by county department heads, city officials, fire districts and local civic groups.

When federal or state funding is available for hazard mitigation, there are usually requirements that establish a rigorous benefit-cost analysis as a predominate criteria in establishing project priorities. The county will understand the basic federal grant program criteria which will drive the identification, selection, and funding of the most competitive and worthy mitigation projects. FEMA's three grant programs (the post-disaster Hazard Mitigation Grant Program, the pre-disaster Flood Mitigation Assistance and Pre-Disaster Mitigation grant programs) that offer federal mitigation funding to state and local governments all include the benefit-cost and repetitive loss selection criteria.

The prioritization of projects will occur annually and be facilitated by the Owyhee County Emergency Management Coordinator to include the County Commissioner's Office, City Mayors and Councils, Fire District Chiefs and Commissioners, agency representatives (BLM, State Lands, etc.). The prioritization of projects will be based on the selection of projects which create a balanced approach to pre-disaster mitigation which recognizes the hierarchy of treating in order (highest first):

- People and Structures
- Infrastructure
- Local and Regional Economy
- Traditional Way of Life
- Ecosystems

While developing and analyzing projects based this hierarchy, specific projects will be evaluated for their intrinsic benefit/cost analysis results, overall benefit to the public good, opportunities for leveraging results from other projects in the county, and coordinating with multi-county activities resulting in specific risk reduction within Owyhee County. The analysis process will include summaries as appropriate for each project, but will include benefit / cost analysis results, which will be one of the criteria for project selection. Projects with a negative benefit / cost analysis result will only be considered in specific circumstances. As a guideline, the decision will be to further consider investments having a B/C Ratio greater than or equal to 1, and reject projects that have a B/C Ratio less than 1. When multiple projects are considered, decision makers will rank by B/C ratio and give the highest ranking projects priority under these criteria. Other criteria will influence final project ranking.

5.2 Possible Fire Mitigation Activities

As part of the implementation of fire mitigation activities in Owyhee County, a variety of management tools may be used. Management tools include but are not limited to the following:

- Homeowner and landowner education
- Building code changes for structures and infrastructure in the WUI

- Homesite defensible zone through fuels modification
- Community defensible zone fuels alteration
- Access improvements
- Access creation
- Emergency response enhancements (training, equipment, locating new fire stations, new fire districts, merging existing districts)
- Regional land management recommendations for private, state, and federal landowners

Maintaining private property rights will continue to be one of the guiding principles of this plan's implementation. Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.

5.3 WUI Safety & Policy

Wildfire mitigation efforts must be supported by a set of policies and regulations at the county level that maintain a solid foundation for safety and consistency. The recommendations enumerated here serve that purpose. Because these items are regulatory in nature, they will not necessarily be accompanied by cost estimates. These recommendations are policy related in nature and therefore are recommendations to the appropriate elected officials; debate and formulation of alternatives will serve to make these recommendations suitable and appropriate.

As part of the Policy of Owyhee County in relation to this planning document, this entire **Wildland-Urban Interface Wildfire Mitigation Plan** should be reviewed annually at a special meeting of the Owyhee County Commissioners, open to the public, where action items, priorities, budgets, and modifications can be made or confirmed. A written review of the plan should be approved by the Chairman of the County Commissioners, detailing plans for the year's activities, and made available to the general public ahead of the meeting (in accord with the Idaho Open Public Meeting Laws). Amendments to the plan should be detailed at this meeting, documented, and attached to the formal plan as an amendment to the WUI Wildfire Mitigation Plan (signatures by the cooperators would be collected at the Chairman's discretion). Re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following.

Prioritization of activities recommended in this plan should be made by the Owyhee County Commissioners consistent with the recommendations made in Chapter 1 of this document. During the annual review of this plan, reprioritization can be justified in response to changing conditions and funding opportunities.

5.3.1 Existing Practices That Should Continue

Owyhee County currently is implementing many projects and activities that, in their absence, could lead to increased wildland fire loss potential. By enumerating some of them here, it is the desire of the authors to point out successful activities.

- Existing rural addressing efforts have aided emergency responses.
- The current 911 service in the county is an excellent service. Activities that build on the rural addressing and current emergency services to develop an Enhanced 911 service would serve the county well.

- Livestock grazing.
- Controlled burning.
- Fire Week Education Program in area schools.

5.3.2 Proposed Activities

Table 5.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.1.a: Continue to adopt and/or amend existing building codes and zoning ordinances as necessary to address wildland fire risks for all construction within the county.	**Protection of people and structures** by applying a standard of road widths, access, and building regulations suitable to insure new homes can be protected while minimizing risks to firefighters. (defensible space, roads and access management, water systems, building codes, signage, and maintenance of private forest and range lands)	**County Commissioners** in cooperation with Rural Fire Districts and Planning and Zoning.	• Year 1 debate and adoption of revised standard (2005). • Review adequacy of changes annually, make changes as needed.
5.1.b: Develop County policy concerning building materials used in high-risk WUI areas on existing structures and new construction	**Protection of people and structures** by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas.	**County Commissioners Office** in cooperation with Rural Fire Departments and Planning and Zoning Committee.	**Year 1 (2005) activity:** Consider and develop policy to address construction materials for homes and businesses located in high wildfire risk areas. Specifically, a County policy concerning wooden roofing materials and flammable siding, especially where juxtaposed near heavy wildland fuels.
5.1.c: Develop a formal WUI Advisory Committee to advise County Commissioners on WUI Issues and Treatments	**Protection of people and structures** by improving the ability of decision makers to make informed decisions about wildfire issues.	**County Commissioners Office**	**Year 1 (2005) activity:** Formalize a committee, its membership and service decided on by the County Commissioners, to collaborate on WUI issues within Owyhee County. Members potentially to include land management organizations and companies, private landowners, and fire protection personnel.
5.1.d: Develop a County Commissioner's Office policy to support the applications for grant monies for projects resulting from recommendations in this plan.	**Protection of people and structures** by improving the ability of residents and organizations to implement sometimes costly projects.	**County Commissioners Office**	**Ongoing activity:** Support grant applications as requested in a manner consistent with applications from residents and organizations in Owyhee County.

5.4 People and Structures

The protection of people and structures will be tied together closely as the loss of life in the event of a wildland fire is generally linked to a person who could not, or did not, flee a structure threatened by a wildfire. The other incident is a fire fighter who suffers the loss of life during the combating of a fire. Many of the recommendations in this section will define a set of criteria for implementation while others will be rather specific in extent and application.

Many of the recommendations in this section involve education and increasing awareness of the residents of Owyhee County. These recommendations stem from a variety of factors including items that became obvious during the analysis of the public surveys, discussions during public meetings, and observations about choices made by residents living in the Wildland-Urban Interface. Over and over, a common theme was present that pointed to a situation of landowners not recognizing risk factors:

- Fire District personnel pointed to numerous examples of inadequate access to homes of people who believe they have adequate ingress.

In addition to those items enumerated in Table 5.1, residents and policy makers of Owyhee County should recognize certain factors that exist today, that in their absence would lead to an increase in the risk factors associated with wildland fires in the WUI of Owyhee County. These items listed below should be encouraged, acknowledged, and recognized for their contributions to the reduction of wildland fire risks:

- **Livestock Grazing** in and around the communities of Owyhee County has led to a reduction of many of the fine fuels that would have been found in and around the communities and in the wildlands of Owyhee County. Domestic livestock not only eat these grasses, forbs, and shrubs, but also trample certain fuels to the ground where decomposition rates may increase. Livestock ranchers tend their stock, placing resource professionals into the forests and rangelands of the area where they may observe ignitions, or potentially risky activities. Livestock grazing in this region should be encouraged into the future as a low cost, positive tool of wildfire mitigation in the Wildland-Urban Interface and in the wildlands.
- **Agriculture** is a significant component of Owyhee County's economy. Much of the northern portion of the county is intermixed with agricultural crops. The original conversion of these lands to agriculture from rangeland, was targeted at the most productive soils and juxtaposition to infrastructure. Many of these productive ecosystems were consequently also at some of the highest risk to wildland fires because biomass accumulations increased in these productive landscapes. The result today, is that much of the rangeland historically prone to frequent fires, has been converted to agriculture, which is at a much lower risk than prior to its conversion. The preservation of a viable agricultural economy in Owyhee County is integral to the continued management of wildfire risk in this region.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.a: Youth and Adult Wildfire Educational Programs	**Protect people and structures** by increasing awareness of WUI risks, how to recognize risk factors, and how to modify those factors to reduce risk	Cooperative effort including: • University of Idaho Cooperative Extension • Idaho Department of Lands • Bureau of Land Management • Local School Districts	To start immediately using existing educational program materials and staffing. Formal needs assessment should be responsibility of University of Idaho Cooperative Extension faculty and include the development of an integrated WUI educational series by year 3 (2007). Costs initially to be funded through existing budgets for these activities to be followed with grant monies to continue the programs as identified in the formal needs assessment.
5.2.b: Wildfire risk assessments of homes in identified communities	**Protect people and structures** by increasing awareness of specific risk factors of individual homesites in the at-risk landscapes. Only after these are completed can homesite treatments follow.	To be implemented by **County Commissioners Office** in cooperation with the **Rural Fire Departments**. Actual work may be completed by Wildfire Mitigation Consultants or trained volunteers.	• **Cost:** Approximately $100 per homesite for inspection, written report, and discussions with the homeowners. • There are approximately 4,450 housing units in Owyhee County, roughly 1,300 of these structures would benefit from a homesite inspection and budget determination for a total cost estimate of $130,000. • **Action Item:** Secure funding and contract to complete the inspections during years 1 & 2 (2005-06) • Homesite inspection reports and estimated budget for each homesite's treatments will be a requirement to receive funding for treatments through grants.
5.2.c: Homesite WUI Treatments	**Protect people, structures, and increase fire fighter safety** by reducing the risk factors surrounding homes in the WUI of Owyhee County	**County Commissioners** in cooperation with Fire Mitigation Consulting company and Rural Fire Districts *Complete concurrently with 5.4.b.*	• Actual funding level will be based on the outcomes of the homesite assessments and cost estimates • **Estimate** that treatments will cost approximately $750 per homesite for a defensible space of roughly 150'. Approximately 1,300 homes in this category for an estimated cost of $975,000. • Homesite treatments can begin after the securing of funding for the treatments and immediate implementation in 2005 and will continue from year 1 through 5 (2010).

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.d: Community Defensible Zone WUI Treatments	**Protect people, structures, and increase fire fighter safety** by reducing the risk factors surrounding high risk communities in the WUI of Owyhee County	**County Commissioners** in cooperation with Fire Mitigation Consultants and Rural Fire Districts	• Actual funding level will be based on the outcomes of the homesite assessments and cost estimates. • **Years 2-5 (2006-10):** Treat high risk wildland fuels from homesite defensible space treatments (5.4.c) to an area extending 400 feet to 750 feet beyond home defensible spaces, where steep slopes and high accumulations of risky fuels exist. Should link together home treatment areas. Treatments target high risk concentrations of fuels and not 100% of the area identified. To be completed only after or during the creation of home defensible spaces have been implemented. • Approximate average cost on a per structure basis is $650-$800 depending on extent of home defensibility site treatments, for a cost estimate of $ 942,500.
5.2.e: Maintenance of Homesite WUI Treatments	**Protect people, structures, and increase fire fighter safety** by reducing the risk factors surrounding homes in the WUI of Owyhee County	**County Commissioners Office** in cooperation with Rural Fire Departments and local home owners	• Homesite defensibility treatments must be maintained periodically to sustain benefits of the initial treatments. • Each site should be assessed 5 years following initial treatment • Estimated re-inspection cost will be $50 per homesite on all sites initially treated or recommended for future inspections ($65,000) • Follow-up inspection reports with treatments as recommended years 5 through 10.
5.2.f: Re-entry of Homesite WUI Treatments	**Protect people, structures, and increase fire fighter safety** by reducing the risk factors surrounding homes in the WUI of Owyhee County	**County Commissioners Office** in cooperation with Rural Fire Departments and local home owners	• Re-entry treatments will be needed periodically to maintain the benefits of the initial WUI home treatments. Each re-entry schedule should be based on the initial inspection report recommendations, observations, and changes in local conditions. Generally occurs every 5-10 years.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.g: Access Improvements of bridges, cattle guards, and limiting road surfaces	**Protection of people, structures, infrastructure, and economy** by improving access for residents and fire fighting personnel in the event of a wildfire. Reduces the risk of a road failure that leads to the isolation of people or the limitation of emergency vehicle and personnel access during an emergency.	**County Roads and Bridges Department** in cooperation with BLM, State of Idaho (Lands and Transportation), and rangeland owners.	• **Year 1 (2005):** Update existing assessment of travel surfaces, bridges, and cattle guards in Owyhee County as to location. Secure funding for implementation of this project (grants) • **Year 2 (2006):** Conduct engineering assessment of limiting weight restrictions for all surfaces (e.g., bridge weight load maximums). Estimate cost of $150,000 which might be shared between County, BLM, State, and private based on landownership associated with road locations. • **Year 2 (2006):** Post weight restriction signs on all crossings, copy information to rural fire districts and wildland fire protection agencies in affected areas. Estimate cost at roughly $25-$30,000 for signs and posting. • **Year 3 (2007):** Identify limiting road surfaces in need of improvements to support wildland fire fighting vehicles and other emergency equipment. Develop plan for improving limiting surfaces including budgets, timing, and resources to be protected for prioritization of projects (benefit/cost ratio analysis). Create budget based on full assessment.

5.5 Infrastructure

Significant infrastructure refers to the communications, transportation (road and rail networks), energy transport supply systems (gas and power lines), and water supply that service a region or a surrounding area. All of these components are important to Owyhee County. These networks are by definition a part of the Wildland-Urban Interface in the protection of people, structures, **infrastructure**, and unique ecosystems. Without supporting infrastructure a community's structures may be protected, but the economy and way of life lost. As such, a variety of components will be considered here in terms of management philosophy, potential policy recommendations, and on-the-ground activities.

Communication Infrastructure: This component of the WUI seems to be diversified across the county with multiple source and destination points, and a spread-out support network. Although site specific treatments will impact local networks directly, little needs done to insure the system's viability.

Transportation Infrastructure (road and rail networks): This component if the WUI has some potential limitations in Owyhee County. The major arterials of Owyhee County's transportation network are U.S. 95 and State Routes 51 and 78. These and other specific infrastructure components have been discussed in this plan.

Ignitions along highways are significant and should be addressed as part of the implementation of this plan. Various alternatives from herbicides to intensive livestock grazing coupled with mechanical treatments have been suggested. As part of the multi-agency WUI team proposed in the previous section, these corridors should be further evaluated with alternatives implemented. A variety of approaches will be appropriate depending on the landowner, fuels present, and other factors. These ignitions are substantial and the potential risk to residents in the area is significant.

Many roads in the county have limiting characteristics, such as narrow travel surfaces, sharp turning radii, low load limit bridges and cattle guards, and heavy accumulations of fuels adjacent to the right-of-way. Some of these road surfaces access remote rangeland areas. While their improvements will facilitate access in the case of a wildfire, they are not necessarily the priority for treatments in the county.

Roads that have these inferior characteristics and access homes and businesses are the priority for improvements in the county. Specific recommendations for these roads are enumerated in Table 5.3.

Energy Transport Supply Systems (gas and power lines): (Owyhee County - Appendix I) A number of power lines crisscross Owyhee County. Unfortunately, many of these power lines cross over rangeland ecosystems. When fires ignite in these vegetation types, the fires tend to be fast moving, but burn at relatively low to moderate intensities. Additionally, there is a potential for high temperatures and low humidity with high winds to produce enough heat and smoke to threaten power line stability. Most power line corridors have been cleared of vegetation both near the wires and from the ground below. Observations across the county of these high tension power lines lead to the conclusion that current conditions coupled with urban developments have mitigated this potential substantially. It is the recommendation of this Wildfire Mitigation Plan that this situation be evaluated annually and monitored but that treatments not be specifically targeted at this time. The use of these areas as "fire breaks" should be evaluated further, especially in light of the treatments enumerated in this plan (eg., intensive livestock grazing, mechanical treatments, and herbicide treatments).

Water Supply: In many of Idaho's communities, water is derived from surface flow that is treated and piped to homes and businesses. When wildfires burn a region, they threaten these watersheds by the removal of vegetation and creation of ash and sediment. As such, watersheds should be afforded the highest level of protection from catastrophic wildfire impacts. In Owyhee County, water is supplied to many homes by single home or multiple home wells. These ground water resources would not be significantly damaged in the event of a wildland fire.

5.5.1 Proposed Activities

Table 5.3. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.3.a: Post FEMA "Emergency Evacuation Route" signs along the identified Primary and secondary access routes in the county.	**Protection of people and structures** by informing residents and visitors of **significant infrastructure** in the county that will be maintained in the case of an emergency.	**County Commissioners** in cooperation with Rural Fire Districts and Roads Department.	• Purchase of signs (2005). • Posting roads and make information available to residents of the importance of Emergency Routes
5.3.b: Fuels mitigation of the FEMA "Emergency Evacuation Routes" in the county to insure these routes can be maintained in the case of an emergency.	**Protection of people and structures** by providing residents and visitors with ingress and egress that can be maintained during an emergency.	**County Commissioners** in cooperation with Rural Fire Districts and Roads Department.	• Full assessment of road defensibility and ownership participation (2005). • Implementation of projects.

5.6 Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland fire fighting districts in Owyhee County. All of the needs identified by the districts are in line with increasing the ability to respond to emergencies in the WUI and are fully supported by the planning committee.

Specific reoccurring themes of needed resources and capabilities include:

- More water tenders for Rural Fire Districts with drafting capabilities at unimproved sites
- New or expanded Fire Districts for Oreana, Indian Valley, Cliffs and Pleasant Valley.
- Expand the existing Fire Districts in the county to include growth areas.
- New fire station at Givens Hot Springs

The implementation of each issue will rely on either the isolated efforts of the fire districts or a concerted effort by the county to achieve equitable enhancements across all of the districts. Given historic trends, individual departments competing against neighboring departments for grant monies and equipment will not necessarily achieve county wide equity. However, the West Central Idaho RC&D may be an organization uniquely suited to work with all of the districts in Owyhee County and adjacent counties to assist in the prioritization of needs across district and even county lines. Once prioritized, the RC&D is in a position to assist these districts with identifying, competing for, and obtaining grants and equipment to meet these needs.

Table 5.4. WUI Action Items in Fire Fighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.a: Enhance radio availability in each district, link into existing dispatch, and improve range within the region, update to new digital, narrow band frequency adopted by feds and state.	**Protection of people and structures** by direct fire fighting capability enhancements.	**BLM** in cooperation with rural and wildland fire districts and County Commissioners	• **Year 1 (2005):** Summarize existing two-way radio capabilities and limitations. Identify costs to upgrade existing equipment and locate funding opportunities. • **Year 2 (2006):** Acquire and install upgrades as needed. • **Year 2-3 (2006-07):** Identify opportunities for radio repeater towers located in the region for multi-county benefits.
5.4.b: Retention of Volunteer Fire Fighters	**Protection of people and structures** by direct fire fighting capability enhancements.	**Rural and Wildland Fire Districts** working with broad base of county citizenry to identify options, determine plan of action, and implement it.	• 5 Year Planning Horizon, extended planning time frame • Target an increased recruitment (+10%) and retention (+20% longevity) of volunteers • **Year 1 (2005):** Develop incentives program and implement it.
5.4.c: Increased training and capabilities of fire fighters	**Protection of people and structures** by direct fire fighting capability enhancements.	**Rural and Wildland Fire Districts** working with the **BLM, IDL, and USFS** for wildland training opportunities and with the **State Fire Marshall's Office** for structural fire fighting training.	• **Year 1 (2005):** Develop a multi-county training schedule that extends 2 or 3 years in advance (continuously). • Identify funding and resources needed to carry out training opportunities and sources to acquire. • Year 1 (2005): Begin implementing training opportunities for volunteers.
5.4.d: Redistricting of Rural Fire Districts	**Protection of people and structures** by improving response time and capturing the synergies in joint Rural/City operations.	All current Rural Fire Districts, State Fire Marshall, County Commissioners, and City governments.	Year 1 (2005): meet with responsible parties to examine feasibility of redistricting. Year 2 (2006) Implement recommendations reached by responsible parties.
5.4.e: New Fire Station at Givens Hot Springs	**Protection of people and structures** by direct fire fighting capability enhancements.	**Murphy Rural Fire District** working with the **BLM**.	Year 1 (2005): meet with responsible parties to examine feasibility of a joint Rural Fire District/ BLM fir Station. Year 2 (2006) Implement

Table 5.4. WUI Action Items in Fire Fighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
			recommendations reached by responsible parties
5.4.f: Identify areas lacking a sufficient water supply and develop publicly accessible fill sites.	**Protection of people and structures** by direct fire fighting capability enhancements.	**County Commissioners and** rural and wildland fire districts.	• Identify populated areas lacking sufficient water supplies and develop project plans to develop fill or helicopter dipping sites. • Implement project plans.
5.4.g: Maintain developed water sources for firefighting purposes.	**Protection of people and structures** by direct fire fighting capability enhancements.	**Rural Fire Districts** in cooperation with the BLM.	On going: Annual review of developed water source areas

5.7 Regional Land Management Recommendations

In section 5.3 of this plan, reference was given to the role that grazing and agriculture have in promoting wildfire mitigation services through active management. Owyhee County is dominated by wide expanses of rangelands intermixed with communities and rural houses.

Wildfires will continue to ignite and burn fuels and homes depending on the weather conditions and other factors enumerated earlier. However, active land management that modifies fuels, promotes healthy range and forestland conditions, and promotes the use of these natural resources (consumptive and non-consumptive) will insure that these lands have value to society and the local region. We encourage the Bureau of Land Management, the Idaho Department of Lands, Industrial land owners, private land owners, and all other landowners in the region to actively administer their Wildland-Urban Interface lands in a manner consistent with the management of reducing fuels and risks in this zone.

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6.3 List of Preparers

The following personnel participated in the formulation, compilation, editing, and analysis of alternatives for this assessment.

Table 6.1. List of Preparers

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6.4 Signature Pages

6.4.1 Representatives of Owyhee County Government

This Wildfire Mitigation Plan and all of its components identified herein were adopted formally through a resolution of the Board of County Commissioners as of _____ 2005, resolution number _____, recorded in the official record of the Owyhee County Commissioners.

By: Harold Tolmie, Chairman Owyhee County Commissioner	Date
By: Chris Salove Owyhee County Commissioner	Date
By: Dick Reynolds Owyhee County Commissioner	Date
By: Jim Desmond Owyhee County Natural Resources Director	Date
By: Gary Aman Owyhee County Sheriff	Date
By: Larry McDaniel Road & Bridge, District #1	Date

By: Dave Miller
Road & Bridge, District #2

Date

By: Brett Endicott
Assessor, Owyhee County

Date

By: Sid Erwin
Chairman, Owyhee County Building, Planning & Zoning Commission

Date

6.4.2 Representatives of City Government in Owyhee County

This Wildfire Mitigation Plan and all of its components identified herein were adopted formally through individual resolutions passed by each city government herein listed.

By: Donald Osterhoudt, Mayor City of Marsing	Date	Adopted by Resolution of the City Resolution Number: _____ Adoption Date: _____
By: Paul Fink, Mayor City of Homedale	Date	Adopted by Resolution of the City Resolution Number: _____ Adoption Date: _____
By: Paul Spang, Mayor City of Grand View	Date	Adopted by Resolution of the City Resolution Number: _____ Adoption Date: _____

6.4.3 Representatives of City and Rural Fire Districts in Owyhee County

This Wildfire Mitigation Plan and all of its components identified herein were developed in close cooperation with the participating fire districts listed herein. Those fire districts which are a City entity have shown their organization's adoption through the formal adoption of the City. Fire protection districts which are independent of a city or the county have indicated their formal adoption of the Wildfire Mitigation Plan below:

By: , Chairman Board of Fire Commisioners Marsing Fire Protection Department	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____
By: Ted Jayo, Chairman Board of Fire Commisioners Grand View Fire Protection Department	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____
By: Tom Benson, Chairman Board of Fire Commisoners Murphy-Renyolds-Wilson Fire Department	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____
By: Dan Mori, Chairman Board of Fire Commisoners Bruneau Fire Department	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____
By: , Chairman Board of Fire Commisoners Homedale Fire Protection District	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____

6.4.4 Representatives of Federal and State Agencies, and Companies

This Wildfire Mitigation Plan was developed in cooperation and collaboration with the additionally listed agencies and organizations. These entities listed below are not elligable to "formally adopt" this plan, but will strive to implement its recommendations.

By: Glen Secrist, Boise District Manager US Department of the Interior, BLM	Date
By: Howard Hedrick, Twin Falls District Manager US Department of the Interior, BLM	Date
By: Steve Douglas, Area Supervisor Idaho Department of Lands, Southwest Supervisory Area	Date
By: Robin Finch, President Southwest Idaho Resource Conservation and Development Council, Inc.	Date
By: By: William E. Schlosser, Ph.D. Project Co-Manager & Lead Author Owyhee County WUI Wildfire Mitigation Plan Northwest Management, Inc.	Date

6.5 Glossary of Terms

Anadromous - Fish species that hatch in fresh water, migrate to the ocean, mature there, and return to fresh water to reproduce (Salmon & Steelhead).

Appropriate Management Response - Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

Biological Assessment - Information document prepared by or under the direction of the Federal agency in compliance with U.S. Fish and Wildlife standards. The document analyzes potential effects of the proposed action on listed and proposed threatened and endangered species and proposed critical habitat that may be present in the action area.

Backfiring - When attack is indirect, intentionally setting fire to fuels inside the control line to contain a rapidly spreading fire. Backfiring provides a wide defense perimeter, and may be further employed to change the force of the convection column.

Blackline - Denotes a condition where the fireline has been established by removal of vegetation by burning.

Burning Out - When attack is direct, intentionally setting fire to fuels inside the control line to strengthen the line. Burning out is almost always done by the crew boss as a part of line construction; the control line is considered incomplete unless there is no fuel between the fire and the line.

Canyon Grassland - Ecological community in which the prevailing or characteristic plants are grasses and similar plants extending from the canyon rim to the rivers edge.

Confine - Confinement is the strategy employed in appropriate management responses where a fire perimeter is managed by a combination of direct and indirect actions and use of natural topographic features, fuel, and weather factors.

Contingency Plans: Provides for the timely recognition of approaching critical fire situations and for timely decisions establishing priorities to resolve those situations.

Control Line - An inclusive term for all constructed or natural fire barriers and treated fire edge used to control a fire.

Crew - An organized group of firefighters under the leadership of a crew boss or other designated official.

Crown Fire - A fire that advances from top to top of trees or shrubs more or less independently of the surface fire. Sometimes crown fires are classed as either running or dependent, to distinguish the degree of independence from the surface fire.

Disturbance - An event which affects the successional development of a plant community (examples: fire, insects, windthrow, timber harvest).

Disturbed Grassland - Grassland dominated by noxious weeds and other exotic species. Greater than 30% exotic cover.

Diversity - The relative distribution and abundance of different plant and animal communities and species within an area.

Drainage Order - Systematic ordering of the net work of stream branches, (e.g., each non-branching channel segment is designated a first order stream, streams which only receive first order segments are termed second order streams).

Duff - The partially decomposed organic material of the forest floor beneath the litter of freshly fallen twigs, needles, and leaves.

Ecosystem - An interacting system of interdependent organisms and the physical set of conditions upon which they are dependent and by which they are influenced.

Ecosystem Stability - The ability of the ecosystem to maintain or return to its steady state after an external interference.

Ecotone - The area influenced by the transition between plant communities or between successional stages or vegetative conditions within a plant community.

Energy Release Component - The Energy Release Component is defined as the potential available energy per square foot of flaming fire at the head of the fire and is expressed in units of BTUs per square foot.

Equivalent Clearcut Area (ECA) - An indicator of watershed condition, which is calculated from the total amount of crown removal that has occurred from harvesting, road building, and other activities based on the current state of vegetative recovery.

Exotic Plant Species - Plant species that are introduced and not native to the area.

Fire Adapted Ecosystem - An arrangement of populations that have made long-term genetic changes in response to the presence of fire in the environment.

Fire Behavior - The manner in which a fire reacts to the influences of fuel, weather, and topography.

Fire Behavior Forecast - Fire behavior predictions prepared for each shift by a fire behavior analysis to meet planning needs of fire overhead organization. The forecast interprets fire calculations made, describes expected fire behavior by areas of the fire, with special emphasis on personnel safety, and identifies hazards due to fire for ground and aircraft activities.

Fire Behavior Prediction Model - A set of mathematical equations that can be used to predict certain aspects of fire behavior when provided with an assessment of fuel and environmental conditions.

Fire Danger - A general term used to express an assessment of fixed and variable factors such as fire risk, fuels, weather, and topography which influence whether fires will start, spread, and do damage; also the degree of control difficulty to be expected.

Fire Ecology - The scientific study of fire's effects on the environment, the interrelationships of plants, and the animals that live in such habitats.

Fire Exclusion - The disruption of a characteristic pattern of fire intensity and occurrence (primarily through fire suppression).

Fire Intensity Level - The rate of heat release (BTU/second) per unit of fire front. Four foot flame lengths or less are generally associated with low intensity burns and four to six foot flame lengths generally correspond to "moderate" intensity fire effects. High intensity flame lengths are usually greater than eight feet and pose multiple control problems.

Fire Prone Landscapes – The expression of an area's propensity to burn in a wildfire based on common denominators such as plant cover type, canopy closure, aspect, slope, road density, stream density, wind patterns, position on the hillside, and other factors.

Fireline - A loose term for any cleared strip used in control of a fire. That portion of a control line from which flammable materials have been removed by scraping or digging down to the mineral soil.

Fire Management - The integration of fire protection, prescribed fire and fire ecology into land use planning, administration, decision making, and other land management activities.

Fire Management Plan (FMP) - A strategic plan that defines a program to manage wildland and prescribed fires and documents the fire management program in the approved land use plan. This plan is supplemented by operational procedures such as preparedness, preplanned dispatch, burn plans, and prevention. The fire implementation schedule that documents the fire management program in the approved forest plan alternative.

Fire Management Unit (FMU) - Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that set it apart from management characteristics of an adjacent unit. FMU's are delineated in FMP's. These units may have dominant management objectives and preselected strategies assigned to accomplish these objectives.

Fire Occurrence - The number of wildland fires started in a given area over a given period of time. (Usually expressed as number per million acres.)

Fire Prevention - An active program in conjunction with other agencies to protect human life, prevent modification, of the ecosystem by human-caused wildfires, and prevent damage to cultural resources or physical facilities. Activities directed at reducing fire occurrence, including public education, law enforcement, personal contact, and reduction of fire risks and hazards.

Fire Regime - The fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity (stand maintenance) fires to long-interval, high-intensity (stand replacement) fires.

Fire Retardant - Any substance that by chemical or physical action reduces flareability of combustibles.

Fire Return Interval - The number of years between two successive fires documented in a designated area.

Fire Risk - The potential that a wildfire will start and spread rapidly as determined by the presence and activities of causative agents.

Fire Severity - The effects of fire on resources displayed in terms of benefit or loss.

Fire Warden - has charge of the fire prevention and suppression system in the fire protection district of the warden and such other duties as are required by law.

Foothills Grassland - Grass and forb co-dominated dry meadows and ridges. Principle habitat type series: bluebunch wheatgrass and Idaho fescue.

Fuel - The materials which are burned in a fire; duff, litter, grass, dead branchwood, snags, logs, etc.

Fuel Break - A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled.

Fuel Loading - Amount of dead fuel present on a particular site at a given time; the percentage of it available for combustion changes with the season.

Fuel Model - Characterization of the different types of wildland fuels (trees, brush, grass, etc.) and their arrangement, used to predict fire behavior.

Fuel Type - An identifiable association of fuel elements of distinctive species; form, size, arrangement, or other characteristics, that will cause a predictable rate of fire spread or difficulty of control, under specified weather conditions.

Fuels Management - Manipulation or reduction of fuels to meet protection and management objectives, while preserving and enhancing environmental quality.

Gap Analysis Program (GAP) - Regional assessments of the conservation status of native vertebrate species and natural land cover types and to facilitate the application of this information to land management activities. This is accomplished through the following five objectives:

1. Map the land cover of the United States
2. Map predicted distributions of vertebrate species for the U.S.
3. Document the representation of vertebrate species and land cover types in areas managed for the long-term maintenance of biodiversity
4. Provide this information to the public and those entities charged with land use research, policy, planning, and management
5. Build institutional cooperation in the application of this information to state and regional management activities

Habitat - A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.

Heavy Fuels - Fuels of a large diameter, such as snags, logs, and large limbwood, which ignite and are consumed more slowly than flash fuels.

Hydrologic Unit Code - A coding system developed by the U. S. Geological Service to identify geographic boundaries of watersheds of various sizes.

Hydrophobic - Resistance to wetting exhibited by some soils, also called water repellency. The phenomena may occur naturally or may be fire-induced. It may be determined by water drop penetration time, equilibrium liquid-contact angles, solid-air surface tension indices, or the characterization of dynamic wetting angles during infiltration.

Human-Caused Fires - Refers to fires ignited accidentally (from campfires or smoking) and by arsonists; does not include fires ignited intentionally by fire management personnel to fulfill approved, documented management objectives (prescribed fires).

Intensity - The rate of heat energy released during combustion per unit length of fire edge.

Inversion - Atmospheric condition in which temperature increases with altitude.

Ladder Fuels - Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Landsat Imagery - Land remote sensing, the collection of data which can be processed into imagery of surface features of the Earth from an unclassified satellite or satellites.

Landscape - All the natural features such as grasslands, hills, forest, and water, which distinguish one part of the earth's surface from another part; usually that portion of land which the eye can comprehend in a single view, including all its natural characteristics.

Lethal - Relating to or causing death; extremely harmful.

Lethal Fires - A descriptor of fire response and effect in forested ecosystems of high-severity or severe fire that burns through the overstory and understory. These fires typically consume large woody surface fuels and may consume the entire duff layer, essentially destroying the stand.

Litter - The top layer of the forest floor composed of loose debris, including dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Maximum Manageable Area - The boundary beyond which fire spread is completely unacceptable.

Metavolcanic - Volcanic rock that has undergone changes due to pressure and temperature.

Minimum Impact Suppression Strategy (MIST) - "Light on the Land." Use of minimum amount of forces necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It implies a greater sensitivity to the impacts of suppression tactics and their long-term effects when determining how to implement an appropriate suppression response.

Mitigation - Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.

Monitoring Team - Two or more individuals sent to a fire to observe, measure, and report its behavior, its effect on resources, and its adherence to or deviation from its prescription.

National Environmental Policy Act (NEPA) - This act declared a national policy to encourage productive and enjoyable harmony between humans and their environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and will stimulate the health and welfare of humankind; to enrich the understanding of important ecological systems and natural resources; and to establish a Council on Environmental Quality.

National Fire Management Analysis System (NFMAS) - The fire management analysis process, which provides input to forest planning and forest and regional fire program development and budgeting.

Native - Indigenous; living naturally within a given area.

Natural Ignition - A wildland fire ignited by a natural event such as lightning or volcanoes.

Noncommercial Thinning - Thinning by fire or mechanical methods of precommercial or commercial size timber, without recovering value, to meet MFP standards relating to the protection/enhancement of adjacent forest or other resource values.

Notice of Availability - A notice of Availability published in the Federal Register stating that an EIS has been prepared and is available for review and comment (for draft) and identifying where copies are available.

Notice of Intent - A notice of Intent published in the Federal Register stating that an EIS will be prepared and considered. This notice will describe the proposed action and possible alternatives, the proposed scoping process, and the name and address of whom to contact concerning questions about the proposed action and EIS.

Noxious Weeds - Rapidly spreading plants that have been designated "noxious" by law which can cause a variety of major ecological impacts to both agricultural and wild lands.

Planned Ignition - A wildland fire ignited by management actions to meet specific objectives.

Prescribed Fire - Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescription - A set of measurable criteria that guides the selection of appropriate management strategies and actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Programmatic Biological Assessment - Assesses the effects of the fire management programs on Federally listed species, not the individual projects that are implemented under these programs. A determination of effect on listed species is made for the programs, which is a valid assessment of the potential effects of the projects completed under these programs, if the projects are consistent with the design criteria and monitoring and reporting requirement contained in the project description and summaries.

Reburn - Subsequent burning of an area in which fire has previously burned but has left flareable light that ignites when burning conditions are more favorable.

Riparian Habitat Conservation Areas (RHCA) - Portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological functioning is crucial to maintenance of the stream's water, sediment, woody debris, and nutrient delivery systems.

Riparian Management Objectives (RMO) - Quantifiable measures of stream and streamside conditions that define good fish habitat and serve as indicators against which attainment or progress toward attainment of goals will be measured.

Road Density - The volume of roads in a given area (mile/square mile).

Scoping - Identifying at an early stage the significant environmental issues deserving of study and de-emphasizing insignificant issues, narrowing the scope of the environmental analysis accordingly.

Seral - Refers to the stages that plant communities go through during succession. Developmental stages have characteristic structure and plant species composition.

Serotinous - Storage of coniferous seeds in closed cones in the canopy of the tree. Serotinous cones of lodgepole pine do not open until subjected to temperatures of 113 to 122 degrees Fahrenheit causing the melting of the resin bond that seals the cone scales.

Stand Replacing Fire - A fire that kills most or all of a stand.

Sub-basin - A drainage area of approximately 800,000 to 1,000,000 acres, equivalent to a 4th - field Hydrologic Unit Code.

Surface Fire - Fire which moves through duff, litter, woody dead and down, and standing shrubs, as opposed to a crown fire.

Watershed - The region draining into a river, river system, or body of water.

Wetline - Denotes a condition where the fireline has been established by wetting down the vegetation.

Wildland Fire - Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Implementation Plan (WFIP) - A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits. A full WFIP consists of three stages. Different levels of completion may occur for differing management strategies (i.e., fires managed for resource benefits will have two-three stages of the WFIP completed while some fires that receive a suppression response may only have a portion of Stage I completed).

Wildland Fire Situation Analysis (WFSA) - A decision making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives.

Wildland Fire Use - The management of naturally ignited wildland fires to accomplish specific prestated resource management objectives in predefined geographic areas outlined in FMP's. Operational management is described in the WFIP. Wildland fire use is not to be confused with "fire use", which is a broader term encompassing more than just wildland fires.

Wildland Fire Use for Resource Benefit (WFURB) - A wildland fire ignited by a natural process (lightning), under specific conditions, relating to an acceptable range of fire behavior and managed to achieve specific resource objectives.

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This plan was developed by Northwest Management, Inc., under contract with the Owyhee County Commissioners and the Southwest Idaho Resource Conservation and Development Council, Inc., with funding provided by the USDI Bureau of Land Management and Owyhee County.

Citation of this work:

Schlosser, W.E., and T.R. Brown *Lead Auth.* 2005. Owyhee County, Idaho, Wildland-Urban Interface Wildfire Mitigation Plan. Northwest Management, Inc., Moscow, Idaho. March 10, 2005. Pp. 161.

Schlosser, W.E., and T.R. Brown *Lead Auth.* 2005. Owyhee County, Idaho, Wildland-Urban Interface Wildfire Mitigation Plan Appendices. Northwest Management, Inc., Moscow, Idaho. March 10, 2005. Pp. 42.

Last Page of Document

Northwest Management, Inc.
233 East Palouse River Drive
PO Box 9748
Moscow ID 83843

208-883-4488 Telephone
208-883-1098 Fax
NWManage@consulting-foresters.com e-Mail
http://www.Consulting-Foresters.com/ Internet

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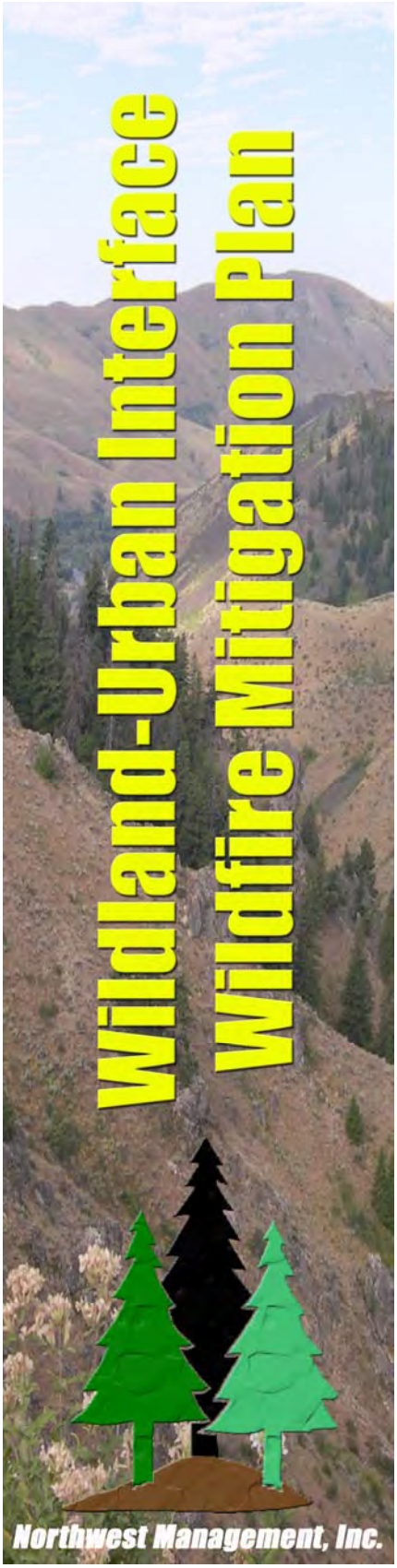
APPENDIX H-2

OWYHEE COUNTY, IDAHO

APPENDICES TO

WILDLAND-URBAN INTERFACE WILDFIRE MITIGATION PLAN

MARCH 10, 2005



Owyhee County, Idaho

Wildland-Urban Interface Wildfire Mitigation Plan

Appendices

March 10, 2005

Mission Statement

To make Owyhee County residents, communities, state agencies, local governments, and businesses less vulnerable to the negative effects of wildland fires through the effective administration of wildfire hazard mitigation grant programs, hazard risk assessments, wise and efficient fuels treatments, and a coordinated approach to mitigation policy through federal, state, regional, and local planning efforts. Our combined prioritization will be the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy

This plan was developed by the Owyhee County Wildland-Urban Interface Wildfire Mitigation Plan Committee in cooperation with Northwest Management, Inc., 233 E. Palouse River Drive, P.O. Box 9748, Moscow, Idaho 83843, Phone: (208) 883-4488, Fax: (208) 883-1098, www.Consulting-Foresters.com

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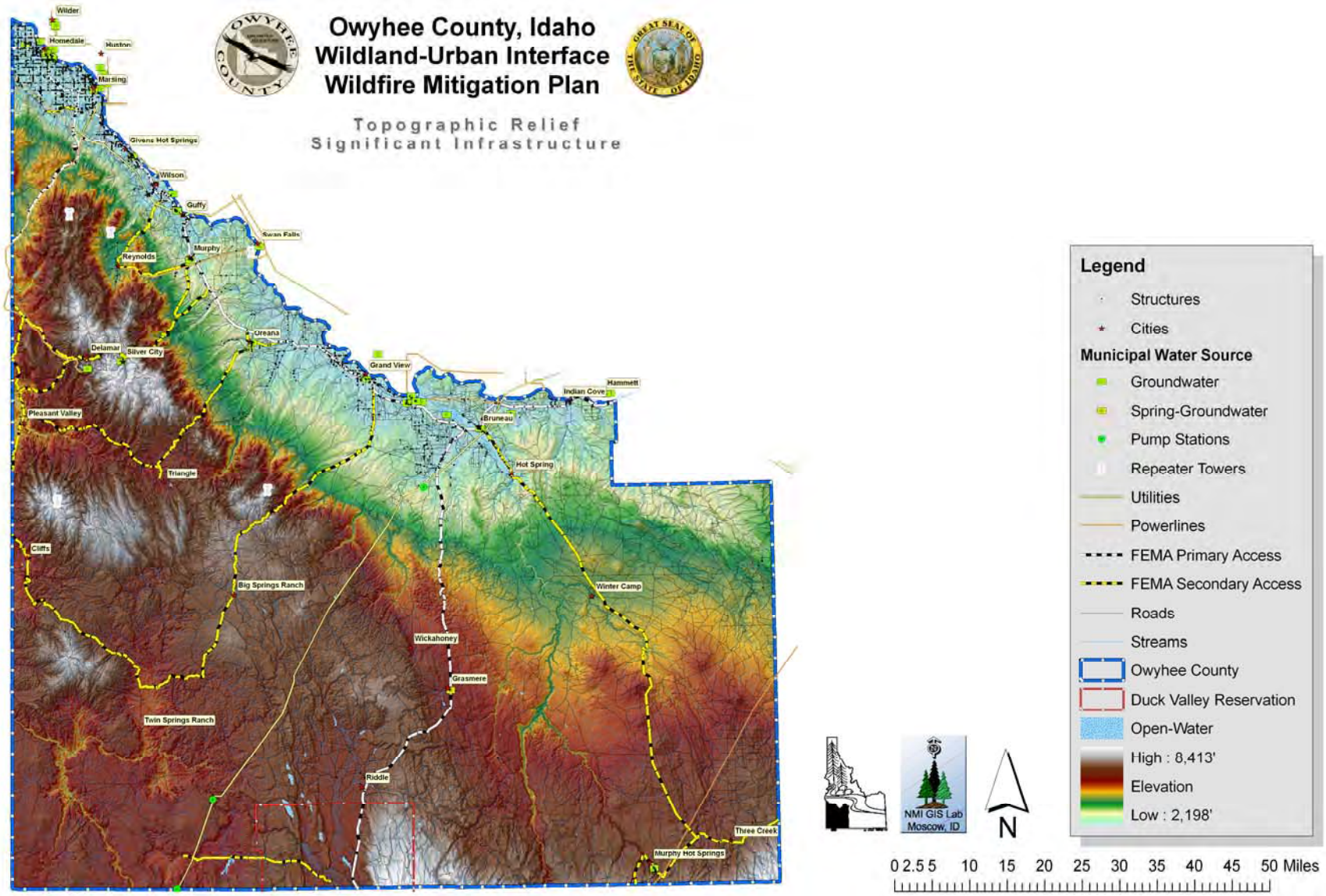
Appendix I: Maps

Map Legend

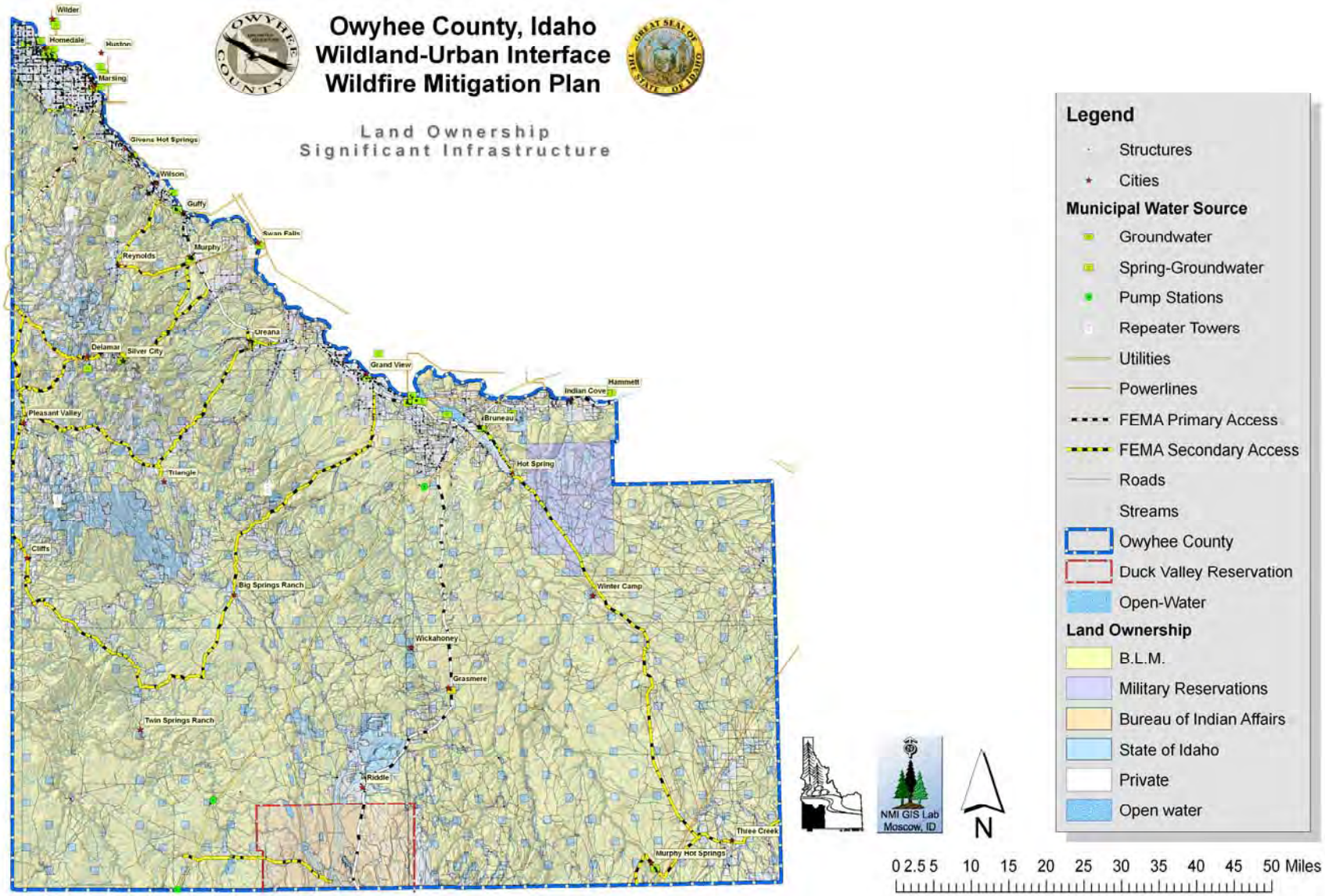
Northwest Management, Inc.
Geographical Information Systems Laboratory
233 East Palouse River Dr., P.O. Box 9748, Moscow, ID 83843 www.Consulting-Foresters.com

The information on the attached maps was derived from digital databases from NMI's GIS lab. Care was taken in the creation of these maps, but all maps are provided "as is" with no warranty or guarantees. Northwest Management, Inc., cannot accept any responsibility for any errors, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. Although information from Land Surveys may have been used in the creation of this product, in no way does this product represent or constitute a Land Survey. Users are cautioned to field verify information on this product before making any decisions.

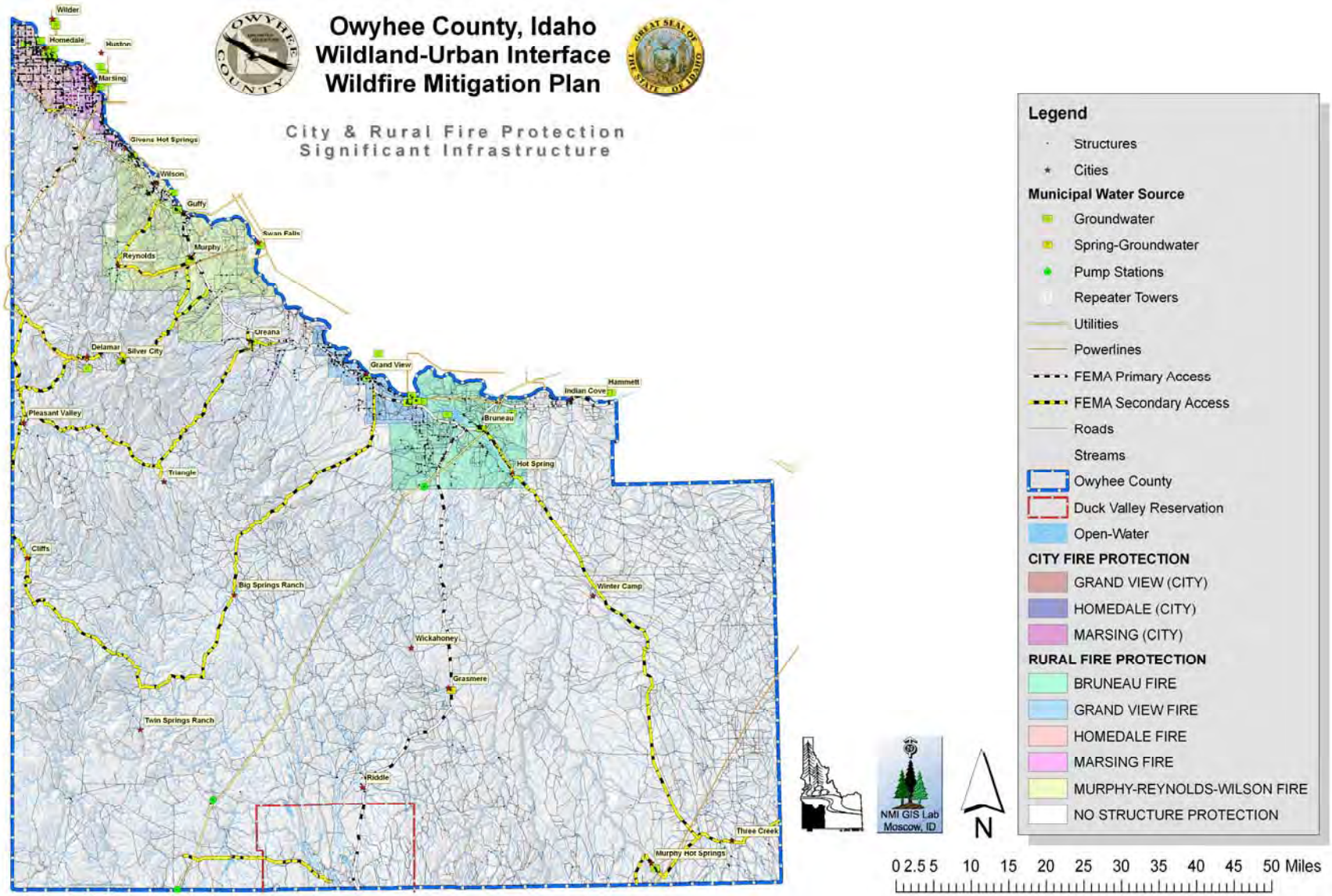
Shaded Elevation Relief of Owyhee County



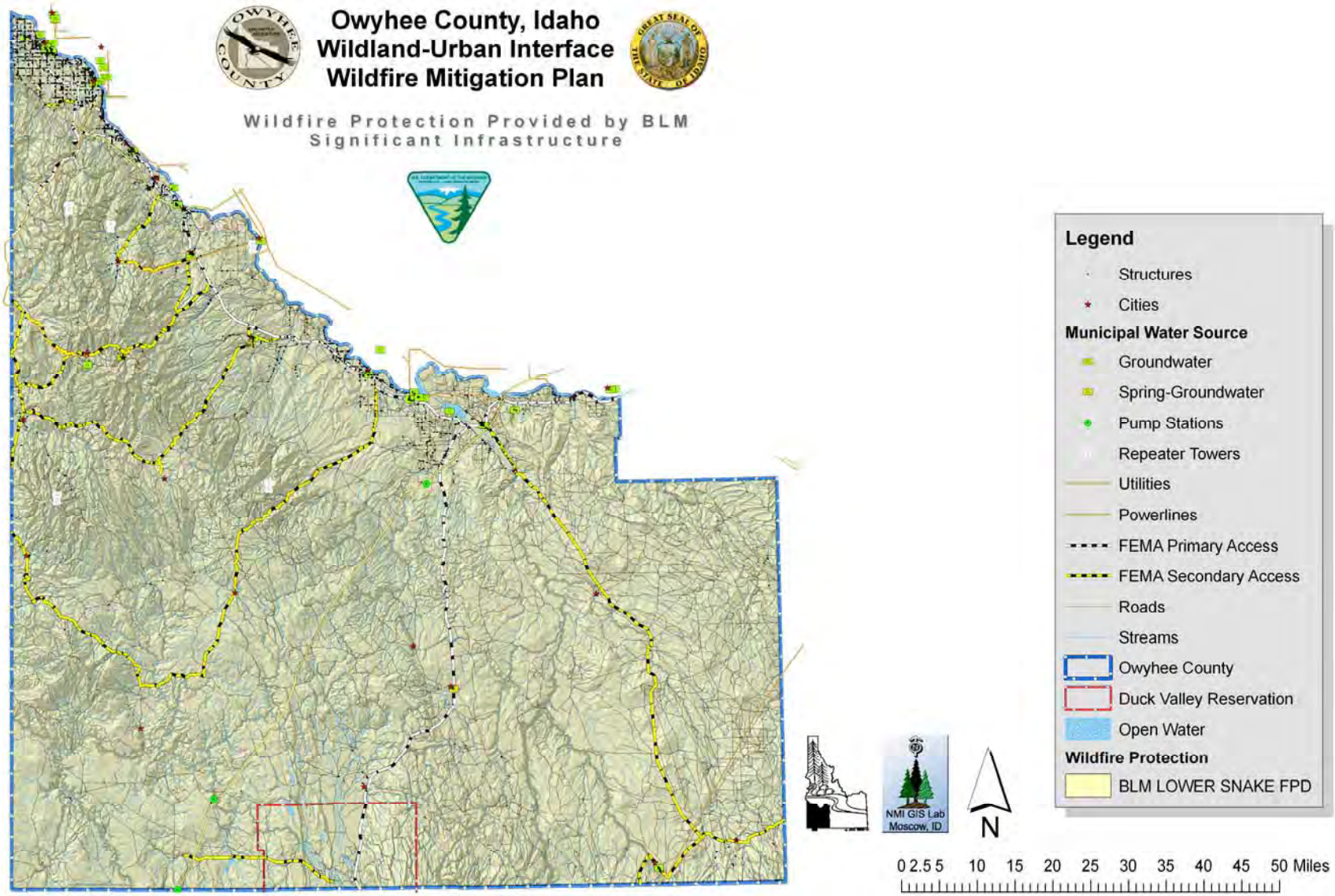
Owyhee County Ownership Map



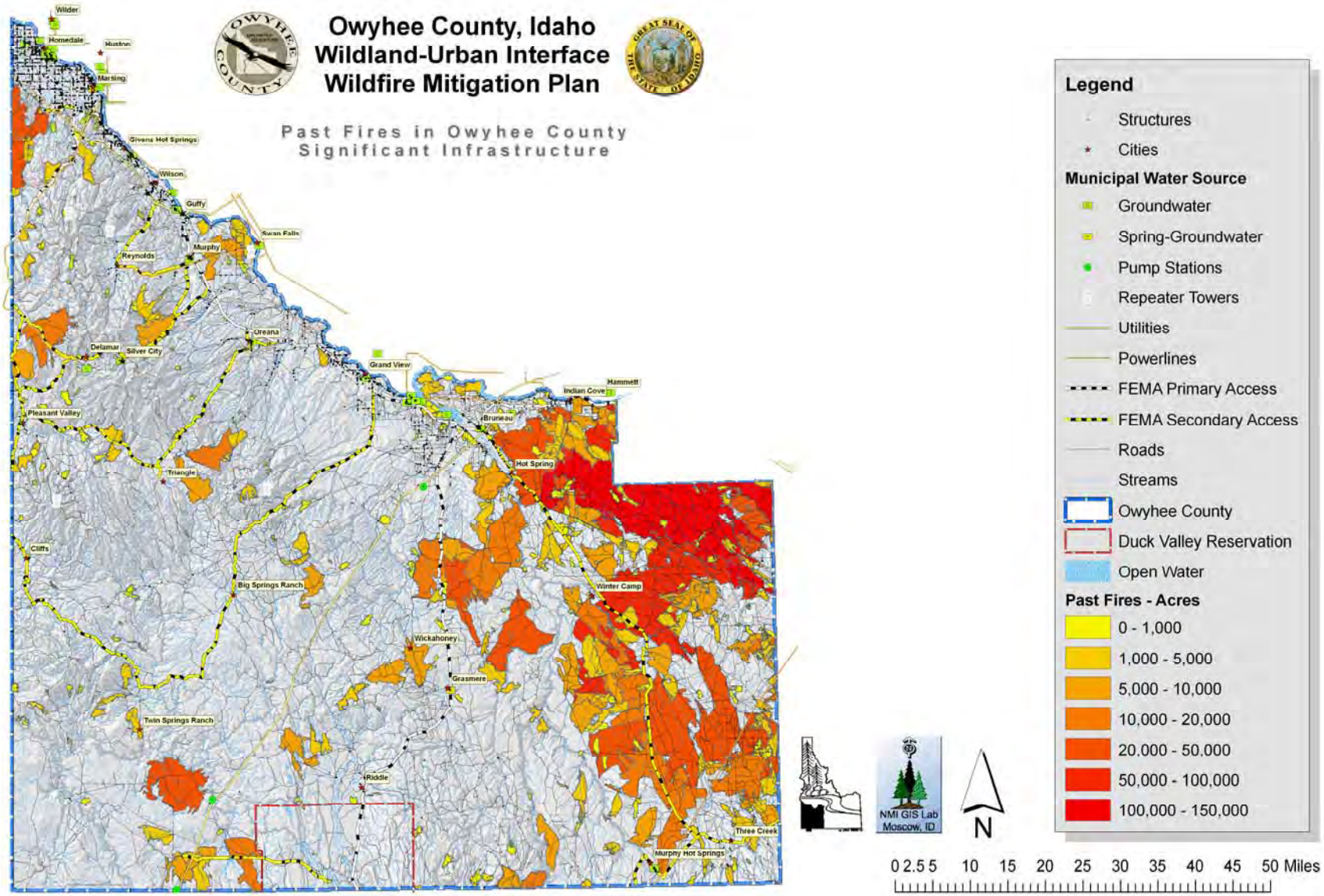
City & Rural Fire Districts



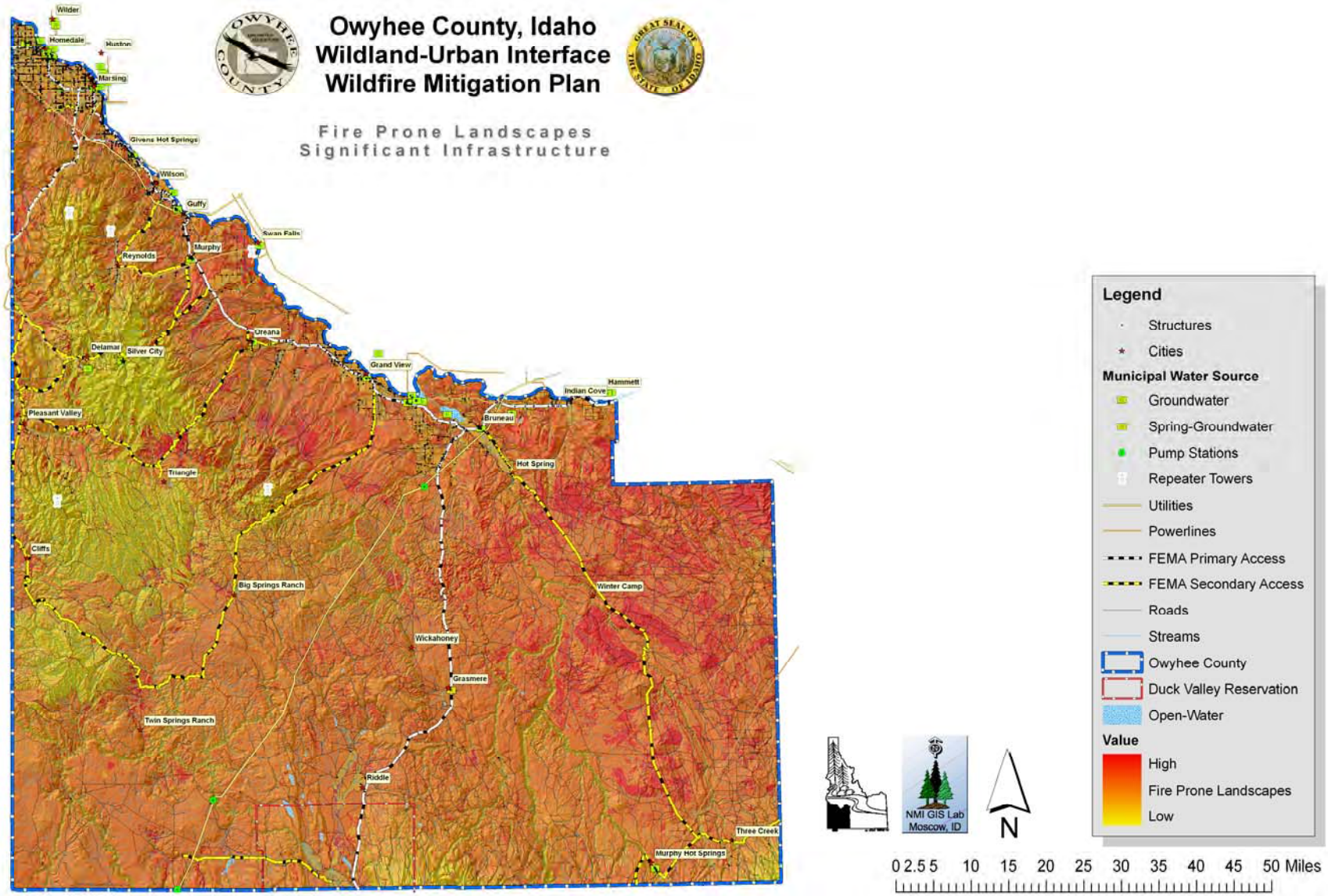
Wildland Fire Protection in Owyhee County



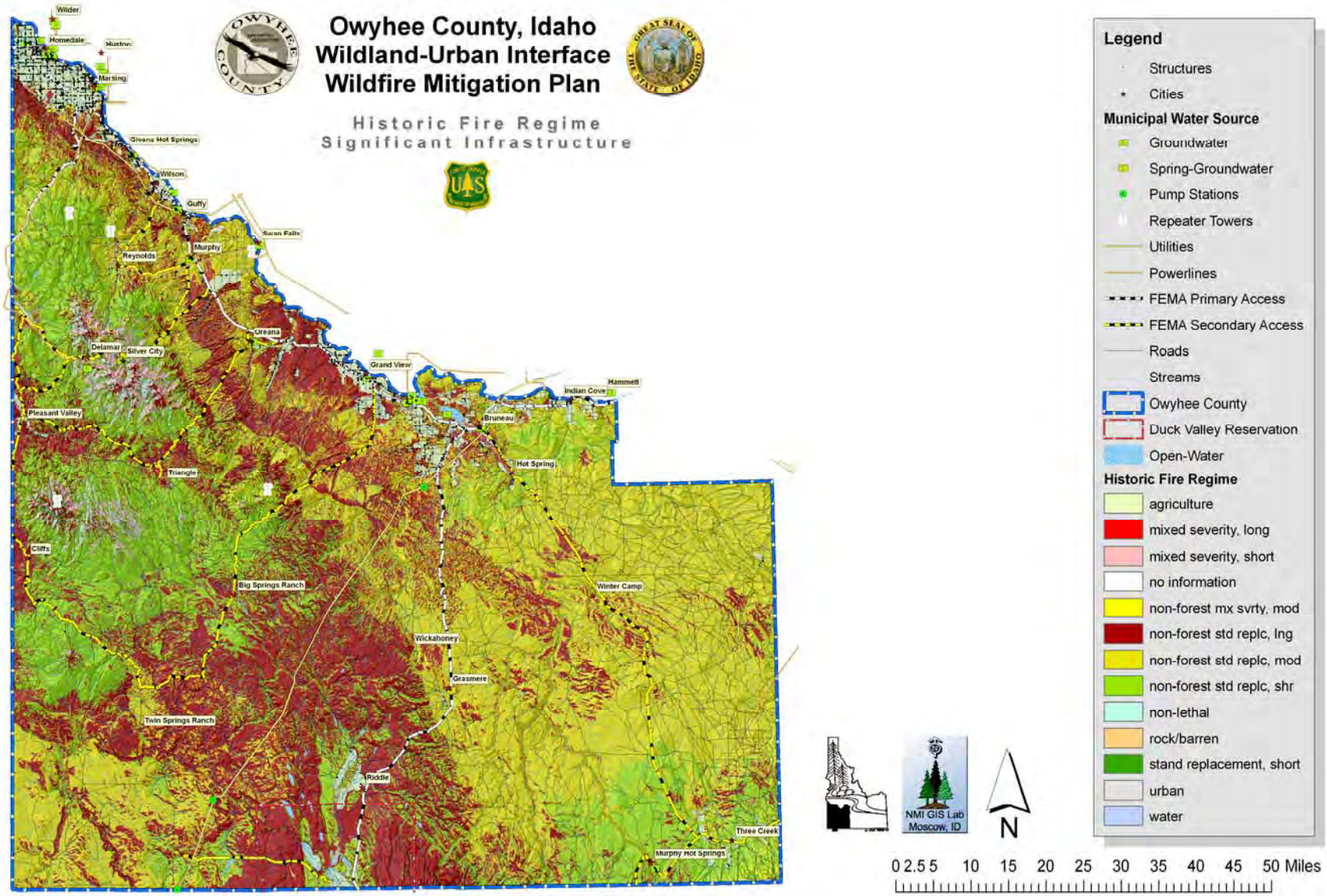
Past Wildfires in Owyhee County



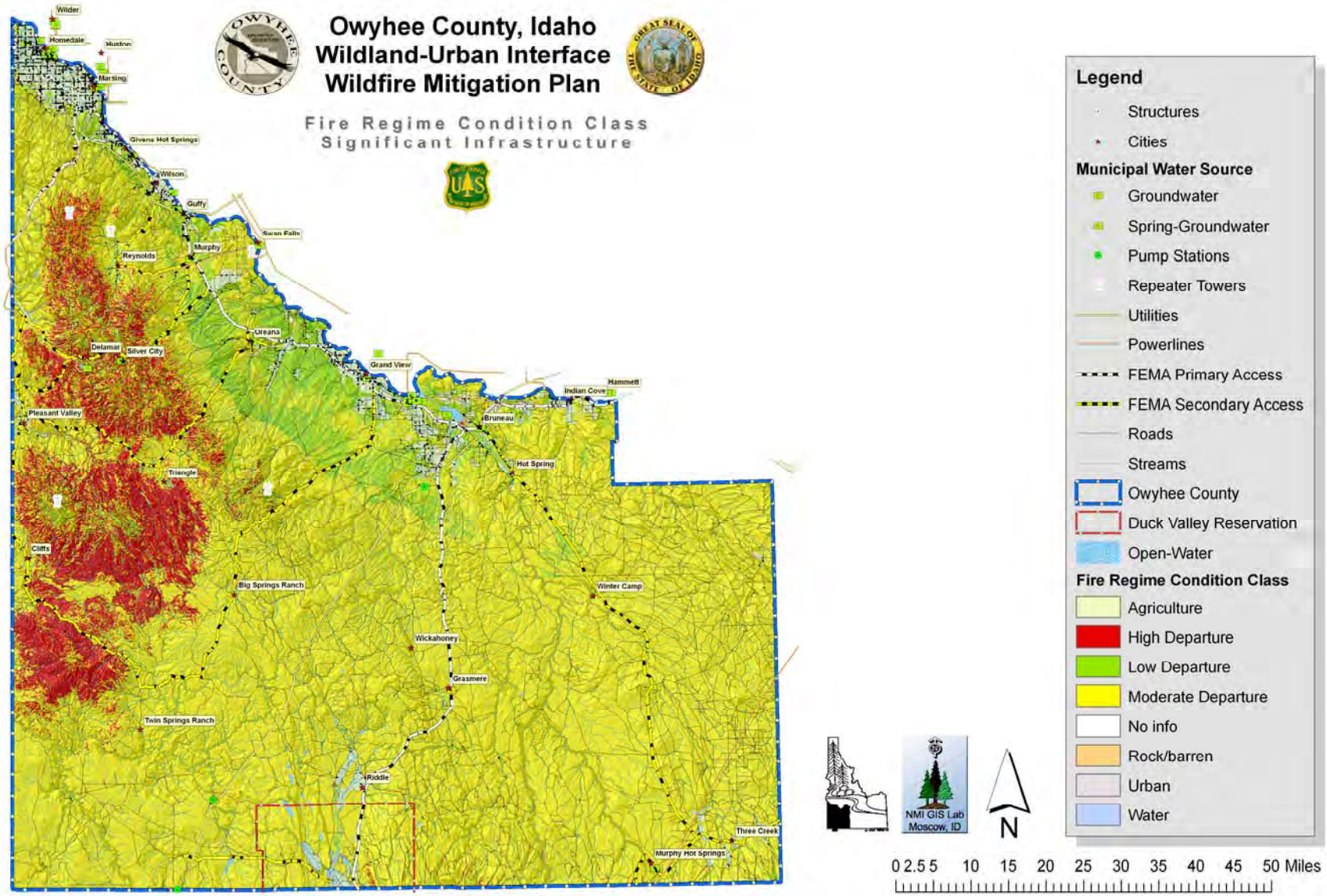
Fire Prone Landscapes in Owyhee County



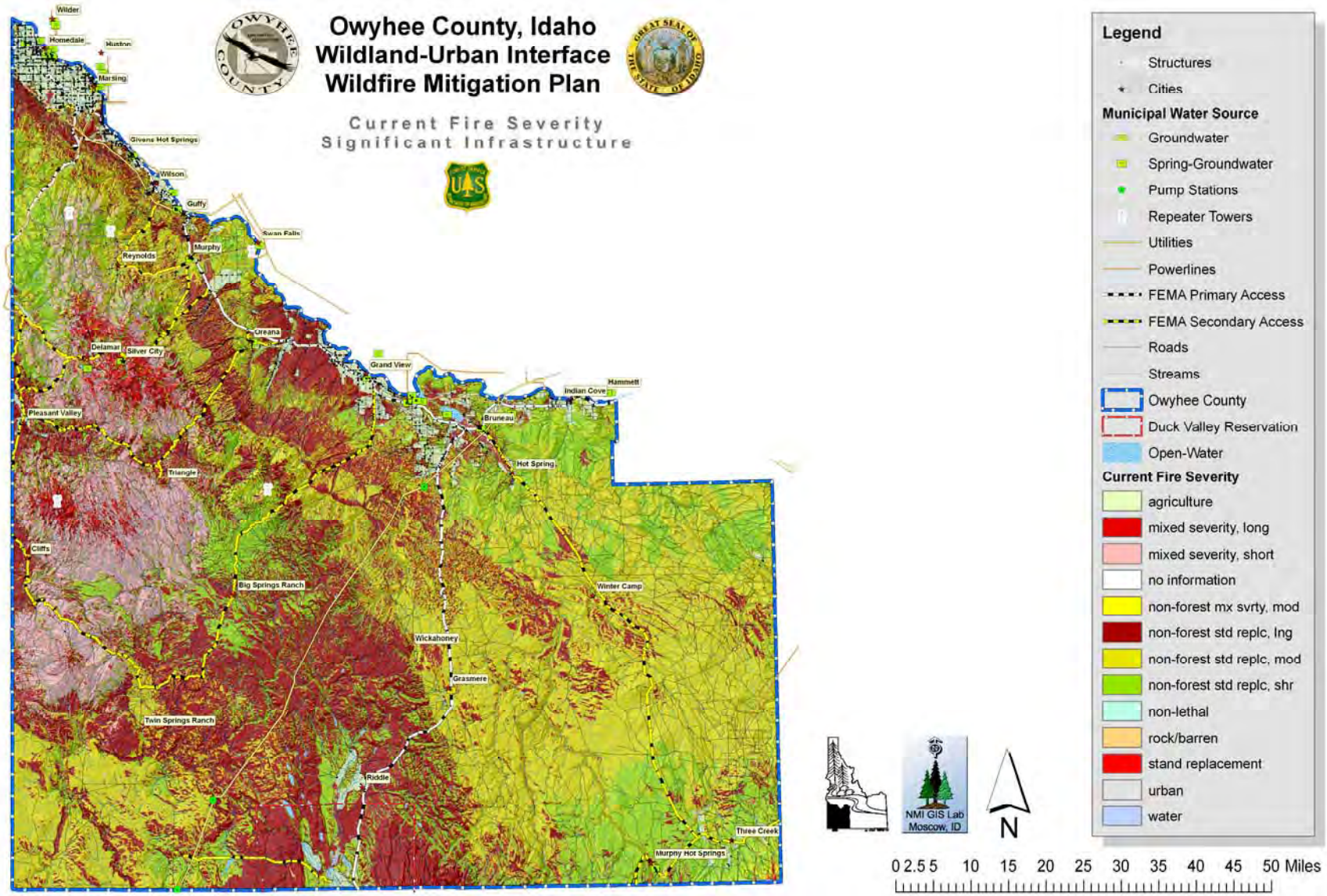
Historic Fire Regime in Owyhee County



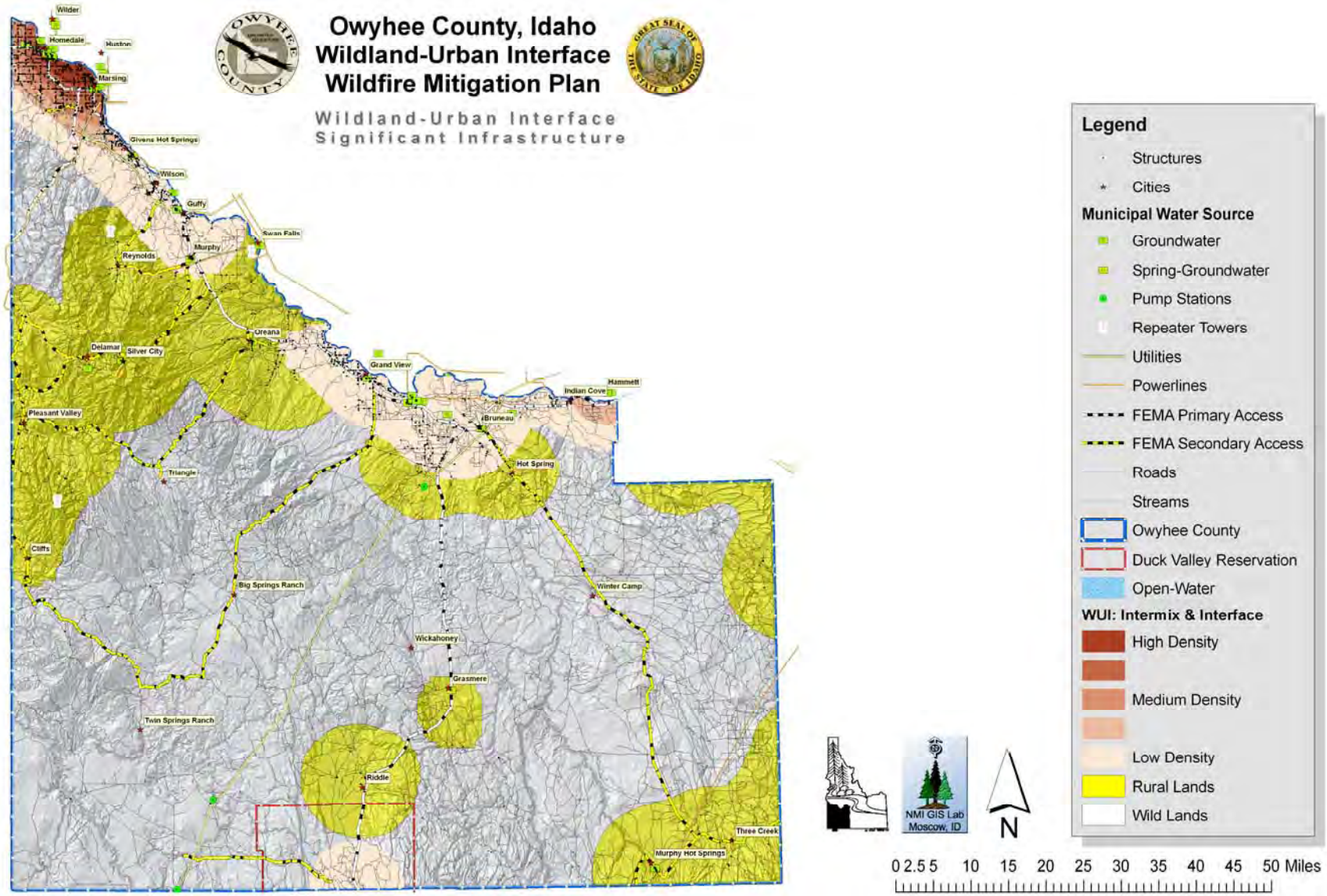
Fire Regime Condition Class in Owyhee County



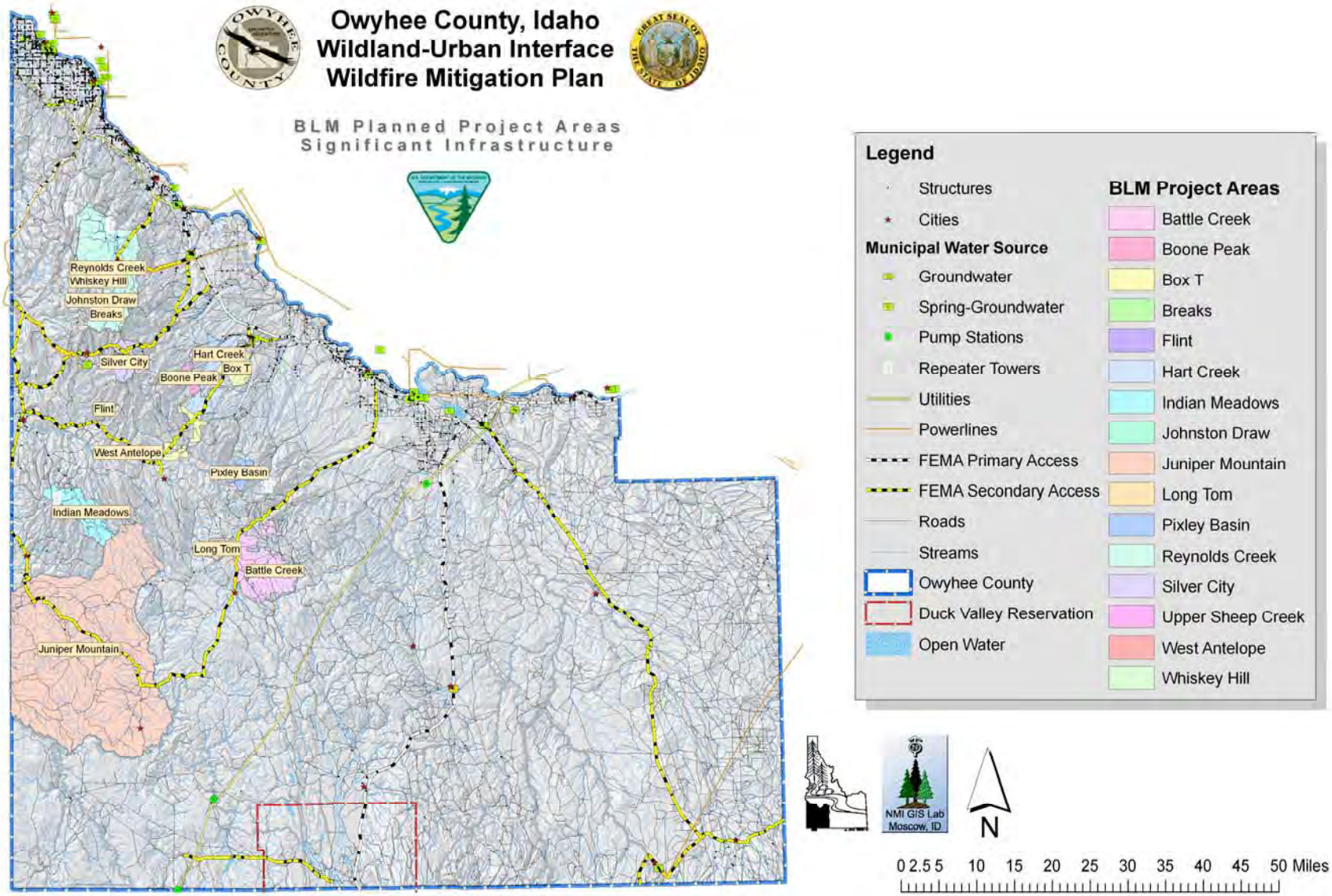
Predicted Fire Severity in Owyhee County



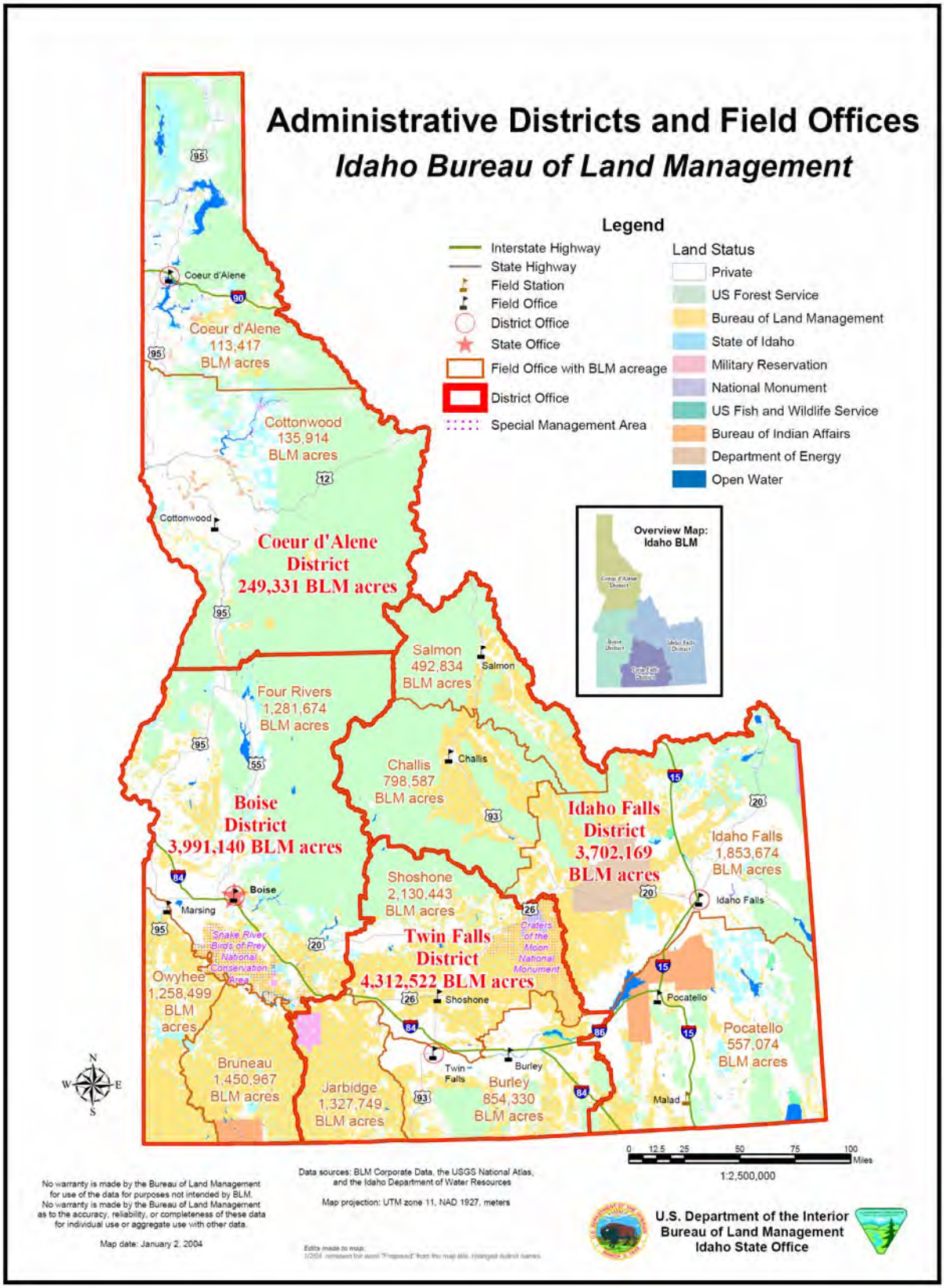
Wildland-Urban Interface and Significant Infrastructure



Planned / Proposed WUI Wildfire Mitigation Treatments by BLM



BLM Administrative Districts Effective September 2004



Appendix II

Public Mail Survey

Public Letter #1

mailed on September 29, 2004

Northwest Management, Inc.
Natural Resources Management

233 E. Palouse River Drive
PO Box 9748
Moscow, ID 83843
Tel: 208-883-4488
Fax: 208-883-1098
www.Consulting-Foresters.com

Providing a Balanced Approach to Natural Resource Management

Owyhee County Wildfire Mitigation Plan Survey

September 29, 2004

Name

Address

City, State Zip

Dear Owyhee County Resident:

Thank you for taking fifteen minutes of your time to read and respond to this short inquiry. We are working with the Owyhee County Commissioners' Office and a host of fire protection and disaster relief organizations in Owyhee County to develop a **Wildland Fire Mitigation Plan** in your area. As an individual who lives in Owyhee County, you know that the urban-rural interface is at very high risk to casualty loss due to wildland fires.

This year we are taking a proactive role in reducing fire starts and mitigating wildland fire-caused casualty loss in your area. We are inviting you to help yourself and your neighbors by taking a proactive role as well by completing and returning the attached survey.

We are developing improved predictive models of where fires are likely to ignite, locating and identifying high risk landscape characteristics, advancing improved land management practices to reduce fire rate-of-spread on forestlands and rangelands, and working with rural landowners to create defensible zones around homes and buildings so that fires are controlled BEFORE they take a landowner's valuable possessions. It is the last of these goals that we need your help with.

We would like you to complete the attached survey about your home's defensible space in the case of wildland fire. Your responses will be kept completely confidential and released only in summative form. This questionnaire will allow us to identify key criteria that may place your home and the homes of your neighbors at the greatest risk. We will use this information to develop mitigation activities that may lead to saving your home and the community you live in. If certain questions are not applicable to your home do not provide an answer and move on to the next question.

We have sent this letter and survey to only a select number of people living in Owyhee County. Because of this, your response is very important to our efforts and the application of our findings to your home and to your community. Please take a few minutes to complete the enclosed survey and return it to us in the self-addressed envelope.

We would like to thank you for your assistance on this project with a small token of appreciation. During the development of this project, we are completing some very advanced mapping of Owyhee County. We have created detailed maps showing roads, rivers, elevation, fire prone landscapes, potential fire ignition locations, plant cover characteristics, and even orthophoto coverage (black and white images taken from high elevation) with features over them. These maps are printed at 8.5” x 11” sizes. If you give us a legal land description, we will make a high resolution map of this property and send it to you. The map might be the locale of your home, your property, or even your favorite recreation spot. When you complete your survey, please mark which map coverage you would like, and we will custom color print this map for you and send it at no charge. It is our way of thanking you for your input to this very important project.

Thank you for your assistance. If you have any questions about this project or this survey please contact me at the Northwest Management, Inc., office in Moscow, Idaho, at 208-883-4488.

Sincerely,

William E. Schlosser, Ph.D.

Project Manager, Owyhee County Wildland Fire Mitigation Plan

Northwest Management, Inc.

Wildland Fire Mitigation Plan

Public Survey

1. Do you have a home in Owyhee County?
   - O Yes
   - O No
2. Is this your primary residence?
   - O Yes
   - O No
3. Which community do you live closest to?

   _____

4. Does your area have 911 emergency telephone service?
   - O Yes
   - O No
5. Is your home protected by a rural fire department?
   - O Yes
   - O No
6. What type of roof does your home have (please mark one):
   - O Composite
   - O Wooden shake (shingles)
   - O Ceramic tiles
   - O Aluminum, tin, or other metal
   - O Other (please indicate: _____)
7. How tall is the vegetation within 75 of your home?
   - O None
   - O 0ft to 2ft
   - O 2ft to 5ft
   - O More than 5ft
8. What type of vegetation is within 75 feet of your home? Check all that apply
   - O None
   - O Grass
   - O Brush
   - O Trees
9. Do you have a lawn surrounding your home?

- No
- Yes, if yes is it kept green and trimmed all summer?
    - No
    - Yes

10. How long is your driveway, from the main road to your home parking area? Please indicate distance units in feet or miles.

    _____ Feet / Miles

11. If your driveway is over ½ mile long, does it have turnouts that would allow two trucks to pass each other?
    - No
    - Yes

12. What type of surfacing does your driveway have?
    - Dirt
    - Gravel/rock
    - Paved

13. If the primary access to your home were cut off because of a wildfire, would you have an alternative route to escape through?
    - No
    - Yes

14. Please indicate which of the following items you have available at or near your home that could be used in fighting a wildland fire that threatens your home (mark all that apply)
    - Hand tools (shovel, pualski, etc.)
    - Portable water tank
    - Stationery water tank
    - Pond, lake, or stream water supply close
    - Water pump and fire hose
    - Equipment suitable for creating fire breaks (bulldozer, cat, skidder, etc.)

15. Please indicate any emergency services training anyone in your household has received.

Type of Training	No	Yes
Wildland Fire Fighting	O	O
City or Rural Fire Fighting	O	O
EMT (Emergency Medical Technician)	O	O
Basic First Aid/ CPR	O	O
Search and Rescue	O	O

16. Do you conduct a periodic fuels reduction program near your home site such as grass or brush burning?

    O No

    O Yes

17. Do livestock (cattle, horses, sheep) graze the grasses and forbs around your home?

    O No

    O Yes

18. Use this exercise below to assess your home's fire risk rating:
    Circle the rating that best describes your home.

	Fuel Hazard Rating Worksheet	Rating
Fuel Hazard	Small, light fuels (grasses, forbs, weeds, shrubs)	1
	Medium size fuels (brush, large shrubs, small trees)	2
	Heavy, large fuels (woodlands, timber, heavy brush)	3
Slope Hazard	Mild slopes (0-5%)	1
	Moderate slope (6-20%)	2
	Steep Slopes (21-40%)	3
	Extreme slopes (41% and greater)	4
Structure Hazard	Noncombustible roof and noncombustible siding materials	1
	Noncombustible roof and combustible siding material	3
	Combustible roof and noncombustible siding material	7
	Combustible roof and combustible siding materials	10
Additional Factors	Rough topography that contains several steep canyons or ridges	+2
	Areas having history of higher than average fire occurrence	+3
	Areas exposed to severe fire weather and strong winds	+4
	Areas with existing fuel modifications or usable fire breaks	-3
	Areas with local facilities (water systems, rural fire districts, dozers)	-3

Calculating your risk:

Fuel Hazard _____ x Slope Hazard _____ = _____

Structural Hazard + _____

Additional Factors (+ or -) _____

Total Hazard Points = _____

Extreme Risk = 26 + points

High Risk = 16–25 points

Moderate Risk = 6–15 points

Low Risk = 6 or less points

19. If offered in your area, would members of your household attend a free, or low cost, one-day training seminar designed to teach homeowners in the rural–urban interface how to improve the defensible space surrounding your home and adjacent outbuildings?

    - ○ No
    - ○ Yes

20. How do you feel All Hazard Mitigation projects should be **funded** in the areas surrounding homes, communities, and infrastructure such as power lines and major roads?

	Mark the box that best applies to your preference		
	100% Public Funding	**Cost-Share (Public & Private)**	**Privately Funded (Owner or Company)**
Home Defensibility Projects	○	○	○
Community Defensibility Projects	○	○	○
Infrastructure Projects **Roads, Bridges, Power Lines, Etc.**	○	○	○

Thank you very much for completing this survey and sending it back to us. This information will be combined with other data to assess the greatest threats to defending homes and adjacent buildings in the rural–urban interface where Wildland fires are common.

Please place the completed survey and the Map Request Form in the self-addressed envelope and place it in the mail for return to us. Thank you!

Order Your Owyhee County Area Map

FREE

As a token of appreciation for completing and returning this survey, we would like to send you a detailed map of your favorite area. Complete this form and return it to us with your survey and we will custom print a color map of your property and send it to you. Maps are produced by NMI during the winter months of December, January and February. Expect your maps to arrive in the mail during this time.

What is the legal land description of the property you want mapped (must be in Owyhee County).

_____ T _____N, R _____ E.

or describe the area _____

_____

About how many acres is the parcel you want mapped? _____ acres

What would you like printed as the title of the map? (Five or less words, please print)

_____

Please select which coverage (only one per map) you would like as the primary theme:

- O Land Ownership Categories (over shaded relief map)
- O Ortho photo (limited availability)

Maps may include:

- Roads
- Streams & rivers
- Community locations
- Building locations

Please verify your name and full address here so we can send your map to you:

Our records indicate that your address is:	If this is incorrect please correct it here:
Name	_____
Address	_____
City State Zip	_____

Public Letter #2

sent as a postcard on October 6, 2004

October 6, 2004

Dear Owyhee County Resident:

About a week ago, I mailed you a letter and a brief survey concerning the wildfire situation in your community. That survey is instrumental to the success of the Wildland Fire Mitigation Plan we are developing in conjunction with the Owyhee County Commissioners Office. We have received responses from many families in the area and we wish to extend our thanks and appreciation to everyone who has participated. However, we still have not received completed surveys from many homes in the region. If you have not returned the completed survey to us yet, please take a few minutes to complete the survey and return it in the self-addressed envelope provided with the letter.

Your responses are very important to this effort which will recommend the location and type of wildfire mitigation projects to be implemented in the area of your home. If you have any questions about the survey, please contact me at 208-883-4488. If you did not receive my original letter, or if you misplaced your survey, you can request a new one at the number below or write me requesting another survey.

William E. Schlosser, Ph.D.

Northwest Management, Inc. Natural Resource Management
233 Palouse River Dr., P.O. Box 9748, Moscow ID 83843
Tel: 208-883-4488, Fax 208-883-1098, http://www.Consulting-Foresters.com/

Public letter #3

Sent on October 19, 2004, and included a replacement survey (not included here).

Northwest Management, Inc.
Natural Resources Management

233 E. Palouse River Drive
PO Box 9748
Moscow, ID 83843
Tel: 208-883-4488
Fax: 208-883-1098
www.Consulting-Foresters.com

Providing a Balanced Approach to Natural Resource Management

Owyhee County Wildfire Mitigation Plan Survey

October 19, 2004

Name
Address
City, State Zip

Dear Owyhee County Resident:

Thank you for taking some of your time to read and respond to this short inquiry. About two weeks ago, I sent you a letter and package of materials much like this one. In it, I asked if you would please assist our efforts by reading, filling out, and returning a survey concerning a **Wildland Fire Mitigation** plan we are preparing for Owyhee County in cooperation with the Owyhee County Commissioner's Office and a host of fire protection and disaster relief organizations in Owyhee County. While we have received excellent responses from many residents of the area, we have not received them from everyone**. If you have completed and returned your survey, please accept our sincere thanks!** If you have not returned the completed survey, please do so as soon as possible.

As an individual who owns property in Owyhee County, you know that many areas of the county are at high risk to casualty loss due to a wildland fire. You are in a unique situation to provide valuable insights and information concerning the fire risks to your home and property in Owyhee County. Without this information, our recommendations for specific fire risk mitigation activities will not be targeted appropriately to where the risks are located. I have enclosed another survey and return envelope with this letter for you. Please complete it and drop it in the mail so that we can include your input with that from your neighbors**. We need your help.**

Because of catastrophic wildland fires occurring across the west in the past several years, state, federal and local agencies have combined efforts in an attempt to reduce the hazards associated with wildland fire. We are doing more than watching disasters happen around us, we are taking a proactive role in reducing the exposure to hazards in our area. We are inviting you to help yourself and your neighbors by taking a proactive role as well by completing and returning the attached survey.

We are developing improved predictive models of where fires are likely to ignite, locating and identifying high risk landscape characteristics, advancing improved land management

practices to reduce fire rate-of-spread on forestlands and rangelands, and working with rural landowners to create defensible zones around homes and buildings so that fires are controlled BEFORE they take a landowner's valuable possessions. It is the last of these goals that we need your help with.

We would like you to complete the attached survey about your home's defensible space in the case of wildland fire. Your responses will be kept completely confidential and released only in summative form. This questionnaire will allow us to identify key criteria that may place your home and the homes of your neighbors at the greatest risk. We will use this information to develop mitigation activities that may lead to saving your home and the community you live in. If certain questions are not applicable to your home do not provide an answer and move on to the next question.

We have sent this letter and survey to only a select number of people living in Owyhee County. Because of this, your response is very important to our efforts and the application of our findings to your home and to your community. Please take a few minutes to complete the enclosed survey and return it to us in the self-addressed envelope.

We would like to thank you for your assistance on this project with a small token of appreciation. During the development of this project, we are completing some very advanced mapping of Owyhee County. We have created detailed maps showing roads, rivers, elevation, fire prone landscapes, potential fire ignition locations, plant cover characteristics, and even orthophoto coverage (black and white images taken from high elevation) with features over them. These maps are printed at 8.5" x 11" sizes. If you give us a legal land description, we will make a high resolution map of this property and send it to you. The map might be the locale of your home, your property, or even your favorite recreation spot. When you complete your survey, please mark which map coverage you would like, and we will custom color print this map for you and send it at no charge. It is our way of thanking you for your input to this very important project.

Thank you for your assistance. If you have any questions about this project or this survey please contact me at the Northwest Management, Inc., office in Moscow, Idaho, at 208-883-4488.

Sincerely,

William E. Schlosser, Ph.D.
Project Manager, Owyhee County All Hazards Mitigation Plan
Northwest Management, Inc.

Appendix III

Potential Funding Sources

Program:	**Rural Fire Assistance**
Source:	Bureau of Land Management
Description:	BLM provides funds to rural fire departments for wildfire fighting; also provides wildland fire equipment, training and/or prevention materials.
More info:	Dale Anderson, RFA Coordinator, BLM, 208-373-3861; dale_anderson@blm.gov

Program:	**Communities at Risk**
Source:	Bureau of Land Management
Description:	Assistance to communities for hazardous fuels reduction projects in the wildland urban interface; includes funding for assessments and mitigation planning.
More info:	Jon Skinner, Idaho BLM, 208-373-3854

Program:	**State Fire Assistance**
Source:	US Forest Service
Description:	USFS grants to state foresters through state and private grants, under authority of Cooperative Forestry Assistance Act. Grant objectives are to maintain and improve protection efficiency and effectiveness on non-federal lands, training, equipment, preparedness, prevention and education.
More info:	www.fireplan.gov and www2.state.id.us/lands; Brian Shiplett, Idaho Department of Lands 208-666-8650

Program:	**State Fire Assistance Hazard Mitigation Program**
Source:	National Fire Plan
Description:	These special state Fire Assistance funds are targeted at hazard fuels treatment in the wildland-urban interface. Recipients include state forestry organizations, local fire services, county emergency planning committees and private landowners.
More info:	www.fireplan.gov and www.fs.fed.us/r4 and www2.state.id.us/lands; Jean Kaysen, Idaho Department of Lands 208-769-1525

Program:	**Volunteer Fire Assistance**
Source:	US Forest Service
Description:	Provides funding and technical assistance to local and volunteer fire departments for organizing, training and equipment to enable them to effectively meet their structure and wildland protection responsibilities. US Forest Service grants provided to state foresters through state and private grants under the authority of Coop Forestry Assistance Act.
More info:	www.fs.fed.us/fire/partners/vfa ; Brian Shiplett, Idaho Department of Lands, 208-666-8650

Program:	**Forest Land Enhancement Program**
Source:	US Forest Service

Description:	The 2002 Farm Bill repealed the Forestry Incentives Program (authorized in 1978) and Stewardship Incentive Program (1990) cost share programs and replaced it with a new Forest Land Enhancement Program (FLEP). FLEP purposes include 1) Enhance the productivity of timber, fish and wildlife habitat, soil and water quality, wetland, recreational resources, and aesthetic values of forest land through landowner cost share assistance, and 2) Establish a coordinated, cooperative federal, state and local sustainable forestry program to establish, manage, maintain, enhance and restore forests on non-industrial private forest land.
More info:	www.usda.gov/farmbill

Program:	**Federal Excess Property**
Source:	US Forest Service
Description:	Provides assistance to state, county and local governments by providing excess federal property (equipment, supplies, tools) for wildland and rural community fire response.
More info:	www2.state.id.us/lands; George Riffle, Idaho Department of Lands, 208-666-8664

Program:	**Economic Action Program**
Source:	US Forest Service
Description:	A USFS, state and private program with involvement from local Forest Service offices to help identify projects. Addresses long-term economic and social health of rural areas; assists the development of enterprises through diversified uses of forest products, marketing assistance, and utilization of hazardous fuel byproducts.
More info:	www.fs.fed.us/r3/spf/community/; Bob Ford, Idaho Department of Commerce, 800-842-5858

Program:	**Forest Stewardship Program**
Source:	US Forest Service
Description:	Funding helps enable preparation of management plans on state, private and tribal lands to ensure effective and efficient hazardous fuel treatment.
More info:	www2.state.id.us/lands; G. Kirk David, Idaho Department of Lands, 208-666-8626

Program:	**Community Planning**
Source:	US Forest Service
Description:	USFS provides funds to recipients with involvement of local Forest Service offices for the development of community strategic action and fire risk management plans to increase community resiliency and capacity.
More info:	www.idoc.state.id.us; Bob Ford, Idaho Department of Commerce, 800-842-5858

Program:	**Firefighters Assistance**
Source:	Federal Emergency Management Agency and US Fire Administration Program
Description:	Financial assistance to help improve fire-fighting operations, services and provide equipment.
More info:	www.usfa.fema.gov

Program:	**Pre-Disaster Mitigation Program**
Source:	Federal Emergency Management Agency

Description:	Emergency management assistance to local governments to develop hazard mitigation plans.
More info:	www.usfa.fema.gov; Steven Weiser, Idaho Bureau of Disaster Services, 208-334-3460

Program:	**Idaho Forestry Assistance Program**
Source:	Idaho Department of Lands
Description:	Funding available to assist with organizing, training, and purchasing fire fighting equipment.
More info:	www2.state.id.us/lands/Bureau/FireMgt/Fire_assistance.htm; Brian Shiplett, Idaho Department of Lands, 208-666-8650

Program:	**Community Facilities Loans and Grants**
Source:	Rural Housing Service (RHS) U. S. Dept. of Agriculture
Description:	Provides grants (and loans) to cities, counties, states and other public entities to improve community facilities for essential services to rural residents. Projects can include fire and rescue services; funds have been provided to purchase fire-fighting equipment for rural areas. No match is required.
More info:	http://www.rurdev.usda.gov;/or local county Rural Development office.

Program:	**Sale of Federal Surplus Personal Property**
Source:	General Services Administration
Description:	This program sells property no longer needed by the federal government. The program provides individuals, businesses and organizations the opportunity to enter competitive bids for purchase of a wide variety of personal property and equipment. Normally, there is no use restrictions on the property purchased.
More info:	www.gsa.gov

Program:	**Reimbursement for Firefighting on Federal Property**
Source:	U. S. Fire Administration, Federal Emergency Management Agency
Description:	Program provides reimbursement to fire service organizations that have engaged in firefighting operations on federal land. Payments can be for direct expenses and direct losses.
More info:	www.fema.gov

Program:	**Fire Management Assistance Grant Program**
Source:	Readiness, Response and Recovery Directorate, FEMA
Description:	Program provides grants to states, tribal governments and local governments for the mitigation, management and control of any fire burning on publicly (nonfederal) or privately owned forest or grassland that threatens such destruction as would constitute a major disaster. The grants are made in the form of cost sharing with the federal share being 75 percent of total eligible costs. Grant approvals are made within 1 to 72 hours from time of request.
More info:	www.fema.gov

Program:	**Hazard Mitigation Grant Program**
Source:	Federal Insurance and Mitigation Administration, FEMA

Description:	Provides states and local governments with financial assistant to implement measures to reduce of eliminate damage and losses from natural hazards. Funded projects have included vegetation management projects. It is each State's responsibility to identify and select hazard mitigation projects.
More info:	www.fema.gov

Program:	**Boise State University Wildland Fire Academy**.
Source:	Partnership between BSU and SWIFT (Southwest Idaho Fire Training, a group including the BLM, Forest Service, and the Idaho Department of Lands).
Description:	Provides a full range of fire training classes during one week in June at the Selland College of Technology on the BSU campus. Tuition is required. Open to federal, state, local fire fighters, contractors, and the public. Housing is available on campus. (Separate from, but in conjunction with, this academy, BSU recently began offering an associate degree program in fire science.)
More info:	BLM training officer, 208-384-3403, or BSU's Selland College, 208-426-1974.

Appendix IV

Training Programs

Program: **National Fire Academy Educational Program**

Source: National Fire Academy, U. S. Fire Administration, FEMA

Description: Provides training to people responsible for fire prevention and control. Training is provided at the resident facility in Emmetsburg, Maryland, and travel stipends are available for attendees. The course is available to any individual who is a member of a fire department; attendees are selected based on need and benefit to be derived by their community.

More info: www.fema.gov

Program: **Emergency Management Institute (EMI), Independent Study Program**

Source: EMI Readiness, Response and Recovery Directorate, FEMA

Description: The program currently provides 32 courses in emergency management practices to assist fire department managers with response to emergencies and disasters. Several courses could apply to fires in rural interface areas.

More info: www.fema.gov

Research Programs

Program: **Forestry Research** (Forest and Rangeland Renewable Resources Research Act)

Source: U S Forest Service

Description: Awards grants for research in a wide array of forest-related fields, including forest management and forest fire protection.

Contact: www.fs.fed.uslinksresearch.html

Private Foundations

Source: **Idaho Community Foundation**

Description: Provides grants for community development, human services; past grants have been awarded for equipment and an array of firefighting and rescue needs. Grants range from $250 to $25,000.

Deadline: Feb 1 for northern region; Nov 1 for statewide cycle

More info: Contact foundation for application information packet: 210 S. State Street, Boise, ID 83702; 208-342-3535; info@idcomfdn.org; www.idcomfdn.org

Source: **The Allstate Foundation**

Description: Provides grants for community development, government/public administration, safety/disasters. Grants average $1,000 to $10,000.

Deadline: None

More info: Guidelines available by mail request only: 2775 Sanders Rd., Suite F3, Northbrook, IL 60062-6127; www.allstate.com/foundation/

Source: **Plum Creek Foundation**

Description: Provides grants for community projects in areas of company operations. In 2000, grants were awarded to a volunteer fire department and a county search & rescue unit. An application form is required. Grants average around $5,000.

Deadline: None

More info: Contact foundation at 999-3rd Ave, Suite 2300, Seattle, WA 98104; 206-467-3600; www.plumcreek.com/company/foundation.cfm; foundation@plumcreek.com

Source: **The Steele-Reese Foundation**

Description: Provides grants for rural development and projects that benefit rural areas; Idaho is one of several areas in which the foundation funds projects. Have funded projects for emergency volunteers and fire protection districts in the past. Grant amounts fall within a wide range. The foundation requires three copies of the request letter; no application form is required.

Deadline: April 1

More info: 32 Washington Square West, New York, NY 10011. Info on Idaho programs:

406-722-4564

Appendix V

Laws Governing Fire Districts in Idaho

In 1943, the Idaho legislature passed, and Governor C.A. Bottolfsen signed, the Idaho Fire Protection District Law. The law specifically recognized the legality of all fire protection districts and the legality of their officers existing prior to its passage. Pre-existing districts were instructed to comply with the provision of the law as soon as they could conveniently do so. Since that time, the law has been amended over two dozen times. The most comprehensive revision of the law occurred in 1994. The 1994 revisions stipulated that all districts created or annexed during the twelve-month period prior to June 1, 1994 were considered to be in full compliance with all applicable laws regardless of prior interpretations.

The basic purpose of the 1994 revisions was to establish procedures for the formation, operation, and dissolution of fire protection districts in the State of Idaho.

What follows is a general description of the steps needed for fire district formation, the expansion of an existing district to take in new territory, and to consolidate two of more districts into one district. Please note that whenever a reference is made to the singular action of one Board of County Commissioner hereafter in this description, it may include joint action taken or required by two or more boards of county commissioners where two or more counties are involved in fire district formation. This also applies to annexation of new territory, or consolidation of two or more fire districts in different counties. Boards of Commissioners in two or more counties are authorized by law to act jointly if a fire district has territory within each county. It is always best to seek competent legal advice if the intent is to form, annex, or consolidate districts.

Additional Information. For additional information regarding fire district officers, duties and responsibilities, operations of the Fire District Board of Commissioners, cooperative arrangements, finance, etc., refer to the Handbook for Idaho Fire Protection Districts.[1]

I. Creation of a New Fire Protection District

A fire protection district may be created in any portion of a county that is not already organized into a district. Three steps must be followed to establish a fire protection district:

1) The proponents of the new district must file a petition with the Board of County Commissioners;
2) The Board of County Commissioner must hold a public hearing before the new district is formed; and
3) The qualified electors within the proposed district must approve the district's formation.

1) Filing the Petition: The first step in creating a fire protection district is to draw up a petition requesting its creation. The petition must designate the boundaries of the district, identify the proposed name, and include a map of the district. It must be signed by at least twenty-five property owners in the proposed district whose property holdings total at least 1,000 contiguous acres or

[1] Handbook for Idaho Fire Protection Districts. Bureau of Public Affairs Research. University of Idaho 2002. More information on how to obtain a handbook is found at the website: http: //www.uidaho.edu/bpar/fire.html

have an assessed valued of at least $500,000 and are not currently included in any existing fire district.

The petition must be presented to the Board of County Commissioners and filed with the Clerk of the Board. The petition and supporting documents must be available for public inspection at the office of the Clerk from the time of filing until the election.

The petitioners must deposit with the Board enough money to cover the costs of advertising and hold the election to create the district. The Board determines the amount required and the funds must be deposited prior to the Board's publishing notice of the hearing for creation of the district. If the district is organized, the petitioners are reimbursed from the first tax money collected by the newly formed district for the advertising and election costs.

Any area within a city may be included within a fire protection district by resolution or ordinance of its governing board.

2) The Hearing: The Board of County Commissioners must set a time for a public hearing on the petition between four and six weeks after it has been filed. If the proposed fire protection district is located in two or more counties, the boards of commissioners of the affected counties must coordinate the hearing date and the publication of the hearing notice so that only one hearing is held. The hearing must be held in the county with the largest area in the proposed fire protection district. The boards of county commissioners representing the affected counties are authorized to act in a joint manner.

For three successive weeks prior to the hearing, the Board must publish notice of the hearing in a newspaper of general circulation in which the proposed district is to be located. The notice must include a description of the proposed district and its boundaries, the date of the public hearing, and state that all taxpayers within the proposed district may appear and express their views on the organization of the district and its boundaries. At the hearing, all objections are presented to the Board. After considering all testimony, the Board decides whether to deny the petition, grant it as filed, or grant it with modification. If the petition is granted, the Board of County Commissioners fixes the boundaries of the proposed district and files a map of the district with the Clerk of the Board.

3) The Election: After the Board of County Commissioners set the boundaries of the district, the Clerk of the Board must twice publish a notice of the election in a newspaper published within the county or counties affected to determine whether or not the district should be organized. The notice must clearly designate the names and boundaries of the proposed district and require voters to cast ballots containing the words "fire protection district, yes," or "fire protection district, no." The first notice must be published not less than 12 days prior to the election and the second not less than five days prior to the election. If the proposed fire protection district is to be located in two or more counties, the boards of county commissioners will conduct the election on the same day in each county.

Voter qualifications for a fire protection district election are the same as for other state elections: a qualified voter must be United States citizen, be at least 18 years old, and be residents of the state or the county for at least 30 days. The voter must also be a resident of the proposed fire protection district and be registered with the County Clerk.

The Board of County Commissioners creates as many election precincts within the proposed district as it deems necessary, and appoints three election judges for each precinct. The election judges forward the official election results to the Clerk of the Board of County Commissioners. Within ten days of receiving the returns, the Board of County Commissioners must canvas the votes. Where more than one county is involved, the boards of commissioners of the affected counties are to coordinate the canvassing and the announcement of the results.

The Board of County Commissioners in each county approving a newly formed district must provide a copy of the legal description and map, prepared in draftsman-like manner, to the County Assessor and Clerk and Recorder of the county or counties within thirty days of the effective date of district's formation. The fire protection district is responsible for filing the map and legal description with the State Tax Commission.

Initially, any newly created fire district must consist of three commissioners. At the time of establishment of a new fire protection district, the Board of County Commissioners shall divide the district into three subdivisions, as nearly equal in population and territory as possible.

II. Expanding an Existing Fire District

Annexation of territory within the same county. Both contiguous and noncontiguous territory may be annexed by an existing fire protection district; however, any noncontiguous territory to be included must, itself, consist of not less than forty -acre parcels of contiguous territory in order to qualify for annexation. There are two methods for annexing territory in the same county:

- At least 75 percent of the owners or contract purchasers of the land sought to be annexed may petition the fire protection board of commissioners for annexation. After receiving the petition, the fire protection district board must hold a public hearing within ten to thirty days. The fire protection district board must publish notice of the place of the hearing in at least one issue of a newspaper of general circulation within the district. Any person attending the hearing who wishes to express support or opposition must be allowed to speak at the hearing. After the hearing, the fire protection district board either approves or rejects the petition. If the board approves the petition, it makes an order to that effect and sends to the Board of County Commissioners a certified copy of the petition and a legal description of the annexed territory. The Board of County Commissioner enters and records an order of annexation, ensuring that the annexed property will be properly included in the tax rolls for the fire protection district.
- If at least 75 percent of the owners or contract purchasers of the land sought for annexation fail to sign the petition for annexation, or if the petition is denied, the territory may still be annexed by securing an affirmative vote of a majority of the qualified voters residing in the additional territory. The vote may be taken at either a general or special election. Before the annexation election, the inclusion must be approved by resolution of the board of the existing fire protection district and entered in the board minutes. The same procedures described above to create and organize a fire protection district, including petition, hearing, election notice, and an election, are to be followed for the annexation election.
- The Board of County Commissioners must provide a copy of the legal description and map, prepared in draftsman-like manner of the new boundaries to the County Assessor and Clerk and Recorder within 30 days of the effective date of the annexation of the district. The district is responsible for filing the map and legal description with the State Tax Commission.

Annexation of territory in an adjoining county. Contiguous or noncontiguous territory located in an adjoining county may be annexed to an existing fire protection district; however, any such noncontiguous territory proposed to be annexed must consist of at least forty contiguous acres. The procedures are similar to those required for the creation of a fire protection district with the following modifications:

- Two or more property owners of contiguous lands totaling at least 100 acres, or having an assessed value of at least $125,000 may initiate proceedings.
- A petition describing the territory to be annexed, naming, and describing the fire protection district to which annexation is sought must be filed with the Board of County Commissioners of the county in which the new territory is situated. The petition must be accompanied by a map showing the boundaries of the original district, the territory proposed to be annexed, the location of the intervening county line, and a certified copy of a resolution of the fire district board consenting to the annexation.
- Notice of the hearing on the petition before the Board of County Commissioners must identify the territory proposed to be annexed, the time and place of the hearing, and state that any taxpayer in the territory may appear and present objections.
- After the hearing, if the petition is granted, the Board of County Commissioners enters an order fixing the boundaries of the annexed territory, directing the Clerk of the Board to have a map prepared. Certified copies of the order and the map are then sent to the Clerk of the Board of County Commissioners of the county in which the original fire protection district is situated.
- An election must then be held in the territory desiring annexation. Notice of the election must describe the boundaries of the territory for which annexation is sought. The notice must describe the form of the ballot to be used at the election.
- The territory proposed to be annexed constitutes one election precinct. If a voter is challenged, he/she must swear in addition to the usual elector's oath, "I am a resident within the boundaries of the territory proposed to be annexed to ___ Fire Protection District."
- The Board of County Commissioners canvasses returns of the election. If more than half of the voters support annexation, the Board of County Commissioners by order declares the territory to be annexed to the existing fire protection district. A certified copy of the order is sent to the board of the original fire protection district, to the Board of County Commissioners of the county in which the original district is situated, and to the County Clerk and Recorder of the county in which the newly annexed territory is situated.
- The Board of County Commissioners of the original fire district must provide a copy of the legal description and map showing the new boundaries of the district to the County Assessor and Clerk and Recorder within 30 days of the effective date of its formation. The fire protection district is responsible for filing the map and legal description with the State Tax Commission.
- At the first meeting of the Board of County Commissioners following the annexation, the Board must re-divide the expanded fire protection district into three subdivisions as equal as possible in terms of land area and population. No more than one fire protection district commissioner may reside in each subdistrict. If redistricting results in two commissioners residing in the same subdistricts, they must draw lots to determine who will remain in position. County Commissioners appoint individuals to fill any vacancies resulting from the annexation and the appointed commissioners serve for the reminder of the term to which they are appointed. Certified copies of appointments of the secretary and treasure of the fire district board must be filed with the clerks of the boards of county commissioners of the affected counties and the County Treasurers in which the district is located.

Any area within the boundaries of an incorporated city may, by resolution or ordinance of the governing board, be annexed to a fire protection district.

III. Consolidation of Fire Districts

One or more fire protection districts may consolidate with each other. Consolidation requires consent of all affected fire protection district boards, and under certain circumstances, the voters of the affected districts.

If two or more fire protection district boards determine it would be advantageous to consolidate into one fire protection district, the boards must prepare a consolidation agreement, which agreement must provide:

- The name of the proposed consolidated district;
- That all debts and property of the separate districts will be transferred to the consolidated district;
- The number of commissioners, either 3 or 5, on the new board;
- That all existing commissioners will be commissioners of the consolidated district until the next scheduled election when new commissioners will be elected;
- Employees of the consolidated district shall be chosen from employees of the existing districts, who shall also retain seniority rights under existing employment contracts or agreements.

Each of the fire district boards must approve the agreement. Between 10 and 30 days after approval of the consolidation agreement, each board must also hold a public haring. Notice of the time and place of hearing must be published in at least one newspaper of general circulation within the proposed consolidated district at least 5 days before the hearing. Any persons attending the hearing must be given the opportunity to support or oppose the agreement. After the hearing, each board votes to approve or reject the proposed consolidation agreement. If each board approves, the agreement becomes effective and the consolidation is effective in 30 days unless a petition of objection is filed.

Consolidation may be initiated by the fire protection district commissioners in the districts affected. An alternative is a signed petition by 10 percent of the electors residing within the districts who voted in the last general election.

Appendix VI

Forming a Not For Profit Fire Service Organization

A non-profit organization is a group organized for purposes other than generating profit and in which no part of the organizations income is distributed to its members, directors, or officers. Some volunteer fire departments are organized as non-profit organizations.

Many -- but not all -- non-profit corporations, depending upon their purposes, can qualify for exemption from federal corporate income taxes. The U.S. Internal Revenue Code contains more than 25 different classifications of tax-exempt groups, including professional associations, charitable organizations, civic leagues, labor unions, fraternal organizations, and social clubs, to name just a few. Depending on the category of the exemption, such groups are entitled to certain privileges and subject to certain reporting and disclosure requirements and limitations on their activities. There are also a number of reporting requirements that must be adhered to after your organization is up and running.

Incorporation as a non-profit organization:

- Incorporation is a good idea if the group plans on being in existence for several years and has the need to raise money through grants and donations that require tax-exempt status.
- Incorporation and the process of seeking tax-exempt status can be costly and time-consuming.
- Liability of leaders and members of the corporation is limited (in other words, the individuals who control the corporation are not responsible, except in unusual situations, for the legal and financial obligations of the organization).
- There is a tax advantage for the financial donor if money is given to a tax-exempt corporation. (Tax-exempt status is defined in section 501 (c) (3) of the IRS Tax Code.) Money can, however, be legally given to any group or individual without tax-exempt status.
- Some foundations will simply not fund groups that do not have final approval from IRS of its tax-exempt application.
- Incorporation requires careful minutes of official organizational meetings and good financial record keeping.
- If the group's budget is more than $25,000 per year, a tax return needs to be filed.
- Incorporation takes between 6 and 18 months to complete.

Incorporation Process:

- Develop clear and detailed By-laws and Articles of Incorporation
- Incorporation as a not-for-profit corporation within the state (filing with the state includes names and addresses of the first board of directors, etc.)
- File for recognition as tax-exempt with IRS

Estimated Costs for Incorporation . $2,600

Attorney fees	$1,000
Accountant fees	$1,000
Incorporation fees (state)	$ 50
Nonprofit application (IRS)	$ 550

Appendix VII

State and Federal Fire Related Codes

This section reviews the state and federal laws, policies, and organizations, which shape the responses to wildland fires that occur in Idaho.

State of Idaho

Federal law grants authority to the federal government and are not allowed to encroach on the constitutional rights afforded to states. Likewise, the state may not make laws that encroach on the powers constitutionally delegated to the federal government.

The State Board of Land Commissioners, all the state-wide elected officials, makes the rules regarding state lands while staying within the bounds of legislated law. The Idaho Department of Lands (IDL) is an extension of the State Board of Land Commissioners (58-101, 58-119 Idaho Code) and, as such, is required to execute the functions of the State Board.

The Idaho Code discusses the responsibility and powers of the State Fire Marshal, an agency of the State Department of Insurance. The Fire Marshal is mandated to carry out the International Fire Code, to prevent fires, to protect life, and to oversee that buildings meet the standards set forth in the International Fire Code (41-253, 41-254, 41-255 Idaho Code). The Fire Marshal is also charged with keeping statistics of all the fires in the state. The agency is authorized by legislation to "Purchase necessary equipment and supplies, and incur any other reasonable and necessary expense in connection with or required for the purpose of carrying out the provisions of this act." (41-255 Idaho Code)

The State Fire Marshal's power extends to the chief (or his deputy) of each fire department or fire protective district organized under state law. In areas where there is no organized fire department, the county sheriff assumes the role of a deputy fire marshal in carrying out the provisions of the International Fire Code, and any additional regulations set forth by the State Fire Marshal. The International Fire Code prescribes regulations consistent with "recognized good practice for the safeguarding of life and property from hazards of fire and explosion . . . in the use or occupancy of buildings or premises." (41-253 Idaho Code)

Title 38 of the Idaho State Statutes is devoted to Forestry, Forest Products, and Stumpage Districts. Idaho code allows for agreement between the Idaho Department of Lands (IDL) and federal agencies for the joint exercise of powers pursuant to certain conditions (58-104 Idaho Code). Those conditions (expressed in 67-2328 Idaho Code) overlap with what the federal agencies expect as far as reaching an agreement.

The Idaho Department of Lands is an extension of the State Board of Land Commissioners and has extensive authority in its approach towards wildland fire. The department has created an extensive wildland fire attack organization through out the state. It has the ability and authority to work with other wildfire fighting resources, in the event a fire exceeds the ability of the initial attach crew,[2] including wildland fire resources under mutual agreements.

The department cooperates with federal and local governments in developing plans for and directing actions relating to the prevention and suppression of wildland fire in the rural areas of the state. The IDL State Forester has the authority to cooperate with private and public landowners,

2 More information regarding state code at the following URL:
http://www2.state.id.us/adm/adminrules/rules/idapa20/20index.htm

political subdivisions, private associations, and other agencies to protect forest resources on a statewide basis. At the local level, IDL Area Supervisors and Fire Wardens are empowered to make agreements with federal, city, county and rural fire department resources regarding fire management.

Key Points of Idaho State Policy

- The Fire Warden of each IDL Fire Protection District takes action on all forest and range fires, regardless of land ownership, which jeopardize lands protected by the Department. In doing so, forest and range fires must meet the criteria as set forth in Title 38, Chapter 1, Idaho Code. (IDL, FMH-800: Fire Control Policy; page 2 part b)
- IDL cooperates with federal and local governments in developing plans for, and directing activities relating to, the prevention and control of wildland fires in the rural areas of the state. (IDL, Mobilization Guide; page 2 par. 2)
- The State Forester, under general supervision of the State Board of Land Commissioners, is responsible for the protection of State forest and rangeland and cooperates with landowners, political subdivisions, private associations, and other agencies in protecting other forest and rangeland resources. (IDL, Mobilization Guide; page 2, point A)
- Upon the request of the State Forester, the United States Forest Service and Bureau of Land Management provides assistance under terms of cooperative agreements. Area Supervisors and Fire Wardens of IDL are delegated the authority to make local agreements relating to fire control matters involving USFS and BLM and other federal firefighting resources not already covered by cooperative agreements. (IDL, Mobilization Guide; page 2, point E)
- Area Supervisors and Fire Wardens are delegated the authority to make local agreements relating to fire control matters involving city, county and rural fire department resources. Agreements affecting statewide operations are coordinated through the State Fire Coordinator. (IDL, Mobilization Guide; page 3, point F)
- General guidelines for fire suppression priorities:
    1. Protection of life and property.
    2. Initial attack.
    3. Emerging fires in need of reinforcement to prevent escape.
    4. Large fires with resource values at risk.
    5. Other large fires.

    (IDL, Mobilization Guide; page 4)
- IDL develops and maintains mutual aid and other cooperative agreements (in writing where possible) with local and adjacent fire suppression agencies and county emergency planning committees, such as Local Emergency Planning Committees. (IDL, Mobilization Guide; page 8, point D)

The Mobilization Guide and other IDL policies and responsibilities are based on state statutory provisions found in Title 38, Chapter 1, of the Idaho Code. A review of that portion of Idaho Code shows that all “forest” and “range” land within the State of Idaho is to be under the protection of either a State Forest Protection District or a Forest Protection Association.

Forest Protection Associations are affiliated or endorsed by IDL. The associations consist of a board of landowners who own forested lands and who agree to protect their own lands using money

from additional property taxes. If a forest landowner does not belong to an association then IDL will assess a tax and assume the responsibility for patrol and suppression of any fires that start on or burn through that owner's property.

Idaho's wildland fire policy has several references to the ability of the state to make agreements with federal and local government fire organizations. The agreements are to be reduced to writing whenever possible. The statutory basis for these agreements makes them legally binding documents. Within these documents, there must be specific roles and duties for each party of involved. The financial arrangements also must be thoroughly documented.

The State's personnel and equipment resources are limited to the nature of their wildland fire training. Lastly, the mobilization guide specifies that the agency provide training to its personnel using the Incident Command System (ICS). ICS is a federal system. This allows the state management teams to operate with their federal counterparts.

The responsibility of suppressing wildland fire on state lands ultimately falls to the IDL. The federal lands that intermingle with Idaho's state lands remain the responsibility of the federal government. However, with mutual aid agreements the IDL may support and work with the federal agencies, provided that the State's resource needs are being met.

The approach towards wildland fire on private forestlands in the state of Idaho is also clear. Private owners are given two choices; they can belong either to a State Forest Protective District or to a Forest Protective Association. This means that the lands are protected by the state or by a state assisted association of trained firefighters.

In the context of statutory language, "forest land" is defined as follows: any land which has upon it sufficient brush or flammable forest growth of any kind or size, living or dead, standing or down, including debris or growth following a fire or removal of forest products, to constitute a fire menace to life (including animal) or property (38-101 Idaho Code). Unfortunately, there is no mention of how a homeowner, whose property does not fit into that definition, will be treated.

The federal wildfire agencies have legal obligations only for federal lands. The state government has legal obligations to state lands, and private lands that are classified as forest or rangelands.

Rural and city fire departments act as extensions of the State Fire Marshal's office. The Fire Marshal provides training for structural and automobile fire protection, as well as medical response duties that are part of emergency services. The Fire Marshal's mission is built around preventing and then fighting structural fires only. Some fire stations have crews that are trained to fight wildland fires, but it is provided through agreements with the Idaho State Department of Lands, not the Fire Marshal's office.

Federal Policy

The Bureau of Land Management, the National Park Service, the Bureau of Indian Affairs, Fish and Wildlife Service, and the US Forest Service are all members of the National Wildfire Coordinating Group (NWCG). This group provides a formalized system of agreement on substantive issues. Any agreed-on policies, standards or procedures are then implemented directly by each agency. In effect, the NWCG is a large umbrella that coordinates wildland fire matters between all members of the group.

The 2001 Federal Wildland Fire Management Policy is in Chapter 3 in a report entitled "Review and Update of the 1995 Federal Wildland Fire Management Policy." The 2001 Wildland Fire Management Policy and the recommended changes in policy were accepted by the US Secretaries of Interior and Agriculture in 2001, bringing policy changes to the local agency level.

The National Fire Policy sets the policy for support among federal agencies for fire management, and encourages coordination with the individual states, tribes, and municipalities. The National Fire Policy places high priority on several other important topics. This interagency policy highlights and

reiterates firefighter and public safety as the number one priority; the policy calls for an assessment of the consequences on safety, property, and cultural resources in choosing the appropriate response to wildland fire.

The National Fire Policy explains the role of federal wildland firefighters (including equipment) as that of only wildland firefighting, and in the special case of the wildland-urban interface use of federal personnel will be limited to exterior structural fire suppression only. The national policy forbids use of wildland firefighters to enter a house (or other structure).

Key Features of the 2001 Wildland Fire Policy:

The 2001 Wildland Fire Policy is the guiding source for how the federal government deals with wildland fire. The document covers a wide variety of issues: safety, protection priorities, planning for possible ignitions, and the use of fire for land management purposes; and communication and education of public and agency personnel.

The 2001 Wildland Fire Policy provides a loose framework that allows agencies at all levels of government (federal to local) to work together. Below are some listed points from the 2001 Wildland Fire Policy that briefly summarize what the document is about, and summarize what applies to the homeowner.

Point 1 - Safety

“Firefighter and public safety is the first priority. All Fire Management Plans and activities must reflect this commitment.”

Point 3 - Response to Wildland Fire

“Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of the fire. The circumstances, under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate management response to the fire.”

Point 6 - Protection Priorities

“The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be based on the values to be protected, human health and safety, and the costs of protection. Once people have been committed to an incident, these human resources become the highest value to be protected.”

Point 7 – Wildland-Urban Interface

“The operational roles of federal agencies as partners in the Wildland-Urban Interface are wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance. Structural fire suppression is the responsibility of tribal, State, or local governments. Federal agencies may assist with exterior structural protection activities under formal Fire Protection Agreements that specify the mutual responsibilities of the partners, including funding.”

Point 14 - Interagency Cooperation

“Fire management planning, preparedness, prevention, suppression, fire use, restoration, and rehabilitation, monitoring, research, and education will be conducted on an interagency basis with the involvement of cooperators and partners.”

Organization

In terms of a firefighting organization, the federal government has come to terms with the challenges of multiple agencies, multiple land ownerships, and multiple objectives. Although each agency views wildland fire differently, through the interagency approach, the federal agencies have managed to establish a strong fire management organization.

The interagency effort has come about because it is difficult for any one agency to fund enough resources to protect all of its lands. By pooling their resources and carefully coordinating their efforts, the agencies can deal with the many fires that burn every year.

On the operational end of the National Wildfire Coordinating Group (NWCG) is the National Interagency Fire Center (NIFC) in Boise, Idaho. NIFC is a complex that houses all of the agencies in one place. NIFC provides safe, effective, and efficient policies and guidance, as well as technical and logistical support to the wildland fire management community.

All of the resources available on the national level are available for fire wildland fire suppression. Through a system of allocation and prioritizing, crews and resources are frequently moved around the United States to provide fire suppression services on federal lands.

The fire teams and crews ultimately carry out the wildland fire policy. These teams have the responsibility of ordering resources, asking for assistance, and for providing the fire suppression. They also determine whose land a fire is on and if it is a threat to people, to homes, or to other property.

The personnel within that fire management organization are wildland fire trained. The rules, regulations, and legal authority of the federal government are for the preservation of federally administered lands. With the exception of government compounds that have firefighters trained to deal with fires inside of buildings and other structures, federal wildland firefighters are not trained to deal with structural fires.

This plan was developed by Northwest Management, Inc., under contract with the Owyhee County Commissioners and the Southwest Idaho Resource Conservation and Development Council, Inc., with funding provided by the USDI Bureau of Land Management and Owyhee County.

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Last Page of Document

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APPENDIX I

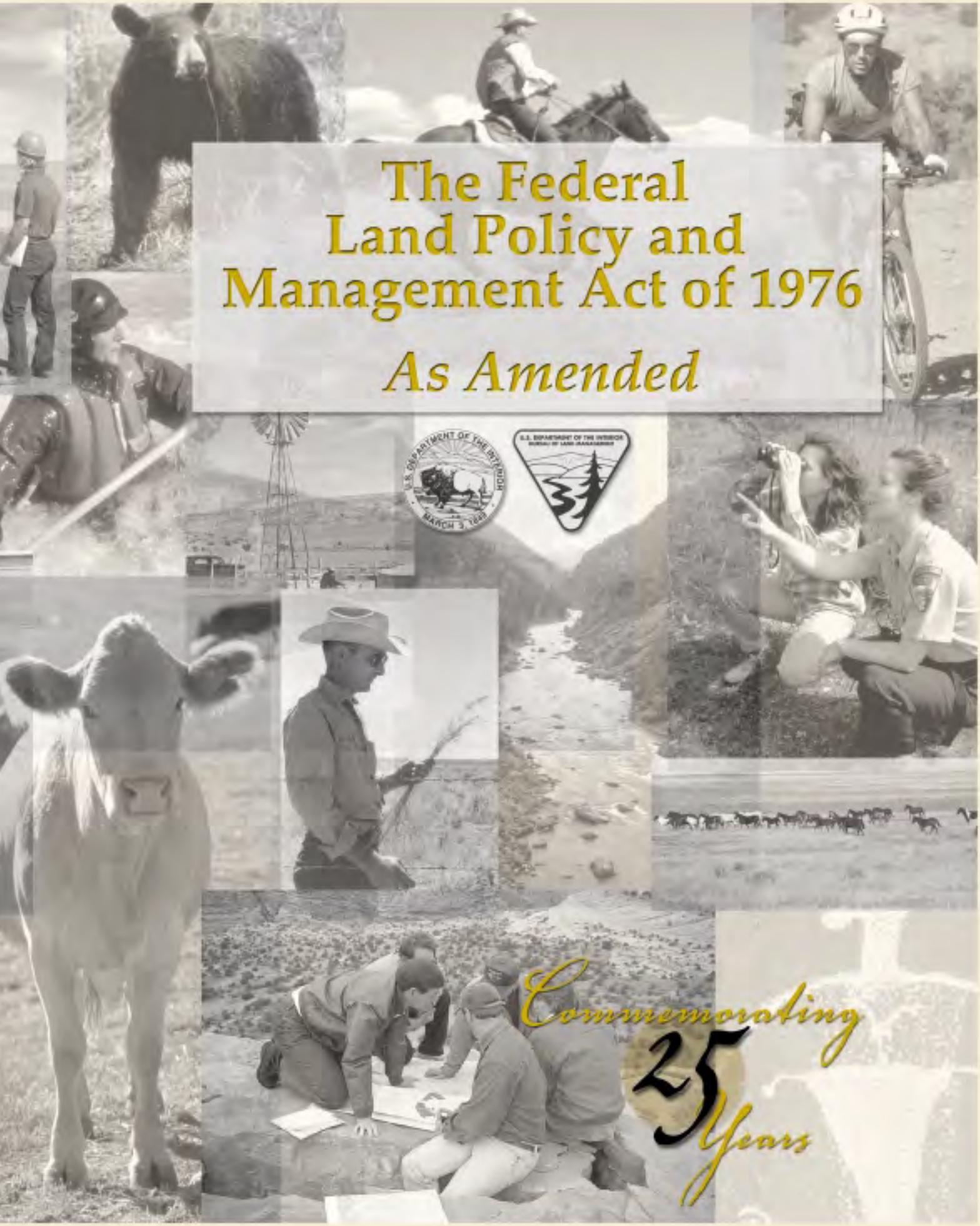
THE FEDERAL LAND POLICY AND MANAGEMENT ACT (FLPMA)

OF 1976

AS AMENDED

The Federal Land Policy and Management Act of 1976

As Amended



Commemorating 25 Years

The Federal Land Policy and Management Act of 1976, as amended, is the Bureau of Land Management "organic act" that establishes the agency's multiple-use mandate to serve present and future generations.

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The Federal Land Policy and Management Act of 1976
As Amended

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Bureau of Land Management
and
Office of the Solicitor

Washington, D.C

October 2001

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FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976

Public Law 94-579
94th Congress

An Act

To establish public land policy; to establish guidelines for its administration; to provide for the management, protection, development, and enhancement of the public lands; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled [italics in original],

Editor's Note

This version of FLPMA was created and updated to include all sections of the Act as originally passed by Congress in 1976; consequently, it is more inclusive and annotated than most. In the text, additions have been italicized and deletions have been removed. Editor's notes are in a different, smaller font, and are framed by brackets "[ ]."

This document was prepared by the Bureau of Land Management and the Office of the Solicitor. Great care was taken to ensure that all amendments were included correctly and with precision. Nevertheless, we recognize that this document still could contain errors. The user is encouraged to consult the official United States Code if there is any doubt about the accuracy of the information contained herein.

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TITLE I

SHORT TITLE, DECLARATION OF POLICY, AND DEFINITIONS

SHORT TITLE

Sec. 101. [43 U.S.C. 1701 note] This Act may be cited as the "Federal Land Policy and Management Act of 1976".

DECLARATION OF POLICY

Sec. 102. [43 U.S.C. 1701] (a) The Congress declares that it is the policy of the United States that–

(1) the public lands be retained in Federal ownership, unless as a result of the land use planning procedure provided for in this Act, it is determined that disposal of a particular parcel will serve the national interest;

(2) the national interest will be best realized if the public lands and their resources are periodically and systematically inventoried and their present and future use is projected through a land use planning process coordinated with other Federal and State planning efforts;

(3) public lands not previously designated for any specific use and all existing classifications of public lands that were effected by executive action or statute before the date of enactment of this Act be reviewed in accordance with the provisions of this Act;

(4) the Congress exercise its constitutional authority to withdraw or otherwise designate or dedicate Federal lands for specified purposes and that Congress delineate the extent to which the Executive may withdraw lands without legislative action;

(5) in administering public land statutes and exercising discretionary authority granted by them, the Secretary be required to establish comprehensive rules and regulations after considering the views of the general public; and to structure adjudication procedures to assure adequate third party participation, objective administrative review of initial decisions, and expeditious decision making;

(6) judicial review of public land adjudication decisions be provided by law;

(7) goals and objectives be established by law as guidelines for public land use planning, and that management be on the basis of multiple use and sustained yield unless otherwise specified by law;

(8) the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use;

(9) the United States receive fair market value of the use of the public lands and their resources unless otherwise provided for by statute;

(10) uniform procedures for any disposal of public land, acquisition of non-Federal land for public purposes, and the exchange of such lands be established by statute, requiring each disposal, acquisition, and exchange to be consistent with the prescribed mission of the department or agency involved, and reserving to the Congress review of disposals in excess of a specified acreage;

(11) regulations and plans for the protection of public land areas of critical environmental concern be promptly developed;

(12) the public lands be managed in a manner which recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from

the public lands including implementation of the Mining and Minerals Policy Act of 1970 (84 Stat. 1876, 30 U.S.C. 21a) as it pertains to the public lands; and

(13) the Federal Government should, on a basis equitable to both the Federal and local taxpayer, provide for payments to compensate States and local governments for burdens created as a result of the immunity of Federal lands from State and local taxation.

(b) The policies of this Act shall become effective only as specific statutory authority for their implementation is enacted by this Act or by subsequent legislation and shall then be construed as supplemental to and not in derogation of the purposes for which public lands are administered under other provisions of law.

DEFINITIONS

Sec. 103. [43 U.S.C. 1702] Without altering in any way the meaning of the following terms as used in any other statute, whether or not such statute is referred to in, or amended by, this Act, as used in this Act–

(a) The term "areas of critical environmental concern" means areas within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

(b) The term "holder" means any State or local governmental entity, individual, partnership, corporation, association, or other business entity receiving or using a right-of-way under title V of this Act.

(c) The term "multiple use" means the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

(d) The term "public involvement" means the opportunity for participation by affected citizens in rule making, decision making, and planning with respect to the public lands, including public meetings or hearings held at locations near the affected lands, or advisory mechanisms, or such other procedures as may be necessary to provide public comment in a particular instance.

(e) The term "public lands" means any land and interest in land owned by the United States within the several States and administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except–

(1) lands located on the Outer Continental Shelf; and

(2) lands held for the benefit of Indians, Aleuts, and Eskimos.

(f) The term "right-of-way" includes an easement, lease, permit, or license to occupy, use, or traverse public lands granted for the purpose listed in title V of this Act.

(g) The term "Secretary," unless specifically designated otherwise, means the Secretary of the Interior.

(h) The term "sustained yield" means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use.

(i) The term “wilderness” as used in section 603 shall have the same meaning as it does in section 2(c) of the Wilderness Act (78 Stat. 890; 16 U.S.C. 1131–1136).

(j) The term “withdrawal” means withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of Federal land, other than “property” governed by the Federal Property and Administrative Services Act, as amended (40 U.S.C. 472) from one department, bureau or agency to another department, bureau or agency.

(k) An “allotment management plan” means a document prepared in consultation with the lessees or permittees involved, which applies to livestock operations on the public lands or on lands within National Forests in the eleven contiguous Western States and which:

(1) prescribes the manner in, and extent to, which livestock operations will be conducted in order to meet the multiple-use, sustained-yield, economic and other needs and objectives as determined for the lands by the Secretary concerned; and

(2) describes the type, location, ownership, and general specifications for the range improvements to be installed and maintained on the lands to meet the livestock grazing and other objectives of land management; and

(3) contains such other provisions relating to livestock grazing and other objectives found by the Secretary concerned to be consistent with the provisions of this Act and other applicable law.

(1) The term “principal or major uses” includes, and is limited to, domestic livestock grazing, fish and wildlife development and utilization, mineral exploration and production, rights-of-way, outdoor recreation, and timber production.

(m) The term “department” means a unit of the executive branch of the Federal Government which is headed by a member of the President’s Cabinet and the term “agency” means a unit of the executive branch of the Federal Government which is not under the jurisdiction of a head of a department.

(n) The term “Bureau” means the Bureau of Land Management.

(o) The term “eleven contiguous Western States” means the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

(p) The term “grazing permit and lease” means any document authorizing use of public lands or lands in National Forests in the eleven contiguous Western States for the purpose of grazing domestic livestock.

[The term “sixteen contiguous Western States,” where changed by P.L. 95-514, refers to: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington and Wyoming. This term is defined by P.L. 95-514 and found in sections 401(b)(1), 402(a) and 403(a).]

TITLE II

LAND USE PLANNING; LAND ACQUISITION AND DISPOSITION

INVENTORY AND IDENTIFICATION

Sec. 201. [43 U.S.C. 1711] (a) The Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values (including, but not limited to, outdoor recreation and scenic values), giving priority to areas of critical environmental concern. This inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values. The preparation and maintenance of such inventory or the identification of such areas shall not, of itself, change or prevent change of the management or use of public lands.

(b) As funds and manpower are made available, the Secretary shall ascertain the boundaries of the public lands; provide means of public identification thereof including, where appropriate, signs and maps; and provide State and local governments with data from the inventory for the purpose of planning and regulating the uses of non-Federal lands in proximity of such public lands.

LAND USE PLANNING

Sec. 202. [43 U.S.C. 1712] (a) The Secretary shall, with public involvement and consistent with the terms and conditions of this Act, develop, maintain, and, when appropriate, revise land use plans which provide by tracts or areas for the use of the public lands. Land use plans shall be developed for the public lands regardless of whether such lands previously have been classified, withdrawn, set aside, or otherwise designated for one or more uses.

(b) In the development and revision of land use plans, the Secretary of Agriculture shall coordinate land use plans for lands in the National Forest System with the land use planning and management programs of and for Indian tribes by, among other things, considering the policies of approval tribal land resource management programs.

(c) In the development and revision of land use plans, the Secretary shall–

(1) use and observe the principles of multiple use and sustained yield set forth in this and other applicable law;

(2) use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences;

(3) give priority to the designation and protection of areas of critical environmental concern;

(4) rely, to the extent it is available, on the inventory of the public lands, their resources, and other values;

(5) consider present and potential uses of the public lands;

(6) consider the relative scarcity of the values involved and the availability of alternative means (including recycling) and sites for realization of those values;

(7) weigh long-term benefits to the public against short-term benefits;

(8) provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans; and

(9) to the extent consistent with the laws governing the administration of the public lands, coordinate the land use inventory, planning, and management activities of or for such lands with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the

lands are located, including, but not limited to, the statewide outdoor recreation plans developed under the Act of September 3, 1964 (78 Stat. 897), as amended [16 U.S.C. 460l–4 et seq. note], and of or for Indian tribes by, among other things, considering the policies of approved State and tribal land resource management programs. In implementing this directive, the Secretary shall, to the extent he finds practical, keep apprised of State, local, and tribal land use plans; assure that consideration is given to those State, local, and tribal plans that are germane in the development of land use plans for public lands; assist in resolving, to the extent practical, inconsistencies between Federal and non-Federal Government plans, and shall provide for meaningful public involvement of State and local government officials, both elected and appointed, in the development of land use programs, land use regulations, and land use decisions for public lands, including early public notice of proposed decisions which may have a significant impact on non-Federal lands. Such officials in each State are authorized to furnish advice to the Secretary with respect to the development and revision of land use plans, land use guidelines, land use rules, and land use regulations for the public lands within such State and with respect to such other land use matters as may be referred to them by him. Land use plans of the Secretary under this section shall be consistent with State and local plans to the maximum extent he finds consistent with Federal law and the purposes of this Act.

(d) Any classification of public lands or any land use plan in effect on the date of enactment of this Act is subject to review in the land use planning process conducted under this section, and all public lands, regardless of classification, are subject to inclusion in any land use plan developed pursuant to this section. The Secretary may modify or terminate any such classification consistent with such land use plans.

(e) The Secretary may issue management decisions to implement land use plans developed or revised under this section in accordance with the following:

(1) Such decisions, including but not limited to exclusions (that is, total elimination) of one or more of the principal or major uses made by a management decision shall remain subject to reconsideration, modification, and termination through revision by the Secretary or his delegate, under the provisions of this section, of the land use plan involved.

(2) Any management decision or action pursuant to a management decision that excludes (that is, totally eliminates) one or more of the principal or major uses for two or more years with respect to a tract of land of one hundred thousand acres or more shall be reported by the Secretary to the House of Representatives and the Senate. If within ninety days from the giving of such notice (exclusive of days on which either House has adjourned for more than three consecutive days), the Congress adopts a concurrent resolution of nonapproval of the management decision or action, then the management decision or action shall be promptly terminated by the Secretary. If the committee to which a resolution has been referred during the said ninety day period, has not reported it at the end of thirty calendar days after its referral, it shall be in order to either discharge the committee from further consideration of such resolution or to discharge the committee from consideration of any other resolution with respect to the management decision or action. A motion to discharge may be made only by an individual favoring the resolution, shall be highly privileged (except that it may not be made after the committee has reported such a resolution), and debate thereon shall be limited to not more than one hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to. If the motion to discharge is agreed to or disagreed to, the motion may not be made with respect to any other resolution with respect to the same management decision or action. When the committee has reprinted, or has been discharged from further consideration of a resolution, it shall at any time thereafter be in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the resolution. The motion shall be highly privileged and shall not be

debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(3) Withdrawals made pursuant to section 204 of this Act may be used in carrying out management decisions, but public lands shall be removed from or restored to the operation of the Mining Law of 1872, as amended (R.S. 2318–2352; 30 U.S.C. 21 et seq.) or transferred to another department, bureau, or agency only by withdrawal action pursuant to section 204 or other action pursuant to applicable law: *Provided*, That nothing in this section shall prevent a wholly owned Government corporation from acquiring and holding rights as a citizen under the Mining Law of 1872.

(f) The Secretary shall allow an opportunity for public involvement and by regulation shall establish procedures, including public hearings where appropriate, to give Federal, State, and local governments and the public, adequate notice and opportunity to comment upon and participate in the formulation of plans and programs relating to the management of the public lands.

SALES

Sec. 203. [43 U.S.C. 1713] (a) A tract of the public lands (except land in units of the National Wilderness Preservation System, National Wild and Scenic Rivers Systems, and National System of Trails) may be sold under this Act where, as a result of land use planning required under section 202 of this Act, the Secretary determines that the sale of such tract meets the following disposal criteria:

(1) such tract because of its location or other characteristics is difficult and uneconomic to manage as part of the public lands, and is not suitable for management by another Federal department or agency; or

(2) such tract was acquired for a specific purpose and the tract is no longer required for that or any other Federal purpose; or

(3) disposal of such tract will serve important public objectives, including but not limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than public land and which outweigh other public objectives and values, including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in Federal ownership.

(b) Where the Secretary determines that land to be conveyed under clause (3) of subsection (a) of this section is of agricultural value and is desert in character, such land shall be conveyed either under the sale authority of this section or in accordance with other existing law.

(c) Where a tract of the public lands in excess of two thousand five hundred acres has been designated for sale, such sale may be made only after the end of the ninety days (not counting days on which the House of Representatives or the Senate has adjourned for more than three consecutive days) beginning on the day the Secretary has submitted notice of such designation to the Senate and the House of Representatives, and then only if the Congress has not adopted a concurrent resolution stating that such House does not approve of such designation. If the committee to which a resolution has been referred during the said ninety day period, has not reported it at the end of thirty calendar days after its referral, it shall be in order to either discharge the committee from further consideration of such resolution or to discharge the committee from consideration of any other resolution with respect to the designation. A motion to discharge may be made only by an individual favoring the resolution, shall be highly privileged (except that it may not be made after the committee has reported such a resolution), and debate thereon shall be limited to not more than one hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to. If the motion to discharge is agreed to or disagreed to, the motion may not be made with respect to any other resolution with respect to the same designation. When the committee has reprinted, or has been discharged from further consideration of a resolution, it shall at any time thereafter be in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the

consideration of the resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(d) Sales of public lands shall be made at a price not less than their fair market value as determined by the Secretary.

(e) The Secretary shall determine and establish the size of tracts of public lands to be sold on the basis of the land use capabilities and development requirements of the lands; and, where any such tract which is judged by the Secretary to be chiefly valuable for agriculture is sold, its size shall be no larger than necessary to support a family-sized farm.

(f) Sales of public lands under this section shall be conducted under competitive bidding procedures to be established by the Secretary. However, where the Secretary determines it necessary and proper in order (1) to assure equitable distribution among purchasers of lands, or (2) to recognize equitable considerations or public policies, including but not limited to, a preference to users, he may sell those lands with modified competitive bidding or without competitive bidding. In recognizing public policies, the Secretary shall give consideration to the following potential purchasers:

(1) the State in which the land is located;

(2) the local government entities in such State which are in the vicinity of the land;

(3) adjoining landowners;

(4) individuals; and

(5) any other person.

(g) The Secretary shall accept or reject, in writing, any offer to purchase made through competitive bidding at his invitation no later than thirty days after the receipt of such offer or, in the case of a tract in excess of two thousand five hundred acres, at the end of thirty days after the end of the ninety-day period provided in subsection (c) of this section, whichever is later, unless the offeror waives his right to a decision within such thirty-day period. Prior to the expiration of such periods the Secretary may refuse to accept any offer or may withdraw any land or interest in land from sale under this section when he determines that consummation of the sale would not be consistent with this Act or other applicable law.

WITHDRAWALS

Sec. 204. [43 U.S.C. 1714] (a) On and after the effective date of this Act the Secretary is authorized to make, modify, extend, or revoke withdrawals but only in accordance with the provisions and limitations of this section. The Secretary may delegate this withdrawal authority only to individuals in the Office of the Secretary who have been appointed by the President, by and with the advice and consent of the Senate.

(b) (1) Within thirty days of receipt of an application for withdrawal, and whenever he proposes a withdrawal on his own motion, the Secretary shall publish a notice in the Federal Register stating that the application has been submitted for filing or the proposal has been made and the extent to which the land is to be segregated while the application is being considered by the Secretary. Upon publication of such notice the land shall be segregated from the operation of the public land laws to the extent specified in the notice. The segregative effect of the application shall terminate upon (a) rejection of the application by the Secretary, (b) withdrawal of lands by the Secretary, or (c) the expiration of two years from the date of the notice.

(2) The publication provisions of this subsection are not applicable to withdrawals under subsection (e) hereof.

(c) (1) On and after the dates of approval of this Act a withdrawal aggregating five thousand acres or more may be made (or such a withdrawal or any other withdrawal involving in the aggregate five thousand acres or more which terminates after such date of approval may be extended) only for a period of not more than twenty years by the Secretary on his own motion or upon request by a department or agency head. The Secretary shall notify both Houses of Congress of such a withdrawal no later than its effective date and the withdrawal shall terminate and become ineffective at

the end of ninety days (not counting days on which the Senate or the House of Representatives has adjourned for more than three consecutive days) beginning on the day notice of such withdrawal has been submitted to the Senate and the House of Representatives, if the Congress has adopted a concurrent resolution stating that such House does not approve the withdrawal. If the committee to which a resolution has been referred during the said ninety day period, has not reported it at the end of thirty calendar days after its referral, it shall be in order to either discharge the committee from further consideration of such resolution or to discharge the committee from consideration of any other resolution with respect to the Presidential recommendation. A motion to discharge may be made only by an individual favoring the resolution, shall be highly privileged (except that it may not be made after the committee has reported such a resolution), and debate thereon shall be limited to not more than one hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to. If the motion to discharge is agreed to or disagreed to, the motion may not be made with respect to any other resolution with respect to the same Presidential recommendation. When the committee has reprinted, or has been discharged from further consideration of a resolution, it shall at any time thereafter be in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(2) With the notices required by subsection (c)(1) of this section and within three months after filing the notice under subsection (e) of this section, the Secretary shall furnish to the committees–

(1) a clear explanation of the proposed use of the land involved which led to the withdrawal;

(2) an inventory and evaluation of the current natural resource uses and values of the site and adjacent public and nonpublic land and how it appears they will be affected by the proposed use, including particularly aspects of use that might cause degradation of the environment, and also the economic impact of the change in use on individuals, local communities, and the Nation;

(3) an identification of present users of the land involved, and how they will be affected by the proposed use;

(4) an analysis of the manner in which existing and potential resource uses are incompatible with or in conflict with the proposed use, together with a statement of the provisions to be made for continuation or termination of existing uses, including an economic analysis of such continuation or termination;

(5) an analysis of the manner in which such lands will be used in relation to the specific requirements for the proposed use;

(6) a statement as to whether any suitable alternative sites are available (including cost estimates) for the proposed use or for uses such a withdrawal would displace;

(7) a statement of the consultation which has been or will be had with other Federal departments and agencies, with regional, State, and local government bodies, and with other appropriate individuals and groups;

(8) a statement indicating the effect of the proposed uses, if any, on State and local government interests and the regional economy;

(9) a statement of the expected length of time needed for the withdrawal;

(10) the time and place of hearings and of other public involvement concerning such withdrawal;

(11) the place where the records on the withdrawal can be examined by interested parties; and

(12) a report prepared by a qualified mining engineer, engineering geologist, or geologist which shall include but not be limited to information on: general geology, known mineral deposits, past and present mineral production, mining claims, mineral leases, evaluation of future mineral potential, present and potential market demands.

(d) A withdrawal aggregating less than five thousand acres may be made under this subsection by the Secretary on his own motion or upon request by a department or an agency head–

(1) for such period of time as he deems desirable for a resource use; or

(2) for a period of not more than twenty years for any other use, including but not limited to use for administrative sites, location of facilities, and other proprietary purposes; or

(3) for a period of not more than five years to preserve such tract for a specific use then under consideration by the Congress.

(e) When the Secretary determines, or when the *Committee on Natural Resources of the House of Representatives or the Committee on Energy and Natural Resources of the Senate* [P.L. 103-437, 1994] notifies the Secretary, that an emergency situation exists and that extraordinary measures must be taken to preserve values that would otherwise be lost, the Secretary notwithstanding the provisions of subsections (c) (1) and (d) of this section, shall immediately make a withdrawal and file notice of such emergency withdrawal with *both of those Committees* [P.L. 103-437, 1994]. Such emergency withdrawal shall be effective when made but shall last only for a period not to exceed three years and may not be extended except under the provisions of subsection (c) (1) or (d), whichever is applicable, and (b) (1) of this section. The information required in subsection (c) (2) of this subsection shall be furnished the committees within three months after filing such notice.

(f) All withdrawals and extensions thereof, whether made prior to or after approval of this Act, having a specific period shall be reviewed by the Secretary toward the end of the withdrawal period and may be extended or further extended only upon compliance with the provisions of subsection (c) (1) or (d), whichever is applicable, and only if the Secretary determines that the purpose for which the withdrawal was first made requires the extension, and then only for a period no longer than the length of the original withdrawal period. The Secretary shall report on such review and extensions to the *Committee on Natural Resources of the House of Representatives and the Committee on Energy and Natural Resources of the Senate*. [P.L. 103-437, 1994]

(g) All applications for withdrawal pending on the date of approval of this Act shall be processed and adjudicated to conclusion within fifteen years of the date of approval of this Act, in accordance with the provisions of this section. The segregative effect of any application not so processed shall terminate on that date.

(h) All new withdrawals made by the Secretary under this section (except an emergency withdrawal made under subsection (e) of this section) shall be promulgated after an opportunity for a public hearing.

(i) In the case of lands under the administration of any department or agency other than the Department of the Interior, the Secretary shall make, modify, and revoke withdrawals only with the consent of the head of the department or agency concerned, except when the provisions of subsection (e) of this section apply.

(j) The Secretary shall not make, modify, or revoke any withdrawal created by Act of Congress; make a withdrawal which can be made only by Act of Congress; modify or revoke any withdrawal creating national monuments under the Act of June 8, 1906 (34 Stat. 225; 16 U.S.C. 431–433); or modify, or revoke any withdrawal which added lands to the National Wildlife Refuge System prior to the date of approval of this Act or which thereafter adds lands to that System under the terms of this Act. Nothing in this Act is intended to modify or change any provision of the Act of February 27, 1976 (90 Stat. 199; 16 U.S.C. 668dd (a)).

(k) There is hereby authorized to be appropriated the sum of $10,000,000 for the purpose of processing withdrawal applications pending on the effective date of this Act, to be available until expended.

(l) (1) The Secretary shall, within fifteen years of the date of enactment of this Act, review withdrawals existing on the date of approval of this Act, in the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming of (1) all Federal lands other than withdrawals of the public lands

administered by the Bureau of Land Management and of lands which, on the date of approval of this Act, were part of Indian reservations and other Indian holdings, the National Forest System, the National Park System, the National Wildlife Refuge System, other lands administered by the Fish and Wildlife Service or the Secretary through the Fish and Wildlife Service, the National Wild and Scenic Rivers System, and the National System of Trails; and (2) all public lands administered by the Bureau of Land Management and of lands in the National Forest System (except those in wilderness areas, and those areas formally identified as primitive or natural areas or designated as national recreation areas) which closed the lands to appropriation under the Mining Law of 1872 (17 Stat. 91, as amended; 30 U.S.C. 22 et seq.) or to leasing under the Mineral Leasing Act of 1920 (41 Stat. 437, as amended; 30 U.S.C. 181 et seq.).

(2) In the review required by paragraph (1) of this subsection, the Secretary shall determine whether, and for how long, the continuation of the existing withdrawal of the lands would be, in his judgment, consistent with the statutory objectives of the programs for which the lands were dedicated and of the other relevant programs. The Secretary shall report his recommendations to the President, together with statements of concurrence or nonconcurrence submitted by the heads of the departments or agencies which administer the lands. The President shall transmit this report to the President of the Senate and the Speaker of the House of Representatives, together with his recommendations for action by the Secretary, or for legislation. The Secretary may act to terminate withdrawals other than those made by Act of the Congress in accordance with the recommendations of the President unless before the end of ninety days (not counting days on which the Senate and the House of Representatives has adjourned for more than three consecutive days) beginning on the day the report of the President has been submitted to the Senate and the House of Representatives the Congress has adopted a concurrent resolution indicating otherwise. If the committee to which a resolution has been referred during the said ninety day period, has not reported it at the end of thirty calendar days after its referral, it shall be in order to either discharge the committee from further consideration of such resolution or to discharge the committee from consideration of any other resolution with respect to the Presidential recommendation. A motion to discharge may be made only by an individual favoring the resolution, shall be highly privileged (except that it may not be made after the committee has reported such a resolution), and debate thereon shall be limited to not more than one hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to. If the motion to discharge is agreed to or disagreed to, the motion may not be made with respect to any other resolution with respect to the same Presidential recommendation. When the committee has reprinted, or has been discharged from further consideration of a resolution, it shall at any time thereafter be in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(3) There are hereby authorized to be appropriated not more than $10,000,000 for the purpose of paragraph (1) of this subsection to be available until expended to the Secretary and to the heads of other departments and agencies which will be involved.

ACQUISITIONS

Sec. 205. [43 U.S.C. 1715] (a) Notwithstanding any other provisions of law, the Secretary, with respect to the public lands and the Secretary of Agriculture, with respect to the acquisition of access over non-Federal lands to units of the National Forest System, are authorized to acquire pursuant to this Act by purchase, exchange, donation, or eminent domain, lands or interests therein: *Provided*, That with respect to the public lands, the Secretary may exercise the power of eminent domain only if necessary to secure access to public lands, and then only if the lands so acquired are

confined to as narrow a corridor as is necessary to serve such purpose. Nothing in this subsection shall be construed as expanding or limiting the authority of the Secretary of Agriculture to acquire land by eminent domain within the boundaries of units of the National Forest System.

(b) Acquisitions pursuant to this section shall be consistent with the mission of the department involved and with applicable departmental land-use plans.

(c) *Except as provided in subsection (e) of this section* [P.L. 99-632, 1986], lands and interests in lands acquired by the Secretary pursuant to this section or section 206 shall, upon acceptance of title, become public lands, and, for the administration of public land laws not repealed by this Act, shall remain public lands. If such acquired lands or interests in lands are located within the exterior boundaries of a grazing district established pursuant to the first section of the Act of June 28, 1934 (48 Stat. 1269, as amended; 43 U.S.C. 315) (commonly known as the " Taylor Grazing Act"), they shall become a part of that district. Lands and interests in lands acquired pursuant to this section which are within boundaries of the National Forest System may be transferred to the Secretary of Agriculture and shall then become National Forest System lands and subject to all the laws, rules, and regulations applicable thereto.

(d) Lands and interests in lands acquired by the Secretary of Agriculture pursuant to this section shall, upon acceptance of title, become National Forest System lands subject to all the laws, rules, and regulations applicable thereto.

(e) *Lands acquired by the Secretary pursuant to this section or section 206* [43 U.S.C. 1716] *in exchange for lands which were revested in the United States pursuant to the provisions of the Act of June 9, 1916 (39 Stat. 218) or reconveyed to the United States pursuant to the provisions of the Act of February 26, 1919* [16 U.S.C. 342] *(40 Stat. 1179), shall be considered for all purposes to have the same status as, and shall be administered in accordance with the same provisions of law applicable to, the revested or reconveyed lands exchanged for the lands acquired by the Secretary*. [P.L. 99-632, 1986]

EXCHANGES

Sec. 206. [43 U.S.C. 1716] (a) A tract of public land or interests therein may be disposed of by exchange by the Secretary under this Act and a tract of land or interests therein within the National Forest System may be disposed of by exchange by the Secretary of Agriculture under applicable law where the Secretary concerned determines that the public interest will be well served by making that exchange: *Provided*, That when considering public interest the Secretary concerned shall give full consideration to better Federal land management and the needs of State and local people, including needs for lands for the economy, community expansion, recreation areas, food, fiber, minerals, and fish and wildlife and the Secretary concerned finds that the values and the objectives which Federal lands or interests to be conveyed may serve if retained in Federal ownership are not more than the values of the non-Federal lands or interests and the public objectives they could serve if acquired.

(b) In exercising the exchange authority granted by subsection (a) or by section 205 (a) of this Act, the Secretary *concerned* [P.L. 100-409 §3, Aug. 20, 1988] may accept title to any non-Federal land or interests therein in exchange for such land, or interests therein which he finds proper for transfer out of Federal ownership and which are located in the same State as the non-Federal land or interest to be acquired. For the purposes of this subsection, unsurveyed school sections which, upon survey by the Secretary, would become State lands, shall be considered as "non-Federal lands". The values of the lands exchanged by the Secretary under this Act and by the Secretary of Agriculture under applicable law relating to lands within the National Forest System either shall be equal, or if they are not equal, the values shall be equalized by the payment of money to the grantor or to the Secretary concerned as the circumstances require so long as payment does not exceed 25 per centum of the total value of the lands or interests transferred out of Federal ownership. *The Secretary concerned and the other party or parties involved in the exchange may mutually agree to waive the requirement for the payment of money to equalize*

values where the Secretary concerned determines that the exchange will be expedited thereby and that the public interest will be better served by such a waiver of cash equalization payments and where the amount to be waived is no more than 3 per centum of the value of the lands being transferred out of Federal ownership or $15,000, whichever is less, except that the Secretary of Agriculture shall not agree to waive any such requirement for payment of money to the United States. [P.L. 100-409 §9, Aug. 20, 1988] The Secretary concerned shall try to reduce the amount of the payment of money to as small an amount as possible.

(c) Lands acquired by *the Secretary* by exchange under this section which are within the boundaries of *any unit* of the National Forest System, *National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers System, National Trails System, National Wilderness Preservation System, or any other system established by Act of Congress, or the boundaries of the California Desert Conservation Area, or the boundaries of any national conservation area or national recreation area established by Act of Congress, upon acceptance of title by the United States shall immediately be reserved for and become a part of the unit or area within which they are located, without further action by the Secretary, and shall thereafter be managed in accordance with all laws, rules, and regulations applicable to such unit or area.* [P.L. 100-409 §3, Aug. 20, 1988]

(d)(1) No later than ninety days after entering into an agreement to initiate an exchange of land or interests therein pursuant to this Act or other applicable law, the Secretary concerned and other party or parties involved in the exchange shall arrange for appraisal (to be completed within a time frame and under such terms as are negotiated by the parties) of the lands or interests therein involved in the exchange in accordance with subsection (f) of this section.

(2) If within one hundred and eighty days after the submission of an appraisal or appraisals for review and approval by the Secretary concerned, the Secretary concerned and the other party or parties involved cannot agree to accept the findings of an appraisal or appraisals, the appraisal or appraisals shall be submitted to an arbitrator appointed by the Secretary from a list of arbitrators submitted to him by the American Arbitration Association for arbitration to be conducted in accordance with the real estate valuation arbitration rules of the American Arbitration Association. Such arbitration shall be binding for a period of not to exceed two years on the Secretary concerned and the other party or parties involved in the exchange insofar as concerns the value of the lands which were the subject of the appraisal or appraisals.

(3) Within thirty days after the completion of the arbitration, the Secretary concerned and the other party or parties involved in the exchange shall determine whether to proceed with the exchange, modify the exchange to reflect the findings of the arbitration or any other factors, or to withdraw from the exchange. A decision to withdraw from the exchange may be made by either the Secretary concerned or the other party or parties involved.

(4) Instead of submitting the appraisal to an arbitrator, as provided in paragraph (2) of this section, the Secretary concerned and the other party or parties involved in an exchange may mutually agree to employ a process of bargaining or some other process to determine the values of the properties involved in the exchange.

(5) The Secretary concerned and the other party or parties involved in an exchange may mutually agree to suspend or modify any of the deadlines contained in this subsection.

(e) Unless mutually agreed otherwise by the Secretary concerned and the other party or parties involved in an exchange pursuant to this Act or other applicable law, all patents or titles to be issued for land or interests therein to be acquired by the Federal Government and lands or interests therein to be transferred out of Federal ownership shall be issued simultaneously after the Secretary concerned has taken any necessary steps to assure that the United States will receive acceptable title.

(f)(1) Within one year after August 20, 1988, the Secretaries of the Interior and Agriculture shall promulgate new and comprehensive rules and regulations governing exchanges of land and interests

therein pursuant to this Act and other applicable law. Such rules and regulations shall fully reflect the changes in law made by subsections (d) through (i) of this section and shall include provisions pertaining to appraisals of lands and interests therein involved in such exchanges.

(2) The provisions of the rules and regulations issued pursuant to paragraph (1) of this subsection governing appraisals shall reflect nationally recognized appraisal standards, including, to the extent appropriate, the Uniform Appraisal Standards for Federal Land Acquisitions: Provided, however, That the provisions of such rules and regulations shall –

(A) ensure that the same nationally approved appraisal standards are used in appraising lands or interest therein being acquired by the Federal Government and appraising lands or interests therein being transferred out of Federal ownership; and

(B) with respect to costs or other responsibilities or requirements associated with land exchanges –

(i) recognize that the parties involved in an exchange may mutually agree that one party (or parties) will assume, without compensation, all or part of certain costs or other responsibilities or requirements ordinarily borne by the other party or parties; and

(ii) also permit the Secretary concerned, where such Secretary determines it is in the public interest and it is in the best interest of consummating an exchange pursuant to this Act or other applicable law, and upon mutual agreement of the parties, to make adjustments to the relative values involved in an exchange transaction in order to compensate a party or parties to the exchange for assuming costs or other responsibilities or requirements which would ordinarily be borne by the other party or parties.

As used in this subparagraph, the term "costs or other responsibilities or requirements" shall include, but not be limited to, costs or other requirements associated with land surveys and appraisals, mineral examinations, title searches, archeological surveys and salvage, removal of encumbrances, arbitration pursuant to subsection (d) of this section, curing deficiencies preventing highest and best use, and other costs to comply with laws, regulations and policies applicable to exchange transactions, or which are necessary to bring the Federal or non-Federal lands or interests involved in the exchange to their highest and best use for the appraisal and exchange purposes. Prior to making any adjustments pursuant to this subparagraph, the Secretary concerned shall be satisfied that the amount of such adjustment is reasonable and accurately reflects the approximate value of any costs or services provided or any responsibilities or requirements assumed.

(g) Until such time as new and comprehensive rules and regulations governing exchange of land and interests therein are promulgated pursuant to subsection (f) of this section, land exchanges may proceed in accordance with existing laws and regulations, and nothing in the Act shall be construed to require any delay in, or otherwise hinder, the processing and consummation of land exchanges pending the promulgation of such new and comprehensive rules and regulations. Where the Secretary concerned and the party or parties involved in an exchange have agreed to initiate an exchange of land or interests therein prior to the day of enactment of such subsections, subsections (d) through (i) of this section shall not apply to such exchanges unless the Secretary concerned and the party or parties involved in the exchange mutually agree otherwise.

(h)(1) Notwithstanding the provisions of this Act and other applicable laws which require that exchanges of land or interests therein be for equal value, where the Secretary concerned determines it is in the public interest and that the consummation of a particular exchange will be expedited thereby, the Secretary concerned may exchange lands or interests therein which are of approximately equal value in cases where –

(A) the combined value of the lands or interests therein to be transferred from Federal ownership by the Secretary concerned in such exchange is not more than $150,000; and

(B) the Secretary concerned finds in accordance with the regulations to be promulgated pur-

suant to subsection (f) of this section that a determination of approximately equal value can be made without formal appraisals, as based on a statement of value made by a qualified appraiser and approved by an authorized officer; and

(C) the definition of and procedure for determining "approximately equal value" has been set forth in regulations by the Secretary concerned and the Secretary concerned documents how such determination was made in the case of the particular exchange involved.

(2) As used in this subsection, the term "approximately equal value" shall have the same meaning with respect to lands managed by the Secretary of Agriculture as it does in the Act of January 22, 1983 (commonly known as the "Small Tracts Act").

(i)(1) Upon receipt of an offer to exchange lands or interests in lands pursuant to this Act or other applicable laws, at the request of the head of the department or agency having jurisdiction over the lands involved, the Secretary of the Interior may temporarily segregate the Federal lands under consideration for exchange from appropriation under the mining laws. Such temporary segregation may only be made for a period of not to exceed five years. Upon a decision not to proceed with the exchange or upon deletion of any particular parcel from the exchange offer, the Federal lands involved or deleted shall be promptly restored to their former status under the mining laws. Any segregation pursuant to this paragraph shall be subject to valid existing rights as of the date of such segregation.

(2) All non-Federal lands which are acquired by the United States through exchange pursuant to this Act or pursuant to other laws applicable to lands managed by the Secretary of Agriculture shall be automatically segregated from appropriation under the public land law, including the mining laws, for ninety days after acceptance of title by the United States. Such segregation shall be subject to valid existing rights as of the date of such acceptance of title. At the end of such ninety day period, such segregation shall end and such lands shall be open to operation of the public land laws and to entry, location, and patent under the mining laws except to the extent otherwise provided by this Act or other applicable law, or appropriate actions pursuant thereto.

[P.L. 100-409 §3, Aug. 20, 1988]

QUALIFIED CONVEYEES

Sec. 207. [43 U.S.C. 1717] No tract of land may be disposed of under this Act, whether by sale, exchange, or donation, to any person who is not a citizen of the United States, or in the case of a corporation, is not subject to the laws of any State or of the United States.

CONVEYANCES

Sec. 208. [43 U.S.C. 1718] The Secretary shall issue all patents or other documents of conveyance after any disposal authorized by this Act. The Secretary shall insert in any such patent or other document of conveyance he issues, except in the case of land exchanges, for which the provisions of subsection 206 (b) of this Act shall apply, such terms, covenants, conditions, and reservations as he deems necessary to insure proper land use and protection of the public interest: *Provided*, That a conveyance of lands by the Secretary, subject to such terms, covenants, conditions, and reservations, shall not exempt the grantee from compliance with applicable Federal or State law or State land use plans: *Provided further,* That the Secretary shall not make conveyances of public lands containing terms and conditions which would, at the time of the conveyance, constitute a violation of any law or regulation pursuant to State and local land use plans, or programs.

RESERVATION AND CONVEYANCE OF MINERALS

Sec. 209. [43 U.S.C. 1719] (a) All conveyances of title issued by the Secretary, except those involving land exchanges provided for in section 206, shall reserve to the United States all minerals in the lands, together with the right to prospect for, mine, and remove the minerals under applicable law and such regulations as the Secretary may prescribe,

except that if the Secretary makes the findings specified in subsection (b) of this section, the minerals may then be conveyed together with the surface to the prospective surface owner as provided in subsection (b).

(b) (1) The Secretary, after consultation with the appropriate department or agency head, may convey mineral interests owned by the United States where the surface is or will be in non-Federal ownership, regardless of which Federal entity may have administered the surface, if he finds (1) that there are no known mineral values in the land, or (2) that the reservation of the mineral rights in the United States is interfering with or precluding appropriate non-mineral development of the land and that such development is a more beneficial use of the land than mineral development.

(2) Conveyance of mineral interests pursuant to this section shall be made only to the existing or proposed record owner of the surface, upon payment of administrative costs and the fair market value of the interests being conveyed.

(3) Before considering an application for conveyance of mineral interests pursuant to this section–

(i) the Secretary shall require the deposit by the applicant of a sum of money which he deems sufficient to cover administrative costs including, but not limited to, costs of conducting an exploratory program to determine the character of the mineral deposits in the land, evaluating the data obtained under the exploratory program to determine the fair market value of the mineral interests to be conveyed, and preparing and issuing the documents of conveyance: *Provided*, That, if the administrative costs exceed the deposit, the applicant shall pay the outstanding amount; and, if the deposit exceeds the administrative costs, the applicant shall be given a credit for or refund of the excess; or

(ii) the applicant, with the consent of the Secretary, shall have conducted, and submitted to the Secretary the results of, such an exploratory program, in accordance with standards promulgated by the Secretary.

(4) Moneys paid to the Secretary for administrative costs pursuant to this subsection shall be paid to the agency which rendered the service and deposited to the appropriation then current.

COORDINATION WITH STATE AND LOCAL GOVERNMENTS

Sec. 210. [43 U.S.C. 1720] At least sixty days prior to offering for sale or otherwise conveying public lands under this Act, the Secretary shall notify the Governor of the State within which such lands are located and the head of the governing body of any political subdivision of the State having zoning or other land use regulatory jurisdiction in the geographical area within which such lands are located, in order to afford the appropriate body the opportunity to zone or otherwise regulate, or change or amend existing zoning or other regulations concerning the use of such lands prior to such conveyance. The Secretary shall also promptly notify such public officials of the issuance of the patent or other document of conveyance for such lands.

OMITTED LANDS

Sec. 211. [43 U.S.C. 1721] Omitted Lands.– (a) The Secretary is hereby authorized to convey to States or their political subdivisions under the Recreation and Public Purposes Act (44 Stat. 741 as amended; 43 U.S.C. 869 et seq.), as amended, but without regard to the acreage limitations contained therein, unsurveyed islands determined by the Secretary to be public lands of the United States. The conveyance of any such island may be made without survey: *Provided, however*, That such island may be surveyed at the request of the applicant State or its political subdivision if such State or subdivision donates money or services to the Secretary for such survey, the Secretary accepts such money or services, and such services are conducted pursuant to criteria established by the Director of the Bureau of Land Management. Any such island so surveyed shall not be conveyed without approval of such survey by the Secretary prior to the conveyance.

(b) (1) The Secretary is authorized to convey to States and their political subdivisions under the Recreation and Public Purposes Act, [43 U.S.C. 869 to 869-4] but without regard to the acreage limitations contained therein, lands other than islands determined by him after survey to be public lands of the United States erroneously or fraudulently omitted from the original surveys (hereinafter referred to as "omitted lands"). Any such conveyance shall not be made without a survey: *Provided*, That the prospective recipient may donate money or services to the Secretary for the surveying necessary prior to conveyance if the Secretary accepts such money or services, such services are conducted pursuant to criteria established by the Director of the Bureau of Land Management, and such survey is approved by the Secretary prior to the conveyance.

(2) The Secretary is authorized to convey to the occupant of any omitted lands which, after survey, are found to have been occupied and developed for a five-year period prior to January 1, 1975, if the Secretary determines that such conveyance is in the public interest and will serve objectives which outweigh all public objectives and values which would be served by retaining such lands in Federal ownership. Conveyance under this subparagraph shall be made at not less than the fair market value of the land, as determined by the Secretary, and upon payment in addition of administrative costs, including the cost of making the survey, the cost of appraisal, and the cost of making the conveyance.

(c) (1) No conveyance shall be made pursuant to this section until the relevant State government, local government, and area wide planning agency designated pursuant to section 204 of the Demonstration Cities and Metropolitan Development Act of 1966 (80 Stat. 1255, 1262) [42 U.S.C. 3334] and/or title IV of the Intergovernmental Cooperation Act of 1968 (82 Stat. 1098, 1103–4) [31 U.S.C. 6506(a)-(e)] have notified the Secretary as to the consistency of such conveyance with applicable State and local government land use plans and programs.

(2) The provisions of section 210 of this Act shall be applicable to all conveyances under this section.

(d) The final sentence of section 1(c) of the Recreation and Public Purposes Act [43 U.S.C. 869(c)] shall not be applicable to conveyances under this section.

(e) No conveyance pursuant to this section shall be used as the basis for determining the baseline between Federal and State ownership, the boundary of any State for purposes of determining the extent of a State's submerged lands or the line of demarcation of Federal jurisdiction, or any similar or related purpose.

(f) The provisions of this section shall not apply to any lands within the National Forest System, defined in the Act of August 17, 1974 (88 Stat. 476; 16 U.S.C. 1601), the National Park System, the National Wildlife Refuge System, and the National Wild and Scenic Rivers System.

(g) Nothing in this section shall supersede the provisions of the Act of December 22, 1928 (45 Stat. 1069; 43 U.S.C. 1068), as amended, and the Act of May 31, 1962 (76 Stat. 89), or any other Act authorizing the sale of specific omitted lands.

RECREATION AND PUBLIC PURPOSES ACT

Sec. 212. The Recreation and Public Purposes Act of 1926 (44 Stat. 741, as amended; 43 U.S.C. 869 et seq.), as amended, is further amended as follows:

(a) The second sentence of subsection (a) of the first section of that Act (43 U.S.C. 869(a)) is amended to read as follows: "Before the land may be disposed of under this Act it must be shown to the satisfaction of the Secretary that the land is to be used for an established or definitely proposed project, that the land involved is not of national significance nor more than is reasonably necessary for the proposed use, and that for proposals of over 640 acres comprehensive land use plans and zoning regulations applicable to the area in which the public lands to be disposed of are located have been adopted by the appropriate State or local authority. The Secretary shall provide an opportunity for participation by affected citizens in disposals under this Act, including public hearings or

meetings where he deems it appropriate to provide public comments, and shall hold at least one public meeting on any proposed disposal of more than six hundred forty acres under this Act."

(b) Subsection (b) (i) of the first section of that Act (43 U.S.C. 869(b)) is amended to read as follows:

"(b) Conveyances made in any one calendar year shall be limited as follows:

"(i) For recreational purposes:

"(A) To any State or the State park agency or any other agency having jurisdiction over the State park system of such State designated by the Governor of that State as its sole representative for acceptance of lands under this provision, hereinafter referred to as the State, or to any political subdivision of such State, six thousand four hundred acres, and such additional acreage as may be needed for small road-side parks and rest sites of not more than ten acres each.

"(B) To any nonprofit corporation or nonprofit association, six hundred and forty acres.

"(C) No more than twenty-five thousand six hundred acres may be conveyed for recreational purposes under this Act in any one State per calendar year. Should any State or political subdivision, however, fail to secure, in any one year, six thousand four hundred acres, not counting lands for small roadside parks and rest sites, conveyances may be made thereafter if pursuant to an application on file with the Secretary of the Interior on or before the last day of said year and to the extent that the conveyance would not have exceeded the limitations of said year."

(c) Section 2(a) of that Act (43 U.S.C. 869–1) is amended by inserting "or recreational purposes" immediately after "historic-monument purposes".

(d) Section 2(b) of that Act (43 U.S.C. 869–1) is amended by adding ", except that leases of such lands for recreational purposes shall be made without monetary consideration" after the phase "reasonable annual rental".

NATIONAL FOREST TOWNSITES

Sec. 213. The Act of July 31, 1958 (72 Stat. 438, 7 U.S.C. 1012a, 16 U.S.C. 478a), is amended to read as follows: "When the Secretary of Agriculture determines that a tract of National Forest System land in Alaska or in the eleven contiguous Western States is located adjacent to or contiguous to an established community, and that transfer of such land would serve indigenous community objectives that outweigh the public objectives and values which would be served by maintaining such tract in Federal ownership, he may, upon application, set aside and designate as a townsite an area of not to exceed six hundred and forty acres of National Forest System land for any one application. After public notice, and satisfactory showing of need therefor by any county, city, or other local governmental subdivision, the Secretary may offer such area for sale to a governmental subdivision at a price not less than the fair market value thereof: *Provided, however,* That the Secretary may condition conveyances of townsites upon the enactment, maintenance, and enforcement of a valid ordinance which assures any land so conveyed will be controlled by the governmental subdivision so that use of the area will not interfere with the protection, management, and development of adjacent or contiguous National Forest System lands."

UNINTENTIONAL TRESPASS ACT

Sec. 214. [43 U.S.C. 1722] (a) Notwithstanding the provisions of the Act of September 26, 1968 (82 Stat. 870; 43 U.S.C. 1431–1435), hereinafter called the "1968 Act," with respect to applications under the 1968 Act which were pending before the Secretary as of the effective date of this subsection and which he approves for sale under the criteria prescribed by the 1968 Act, he shall give the right of first refusal to those having a preference right under section 2 of the 1968 Act. The Secretary shall offer such lands to such preference right holders at their fair market value (exclusive of any values added to the land by such holders and their predecessors in interest) as determined by the Secretary as of September 26, 1973.

(b) Within three years after the date of approval of this Act, the Secretary shall notify the filers of applications subject to paragraph (a) of this section whether he will offer them the lands applied for and at what price; that is, their fair market value as of September 26, 1973, excluding any value added to the lands by the applicants or their predecessors in interest. He will also notify the President of the Senate and the Speaker of the House of Representatives of the lands which he has determined not to sell pursuant to paragraph (a) of this section and the reasons therefor. With respect to such lands which the Secretary determined not to sell, he shall take no other action to convey those lands or interests in them before the end of ninety days (not counting days on which the House of Representatives or the Senate has adjourned for more than three consecutive days) beginning on the date the Secretary has submitted such notice to the Senate and House of Representatives. If, during that ninety-day period, the Congress adopts a concurrent resolution stating the length of time such suspension of action should continue, he shall continue such suspension for the specified time period. If the committee to which a resolution has been referred during the said ninety-day period, has not reported it at the end of thirty calendar days after its referral, it shall be in order to either discharge the committee from further consideration of such resolution or to discharge the committee from consideration of any other resolution with respect to the suspension of action. A motion to discharge may be made only by an individual favoring the resolution, shall be highly privileged (except that it may not be made after the committee has reported such a resolution), and debate thereon shall be limited to not more than one hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to. If the motion to discharge is agreed to or disagreed to, the motion may not be made with respect to any other resolution with respect to the same suspension of action. When the committee has reprinted, or has been discharged from further consideration of a resolution, it shall at any time thereafter be in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(c) Within five years after the date of approval of this Act, the Secretary shall complete the processing of all applications filed under the 1968 Act and hold sales covering all lands which he has determined to sell thereunder.

Sec. 215. [43 U.S.C. 1723] *(a) When the sole impediment to consummation of an exchange of lands or interests therein (hereinafter referred to as an exchange) determined to be in the public interest, is the inability of the Secretary of the Interior to revoke, modify, or terminate part or all of a withdrawal or classification because of the order (or subsequent modification or continuance thereof) of the United States District Court for the District of Columbia dated February 10, 1986, in Civil Action No. 85-2238 (National Wildlife Federation v. Robert E. Burford, et al.), the Secretary of the Interior is hereby authorized, notwithstanding such order (or subsequent modification or continuance thereof) to use the authority contained herein, in lieu of other authority provided in this Act including section 204, to revoke, modify, or terminate in whole or in part, withdrawals or classifications to the extent deemed necessary by the Secretary to enable the United States to transfer land or interests therein out of Federal ownership pursuant to an exchange.*

(b) REQUIREMENTS. – The authority specified in subsection (a) of this section may be exercised only in cases where –

(1) a particular exchange is proposed to be carried out pursuant to this Act, as amended, or other applicable law authorizing such an exchange;

(2) the proposed exchange has been prepared in compliance with all laws applicable to such exchange;

(3) the head of each Federal agency managing the lands proposed for such transfer has submitted to the Secretary of the Interior a statement of concurrence with the proposed revocation, modification, or termination;

(4) at least sixty days have elapsed since the Secretary of the Interior has published in the Federal Register a notice of the proposed revocation, modification, or termination; and

(5) at least sixty days have elapsed since the Secretary of the Interior has transmitted to the Committee on Natural Resources [P.L. 103-437 1994] of the House of Representatives and the Committee on Energy and Natural Resources of the United States Senate a report which includes –

(A) a justification for the necessity of exercising such authority in order to complete an exchange;

(B) an explanation of the reasons why the continuation of the withdrawal or a classification or portion thereof proposed for revocation, modification, or termination is no longer necessary for the purposes of the statutory or other program or programs for which the withdrawal or classification was made or other relevant programs;

(C) assurances that all relevant documents concerning the proposed exchange or purchase for which such authority is proposed to be exercised (including documents related to compliance with the National Environmental Policy Act of 1969 and all other applicable provisions of law) are available for public inspection in the office of the Secretary concerned located nearest to the lands proposed for transfer out of Federal ownership in furtherance of such exchange and that the relevant portions of such documents are also available in the offices of the Secretary concerned in Washington, District of Columbia; and

(D) an explanation of the effect of the revocation, modification, or termination of a withdrawal or classification or portion thereof and the transfer of lands out of Federal ownership pursuant to the particular proposed exchange, on the objectives of the land management plan which is applicable at the time of such transfer to the land to be transferred out of Federal ownership.

(c) LIMITATIONS. – (1) Nothing in this section shall be construed as affirming or denying any of the allegations made by any party in the civil action specified in subsection (a), or as constituting an expression of congressional opinion with respect to the merits of any allegation, contention, or argument made or issue raised by any party in such action, or as expanding or diminishing the jurisdiction of the United States District Court for the District of Columbia.

(2) Except as specifically provided in this section, nothing in this section shall be construed as modifying, terminating, revoking, or otherwise affecting any provision of law applicable to land exchanges, withdrawals, or classifications.

(3) The availability or exercise of the authority granted in subsection (a) may not be considered by the Secretary of the Interior in making a determination pursuant to this Act or other applicable law as to whether or not any proposed exchange is in the public interest.

(d) TERMINATION. – The authority specified in subsection (a) shall expire either (1) on December 31, 1990, or (2) when the Court order (or subsequent modification or continuation thereof) specified in subsection (a) is no longer in effect, whichever occurs first. [P.L. 100-409 1988]

[The termination clause in subsection (d) was satisfied on November 4, 1988, when the Court order specified in subsection (a) was vacated by National Wildlife Federation v. Burford, 699 F. Supp. 327, 332 (D.D.C. 1988). That reversal was upheld in a 1989 Appeals court decision, 878 F.2d 422, and by the Supreme Court in 1990, 497 U.S. 871.]

TITLE III

ADMINISTRATION

BLM DIRECTORATE AND FUNCTIONS

Sec. 301. [43 U.S.C. 1731] (a) The Bureau of Land Management established by Reorganization Plan Numbered 3, of 1946 (5 U.S.C. App. 519) shall have as its head a Director. Appointments to the position of Director shall hereafter be made by the President, by and with the advice and consent of the Senate. The Director of the Bureau shall have a broad background and substantial experience in public land and natural resource management. He shall carry out such functions and shall perform such duties as the Secretary may prescribe with respect to the management of lands and resources under his jurisdiction according to the applicable provisions of this Act and any other applicable law.

(b) Subject to the discretion granted to him by Reorganization Plan Numbered 3 of 1950 (43 U.S.C. 1451 note), the Secretary shall carry out through the Bureau all functions, powers, and duties vested in him and relating to the administration of laws which, on the date of enactment of this section, were carried out by him through the Bureau of Land Management established by section 403 of Reorganization Plan Numbered 3 of 1946. The Bureau shall administer such laws according to the provisions thereof existing as of the date of approval of this Act as modified by the provisions of this Act or by subsequent law.

(c) In addition to the Director, there shall be an Associate Director of the Bureau and so many Assistant Directors, and other employees, as may be necessary, who shall be appointed by the Secretary subject to the provisions of title 5, United States Code [5 U.S.C. 101 et seq.], governing appointments in the competitive service, and shall be paid in accordance with the provisions of chapter 51 and subchapter III of chapter 53 of such title [5 U.S.C. 5101 et seq., 5331] relating to classification and General Schedule pay rates.

(d) Nothing in this section shall affect any regulation of the Secretary with respect to the administration of laws administered by him through the Bureau on the date of approval of this section.

MANAGEMENT OF USE, OCCUPANCY, AND DEVELOPMENT

Sec. 302. [43 U.S.C. 1732] (a) The Secretary shall manage the public lands under principles of multiple use and sustained yield, in accordance with the land use plans developed by him under section 202 of this Act when they are available, except that where a tract of such public land has been dedicated to specific uses according to any other provisions of law it shall be managed in accordance with such law.

(b) In managing the public lands, the Secretary shall, subject to this Act and other applicable law and under such terms and conditions as are consistent with such law, regulate, through easements, permits, leases, licenses, published rules, or other instruments as the Secretary deems appropriate, the use, occupancy, and development of the public lands, including, but not limited to, long-term leases to permit individuals to utilize public lands for habitation, cultivation, and the development of small trade or manufacturing concerns: *Provided*, That unless otherwise provided for by law, the Secretary may permit Federal departments and agencies to use, occupy, and develop public lands only through rights-of-way under section 507 of this Act, withdrawals under section 204 of this Act, and, where the proposed use and development are similar or closely related to the programs of the Secretary for the public lands involved, cooperative agreements under subsection (b) of section 307 of this Act: *Provided further*, That nothing in this Act shall be construed as authorizing the Secretary concerned to require Federal permits to hunt and fish on public lands or on lands in the National Forest System and adjacent waters or as

enlarging or diminishing the responsibility and authority of the States for management of fish and resident wildlife. However, the Secretary concerned may designate areas of public land and of lands in the National Forest System where, and establish periods when, no hunting or fishing will be permitted for reasons of public safety, administration, or compliance with provisions of applicable law. Except in emergencies, any regulations of the Secretary concerned relating to hunting and fishing pursuant to this section shall be put into effect only after consultation with the appropriate State fish and game department. Nothing in this Act shall modify or change any provision of Federal law relating to migratory birds or to endangered or threatened species. Except as provided in section 314, section 603, and subsection (f) of section 601 of this Act and in the last sentence of this paragraph, no provision of this section or any other section of this Act shall in any way amend the Mining Law of 1872 or impair the rights of any locators or claims under that Act, including, but not limited to, rights of ingress and egress. In managing the public lands the Secretary shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands.

(c) The Secretary shall insert in any instrument providing for the use, occupancy, or development of the public lands a provision authorizing revocation or suspension, after notice and hearing, of such instrument upon a final administrative finding of a violation of any term or condition of the instrument, including, but not limited to, terms and conditions requiring compliance with regulations under Acts applicable to the public lands and compliance with applicable State or Federal air or water quality standard or implementation plan: *Provided*, That such violation occurred on public lands covered by such instrument and occurred in connection with the exercise of rights and privileges granted by it: *Provided further*, That the Secretary shall terminate any such suspension no later than the date upon which he determines the cause of said violation has been rectified: *Provided further*, That the Secretary may order an immediate temporary suspension prior to a hearing or final administrative finding if he determines that such a suspension is necessary to protect health or safety or the environment: *Provided further*, That, where other applicable law contains specific provisions for suspension, revocation, or cancellation of a permit, license, or other authorization to use, occupy, or develop the public lands, the specific provisions of such law shall prevail.

(d) (1) The Secretary of the Interior, after consultation with the Governor of Alaska, may issue to the Secretary of Defense or to the Secretary of a military department within the Department of Defense or to the Commandant of the Coast Guard a nonrenewable general authorization to utilize public lands in Alaska (other than within a conservation system unit or the Steese National Conservation Area or the White Mountains National Recreation Area) for purposes of military maneuvering, military training, or equipment testing not involving artillery firing, aerial or other gunnery, or other use of live ammunition or ordnance.

(2) Use of public lands pursuant to a general authorization under this subsection shall be limited to areas where such use would not be inconsistent with the plans prepared pursuant to section 202. Each such use shall be subject to a requirement that the using department shall be responsible for any necessary cleanup and decontamination of the lands used, and to such other terms and conditions (including but not limited to restrictions on use of off-road or all-terrain vehicles) as the Secretary of the Interior may require to –

(A) minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved; and

(B) minimize the period and method of such use and the interference with or restrictions on other uses of the public lands involved.

(3) (A) A general authorization issued pursuant to this subsection shall not be for a term of more than three years and shall be revoked in whole or in part, as the Secretary of the Interior finds necessary, prior to the end of such term upon a determination by the Secretary of the Interior that there has been a failure to comply with its terms and conditions or that activities pursuant to such an authorization have had or might have a significant

adverse impact on the resources or values of the affected lands.

(B) Each specific use of a particular area of public lands pursuant to a general authorization under this subsection shall be subject to specific authorization by the Secretary and to appropriate terms and conditions, including such as are described in paragraph (2) of this subsection.

(4) Issuance of a general authorization pursuant to this subsection shall be subject to the provisions of section 202(f) of this Act, section 810 of the Alaska National Interest Lands Conservation Act, and all other applicable provisions of law. The Secretary of a military department (or the Commandant of the Coast Guard) requesting such authorization shall reimburse the Secretary of the Interior for the costs of implementing this paragraph. An authorization pursuant to this subsection shall not authorize the construction of permanent structures or facilities on the public lands.

(5) To the extent that public safety may require closure to public use of any portion of the public lands covered by an authorization issued pursuant to this subsection, the Secretary of the military department concerned or the Commandant of the Coast Guard shall take appropriate steps to notify the public concerning such closure and to provide appropriate warnings of risks to public safety.

(6) For purposes of this subsection, the term "conservation system unit" has the same meaning as specified in section 102 of the Alaska National Interest Lands Conservation Act [16 U.S.C. 3102]. [P.L. 100-586, 1988]

ENFORCEMENT AUTHORITY

Sec. 303. [43 U.S.C. 1733] (a) The Secretary shall issue regulations necessary to implement the provisions of this Act with respect to the management, use, and protection of the public lands, including the property located thereon. Any person who knowingly and willfully violates any such regulation which is lawfully issued pursuant to this Act shall be fined no more than $1,000 or imprisoned no more than twelve months, or both. Any person charged with a violation of such regulation may be tried and sentenced by any United States magistrate *judge* [P.L. 101-650, 1990] designated for that purpose by the court by which he was appointed, in the same manner and subject to the same conditions and limitations as provided for in section 3401 of title 18 of the United States Code.

(b) At the request of the Secretary, the Attorney General may institute a civil action in any United States district court for an injunction or other appropriate order to prevent any person from utilizing public lands in violation of regulations issued by the Secretary under this Act.

(c) (1) When the Secretary determines that assistance is necessary in enforcing Federal laws and regulations relating to the public lands or their resources he shall offer a contract to appropriate local officials having law enforcement authority within their respective jurisdictions with the view of achieving maximum feasible reliance upon local law enforcement officials in enforcing such laws and regulations. The Secretary shall negotiate on reasonable terms with such officials who have authority to enter into such contracts to enforce such Federal laws and regulations. In the performance of their duties under such contracts such officials and their agents are authorized to carry firearms; execute and serve any warrant or other process issued by a court or officer of competent jurisdiction; make arrests without warrant or process for a misdemeanor he has reasonable grounds to believe is being committed in his presence or view, or for a felony if he has reasonable grounds to believe that the person to be arrested has committed or is committing such felony; search without warrant or process any person, place, or conveyance according to any Federal law or rule of law; and seize without warrant or process any evidentiary item as provided by Federal law. The Secretary shall provide such law enforcement training as he deems necessary in order to carry out the contracted for responsibilities. While exercising the powers and authorities provided by such contract pursuant to this section, such law enforcement officials and their agents shall have all the immunities of Federal law enforcement officials.

(2) The Secretary may authorize Federal personnel or appropriate local officials to carry out his law enforcement responsibilities with respect to the public lands and their resources.

Such designated personnel shall receive the training and have the responsibilities and authority provided for in paragraph (1) of this subsection.

(d) In connection with the administration and regulation of the use and occupancy of the public lands, the Secretary is authorized to cooperate with the regulatory and law enforcement officials of any State or political subdivision thereof in the enforcement of the laws or ordinances of such State or subdivision. Such cooperation may include reimbursement to a State or its subdivision for expenditures incurred by it in connection with activities which assist in the administration and regulation of use and occupancy of the public lands.

(e) Nothing in this section shall prevent the Secretary from promptly establishing a uniformed desert ranger force in the California Desert Conservation Area established pursuant to section 601 of this Act for the purpose of enforcing Federal laws and regulations relating to the public lands and resources managed by him in such area. The officers and members of such ranger force shall have the same responsibilities and authority as provided for in paragraph (1) of subsection (c) of this section.

(f) Nothing in this Act shall be construed as reducing or limiting the enforcement authority vested in the Secretary by any other statute.

(g) The use, occupancy, or development of any portion of the public lands contrary to any regulation of the Secretary or other responsible authority, or contrary to any order issued pursuant to any such regulation, is unlawful and prohibited.

SERVICE CHARGES, REIMBURSEMENT PAYMENTS, AND EXCESS PAYMENTS

Sec. 304. [43 U.S.C. 1734] (a) Notwithstanding any other provision of law, the Secretary may establish reasonable filing and service fees and reasonable charges, and commissions with respect to applications and other documents relating to the public lands and may change and abolish such fees, charges, and commissions.

(b) The Secretary is authorized to require a deposit of any payments intended to reimburse the United States for reasonable costs with respect to applications and other documents relating to such lands. The moneys received for reasonable costs under this subsection shall be deposited with the Treasury in a special account and are hereby authorized to be appropriated and made available until expended. As used in this section "reasonable costs" include, but are not limited to, the costs of special studies; environmental impact statements; monitoring construction, operation, maintenance, and termination of any authorized facility; or other special activities. In determining whether costs are reasonable under this section, the Secretary may take into consideration actual costs (exclusive of management overhead), the monetary value of the rights or privileges sought by the applicant, the efficiency to the government processing involved, that portion of the cost incurred for the benefit of the general public interest rather than for the exclusive benefit of the applicant, the public service provided, and other factors relevant to determining the reasonableness of the costs.

(c) In any case where it shall appear to the satisfaction of the Secretary that any person has made a payment under any statute relating to the sale, lease, use, or other disposition of public lands which is not required or is in excess of the amount required by applicable law and the regulations issued by the Secretary, the Secretary, upon application or otherwise, may cause a refund to be made from applicable funds.

[43 U.S.C. 1734a] *In Fiscal Year 1997 and thereafter, all fees, excluding mining claim fees, in excess of the fiscal year 1996 collections established by the Secretary of the Interior under the authority of section 1734 of this title for processing, recording, or documenting authorizations to use public lands or public land natural resources (including cultural, historical, and mineral) and for providing specific services to public land users, and which are not presently being covered into any Bureau of Land Management appropriation accounts, and not otherwise dedicated by law for a specific distribution, shall be made immediately available for program operations in this account and remain available until expended.* [P.L. 104-208, 1996]

DEPOSITS AND FORFEITURES

Sec. 305. [43 U.S.C. 1735] (a) Any moneys received by the United States as a result of the forfeiture of a bond or other security by a resource developer or purchaser or permittee who does not fulfill the requirements of his contract or permit or does not comply with the regulations of the Secretary; or as a result of a compromise or settlement of any claim whether sounding in tort or in contract involving present or potential damage to the public lands shall be credited to a separate account in the Treasury and are hereby authorized to be appropriated and made available, until expended as the Secretary may direct, to cover the cost to the United States of any improvement, protection, or rehabilitation work on those public lands which has been rendered necessary by the action which has led to the forfeiture, compromise, or settlement.

(b) Any moneys collected under this Act in connection with lands administered under the Act of August 28, 1937 (50 Stat. 874; 43 U.S.C. 1181a-1181j), shall be expended for the benefit of such land only.

(c) If any portion of a deposit or amount forfeited under this Act is found by the Secretary to be in excess of the cost of doing the work authorized under this Act, the Secretary, upon application or otherwise, may cause a refund of the amount in excess to be made from applicable funds.

[43 U.S.C. 1735 note. P.L. 106-291, 2000, defines the conditions under which excess repair funds may be used to repair other lands. P.L. 106-291 was intended to clarify, but did not amend 43 U.S.C. 1735. It should be consulted when relevant (see Title I, "Service Charges, Deposits, And Forfeitures").]

WORKING CAPITAL FUND

Sec. 306. [43 U.S.C. 1736] (a) There is hereby established a working capital fund for the management of the public lands. This fund shall be available without fiscal year limitation for expenses necessary for furnishing, in accordance with the Federal Property and Administrative Services Act of 1949 (63 Stat. 377, as amended), [40 U.S.C. 471 note] and regulations promulgated thereunder, supplies and equipment services in support of Bureau programs, including but not limited to, the purchase or construction of storage facilities, equipment yards, and related improvements and the purchase, lease, or rent of motor vehicles, aircraft, heavy equipment, and fire control and other resource management equipment within the limitations set forth in appropriations made to the Secretary for the Bureau.

(b) The initial capital of the fund shall consist of appropriations made for that purpose together with the fair and reasonable value at the fund's inception of the inventories, equipment, receivables, and other assets, less the liabilities, transferred to the fund. The Secretary is authorized to make such subsequent transfers to the fund as he deems appropriate in connection with the functions to be carried on through the fund.

(c) The fund shall be credited with payments from appropriations, and funds of the Bureau, other agencies of the Department of the Interior, other Federal agencies, and other sources, as authorized by law, at rates approximately equal to the cost of furnishing the facilities, supplies, equipment, and services (including depreciation and accrued annual leave). Such payments may be made in advance in connection with firm orders, or by way of reimbursement.

(d) There is hereby authorized to be appropriated a sum not to exceed $3,000,000 as initial capital of the working capital fund.

[43 U.S.C. 1736a] *There is hereby established in the Treasury of the United States a special fund to be derived hereafter* [October 5, 1992] *from the Federal share of moneys received from the disposal of salvage timber prepared for sale from the lands under the jurisdiction of the Bureau of Land Management, Department of the Interior. The money in this fund shall be immediately available to the Bureau of Land Management without further appropriation, for the purposes of planning and preparing salvage timber for disposal, the administration of salvage timber sales, and subsequent site preparation and reforestation.* [P.L. 102-381, 1992]

STUDIES, COOPERATIVE AGREEMENTS, AND CONTRIBUTIONS

Sec. 307. [43 U.S.C. 1737] (a) The Secretary may conduct investigations, studies, and experiments, on his own initiative or in cooperation with others, involving the management, protection, development, acquisition, and conveying of the public lands.

(b) Subject to the provisions of applicable law, the Secretary may enter into contracts and cooperative agreements involving the management, protection, development, and sale of public lands.

(c) The Secretary may accept contributions or donations of money, services, and property, real, personal, or mixed, for the management, protection, development, acquisition, and conveying of the public lands, including the acquisition of rights-of-way for such purposes. He may accept contributions for cadastral surveying performed on federally controlled or intermingled lands. Moneys received hereunder shall be credited to a separate account in the Treasury and are hereby authorized to be appropriated and made available until expended, as the Secretary may direct, for payment of expenses incident to the function toward the administration of which the contributions were made and for refunds to depositors of amounts contributed by them in specific instances where contributions are in excess of their share of the cost.

(d) The Secretary may recruit, without regard to the civil service classification laws, rules, or regulations, the services of individuals contributed without compensation as volunteers for aiding in or facilitating the activities administered by the Secretary through the Bureau of Land Management.

(e) In accepting such services of individuals as volunteers, the Secretary –

(1) shall not permit the use of volunteers in hazardous duty or law enforcement work, or in policymaking processes or to displace any employee; and

(2) may provide for services or costs incidental to the utilization of volunteers, including transportation, supplies, lodging, subsistence, recruiting, training, and supervision.

(f) Volunteers shall not be deemed employees of the United States except for the purposes of – [P.L. 98-540, 1984]

(1) the tort claims provisions of title 28;

(2) subchapter 1 of chapter 81 of title 5; and

(3) claims relating to damage to, or loss of, personal property of a volunteer incident to volunteer service, in which case the provisions of 31 U.S.C. 3721 shall apply. [P.L. 101-286, 1990]

(g) Effective with fiscal years beginning after September 30, 1984, there are authorized to be appropriated such sums as may be necessary to carry out the provisions of subsection (d), but not more than $250,000 may be appropriated for any one fiscal year. [P.L. 98-540, 1984]

CONTRACTS FOR SURVEYS AND RESOURCE PROTECTION

Sec. 308. [43 U.S.C. 1738] (a) The Secretary is authorized to enter into contracts for the use of aircraft, and for supplies and services, prior to the passage of an appropriation therefor, for airborne cadastral survey and resource protection operations of the Bureau. He may renew such contracts annually, not more than twice, without additional competition. Such contracts shall obligate funds for the fiscal years in which the costs are incurred.

(b) Each such contract shall provide that the obligation of the United States for the ensuing fiscal years is contingent upon the passage of an applicable appropriation, and that no payment shall be made under the contract for the ensuing fiscal years until such appropriation becomes available for expenditure.

ADVISORY COUNCILS AND PUBLIC PARTICIPATION

Sec. 309. [43 U.S.C. 1739] (a) The Secretary *shall* [P.L. 95-514, 1978] establish advisory councils of not less than ten and not more than fifteen members appointed by him from among persons who are representative of the various major citizens' interests concerning the problems relating to land use

planning or the management of the public lands located within the area for which an advisory council is established. At least one member of each council shall be an elected official of general purpose government serving the people of such area. To the extent practicable there shall be no overlap or duplication of such councils. Appointments shall be made in accordance with rules prescribed by the Secretary. The establishment and operation of an advisory council established under this section shall conform to the requirements of the Federal Advisory Committee Act (86 Stat. 770; 5 U. S.C. App. 1).

(b) Notwithstanding the provisions of subsection (a) of this section, each advisory council established by the Secretary under this section shall meet at least once a year with such meetings being called by the Secretary.

(c) Members of advisory councils shall serve without pay, except travel and per diem will be paid each member for meetings called by the Secretary.

(d) An advisory council may furnish advice to the Secretary with respect to the land use planning, classification, retention, management, and disposal of the public lands within the area for which the advisory council is established and such other matters as may be referred to it by the Secretary.

(e) In exercising his authorities under this Act, the Secretary, by regulation, shall establish procedures, including public hearings where appropriate, to give the Federal, State, and local governments and the public adequate notice and an opportunity to comment upon the formulation of standards and criteria for, and to participate in, the preparation and execution of plans and programs for, and the management of, the public lands.

RULES AND REGULATIONS

Sec. 310. [43 U.S.C. 1740] The Secretary, with respect to the public lands, shall promulgate rules and regulations to carry out the purposes of this Act and of other laws applicable to the public lands, and the Secretary of Agriculture, with respect to lands within the National Forest System, shall promulgate rules and regulations to carry out the purposes of this Act. The promulgation of such rules and regulations shall be governed by the provisions of chapter 5 of title 5 of the United States Code, without regard to section 553 (a) (2). Prior to the promulgation of such rules and regulations, such lands shall be administered under existing rules and regulations concerning such lands to the extent practical.

PUBLIC LANDS PROGRAM REPORT

Sec. 311. [43 U.S.C. 1741] (a) For the purpose of providing information that will aid Congress in carrying out its oversight responsibilities for public lands programs and for other purposes, the Secretary shall prepare a report in accordance with subsections (b) and (c) and submit it to the Congress no later than one hundred and twenty days after the end of each fiscal year beginning with the report for fiscal year 1979.

(b) A list of programs and specific information to be included in the report as well as the format of the report shall be developed by the Secretary after consulting with the *Committee on Natural Resources of the House of Representatives and the Committee on Energy and Natural Resources of the Senate* [P.L. 103-437, 1994] and shall be provided to the committees prior to the end of the second quarter of each fiscal year.

(c) The report shall include, but not be limited to, program identification information, program evaluation information, and program budgetary information for the preceding current and succeeding fiscal years.

SEARCH AND RESCUE

Sec. 312. [43 U.S.C. 1742] Where in his judgment sufficient search, rescue, and protection forces are not otherwise available, the Secretary is authorized in cases of emergency to incur such expenses as may be necessary (a) in searching for and rescuing, or in cooperating in the search for and rescue of, persons lost on the public lands, (b) in protecting or rescuing, or in cooperating in the protection and rescue of, persons or animals endangered by an act of God, and (c) in transporting deceased persons

or persons seriously ill or injured to the nearest place where interested parties or local authorities are located.

SUNSHINE IN GOVERNMENT

Sec. 313. [43 U.S.C. 1743] (a) Each officer or employee of the Secretary and the Bureau who–

(1) performs any function or duty under this Act; and

(2) has any known financial interest in any person who (A) applies for or receives any permit, lease, or right-of-way under, or (B) applies for or acquires any land or interests therein under, or (C) is otherwise subject to the provisions of, this Act, shall, beginning on February 1, 1977, annually file with the Secretary a written statement concerning all such interests held by such officer or employee during the preceding calendar year. Such statement shall be available to the public.

(b) The Secretary shall–

(1) act within ninety days after the date of enactment of this Act–

(A) to define the term "known financial interests" for the purposes of subsection (a) of this section; and

(B) to establish the methods by which the requirement to file written statements specified in subsection (a) of this section will be monitored and enforced, including appropriate provisions for the filing by such officers and employees of such statements and the review by the Secretary of such statements; and

(2) report to the Congress on June 1 of each calendar year with respect to such disclosures and the actions taken in regard thereto during the preceding calendar year.

(c) In the rules prescribed in subsection (b) of this section, the Secretary may identify specific positions within the Department of the Interior which are of a nonregulatory or nonpolicymaking nature and provide that officers or employees occupying such positions shall be exempt from the requirements of this section.

(d) Any officer or employee who is subject to, and knowingly violates, this section, shall be fined not more than $2,500 or imprisoned not more than one year, or both.

RECORDATION OF MINING CLAIMS AND ABANDONMENT

Sec. 314. [43 U.S.C. 1744] (a) The owner of an unpatented lode or placer mining claim located prior to the date of this Act shall, within the three-year period following the date of the approval of this Act and prior to December 31 of each year thereafter, file the instruments required by paragraphs (1) and (2) of this subsection. The owner of an unpatented lode or placer mining claim located after the date of this Act shall, prior to December 31 of each year following the calendar year in which the said claim was located, file the instruments required by paragraphs (1) and (2) of this subsection:

(1) File for record in the office where the location notice or certificate is recorded either a notice of intention to hold the mining claim (including but not limited to such notices as are provided by law to be filed when there has been a suspension or deferment of annual assessment work), an affidavit of assessment work performed thereon, on a detailed report provided by the Act of September 2, 1958 (72 Stat. 1701; 30 U.S.C. 28–1), relating thereto.

(2) File in the office of the Bureau designated by the Secretary a copy of the official record of the instrument filed or recorded pursuant to paragraph (1) of this subsection, including a description of the location of the mining claim sufficient to locate the claimed lands on the ground.

(b) The owner of an unpatented lode or placer mining claim or mill or tunnel site located prior to the date of approval of this Act shall, within the three-year period following the date of approval of this Act, file in the office of the Bureau designated by the Secretary a copy of the official record of the notice of location or certificate of location, including a description of the location of the mining claim or mill or tunnel site sufficient to locate the claimed lands on the ground. The owner of an unpatented lode or placer mining claim or mill or tunnel site located after the date of approval of this Act shall, within ninety days after the date of

location of such claim, file in the office of the Bureau designated by the Secretary a copy of the official record of the notice of location or certificate of location, including a description of the location of the mining claim or mill or tunnel site sufficient to locate the claimed lands on the ground.

(c) The failure to file such instruments as required by subsections (a) and (b) shall be deemed conclusively to constitute an abandonment of the mining claim or mill or tunnel site by the owner; but it shall not be considered a failure to file if the instrument is defective or not timely filed for record under other Federal laws permitting filing or recording thereof, or if the instrument is filed for record by or on behalf of some but not all of the owners of the mining claim or mill or tunnel site.

(d) Such recordation or application by itself shall not render valid any claim which would not be otherwise valid under applicable law. Nothing in this section shall be construed as a waiver of the assessment and other requirements of such law.

RECORDABLE DISCLAIMERS OF INTEREST IN LAND

Sec. 315. [43 U.S.C. 1745] (a) After consulting with any affected Federal agency, the Secretary is authorized to issue a document of disclaimer of interest or interests in any lands in any form suitable for recordation, where the disclaimer will help remove a cloud on the title of such lands and where he determines (1) a record interest of the United States in lands has terminated by operation of law or is otherwise invalid; or (2) the lands lying between the meander line shown on a plat of survey approved by the Bureau or its predecessors and the actual shoreline of a body of water are not lands of the United States; or (3) accreted, relicted, or avulsed lands are not lands of the United States.

(b) No document or disclaimer shall be issued pursuant to this section unless the applicant therefor has filed with the Secretary an application in writing and notice of such application setting forth the grounds supporting such application has been published in the Federal Register at least ninety days preceding the issuance of such disclaimer and until the applicant therefor has paid to the Secretary the administrative costs of issuing the disclaimer as determined by the Secretary. All receipts shall be deposited to the then-current appropriation from which expended.

(c) Issuance of a document of disclaimer by the Secretary pursuant to the provisions of this section and regulations promulgated hereunder shall have the same effect as a quit-claim deed from the United States.

CORRECTION OF CONVEYANCE DOCUMENTS

Sec. 316. [43 U.S.C. 1746] The Secretary may correct patents or documents of conveyance issued pursuant to section 208 of this Act or to other Acts relating to the disposal of public lands where necessary in order to eliminate errors. In addition, the Secretary may make corrections of errors in any documents of conveyance which have heretofore been issued by the Federal Government to dispose of public lands.

MINERAL REVENUES

Sec. 317. [30 U.S.C. 191] (a) Section 35 of the Act of February 25, 1920 (41 Stat. 437, 450; 30 U.S.C. 181, 191), as amended, is further amended to read as follows: “All money received from sales, bonuses, royalties, and rentals of the public lands under the provisions of this Act and the Geothermal Steam Act of 1970 [30 U.S.C. 1001 note.], notwithstanding the provisions of section 20 thereof, shall be paid into the Treasury of the United States; 50 per centum thereof shall be paid by the Secretary of the Treasury as soon as practicable after March 31 and September 30 of each year to the State other than Alaska within the boundaries of which the leased lands or deposits are or were located; said moneys paid to any of such States on or after January 1, 1976, to be used by such State and its subdivisions, as the legislature of the State may direct giving priority to those subdivisions of the State socially or economically impacted by development of minerals leased under this Act, for (i) planning, (ii) construction and maintenance of

public facilities, and (iii) provision of public service; and excepting those from Alaska, 40 per centum thereof shall be paid into, reserved, appropriated, as part of the reclamation fund created by the Act of Congress known as the Reclamation Act [43 U.S.C. 391 note.], approved June 17, 1902, and of those from Alaska as soon as practicable after March 31 and September 30 of each year, 90 per centum thereof shall be paid to the State of Alaska for disposition by the legislature thereof: *Provided*, That all moneys which may accrue to the United States under the provisions of this Act and the Geothermal Steam Act of 1970 [30 U.S.C. 1001 note.] from lands within the naval petroleum reserves shall be deposited in the Treasury as 'miscellaneous receipts', as provided by the Act of June 4, 1920 (41 Stat. 813), as amended June 30, 1938 (52 Stat. 1252). All moneys received under the provisions of this Act and the Geothermal Steam Act of 1970 not otherwise disposed of by this section shall be credited to miscellaneous receipts."

(b) Funds now held pursuant to said section 35 [30 U.S.C. 191 note.] by the States of Colorado and Utah separately from the Department of the Interior oil shale test leases known as C-A; C-B; U-A and U-B shall be used by such States and subdivisions as the legislature of each State may direct giving priority to those subdivisions socially or economically impacted by the development of minerals leased under this Act for (1) planning, (2) construction and maintenance of public facilities, and (3) provision of public services.

[43 U.S.C. 1747](c)(1) The Secretary is authorized to make loans to States and their political subdivisions in order to relieve social or economic impacts occasioned by the development of minerals leased in such States pursuant to the Act of February 25, 1920, as amended [30 U.S.C. 181 et seq.]. Such loans shall be confined to the uses specified for the 50 per centum of mineral leasing revenues to be received by such States and subdivisions pursuant to section 35 of such Act [30 U.S.C. 191].

(2) The total amount of loans outstanding pursuant to this subsection for any State and political subdivisions thereof in any year shall be not more than the anticipated mineral leasing revenues to be received by that State pursuant to section 35 of the Act of February 25, 1920, as amended [30 U.S.C. 191], for the ten years following.

(3) The Secretary, after consultation with the Governors of the affected States, shall allocate such loans among the States and their political subdivisions in a fair and equitable manner, giving priority to those States and subdivisions suffering the most severe impacts.

(4) Loans made pursuant to this subsection shall be subject to such terms and conditions as the Secretary determines necessary to assure the achievement of the purpose of this subsection. The Secretary shall promulgate such regulations as may be necessary to carry out the provisions of this subsection no later than three months after August 20, 1978.

(5) Loans made pursuant to this subsection shall bear interest equivalent to the lowest interest rate paid on an issue of at least $1,000,000 of tax exempt bonds of such State or any agency thereof within the preceding calendar year.

(6) Any loan made pursuant to this subsection shall be secured only by a pledge of the revenues received by the State or the political subdivision thereof pursuant to section 35 of the Act of February 25, 1920, as amended [30 U.S.C. 191], and shall not constitute an obligation upon the general property or taxing authority of such unit of government.

(7) Notwithstanding any other provision of law, loans made pursuant to this subsection may be used for the non-Federal share of the aggregate cost of any project or program otherwise funded by the Federal Government which requires a non-Federal share for such project or program and which provides planning or public facilities otherwise eligible for assistance under this subsection.

(8) Nothing in this subsection shall be construed to preclude any forbearance for the benefit of the borrower including loan restructuring, which may be determined by the Secretary as justified by the failure of anticipated mineral development or related revenues to materialize as expected when the loan was made pursuant to this subsection.

(9) Recipients of loans made pursuant to this subsection shall keep such records as the Secretary shall prescribe by regulation, including records which fully disclose the disposition of the proceeds of such assistance and such other records as the Secretary may require to facilitate an effective audit. The Secretary and the Comptroller General of the United States or their duly authorized representatives shall have access, for the purpose of audit, to such records.

(10) No person in the United States shall, on the grounds of race, color, religion, national origin, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under, any program or activity funded in whole or part with funds made available under this subsection.

(11) All amounts collected in connection with loans made pursuant to this subsection, including interest payments or repayments of principal on loans, fees, and other moneys, derived in connection with this subsection, shall be deposited in the Treasury as miscellaneous receipts. [P.L. 95-352, 1978]

APPROPRIATION AUTHORIZATION

Sec. 318. [43 U.S.C. 1748] (a) There are hereby authorized to be appropriated such sums as are necessary to carry out the purposes and provisions of this Act, but no amounts shall be appropriated to carry out after *October 1, 2002* [P.L. 104-333, 1996], any program, function, or activity of the Bureau under this or any other Act unless such sums are specifically authorized to be appropriated as of October 21, 1976, or are authorized to be appropriated in accordance with the provisions of subsection (b) of this section.

(b) Consistent with section 607 of the Congressional Budget Act of 1974 [31 U.S.C. 1110], beginning May 15, 1977, and not later than May 15 of each second even numbered year thereafter, the Secretary shall submit to the Speaker of the House of Representatives and the President of the Senate a request for the authorization of appropriations for all programs, functions, and activities of the Bureau to be carried out during the four-fiscal-year period beginning on October 1 of the calendar year following the calendar year in which such request is submitted. The Secretary shall include in his request, in addition to the information contained in his budget request and justification statement to the Office of Management and Budget, the funding levels which he determines can be efficiently and effectively utilized in the execution of his responsibilities for each such program, function, or activity, notwithstanding any budget guidelines or limitations imposed by any official or agency of the executive branch.

(c) Nothing in this section shall apply to the distribution of receipts of the Bureau from the disposal of lands, natural resources, and interests in lands in accordance with applicable law, nor to the use of contributed funds, private deposits for public survey work, and townsite trusteeships, nor to fund allocations from other Federal agencies, reimbursements from both Federal and non-Federal sources, and funds expended for emergency firefighting and rehabilitation.

(d) In exercising the authority to acquire by purchase granted by subsection (a) of section 205 of this Act, the Secretary may use the Land and Water Conservation Fund to purchase lands which are necessary for proper management of public lands which are primarily of value for outdoor recreation purposes.

TITLE IV

RANGE MANAGEMENT

GRAZING FEES

Sec. 401. [43 U.S.C. 1751] (a) The Secretary of Agriculture and the Secretary of the Interior shall jointly cause to be conducted a study to determine the value of grazing on the lands under their jurisdiction in the eleven Western States with a view to establishing a fee to be charged for domestic livestock grazing on such lands which is equitable to the United States and to the holders of grazing permits and leases on such lands. In making such study, the Secretaries shall take into consideration the costs of production normally associated with domestic livestock grazing in the eleven Western States, differences in forage values, and such other factors as may relate to the reasonableness of such fees. The Secretaries shall report the result of such study to the Congress not later than one year from and after the date of approval of this Act, together with recommendations to implement a reasonable grazing fee schedule based upon such study. If the report required herein has not been submitted to the Congress within one year after the date of approval of this Act, the grazing fee charge then in effect shall not be altered and shall remain the same until such report has been submitted to the Congress. Neither Secretary shall increase the grazing fee in the 1977 grazing year.

(b) (1) Congress finds that a substantial amount of the Federal range lands is deteriorating in quality, and that installation of additional range improvements could arrest much of the continuing deterioration and could lead to substantial betterment of forage conditions with resulting benefits to wildlife, watershed protection, and livestock production. Congress therefore directs that 50 per centum or *$10,000,000 per annum, whichever is greater* [P.L. 95-514, 1978] of all moneys received by the United States as fees for grazing domestic livestock on public lands (other than from ceded Indian lands) under the Taylor Grazing Act (48 Stat. 1269; 43 U.S.C. 315 et seq.) and the Act of August 28, 1937 (50 Stat. 874; 43 U.S.C. 1181d), and on lands in National Forests in the *sixteen* [P.L. 95-514, 1978] contiguous Western States under the provisions of this section shall be credited to a separate account in the Treasury, one-half of which is authorized to be appropriated and made available for use in the district, region, or national forest from which such moneys were derived, as the respective Secretary may direct after consultation with district, regional, or national forest user representatives, for the purpose of on-the-ground range rehabilitation, protection, and improvements on such lands, and the remaining one-half shall be used for on-the-ground range rehabilitation, protection, and improvements as the Secretary concerned directs. Any funds so appropriated shall be in addition to any other appropriations made to the respective Secretary for planning and administration of the range betterment program and for other range management. Such rehabilitation, protection, and improvements shall include all forms of range land betterment including, but not limited to, seeding and reseeding, fence construction, weed control, water development, and fish and wildlife habitat enhancement as the respective Secretary may direct after consultation with user representatives. The annual distribution and use of range betterment funds authorized by this paragraph shall not be considered a major Federal action requiring a detailed statement pursuant to section 4332(c) of title 42 of the United States Code.

(2) The first clause of section 10 (b) of the Taylor Grazing Act (48 Stat. 1269), as amended by the Act of August 6, 1947 (43 U.S.C. 315i), [43 U.S.C. 1751] is hereby repealed. All distributions of moneys made under section (b) (1) of this section shall be in addition to distributions made under section 10 of the Taylor Grazing Act [43 U.S.C. 315i] and shall not apply to distribution of moneys made under section 11 of that Act [43 U.S.C. 315j]. The

remaining moneys received by the United States as fees for grazing domestic livestock on the public lands shall be deposited in the Treasury as miscellaneous receipts.

(3) Section 3 of the Taylor Grazing Act, [43 U.S.C. 315b] as amended (43 U.S.C. 315), is further amended by–

(a) Deleting the last clause of the first sentence thereof, which begins with "and in fixing," deleting the comma after "time," and adding to that first sentence the words "in accordance with governing law."

(b) Deleting the second sentence thereof.

GRAZING LEASES AND PERMITS

Sec. 402. [43 U.S.C. 1752] (a) Except as provided in subsection (b) of this section, permits and leases for domestic livestock grazing on public lands issued by the Secretary under the Act of June 28, 1934 (48 Stat. 1269, as amended; 43 U.S.C. 315 et seq.) or the Act of August 28, 1937 (50 Stat. 874, as amended; 43 U.S.C. 1181a-1181j), or by the Secretary of Agriculture, with respect to lands within National Forests in the *sixteen* [P.L. 95-914, 1978] contiguous Western States, shall be for a term of ten years subject to such terms and conditions the Secretary concerned deems appropriate and consistent with the governing law, including, but not limited to, the authority of the Secretary concerned to cancel, suspend, or modify a grazing permit or lease, in whole or in part, pursuant to the terms and conditions thereof, or to cancel or suspend a grazing permit or lease for any violation of a grazing regulation or of any term or condition of such grazing permit or lease.

(b) Permits or leases may be issued by the Secretary concerned for a period shorter than ten years where the Secretary concerned determines that–

(1) the land is pending disposal; or

(2) the land will be devoted to a public purpose prior to the end of ten years; or

(3) it will be in the best interest of sound land management to specify a shorter term: *Provided,* That the absence from an allotment management plan of details the Secretary concerned would like to include but which are undeveloped shall not be the basis for establishing a term shorter than ten years: *Provided further, That the absence of completed land use plans or court ordered environmental statements shall not be the sole basis for establishing a term shorter than ten years unless the Secretary determines on a case-by-case basis that the information to be contained in such land use plan or court ordered environmental impact statement is necessary to determine whether a shorter term should be established for any of the reasons set forth in items (1) through (3) of this subsection.* [P.L. 95-914, 1978]

(c) So long as (1) the lands for which the permit or lease is issued remain available for domestic livestock grazing in accordance with land use plans prepared pursuant to section 202 of this Act or section 5 of the Forest and Rangeland Renewable Resources Planning Act of 1974 (88 Stat. 477; 16 U.S.C. 1601), (2) the permittee or lessee is in compliance with the rules and regulations issued and the terms and conditions in the permit or lease specified by the Secretary concerned, and (3) the permittee or lessee accepts the terms and conditions to be included by the Secretary concerned in the new permit or lease, the holder of the expiring permit or lease shall be given first priority for receipt of the new permit or lease.

(d) All permits and leases for domestic livestock grazing issued pursuant to this section may incorporate an allotment management plan developed by the Secretary concerned. However, nothing in this subsection shall be construed to supersede any requirement for completion of court ordered environmental impact statements prior to development and incorporation of allotment management plans. If the Secretary concerned elects to develop an allotment management plan for a given area, he shall do so in careful and considered consultation, cooperation and coordination with the lessees, permittees, and landowners involved, the district grazing advisory boards established pursuant to section 403 of the Federal Land Policy and Management Act (43 U.S.C. 1753), and any State or States having lands within the area to be

covered by such allotment management plan. Allotment management plans shall be tailored to the specific range condition of the area to be covered by such plan, and shall be reviewed on a periodic basis to determine whether they have been effective in improving the range condition of the lands involved or whether such lands can be better managed under the provisions of subsection (e) of this section. The Secretary concerned may revise or terminate such plans or develop new plans from time to time after such review and careful and considered consultation, cooperation and coordination with the parties involved. As used in this subsection, the terms "court ordered environmental impact statement" and "range condition" shall be defined as in the "Public Rangelands Improvement Act of 1978(43 U.S.C. 1901 et seq.)". [P.L. 95-514, 1978]

(e) *In* [P.L. 95-514, 1978] all cases where the Secretary concerned has not completed an allotment management plan or determines that an allotment management plan is not necessary for management of livestock operations and will not be prepared, the Secretary concerned shall incorporate in grazing permits and leases such terms and conditions as he deems appropriate for management of the permitted or leased lands pursuant to applicable law. The Secretary concerned shall also specify therein the numbers of animals to be grazed and the seasons of use and that he may reexamine the condition of the range at any time and, if he finds on reexamination that the conditions of the range requires adjustment in the amount or other aspect of grazing use, that the permittee or lessee shall adjust his use to the extent the Secretary concerned deems necessary. Such readjustment shall be put into full force and effect on the date specified by the Secretary concerned.

(f) Allotment management plans shall not refer to livestock operations or range improvements on non-Federal lands except where the non-Federal lands are intermingled with, or, with the consent of the permittee or lessee involved, associated with, the Federal lands subject to the plan. The Secretary concerned under appropriate regulations shall grant to lessees and permittees the right of appeal from decisions which specify the terms and conditions of allotment management plans. The preceding sentence of this subsection shall not be construed as limiting any other right of appeal from decisions of such officials.

(g) Whenever a permit or lease for grazing domestic livestock is canceled in whole or in part, in order to devote the lands covered by the permit or lease to another public purpose, including disposal, the permittee or lessee shall receive from the United States a reasonable compensation for the adjusted value, to be determined by the Secretary concerned, of his interest in authorized permanent improvements placed or constructed by the permittee or lessee on lands covered by such permit or lease, but not to exceed the fair market value of the terminated portion of the permittee's or lessee's interest therein. Except in cases of emergency, no permit or lease shall be canceled under this subsection without two years' prior notification.

(h) Nothing in this Act shall be construed as modifying in any way law existing on the date of approval of this Act with respect to the creation of right, title, interest or estate in or to public lands or lands in National Forests by issuance of grazing permits and leases.

GRAZING ADVISORY BOARDS

Sec. 403. [43 U.S.C. 1753] (a) For each Bureau district office and National Forest headquarters office in the *sixteen* [P.L. 95-514, 1978] contiguous Western States having jurisdiction over more than five hundred thousand acres of lands subject to commercial livestock grazing (hereinafter in this section referred to as "office"), the Secretary and the Secretary of Agriculture, upon the petition of a simple majority of the livestock lessees and permittees under the jurisdiction of such office, shall establish and maintain at least one grazing advisory board of not more than fifteen advisers.

(b) The function of grazing advisory boards established pursuant to this section shall be to offer advice and make recommendations to the head of the office involved concerning the development of allotment management plans and the utilization of range-betterment funds.

(c) The number of advisers on each board and the number of years an adviser may serve shall be

determined by the Secretary concerned in his discretion. Each board shall consist of livestock representatives who shall be lessees or permittees in the area administered by the office concerned and shall be chosen by the lessees and permittees in the area through an election prescribed by the Secretary concerned.

(d) Each grazing advisory board shall meet at least once annually.

(e) Except as may be otherwise provided by this section, the provisions of the Federal Advisory Committee Act (86 Stat. 770; 5 U.S. C. App. 1) shall apply to grazing advisory boards.

(f) The provisions of this section shall expire December 31, 1985.

MANAGEMENT OF CERTAIN HORSES AND BURROS

Sec. 404. Sections 9 and 10 of the Act of December 15, 1971 (85 Stat. 649, 651; 16 U.S.C. 1331, 1339–1340) are renumbered as sections 10 and 11, respectively, and the following new section is inserted after section 8:

"Sec. 9. [16 U.S.C. 1338a] In administering this Act, the Secretary may use or contract for the use of helicopters or, for the purpose of transporting captured animals, motor vehicles. Such use shall be undertaken only after a public hearing and under the direct supervision of the Secretary or of a duly authorized official or employee of the Department. The provisions of subsection (a) of the Act of September 8, 1959 (73 Stat. 470; 18 U.S.C. 47(a)) shall not be applicable to such use. Such use shall be in accordance with humane procedures prescribed by the Secretary."

[16 U.S.C. 1338a Note: Subsequent amendments were made to this section in 1996 concerning management of the National Park System.]

TITLE V

RIGHTS-OF-WAY

AUTHORIZATION TO GRANT RIGHTS-OF-WAY

Sec. 501. [43 U.S.C. 1761] (a) The Secretary, with respect to the public lands *(including public lands, as defined in section 103(e) of this Act, which are reserved from entry pursuant to section 24 of the Federal Power Act (16 U.S.C. 818))* [P.L. 102-486, 1992] and, the Secretary of Agriculture, with respect to lands within the National Forest System (except in each case land designated as wilderness), are authorized to grant, issue, or renew rights-or-way over, upon, under, or through such lands for–

(1) reservoirs, canals, ditches, flumes, laterals, pipes, pipelines, tunnels, and other facilities and systems for the impoundment, storage, transportation, or distribution of water;

(2) pipelines and other systems for the transportation or distribution of liquids and gases, other than water and other than oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced therefrom, and for storage and terminal facilities in connection therewith;

(3) pipelines, slurry and emulsion systems, and conveyor belts for transportation and distribution of solid materials, and facilities for the storage of such materials in connection therewith;

(4) systems for generation, transmission, and distribution of electric energy, except that the applicant shall also comply with all applicable requirements of the *Federal Energy Regulatory Commission under the Federal Power Act, including part I thereof* (41 Stat. 1063, 16 U.S.C. 791a-825r) [P.L. 102-486, 1992];

(5) systems for transmission or reception of radio, television, telephone, telegraph, and other electronic signals, and other means of communication;

(6) roads, trails, highways, railroads, canals, tunnels, tramways, airways, livestock driveways, or other means of transportation except where such facilities are constructed and maintained in connection with commercial recreation facilities on lands in the National Forest System; or

(7) such other necessary transportation or other systems or facilities which are in the public interest and which require rights-of-way over, upon, under, or through such lands.

(b) (1) The Secretary concerned shall require, prior to granting, issuing, or renewing a right-of-way, that the applicant submit and disclose those plans, contracts, agreements, or other information reasonably related to the use, or intended use, of the right-of-way, including its effect on competition, which he deems necessary to a determination, in accordance with the provisions of this Act, as to whether a right-of-way shall be granted, issued, or renewed and the terms and conditions which should be included in the right-of-way.

(2) If the applicant is a partnership, corporation, association, or other business entity, the Secretary concerned, prior to granting a right-to-way pursuant to this title, shall require the applicant to disclose the identity of the participants in the entity, when he deems it necessary to a determination, in accordance with the provisions of this title, as to whether a right-of-way shall be granted, issued, or renewed and the terms and conditions which should be included in the right-of-way. Such disclosures shall include, where applicable: (A) the name and address of each partner; (B) the name and address of each share-holder owning 3 per centum or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote; and (C) the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and, in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting

stock of that entity owned, directly or indirectly, by the affiliate.

(3) The Secretary of Agriculture shall have the authority to administer all rights-of-way granted or issued under authority of previous Acts with respect to lands under the jurisdiction of the Secretary of Agriculture, including rights-of-way granted or issued pursuant to authority given to the Secretary of the Interior by such previous Acts. *[P.L. 99-545, 1986]*

(c) (1) Upon receipt of a written application pursuant to paragraph (2) of this subsection from an applicant meeting the requirements of this subsection, the Secretary of Agriculture shall issue a permanent easement, without a requirement for reimbursement, for a water system as described in subsection (a)(1) of this section, traversing Federal lands within the National Forest System ('National Forest Lands'), constructed and in operation or placed into operation prior to October 21, 1976, if –

(A) the traversed National Forest lands are in a State where the appropriation doctrine governs the ownership of water rights;

(B) at the time of submission of the application the water system is used solely for agricultural irrigation or livestock watering purposes;

(C) the use served by the water system is not located solely on Federal lands;

(D) the originally constructed facilities comprising such system have been in substantially continuous operation without abandonment;

(E) the applicant has a valid existing right, established under applicable State law, for water to be conveyed by the water system;

(F) a recordable survey and other information concerning the location and characteristics of the system as necessary for proper management of National Forest lands is provided to the Secretary of Agriculture by the applicant for the easement; and

(G) the applicant submits such application on or before December 31, 1996.

(2) (A) Nothing in this subsection shall be construed as affecting any grants made by any previous Act. To the extent any such previous grant of right-of-way is a valid existing right, it shall remain in full force and effect unless an owner thereof notifies the Secretary of Agriculture that such owner elects to have a water system on such right-of-way governed by the provision of this subsection and submits a written application for issuance of an easement pursuant to this subsection, in which case upon the issuance of an easement pursuant to this subsection such previous grant shall be deemed to have been relinquished and shall terminate.

(B) Easements issued under the authority of this subsection shall be fully transferable with all existing conditions and without the imposition of fees or new conditions or stipulations at the time of transfer. The holder shall notify the Secretary of Agriculture within sixty days of any address change of the holder or change in ownership of the facilities.

(C) Easements issued under the authority of this subsection shall include all changes or modifications to the original facilities in existence as of October 21, 1976, the date of enactment of this Act.

(D) Any future extension or enlargement of facilities after October 21, 1976, shall require the issuance of a separate authorization, not authorized under this subsection.

(3) (A) Except as otherwise provided in this subsection, the Secretary of Agriculture may terminate or suspend an easement issued pursuant to this subsection in accordance with the procedural and other provisions of section 506 [43 U.S.C. 1766] *of this Act. An easement issued pursuant to this subsection shall terminate if the water system for which such easement was issued is used for any purpose other than agricultural irrigation or livestock watering use. For purposes of subparagraph (D) of paragraph (1) of this subsection, non-use of a water system for agricultural irrigation or livestock watering purposes for any continuous five-year period shall constitute a rebuttable presumption of abandonment of the facilities comprising such system.*

(B) Nothing in this subsection shall be deemed to be an assertion by the United States of any right

or claim with regard to the reservation, acquisition, or use of water. Nothing in this subsection shall be deemed to confer on the Secretary of Agriculture any power or authority to regulate or control in any manner the appropriation, diversion, or use of water for any purpose (nor to diminish any such power to authority of such Secretary under applicable law) or to require the conveyance or transfer to the United States of any right or claim to the appropriation, diversion, or use of water.

(C) Except as otherwise provided in this subsection, all rights-of-way issued pursuant to this subsection are subject to all conditions and requirements of this Act.

(D) In the event a right-of-way issued pursuant to this subsection is allowed to deteriorate to the point of threatening persons or property and the holder of the right-of-way, after consultation with the Secretary of Agriculture, refuses to perform the repair and maintenance necessary to remove the threat to persons or property, the Secretary shall have the right to undertake such repair and maintenance on the right-of-way and to assess the holder for the costs of such repair and maintenance, regardless of whether the Secretary had required the holder to furnish a bond or other security pursuant to subsection (i) of this section. [P.L. 99-545, 1986]

(d) With respect to any project or portion thereof that was licensed pursuant to, or granted an exemption from, part I of the Federal Power Act [16 U.S.C. 791a et seq.] which is located on lands subject to a reservation under section 24 of the Federal Power Act [16 U.S.C. 818] and which did not receive a permit, right-of-way or other approval under this section prior to enactment of this subsection, no such permit, right-of-way, or other approval shall be required for continued operation, including continued operation pursuant to section 15 of the Federal Power Act [16 U.S.C. 808*], of such project unless the Commission determines that such project involves the use of any additional public lands or National Forest lands not subject to such reservation.* [P.L. 102-486, 1992]

COST-SHARE ROAD AUTHORIZATION

Sec. 502. [43 U.S.C. 1762] (a) The Secretary, with respect to the public lands, is authorized to provide for the acquisition, construction, and maintenance of roads within and near the public lands in locations and according to specifications which will permit maximum economy in harvesting timber from such lands tributary to such roads and at the same time meet the requirements for protection, development, and management of such lands for utilization of the other resources thereof. Financing of such roads may be accomplished (1) by the Secretary utilizing appropriated funds, (2) by requirements on purchasers of timber and other products from the public lands, including provisions for amortization of road costs in contracts, (3) by cooperative financing with other public agencies and with private agencies or persons, or (4) by a combination of these methods: *Provided*, That, where roads of a higher standard than that needed in the harvesting and removal of the timber and other products covered by the particular sale are to be constructed, the purchaser of timber and other products from public lands shall not, except when the provisions of the second proviso of this subsection apply, be required to bear that part of the costs necessary to meet such higher standard, and the Secretary is authorized to make such arrangements to this end as may be appropriate: *Provided further*, That when timber is offered with the condition that the purchaser thereof will build a road or roads in accordance with standards specified in the offer, the purchaser of the timber will be responsible for paying the full costs of construction of such roads.

(b) Copies of all instruments affecting permanent interests in land executed pursuant to this section shall be recorded in each county where the lands are located.

(c) The Secretary may require the user or users of a road, trail, land, or other facility administered by him through the Bureau, including purchasers of Government timber and other products, to maintain such facilities in a satisfactory condition commensurate with the particular use requirements

of each. Such maintenance to be borne by each user shall be proportionate to total use. The Secretary may also require the user or users of such a facility to reconstruct the same when such reconstruction is determined to be necessary to accommodate such use. If such maintenance or reconstruction cannot be so provided or if the Secretary determines that maintenance or reconstruction by a user would not be practical, then the Secretary may require that sufficient funds be deposited by the user to provide his portion of such total maintenance or reconstruction. Deposits made to cover the maintenance or reconstruction of roads are hereby made available until expended to cover the cost to the United States of accomplishing the purposes for which deposited: *Provided*, That deposits received for work on adjacent and overlapping areas may be combined when it is the most practicable and efficient manner of performing the work, and cost thereof may be determined by estimates: *And provided further*, That unexpended balances upon accomplishment of the purpose for which deposited shall be transferred to miscellaneous receipts or refunded.

(d) Whenever the agreement under which the United States has obtained for the use of, or in connection with, the public lands a right-of-way or easement for a road or an existing road or the right to use an existing road provides for delayed payments to the Government's grantor, any fees or other collections received by the Secretary for the use of the road may be placed in a fund to be available for making payments to the grantor.

RIGHT-OF-WAY CORRIDORS

Sec. 503. [43 U.S.C. 1763] In order to minimize adverse environmental impacts and the proliferation of separate rights-of-way, the utilization of rights-of-way in common shall be required to the extent practical, and each right-of-way or permit shall reserve to the Secretary concerned the right to grant additional rights-of-way or permits for compatible uses on or adjacent to rights-of-way granted pursuant to this Act. In designating right-of-way corridors and in determining whether to require that rights-of-way be confined to them, the Secretary concerned shall take into consideration national and State land use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices. The Secretary concerned shall issue regulations containing the criteria and procedures he will use in designating such corridors. Any existing transportation and utility corridors may be designated as transportation and utility corridors pursuant to this subsection without further review.

GENERAL PROVISIONS

Sec. 504. [43 U.S.C. 1764] (a) The Secretary concerned shall specify the boundaries of each right-of-way as precisely as is practical. Each right-of-way shall be limited to the ground which the Secretary concerned determines (1) will be occupied by facilities which constitute the project for which the right-of-way is granted, issued, or renewed, (2) to be necessary for the operation or maintenance of the project, (3) to be necessary to protect the public safety, and (4) will do no unnecessary damage to the environment. The Secretary concerned may authorize the temporary use of such additional lands as he determines to be reasonably necessary for the construction, operation, maintenance, or termination of the project or a portion thereof, or for access thereto.

(b) Each right-of-way or permit granted, issued, or renewed pursuant to this section shall be limited to a reasonable term in light of all circumstances concerning the project. In determining the duration of a right-of-way the Secretary concerned shall, among other things, take into consideration the cost of the facility, its useful life, and any public purpose it serves. The right-of-way shall specify whether it is or is not renewable and the terms and conditions applicable to the renewal.

(c) Rights-of-way shall be granted, issued, or renewed pursuant to this title under such regulations or stipulations, consistent with the provisions of this title or any other applicable law, and shall also be subject to such terms and conditions as the Secretary concerned may prescribe regarding extent, duration, survey, location, construction, maintenance, transfer or assignment, and termination.

(d) The Secretary concerned prior to granting or issuing a right-of-way pursuant to this title for a new project which may have a significant impact on the environment, shall require the applicant to submit a plan of construction, operation, and rehabilitation for such right-of-way which shall comply with stipulations or with regulations issued by that Secretary, including the terms and conditions required under section 505 of this Act.

(e) The Secretary concerned shall issue regulations with respect to the terms and conditions that will be included in rights-of-way pursuant to section 505 of this title. Such regulations shall be regularly revised as needed. Such regulations shall be applicable to every right-of-way granted or issued pursuant to this title and to any subsequent renewal thereof, and may be applicable to rights-of-way not granted or issued, but renewed pursuant to this title.

(f) Mineral and vegetative materials, including timber, within or without a right-of-way, may be used or disposed of in connection with construction or other purposes only if authorization to remove or use such materials has been obtained pursuant to applicable laws or *for emergency repair work necessary for those rights-of-way authorized under section 501(c) of this Act.* [P.L. 99-545, 1986]

(g) *The holder of a right-of-way shall pay in advance the fair market value thereof, as determined by the Secretary granting, issuing, or renewing such right-of-way. The Secretary concerned may require either annual payment or a payment covering more than one year at a time except that private individuals may make at their option either annual payments or payments covering more than one year if the annual fee is greater than one hundred dollars. The Secretary concerned may waive rentals where a right-of-way is granted, issued or renewed in consideration of a right-of-way conveyed to the United States in connection with a cooperative cost share program between the United States and the holder.* [P.L. 99-545, 1986] The Secretary concerned may, by regulation or prior to promulgation of such regulations, as a condition of a right-of-way, require an applicant for or holder of a right-of-way to reimburse the United States for all reasonable administrative and other costs incurred in processing an application for such right-of-way and in inspection and monitoring of construction, operation, and termination of the facility pursuant to such right-of-way: *Provided, however,* That the Secretary concerned need not secure reimbursement in any situation where there is in existence a cooperative cost share right-of-way program between the United States and the holder of a right-of-way. Rights-of-way may be granted, issued, or renewed to a Federal, State, or local government or any agency or instrumentality thereof, to nonprofit associations or nonprofit corporations which are not themselves controlled or owned by profit making corporations or business enterprises, or to a holder where he provides without or at reduced charges a valuable benefit to the public or to the programs of the Secretary concerned, or to a holder in connection with the authorized use or occupancy of Federal land for which the United States is already receiving compensation for such lesser charge, including free use as the Secretary concerned finds equitable and in the public interest. Such rights-of-way issued at less than fair market value are not assignable except with the approval of the Secretary issuing the right-of-way. The moneys received for reimbursement of reasonable costs shall be deposited with the Treasury in a special account and are hereby authorized to be appropriated and made available until expended. *Rights-of-way shall be granted, issued, or renewed, without rental fees, for electric or telephone facilities, eligible for financing pursuant to the Rural Electrification Act of 1936, as amended [7 U.S.C. 901 et seq.], determined without regard to any application requirement under that Act,* [P.L. 104-333, 1996] *or any extensions from such facilities: Provided, That nothing in this sentence shall be construed to affect the authority of the Secretary granting, issuing, or renewing the right-of-way to require reimbursement of reasonable administrative and other costs pursuant to the second sentence of this subsection.* [P.L. 98-300, 1984]

[43 U.S.C. 1764 Note: effective date shall apply with respect to rights-of-way leases held on or after the date of enactment of this Act. [P.L. 104-333, 1996]]

(h) (1) The Secretary concerned shall promulgate regulations specifying the extent to which holders of rights-of-way under this title shall be liable to the United States for damage or injury incurred by the United States caused by the use and occupancy of the rights-of-way. The regulations shall also specify the extent to which such holders shall indemnify or hold harmless the United States for liabilities, damages, or claims caused by their use and occupancy of the rights-of-way.

(2) Any regulation or stipulation imposing liability without fault shall include a maximum limitation on damages commensurate with the foreseeable risks or hazards presented. Any liability for damage or injury in excess of this amount shall be determined by ordinary rules of negligence.

(i) Where he deems it appropriate, the Secretary concerned may require a holder of a right-of-way to furnish a bond, or other security, satisfactory to him to secure all or any of the obligations imposed by the terms and conditions of the right-of-way or by any rule or regulation of the Secretary concerned.

(j) The Secretary concerned shall grant, issue, or renew a right-of-way under this title only when he is satisfied that the applicant has the technical and financial capability to construct the project for which the right-of-way is requested, and in accord with the requirements of this title.

TERMS AND CONDITIONS

SEC. 505. [43 U.S.C. 1765] Each right-of-way shall contain–

(a) terms and conditions which will (i) carry out the purposes of this Act and rules and regulations issued thereunder; (ii) minimize damage to scenic and esthetic values and fish and wildlife habitat and otherwise protect the environment; (iii) require compliance with applicable air and water quality standards established by or pursuant to applicable Federal or State law; and (iv) require compliance with State standards for public health and safety, environmental protection, and siting, construction, operation, and maintenance of or for rights-of-way for similar purposes if those standards are more stringent than applicable Federal standards; and

(b) such terms and conditions as the Secretary concerned deems necessary to (i) protect Federal property and economic interests; (ii) manage efficiently the lands which are subject to the right-of-way or adjacent thereto and protect the other lawful users of the lands adjacent to or traversed by such right-of-way; (iii) protect lives and property; (iv) protect the interests of individuals living in the general area traversed by the right-of-way who rely on the fish, wildlife, and other biotic resources of the area for subsistence purposes; (v) require location of the right-of-way along a route that will cause least damage to the environment, taking into consideration feasibility and other relevant factors; and (vi) otherwise protect the public interest in the lands traversed by the right-of-way or adjacent thereto.

SUSPENSION OR TERMINATION OF RIGHTS-OF-WAY

Sec. 506. [43 U.S.C. 1766] Abandonment of a right-of-way or noncompliance with any provision of this title, condition of the right-of-way, or applicable rule or regulation of the Secretary concerned may be grounds for suspension or termination of the right-of-way if, after due notice to the holder of the right-of-way, and with respect to easements, an appropriate administrative proceeding pursuant to section 554 of title 5 of the United States Code, the Secretary concerned determines that any such ground exists and that suspension or termination is justified. No administrative proceeding shall be required where the right-of-way by its terms provides that it terminates on the occurrence of a fixed or agreed-upon condition, event, or time. If the Secretary concerned determines that an immediate temporary suspension of activities within a right-of-way for violation of its terms and conditions is necessary to protect public health or safety or the environment, he may abate such activities prior to an administrative proceeding. Prior to commencing any proceeding to suspend or terminate a right-of-way the Secretary concerned shall give written notice to the holder of the grounds for

such action and shall give the holder a reasonable time to resume use of the right-of-way or to comply with this title, condition, rule, or regulation as the case may be. Failure of the holder of the right-of-way to use the right-of-way for the purpose for which it was granted, issued, or renewed, for any continuous five-year period, shall constitute a rebuttable presumption of abandonment of the right-of-way, except that where the failure of the holder to use the right-of-way for the purpose for which it was granted, issued, or renewed for any continuous five-year period is due to circumstances not within the holder's control, the Secretary concerned is not required to commence proceedings to suspend or terminate the right-of-way.

RIGHTS-OF-WAY FOR FEDERAL AGENCIES

Sec. 507. [43 U.S.C. 1767] (a) The Secretary concerned may provide under applicable provisions of this title for the use of any department or agency of the United States a right-of-way over, upon, under or through the land administered by him, subject to such terms and conditions as he may impose.

(b) Where a right-of-way has been reserved for the use of any department or agency of the United States, the Secretary shall take no action to terminate, or otherwise limit, that use without the consent of the head of such department or agency.

CONVEYANCE OF LANDS

Sec. 508. [43 U.S.C. 1768] If under applicable law the Secretary concerned decides to transfer out of Federal ownership any lands covered in whole or in part by a right-of-way, including a right-of-way granted under the Act of November 16, 1973 (87 Stat. 576; 30 U.S.C. 185), the lands may be conveyed subject to the right-of-way; however, if the Secretary concerned determines that retention of Federal control over the right-of-way is necessary to assure that the purposes of this title will be carried out, the terms and conditions of the right-of-way complied with, or the lands protected, he shall (a) reserve to the United States that portion of the lands which lies within the boundaries of the right-of-way, or (b) convey the lands, including that portion within the boundaries of the right-of-way, subject to the right-of-way and reserving to the United States the right to enforce all or any of the terms and conditions of the right-of-way, including the right to renew it or extend it upon its termination and to collect rents.

EXISTING RIGHTS-OF-WAY

Sec. 509. [43 U.S.C. 1769] (a) Nothing in this title shall have the effect of terminating any right-of-way or right-of-use heretofore issued, granted, or permitted. However, with the consent of the holder thereof, the Secretary concerned may cancel such a right-of-way or right-of-use and in its stead issue a right-of-way pursuant to the provisions of this title.

(b) When the Secretary concerned issues a right-of-way under this title for a railroad and appurtenant communication facilities in connection with a realinement of a railroad on lands under his jurisdiction by virtue of a right-of-way granted by the United States, he may, when he considers it to be in the public interest and the lands involved are not within an incorporated community and are of approximately equal value, notwithstanding the provisions of this title, provide in the new right-of-way the same terms and conditions as applied to the portion of the existing right-of-way relinquished to the United States with respect to the payment of annual rental, duration of the right-of-way, and the nature of the interest in lands granted. The Secretary concerned or his delegate shall take final action upon all applications for the grant, issue, or renewal of rights-of-way under subsection (b) of this section no later than six months after receipt from the applicant of all information required from the applicant by this title.

EFFECT ON OTHER LAWS

Sec. 510. [43 U.S.C. 1770] (a) Effective on and after the date of approval of this Act, no right-of-way for the purposes listed in this title shall be granted, issued, or renewed over, upon, under, or through such lands except under and subject to the provisions, limitations, and conditions of this title:

Provided, That nothing in this title shall be construed as affecting or modifying the provisions of the Act of October 13, 1964 (78 Stat. 1089; 16 U.S.C. 532–538) and in the event of conflict with, or inconsistency between, this title and the Act of October 13, 1964, the latter shall prevail: *Provided further*, That nothing in this Act should be construed as making it mandatory that, with respect to forest roads, the Secretary of Agriculture limit rights-of-way grants or their term of years or require disclosure pursuant to Section 501 (b) or impose any other condition contemplated by this Act that is contrary to present practices of that Secretary under the Act of October 13, 1964. Any pending application for a right-of-way under any other law on the effective date of this section shall be considered as an application under this title. The Secretary concerned may require the applicant to submit any additional information he deems necessary to comply with the requirements of this title.

(b) Nothing in this title shall be construed to preclude the use of lands covered by this title for highway purposes pursuant to sections 107 and 317 of title 23 of the United States Code.

(c) (1) Nothing in this title shall be construed as exempting any holder of a right-of-way issued under this title from any provision of the antitrust laws of the United States.

(2) For the purposes of this subsection, the term "antitrust laws" includes the Act of July 2, 1890 (26 Stat. 15 U.S.C. 1 et seq.); the Act of October 15, 1914 (38 Stat. 730, 15 U.S.C. 12 et seq.); the Federal Trade Commission Act (38 Stat. 717; 15 U.S.C. 41 et seq.); and sections 73 and 74 of the Act of August 27, 1894. [15 U.S.C. 8, 9]

COORDINATION OF APPLICATIONS

Sec. 511. [43 U.S.C. 1771] Applicants before Federal departments and agencies other than the Department of the Interior or Agriculture seeking a license, certificate, or other authority for a project which involve a right-of-way over, upon, under, or through public land or National Forest System lands must simultaneously apply to the Secretary concerned for the appropriate authority to use public lands or National Forest System lands and submit to the Secretary concerned all information furnished to the other Federal department or agency.

TITLE VI

DESIGNATED MANAGEMENT AREAS

CALIFORNIA DESERT CONSERVATION AREA

Sec. 601. [43 U.S.C. 1781] (a) The Congress finds that–

(1) the California desert contains historical, scenic, archeological, environmental, biological, cultural, scientific, educational, recreational, and economic resources that are uniquely located adjacent to an area of large population;

(2) the California desert environment is a total ecosystem that is extremely fragile, easily scarred, and slowly healed;

(3) the California desert environment and its resources, including certain rare and endangered species of wildlife, plants, and fishes, and numerous archeological and historic sites, are seriously threatened by air pollution, inadequate Federal management authority, and pressures of increased use, particularly recreational use, which are certain to intensify because of the rapidly growing population of southern California;

(4) the use of all California desert resources can and should be provided for in a multiple use and sustained yield management plan to conserve these resources for future generations, and to provide present and future use and enjoyment, particularly outdoor recreation uses, including the use, where appropriate, of off-road recreational vehicles;

(5) the Secretary has initiated a comprehensive planning process and established an interim management program for the public lands in the California desert; and

(6) to insure further study of the relationship of man and the California desert environment, preserve the unique and irreplaceable resources, including archeological values, and conserve the use of the economic resources of the California desert, the public must be provided more opportunity to participate in such planning and management, and additional management authority must be provided to the Secretary to facilitate effective implementation of such planning and management.

(b) It is the purpose of this section to provide for the immediate and future protection and administration of the public lands in the California desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality.

(c) (1) For the purpose of this section, the term "California desert" means the area generally depicted on a map entitled "California Desert Conservation Area—Proposed" dated April 1974, and described as provided in subsection (c) (2).

(2) As soon as practicable after the date of approval of this Act, the Secretary shall file a revised map and a legal description of the California Desert Conservation Area with the Committees on Interior and Insular Affairs of the United States Senate and the House of Representatives, and such map and description shall have the same force and effect as if included in this Act. Correction of clerical and typographical errors in such legal description and a map may be made by the Secretary. To the extent practicable, the Secretary shall make such legal description and map available to the public promptly upon request.

(d) The Secretary, in accordance with section 202 of this Act, shall prepare and implement a comprehensive, long-range plan for the management, use, development, and protection of the public lands within the California Desert Conservation Area. Such plan shall take into account the principles of multiple use and sustained yield in providing for resource use and development, including, but not limited to, maintenance of environmental quality, rights-of-way, and mineral development. Such plan shall be completed and implementation thereof initiated on or before September 30, 1980.

(e) During the period beginning on the date of approval of this Act and ending on the effective

date of implementation of the comprehensive, long-range plan, the Secretary shall execute an interim program to manage, use, and protect the public lands, and their resources now in danger of destruction, in the California Desert Conservation Area, to provide for the public use of such lands in an orderly and reasonable manner such as through the development of campgrounds and visitor centers, and to provide for a uniformed desert ranger force.

(f) Subject to valid existing rights, nothing in this Act shall affect the applicability of the United States mining laws on the public lands within the California Desert Conservation Area, except that all mining claims located on public lands within the California Desert Conservation Area shall be subject to such reasonable regulations as the Secretary may prescribe to effectuate the purposes of this section. Any patent issued on any such mining claim shall recite this limitation and continue to be subject to such regulations. Such regulations shall provide for such measures as may be reasonable to protect the scenic, scientific, and environmental values of the public lands of the California Desert Conservation Area against undue impairment, and to assure against pollution of the streams and waters within the California Desert Conservation Area.

(g) (1) The Secretary, within sixty days after the date of approval of this Act, shall establish a California Desert Conservation Area Advisory Committee (hereinafter referred to as "advisory committee") in accordance with the provisions of section 309 of this Act.

(2) It shall be the function of the advisory committee to advise the Secretary with respect to the preparation and implementation of the comprehensive, long-range plan required under subsection (d) of this section.

(h) The Secretary of Agriculture and the Secretary of Defense shall manage lands within their respective jurisdictions located in or adjacent to the California Desert Conservation Area, in accordance with the laws relating to such lands and wherever practicable, in a manner consonant with the purpose of this section. The Secretary, the Secretary of Agriculture, and the Secretary of Defense are authorized and directed to consult among themselves and take cooperative actions to carry out the provisions of this subsection, including a program of law enforcement in accordance with applicable authorities to protect the archeological and other values of the California Desert Conservation Area and adjacent lands.

(i) The Secretary shall report to the Congress no later than two years after the date of approval of this Act, and annually thereafter, on the progress in, and any problems concerning, the implementation of this section, together with any recommendations, which he may deem necessary, to remedy such problems.

(j) There are authorized to be appropriated for fiscal years 1977 through 1981 not to exceed $40,000,000 for the purpose of this section, such amount to remain available until expended.

KING RANGE

Sec. 602.Section 9 of the Act of October 21, 1970 (84 Stat. 1067), [16 U.S.C. 460y-8] is amended by adding a new subsection (c), as follows:

"(c) In addition to the lands described in subsection (a) of this section, the land identified as the Punta Gorda Addition and the Southern Additions on the map entitled 'King Range National Conservation Area Boundary Map No. 2,' dated July 29, 1975, is included in the survey and investigation area referred to in the first section of this Act."

BUREAU OF LAND MANAGEMENT WILDERNESS STUDY

Sec. 603. [43 U.S.C. 1782] (a) Within fifteen years after the date of approval of this Act, the Secretary shall review those roadless areas of five thousand acres or more and roadless islands of the public lands, identified during the inventory required by section 201(a) of this Act as having wilderness characteristics described in the Wilderness Act of September 3, 1964 (78 Stat. 890; 16 U.S.C. 1131 et seq.) and shall from time to time report to the President his recommendation as to the suitability

or nonsuitability of each such area or island for preservation as wilderness: *Provided*, That prior to any recommendations for the designation of an area as wilderness the Secretary shall cause mineral surveys to be conducted by the *United States* Geological Survey [P.L. 102-154, 1991] and the *United States* Bureau of Mines [P.L. 102-285, 1992] to determine the mineral values, if any, that may be present in such areas: *Provided further*, That the Secretary shall report to the President by July 1, 1980, his recommendations on those areas which the Secretary has prior to November 1, 1975, formally identified as natural or primitive areas. The review required by this subsection shall be conducted in accordance with the procedure specified in section 3(d) of the Wilderness Act.

(b) The President shall advise the President of the Senate and the Speaker of the House of Representatives of his recommendations with respect to designation as wilderness of each such area, together with a map thereof and a definition of its boundaries. Such advice by the President shall be given within two years of the receipt of each report from the Secretary. A recommendation of the President for designation as wilderness shall become effective only if so provided by an Act of Congress.

(c) During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands according to his authority under this Act and other applicable law in a manner so as not to impair the suitability of such areas for preservation as wilderness, subject, however, to the continuation of existing mining and grazing uses and mineral leasing in the manner and degree in which the same was being conducted on October 21, 1976: *Provided*, That, in managing the public lands the Secretary shall by regulation or otherwise take any action required to prevent unnecessary or undue degradation of the lands and their resources or to afford environmental protection. Unless previously withdrawn from appropriation under the mining laws, such lands shall continue to be subject to such appropriation during the period of review unless withdrawn by the Secretary under the procedures of section 204 of this Act for reasons other than preservation of their wilderness character. Once an area has been designated for preservation as wilderness, the provisions of the Wilderness Act [16 U.S.C. 1131 et seq.] which apply to national forest wilderness areas shall apply with respect to the administration and use of such designated area, including mineral surveys required by section 4(d)(2) of the Wilderness Act, [16 U.S.C. 1133(d)(2)] and mineral development, access, exchange of lands, and ingress and egress for mining claimants and occupants.

43 U.S.C. 1783. **Yaquina Head Outstanding Natural Area** [P.L. 96-199, §119, 1980]

(a) In order to protect the unique scenic, scientific, educational, and recreational values of certain lands in and around Yaquina Head, in Lincoln County, Oregon, there is hereby established, subject to valid existing rights, the Yaquina Head Outstanding Natural Area (hereinafter referred to as the "area"). The boundaries of the area are those shown on the map entitled "Yaquina Head Area", dated July 1979, which shall be on file and available for public inspection in the Office of the Director, Bureau of Land Management, United States Department of the Interior, and the State Office of the Bureau of Land Management in the State of Oregon.

(b)(1) The Secretary of the Interior (hereinafter referred to as the "Secretary") shall administer the Yaquina Head Outstanding Natural Area in accordance with the laws and regulations applicable to the public lands as defined in section 103(e) of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1702) [43 U.S.C. 1702(e)], in such a manner as will best provide for–

(A) the conservation and development of the scenic, natural, and historic values of the area;

(B) the continued use of the area for purposes of education, scientific study, and public recreation which do not substantially impair the purposes for which the area is established; and

(C) protection of the wildlife habitat of the area.

(2) The Secretary shall develop a management plan for the area which accomplishes the purposes and is consistent with the provisions of this section. This plan shall be developed in accordance

with the provisions of section 202 of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1712).

(3) Notwithstanding any other provision of this section, the Secretary is authorized to issue permits or to contract for the quarrying of materials from the area in accordance with the management plan for the area on condition that the lands be reclaimed and restored to the satisfaction of the Secretary. Such authorization to quarry shall require payment of fair market value for the materials to be quarried, as established by the Secretary, and shall also include any terms and conditions which the Secretary determines necessary to protect the values of such quarry lands for purposes of this section.

(c) The reservation of lands for lighthouse purposes made by Executive order of June 8, 1866, of certain lands totaling approximately 18.1 acres, as depicted on the map referred to in subsection (a) of this section, is hereby revoked. The lands referred to in subsection (a) of this section are hereby restored to the status of public lands as defined in section 103(e) of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1702) [43 U.S.C. 1702(e)], and shall be administered in accordance with the management plan for the area developed pursuant to subsection (b) of this section, except that such lands are hereby withdrawn from settlement, sale, location, or entry, under the public land laws, including the mining laws (30 U.S.C., ch. 2), leasing under the mineral leasing laws (30 U.S.C. 181 et seq.), and disposals under the Materials Act of July 31, 1947, as amended (30 U.S.C. 601, 602).

(d) The Secretary shall, as soon as possible but in no event later than twenty-four months following the date of enactment of this section [March 5, 1980], acquire by purchase, exchange, donation, or condemnation all or any part of the lands and waters and interests in lands and waters within the area referred to in subsection (a) of this section which are not in Federal ownership except that State land shall not be acquired by purchase or condemnation. Any lands or interests acquired by the Secretary pursuant to this section shall become public lands as defined in the Federal Land Policy and Management Act of 1976, as amended [43 U.S.C. 1701 et seq.]. Upon acquisition by the United States, such lands are automatically withdrawn under the provisions of subsection (c) of this section except that lands affected by quarrying operations in the area shall be subject to disposals under the Materials Act of July 31, 1947, as amended (30 U.S.C. 601, 602). Any lands acquired pursuant to this subsection shall be administered in accordance with the management plan for the area developed pursuant to subsection (b) of this section.

(e) The Secretary is authorized to conduct a study relating to the use of lands in the area for purposes of wind energy research. If the Secretary determines after such study that the conduct of wind energy research activity will not substantially impair the values of the lands in the area for purposes of this section, the Secretary is further authorized to issue permits for the use of such lands as a site for installation and field testing of an experimental wind turbine generating system. Any permit issued pursuant to this subsection shall contain such terms and conditions as the Secretary determines necessary to protect the values of such lands for purposes of this section.

(f) The Secretary shall develop and administer, in addition to any requirements imposed pursuant to subsection (b) (3) of this section, a program for the reclamation and restoration of all lands affected by quarrying operations in the area acquired pursuant to subsection (d) of this section. All revenues received by the United States in connection with quarrying operations authorized by subsection (b) (3) of this section shall be deposited in a separate fund account which shall be established by the Secretary of the Treasury. Such revenues are hereby authorized to be appropriated to the Secretary as needed for reclamation and restoration of any lands acquired pursuant to subsection (d) of this section. After completion of such reclamation and restoration to the satisfaction of the Secretary, any unexpended revenues in such fund shall be returned to the general fund of the United States Treasury.

(g) There are hereby authorized to be appropriated in addition to that authorized by subsection (f) of this section, such sums as may be necessary to carry out the provisions of this section.

43 U.S.C. 1784. **Lands in Alaska; Bureau of Land Management Land Reviews.** [P.L. 96-487, title XIII, §1320, 1980]

Notwithstanding any other provision of law, section 1782 of the Federal Land Policy and Management Act of 1976 shall not apply to any lands in Alaska. However, in carrying out his duties under sections 1711 and 1712 of this title and other applicable laws, the Secretary may identify areas in Alaska which he determines are suitable as wilderness and may, from time to time, make recommendations to the Congress for inclusion of any such areas in the National Wilderness Preservation System, pursuant to the provisions of the Wilderness Act [16 U.S.C. 1131 et seq.]. In the absence of congressional action relating to any such recommendation of the Secretary, the Bureau of Land Management shall manage all such areas which are within its jurisdiction in accordance with the applicable land use plans and applicable provisions of law.

43 U.S.C. 1785. **Fossil Forest Research Natural Area**. [P.L. 98-603, title I, §103, 1984; P.L. 104-333, div. I, title X, §1022, 1996]

(a) Establishment. – To conserve and protect natural values and to provide scientific knowledge, education, and interpretation for the benefit of future generations, there is established the Fossil Forest Research Natural Area (referred to in this section as the "Area"), consisting of the approximately 2,770 acres in the Farmington District of the Bureau of Land Management, New Mexico, as generally depicted on a map entitled "Fossil Forest", dated June 1983.

(b) Map and Legal Description. –

(1) In General. – As soon as practicable after the date of enactment of this paragraph [November 12, 1996], the Secretary of the Interior shall file a map and legal description of the Area with the Committee on Energy and Natural Resources of the Senate and the Committee on [P.L. 106-176, 2000] Resources of the House of Representatives.

(2) Force and Effect. – The map and legal description described in paragraph (1) shall have the same force and effect as if included in this Act.

(3) Technical Corrections. – The Secretary of the Interior may correct clerical, typographical, and cartographical errors in the map and legal description subsequent to filing the map pursuant to paragraph (1).

(4) Public Inspection. – The map and legal description shall be on file and available for public inspection in the Office of the Director of the Bureau of Land Management, Department of the Interior.

(c) Management. –

(1) In General. – The Secretary of the Interior, acting through the Director of the Bureau of Land Management, shall manage the Area–

(A) to protect the resources within the Area; and

(B) in accordance with this Act, the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.), and other applicable provisions of law.

(2) Mining. –

(A) Withdrawal. – Subject to valid existing rights, the lands within the Area are withdrawn from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral leasing, geothermal leasing, and mineral material sales.

(B) Coal Preference Rights. – The Secretary of the Interior is authorized to issue coal leases in New Mexico in exchange for any preference right coal lease application within the Area. Such exchanges shall be made in accordance with applicable existing laws and regulations relating to coal leases after a determination has been made by the Secretary that the applicant is entitled to a preference right lease and that the exchange is in the public interest.

(C) Oil and Gas Leases. – Operations on oil and gas leases issued prior to the date of enactment of this paragraph [November 12, 1996], shall be subject to the applicable provisions of Group 3100 of title 43, Code of Federal Regulations (including section 3162.5-1), and such other terms, stipulations, and conditions as the Secretary of the Interior considers necessary to avoid significant disturbance of the land surface or impairment of

the natural, educational, and scientific research values of the Area in existence on the date of enactment of this paragraph [November 12, 1996].

(3) Grazing. – Livestock grazing on lands within the Area may not be permitted.

(d) Inventory. – Not later than 3 full fiscal years after the date of enactment of this subsection [November 12, 1996], the Secretary of the Interior, acting through the Director of the Bureau of Land Management, shall develop a baseline inventory of all categories of fossil resources within the Area. After the inventory is developed, the Secretary shall conduct monitoring surveys at intervals specified in the management plan developed for the Area in accordance with subsection (e).

(e) Management Plan. –

(1) In General. – Not later than 5 years after the date of enactment of this act [November 12, 1996], the Secretary of the Interior shall develop and submit to the Committee on Energy and Natural Resources of the Senate and the Committee on [P.L. 106-176, 2000] Resources of the House of Representatives a management plan that describes the appropriate use of the Area consistent with this subsection [P.L. 106-176, 2000].

(2) Contents. – The management plan shall include–

(A) a plan for the implementation of a continuing cooperative program with other agencies and groups for–

(i) laboratory and field interpretation; and

(ii) public education about the resources and values of the Area (including vertebrate fossils);

(B) provisions for vehicle management that are consistent with the purpose of the Area and that provide for the use of vehicles to the minimum extent necessary to accomplish an individual scientific project;

(C) procedures for the excavation and collection of fossil remains, including botanical fossils, and the use of motorized and mechanical equipment to the minimum extent necessary to accomplish an individual scientific project; and

(D) mitigation and reclamation standards for activities that disturb the surface to the detriment of scenic and environmental values.

TITLE VII

EFFECT ON EXISTING RIGHTS; REPEAL OF EXISTING LAWS; SEVERABILITY

EFFECT ON EXISTING RIGHTS

Sec. 701. [43 U.S.C. 1701 note] (a) Nothing in this Act, or in any amendment made by this Act, shall be construed as terminating any valid lease, permit, patent, right-of-way, or other land use right or authorization existing on the date of approval of this Act.

(b) Notwithstanding any provision of this Act, in the event of conflict with or inconsistency between this Act and the Acts of August 28, 1937 (50 Stat. 874; 43 U.S.C. 1181a-1181j), and May 24, 1939 (53 Stat. 753), insofar as they relate to management of timber resources, and disposition of revenues from lands and resources, the latter Acts shall prevail.

(c) All withdrawals, reservations, classifications, and designations in effect as of the date of approval of this Act shall remain in full force and effect until modified under the provisions of this Act or other applicable law.

(d) Nothing in this Act, or in any amendments made by this Act, shall be construed as permitting any person to place, or allow to be placed, spent oil shale, overburden, or byproducts from the recovery of other minerals found with oil shale, on any Federal land other than Federal land which has been leased for the recovery of shale oil under the Act of February 25, 1920 (41 Stat. 437, as amended; 30 U.S.C. 181 et seq.).

(e) Nothing in this Act shall be construed as modifying, revoking, or changing any provision of the Alaska Native Claims Settlement Act (85 Stat. 688, as amended; 43 U.S.C. 1601 et seq.).

(f) Nothing in this Act shall be deemed to repeal any existing law by implication.

(g) Nothing in this Act shall be construed as limiting or restricting the power and authority of the United States or–

(1) as affecting in any way any law governing appropriation or use of, or Federal right to, water on public lands;

(2) as expanding or diminishing Federal or State jurisdiction, responsibility, interests, or rights in water resources development or control;

(3) as displacing, superseding, limiting, or modifying any interstate compact or the jurisdiction or responsibility of any legally established joint or common agency of two or more States or of two or more States and the Federal Government;

(4) as superseding, modifying, or repealing, except as specifically set forth in this Act, existing laws applicable to the various Federal agencies which are authorized to develop or participate in the development of water resources or to exercise licensing or regulatory functions in relation thereto;

(5) as modifying the terms of any interstate compact; or

(6) as a limitation upon any State criminal statute or upon the police power of the respective States, or as derogating the authority of a local police officer in the performance of his duties, or as depriving any State or political subdivision thereof of any right it may have to exercise civil and criminal jurisdiction on the national resource lands; or as amending, limiting, or infringing the existing laws providing grants of lands to the States.

(h) All actions by the Secretary concerned under this Act shall be subject to valid existing rights.

(i) The adequacy of reports required by this Act to be submitted to the Congress or its committees shall not be subject to judicial review.

(j) Nothing in this Act shall be construed as affecting the distribution of livestock grazing revenues to local governments under the Granger-Thye Act (64 Stat. 85, 16 U.S.C. 580h), under the

Act of May 23, 1908 (35 Stat. 260, as amended; 16 U.S.C. 500), under the Act of March 4, 1913 (37 Stat. 843, as amended; 16 U.S.C. 501), and under the Act of June 20, 1910 (36 Stat. 557).

REPEAL OF LAWS RELATING TO HOMESTEADING AND SMALL TRACTS

Sec. 702. Effective on and after the date of approval of this Act, the following statutes or parts of statutes are repealed except the effective date shall be on and after the tenth anniversary of the date of approval of this Act insofar as the listed homestead laws apply to public lands in Alaska:

Act of	Chapter	Section	Statute at Large	43 U.S. Code
1. Homesteads:				
Revised Statute 2289				161, 171.
Mar. 3, 1891	561	5	26:1097	161, 162.
Revised Statute 2290				162.
Revised Statute 2295				163.
Revised Statute 2291				164.
June 6, 1912	153		37:123	164, 169, 218
May 14, 1880	89		21:141	166, 185, 202, 223.
June 6, 1900	821		31:683	166, 223.
Aug. 9, 1912	280		37:267	
Apr. 6, 1914	51		38:312	167.
Mar. 1, 1921	90		41:1193	
Oct. 17, 1914	325		38:740	168.
Revised Statute				169.
Mar. 31, 1881	153		21:511	
Oct. 22, 1914	335		38:766	170.
Revised Statute 2292				171.
June 8, 1880	136		21:166	172.
Revised Statute				173.
Mar. 3, 1891	561	6	26:1098	
June 3, 1896	312	2	29:197	
Revised Statute 2288				174.
Mar. 3, 1891	561	3	26:1097	
Mar. 3, 1905	1424		36:991	
Revised Statute 2296				175.
Apr. 28, 1922	155		42:502	
May 17, 1900	479	1	31:179	179.
Jan. 26, 1901	180		31:740	180.
Sept. 5, 1914	294		38:712	182.
Revised Statute 2300				183.
Aug. 31, 1918	166	8	40:957	
Sept. 13, 1918	173		40:960	
Revised Statute 2302				184, 201.
July 26,1892	251		27:270	185.
Feb. 14, 1920	76		41:434	186.
Jan. 21, 1922	32		42:358	
Dec. 28, 1922	19		42:1067	
June 12, 1930	471		46:580	
Feb. 25, 1925	326		43:081	187.
June 21, 1934	690		48:1185	187a.
May 22, 1902	821	2	32:203	187b.
June 5, 1900	716		31:27	188, 217.
Mar. 3, 1875	131	15	18:420	189.
July 4, 1884	180	Only last paragraph of sec. 1.	23: 96	190.
Mar. 1, 1933	160	1	47:1418	190a.

The following words only: "Provided, That no further allotments of lands to Indians on the public domain shall be made in San Juan County, Utah, nor shall further Indian homesteads be made in said county under the Act of July 4, 1884 (23 Stat. 96; U.S.C. title 48, sec. 190)."

Revised Statutes 2310, 2311				191.
June 13, 1902	1080		32:384	203.
Mar. 3, 1879	191		20:472	204.
July 1, 1879	60		21:46	205.
May 6, 1886	88		24:22	206.
Aug. 21, 1916	361		39:518	207.
June 3, 1924	240		43:357	208.
Revised Statute 2298				211.
Aug. 30, 1890	837		26:391	212.

The following words only: "No person who shall after the passage of this act, enter upon any of the public lands with a view to occupation, entry or settlement under any of the land laws shall be permitted to acquire title to more than three hundred and twenty acres in the aggregate, under all of said laws, but his limitation shall not operate to curtail

the right of any person who has heretofore made entry or settlement on the public lands, or whose occupation, entry or settlement, is validated by this act:"

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Mar. 3, 1891	561	17	26: 1101	

The following words only: "and that the provision of 'An Act making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and ninety-one, and for other purposes,' which reads as follows, viz: ' No person who shall after the passage of this act enter upon any of the public lands with a view to occupation, entry or settlement under any of the land laws shall be permitted to acquire title to more than three hundred and twenty acres in the aggregate under all said laws,' shall be construed to include in the maximum amount of lands the title to which is permitted to be acquired by one person only agricultural lands and not to include lands entered or sought to be entered under mineral land laws."

Apr. 28, 1904	1776		33:527	213.
Aug. 3, 1950	521		64:398	
Mar. 2, 1889	381	6	25:854	214.
Feb. 20, 1917	98		39:925	215.
Mar. 4, 1921	162	1	41:1433	216.
Feb. 19, 1909	160		35:639	218.
June 13, 1912	166		37:132	
Mar. 3, 1915	84		38:953	
Mar. 3, 1915	91		38:957	
Mar. 4, 1915	150	2	38:1163	
July 3, 1916	220		39:344	
Feb. 11, 1913	39		37:666	218, 219.
June 17, 1910	298		36:531	219.
Mar. 3, 1915	91		38:957	
Sept. 5, 1916	440		39:724	
Aug. 10, 1917	52	10	40:275	
Mar. 4, 1915	150	1	38:1162	220.
Mar. 4, 1923	245	1	42:1445	222.
Apr. 28, 1904	1801		33:547	224.
Mar. 2, 1907	2527		34:1224	
May 29, 1908	220	7	35:466	
Aug. 24, 1912	371		37:499	
Aug. 22, 1914	270		38:704	231.
Feb. 25, 1919	21		40:1153	
July 3, 1916	214		39:341	232.
Sept. 29, 1919	64		41:288	233.
Apr. 6, 1922	122		42:491	233, 272, 273.

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Mar. 2, 1889	381	3	25:854	234.
Dec. 29, 1894	14		28:599	
July 1, 1879	63	1	21:48	235.
Dec. 20, 1917	6		40:430	236.
Jult 24, 1919	126	Next to last paragraph only.	41:271	237.
Mar. 2, 1932	69		47:59	237a.
May 21, 1934	320		48:787	237b.
May 25, 1935	135		49:286	237c.
Aug. 19, 1935	560		49:659	237d.
Mar. 31, 1938	57		52:149	
Apr. 20, 1936	239		49:1235	237e
July 30, 1956	778	1, 2, 4	70:715	237f,g,h.
Mar. 1, 1921	102		41:1202	238.
Apr. 7, 1922	125		42:492	
Revised Statute				239.
June 16, 1898	458		30:473	240.
Aug. 29, 1916	420		39:671	
Apr. 7, 1930	108		46:144	243.
Mar. 3, 1933	198		47:1424	243a.
Mar. 3, 1879	192		20:472	251.
Mar. 2, 1889	381	7	25:855	252.
June 3, 1878	152		20:91	253.
Revised Statute 2294				254.
May 26, 1890	355		26:121	
Mar. 11, 1902	182		32:63	
Mar. 4, 1904	394		33:59	
Feb. 23, 1923	105		42:1281	
Revised Statute 2293				255.
Oct. 6, 1917	86		40:391	
Mar. 4, 1913	149	Only last paragraph of section headed "Public Land Service."	37:925	256.
May 13, 1932	178		47:153	256a.
June 16, 1933	99		48:274	
June 26, 1935	419		49:504	
June 16, 1937	361		50:303	
Aug. 27, 1935	770		49:909	256b.
Sept. 30, 1890	J. Res. 59		26:684	261.
June 16, 1880	244		21:287	263.
Apr. 18, 1904	25		33:589	
Revised Statute 2304				271.
Mar. 1, 1901	674		31:847	271, 272.
Revised Statute 2305				272.
Feb. 25, 1919	37		40:1161	272a.

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Dec. 28, 1922	19		42:1067	
Revised Statute 2306				274.
Mar. 3, 1893	208		27:593	275.

The following words only: "And provided further: That where soldier's additional homestead entries have been made or initiated upon certificate of the Commissioner of the General Land Office of the right to make such entry, and there is no adverse claimant, and such certificate is found erroneous or invalid for any cause, the purchaser thereunder, on making proof of such purchase, may perfect his title by payment of the Government price for the land: but no person shall be permitted to acquire more than one hundred and sixty acres of public land through the location of any such certificate."

Aug. 18, 1894	301	Only last paragraph of section headed "Surveying the Public Lands."	28:397	276.
Revised Statute 2309				277.
Revised Statute 2307				278.
Sept. 21, 1922	357		42:990	
Sept. 27, 1944	421		58:747	279-283.
June 25, 1946	474		60:308	279.
May 31, 1947	88		61:123	279, 280, 282.
June 18, 1954	306		68:253	279, 282.
June 3, 1948	399		62:305	283, 284.
Dec. 29, 1916	9	1 - 8	39:862	291-298.
Feb. 28, 1931	328		46:1454	291.
June 9, 1933	53		48:119	291.
June 6, 1924	274		46:469	292.
Oct. 25, 1918	195		40:1016	293.
Sept. 29, 1919	63		41:287	294, 295.
Mar. 4, 1923	245	2	42:1445	302.
Aug. 21, 1916	361		39:518	1075.
Aug. 28, 1937	876	3	50:875	1181c.
2. Small tracts:				
June 1, 1938	317		52:609	682a-e.
June 8, 1954	270		68:239	
July 14, 1945	298		59: 467	

REPEAL OF LAWS RELATED TO DISPOSAL

Sec. 703. (a) Effective on and after the tenth anniversary of the date of approval of this Act, the statutes and parts of statutes listed below as "Alaska Settlement Laws," and effective on and after the date of approval of this Act, the remainder of the following statutes and parts of statutes are hereby repealed:

Act of	Chapter	Section	Statute at Large	43 U.S. Code
1. Sale and Disposal laws:				
Mar. 3, 1891	561	9	26: 1099	671.
Revised Statute 2354				673.
Revised Statute 2355				674.
May 18, 1898	344	2	30:418	675.
Revised Statute 2365				676.
Revised Statute 2357				678.
June 15, 1880	227	3, 4	21:238	679-680.
Mar. 2, 1889	381	4	25:854	681.
Mar. 1, 1907	2286		34:1052	682.
Revised Statute 2361				688.
Revised Statute 2362				689.
Revised Statute 2363				690.
Revised Statute 2368				691.
Revised Statute 2366				692.
Revised Statute 2369				693.
Revised Statute 2370				694.
Revised Statute 2371				695.
Revised Statute 2374				696.
Revised Statute 2372				697.
Feb. 24, 1909	181		35:645	
May 21, 1926	353	The 2 provisos only.	44:591	

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Revised Statute 2375				698.
Revised Statute 2376				699.
Mar. 2, 1889	381	1	25:854	700.
2. Townsite Reservation and Sale:				
Revised Statute 2380				711.
Revised Statute 2381				712.
Revised Statute 2382				713.
Aug. 24, 1954	904		68:792	
Revised Statute 2383				714.
Revised Statute 2384				715.
Revised Statute 2386				717.
Revised Statute 2387				718.
Revised Statute 2388				719.
Revised Statute 2389				720.
Revised Statute 2391				721.
Revised Statute 2392				722.
Revised Statute 2393				723.
Revised Statute 2394				724.
Mar. 3, 1877	113	1, 3, 4	19:392	725-727.
Mar. 3, 1891	561	16	26:1101	728.
July 9, 1914	138		38:454	730.
Feb. 9, 1903	531		32:820	731.
3. Drainage Under State Laws:				
May 20, 1908	181	1-7	35:171	1021-1027.
Mar. 3, 1919	113		40:1321	1028.
May 1, 1958	P.L. 85-387		72:99	1029-1034.
Jan. 17, 1920	47		41:392	1041-1048.
4. Abandoned Military Reservation:				
July 5, 1884	214	5	23:104	1074.
Aug. 21, 1916	361		39:518	1075.
Mar. 3, 1893	208		27:593	1076.

The following words only: “Provided, That the President is hereby authorized by proclamation to withhold from sale and grant for public use to the municipal corporation in which the same is situated all or any portion of any abandoned military reservation not exceeding twenty acres in one place.”

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Aug. 23, 1894	314		23:491	1077, 1078.
Feb. 11, 1903	543		32:822	1079.
Feb. 15, 1895	92		28:664	1080, 1077.
Apr. 23, 1904	1496		33:306	1081.
5. Public Lands; Oklahoma:				
May 2, 1890	182	Last paragraph of sec. 18 and secs. 20, 21, 22, 24, 27.	26:90	1091-1094, 1096, 1097.
Mar. 3, 1891	543	16	26:1026	1098.
Aug. 7, 1946	772	1,2	60:872	1100-1101.
Aug. 3, 1955	498	1-8	69:445	1102-1102g.
May 14, 1890	207		26:109	1111-1117.
Sept. 1, 1893	J. Res. 4		28:11	1118.
May 11, 1896	168	1,2	29:116	1119.
Jan. 18, 1897	62	1-3, 5, 7	29:490	1131-1134.
June 23, 1897	8		30:105	
Mar. 1, 1899	328		30:966	
6. Sales of Isolated Tracts:				
Revised Statute 2455				1171.
Feb. 26, 1895	133		28:687	
June 27, 1906	3554		34:517	
Mar. 28, 1912	67		37:77	
Mar. 9, 1928	164		45:253	
June 28, 1934	865	14	48:1274	
July 30, 1947	383		61:630	
Apr. 24, 1928	428		45:457	1171a.
May 23, 1930	313		46:377	1171b.
Feb. 4, 1919	13		40:1055	1172.
May 10, 1920	178		41:595	1173.
Aug. 11, 1921	62		42:159	1175.
May 19, 1926	337		44:566	1176.
Feb. 14, 1931	170		46:1105	1177.
7. Alaska Special Laws:				
Mar. 3, 1891	561	11	26:1099	732.
May 25, 1926	379		44:629	733-736.
May 29, 1963	P.L. 88-34		77:52	
July 24, 1947	305		61:414	738.
Aug. 17, 1961	P.L.87-147		75:384	270-13.
Oct. 3, 1962	P.L. 87-742		76:740	
July 19, 1963	P.L. 86-66		77:80	687b-5.
May 14, 1898	299	1	30:409	270.
Mar. 3, 1903	1002		32:1028	
Apr. 29, 1950	137	1	64:94	
Aug. 3, 1955	496		69:444	270, 687a-2
Apr. 29, 1950	137	2-5	64:95	270-5, 260-6, 270-7, 687a-1.

Act of	Chapter	Section	Statute at Large	43 U.S. Code
July 11, 1956	571	2	70:529	270-7.
July 8, 1916	228		39:352	270-8, 270-9.
June 28, 1918	110		40:632	270-10, 270-14.
July 11, 1956	571	1	70:528	
8. Alaska Settlement Laws:				
Mar. 8, 1922	96	1	42:415	270-11.
Aug. 23, 1958	P.L. 85-725	1,4	72:730	
Apr. 13, 1926	121		44:243	270-15.
Apr. 29, 1950	134	3	64:93	270-16, 270-17.
May 14, 1898	299	10	30:413	270-4, 687a to 687a-5.
Mar. 3, 1927	323		44:1364	
May 26, 1934	357		48:809	
Aug. 23, 1958	P.L. 85-725	3	72:730	
Mar. 3, 1891	561	13	26:1100	687a-6.
Aug. 30, 1949	521		63:679	687b to 687b-4.
9. Pittman Underground Water Act:				
Sept. 22, 1922	400		42:1012	356.

(c) [43 U.S.C. 270–12, 270–12 note] Effective on and after the tenth anniversary of the date of approval of this Act, section 2 of the Act of March 8, 1922 (42 Stat. 415, 416), as amended by section 2 of the Act of August 23, 1958 (72 Stat. 730), is further amended to read:

"The coal, oil, or gas deposits reserved to the United States in accordance with the Act of March 8, 1922 (42 Stat. 415; 43 U.S.C. 270–11 et seq.), as added to by the Act of August 17, 1961 (75 Stat. 384; 43 U.S.C. 270–13), and amended by the Act of October 3, 1962 (76 Stat. 740; 43 U.S.C. 270–13), shall be subject to disposal by the United States in accordance with the provisions of the laws applicable to coal, oil, or gas deposits or coal, oil, or gas lands in Alaska in force at the time of such disposal. Any person qualified to acquire coal, oil, or gas deposits, or the right to mine or remove the coal or to drill for and remove the oil or gas under the laws of the United States shall have the right at all times to enter upon the lands patented under the Act of March 8, 1922, as amended, and in accordance with the provisions hereof, for the purpose of prospecting for coal, oil, or gas therein, upon the approval by the Secretary of the Interior of a bond or undertaking to be filed with him as security for the payment of all damages to the crops and improvements on such lands by reason of such prospecting. Any person who has acquired from the United States the coal, oil, or gas deposits in any such land, or the right to mine, drill for, or remove the same, may reenter and occupy so much of the surface thereof incident to the mining and removal of the coal, oil, or gas therefrom, and mine and remove the coal or drill for and remove oil and gas upon payment of the damages caused thereby to the owner thereof, or upon giving a good and sufficient bond or undertaking in an action instituted in any competent court to ascertain and fix said damages: *Provided*, That the owner under such limited patent shall have the right to mine the coal for use on the land for domestic purposes at any time prior to the disposal by the United States of the coal deposits: *Provided further*, That nothing in this Act shall be construed as authorizing the exploration upon or entry of any coal deposits withdrawn from such exploration and purchase."

(d) Section 3 of the Act of August 30, 1949 (63 Stat. 679; 43 U.S.C. 687b et seq.), [43 U.S.C. 687b-2] is amended to read:

"Notwithstanding the provisions of any Act of Congress to the contrary, any person who prospects for, mines, or removes any minerals from any land disposed of under the Act of August 30, 1949 (63 Stat. 679), shall be liable for any damage that may be caused to the value of the land and tangible improvements thereon by such prospecting for, mining, or removal of minerals. Nothing in this section shall be construed to impair any vested right in existence on August 30, 1949."

REPEAL OF WITHDRAWAL LAWS

Sec. 704. (a) Effective on and after the date of approval of this Act, the implied authority of the President to make withdrawals and reservations resulting from acquiescence of the Congress (U.S. v. Midwest Oil Co., 236 U.S. 459) and the following statutes and parts of statutes are repealed:

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Oct. 2, 1888	1069		25: 527	662.

Only the following portion under the section headed U.S. Geological Survey: The last sentence of

the paragraph relating to investigation of irrigable lands in the arid region, including the proviso at the end thereof.

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Mar. 3,1891	561	24	26: 1103	16 U.S.C. 471.
Mar. 1, 1893	183	21	27: 510	33 U.S.C. 681.
Aug. 18, 1894	301	4	28: 422	641.

Only that portion of the first sentence of the second paragraph beginning with “and the Secretary of the Interior” and ending with “shall not be approved.”

May 14, 1898	299	10	30: 413	687a-4.

Only the fifth proviso of the first paragraph.

June 17, 1902	1093	3	32: 388	416.

Only that portion of section three preceding the first proviso.

Apr. 16, 1906	1631	1	34: 116	561.

Only the words “withdraw from public entry any lands needed for townsite purposes”, and also after the word “case”, the word “and.”

June 27, 1906	3559	4	34: 520	561.

Only the words “withdraw and.”

Mar. 15, 1910	96		36: 237	643.
June 25, 1910	421	1, 2	36: 847	141,142,16 U.S.C. 471(a).

All except the second and third provisos.

June 25, 1914	431	13	36: 858	148.
Mar. 12, 1914	37	1	38: 305	975b.

Only that portion which authorizes the President to withdraw, locate, and dispose of lands for townsites.

Oct. 5, 1914	316	1	38: 727	569(a).
June 9, 1916	137	2	39: 219	

Under “Class One,” only the words “withdrawal and.”

Dec. 29, 1916	9	10	39:865	300.
June 7, 1924	348	9	43:655	16 U.S.C. 471.
Aug. 19, 1935	561	“Sec. 4”	49:661	22 U.S.C. 277c.

In “Sec. 4,” only paragraph “c” except the proviso thereof.

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Mar. 3, 1927	299	4	44: 1347	25 U.S.C. 389d.

Only the proviso thereof.

May 24, 1928	729	4	45: 729	49 U.S.C. 214.
Dec. 21, 1928	42	9	45: 1063	617h.
Mar. 6, 1946	58		69: 36	617h.

First sentence only.

June 16, 1934	557	“Sec. 40(a)”	48: 977	30 U.S.C. 229a.

The proviso only.

May 1, 1936	254	2	49: 1250	
May 31, 1938	304		52: 593	25 U.S.C. 497.
July 20, 1939	334		53: 1071	16 U.S.C. 471b.
May 28, 1940	220	1	54: 224	16 U.S.C. 552a.

All except the second proviso.

Apr. 11, 1956	203	8	70: 110	620g.

Only the words “and to withdraw public lands from entry or other disposition under the public land laws.”

Aug. 10, 1956	Chapter 949	9772	70A: 588	10 U.S.C. 4472, 9772.
Aug. 16, 1952	P.L. 87-590	4	76:389	616c.

Only the words “and to withdraw public lands from entry or other disposition under the public land laws.”

(b) The second sentence of the Act of March 6, 1946 (60 Stat. 36; 43 U.S.C. 617(h)), [43 U.S.C. 617h] is amended by deleting “Thereafter, at the direction of the Secretary of the Interior, such lands” and by substituting therefor the following: “Lands found to be practicable of irrigation and reclamation by irrigation works and withdrawn under the Act of March 6, 1946 (43 U.S.C. 617(h)).”

REPEAL OF LAW RELATING TO ADMINISTRATION OF PUBLIC LANDS

Sec. 705. (a) Effective on and after the date of approval of this Act, the following statutes or parts of statutes are repealed:

Act of	Chapter	Section	Statute at Large	43 U.S. Code
1.Mar. 2,1895	174		28:744	176.
2. June 28,1934	865	8	48:1272	315g.
June 26, 1936	842	3	49:1976, title I	
June 19, 1948	548	1	62:533	
July 9, 1962 P.L.87-524			76:140	315g-1.
3.Aug. 24, 1937	744		50:748	315p.
4.Mar. 3, 1909	271	2d proviso only.	35:845	772.
June 25, 1910	J.Res. 40		36:884	
5. June 21, 1934	689		48:1185	871a.
6. Revised Statute 2447				1151.
Revised Statute 2448				1152.
7.June 6, 1874	223		18:62	1153; 1154.
8.Jan. 28, 1879	30		20:274	1155.
9. May 30, 1894	87		28:84	1156.
10. Revised Statute 2471				1191.
Revised Statute 2472				1192.
Revised Statute 2473				1193.
11. July 14, 1960 P.L. 86-649		101-202(a) ,203-204(a), 301-303.	74:506	1361, 1362, 1363-1383.
12. Sept. 26, 1970 P.L. 91-429			84:885	1362a.
13. July 31, 1939	401	1,2	53:1144	

REPEAL OF LAWS RELATING TO RIGHTS-OF-WAY

Sec. 706. (a) Effective on and after the date of approval of this Act, R.S. 2477 (43 U.S.C. 932) is repealed in its entirety and the following statutes or parts of statutes are repealed insofar as they apply to the issuance of rights-of-way over, upon, under, and through the public lands and lands in the National Forest System:

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Revised Statute 2339				661.

The following words only: "and the right-of-way for the construction of ditches and canals for the purpose herein specified is acknowledged and confirmed: but whenever any person, in the construction of any ditch or canal, injures or damages the possession of any settler on the public domain, the party committing such injury or damages shall be liable to the party injured for such injury or damage."

Revised Statute 2340				661.

The following words only: ", or rights to ditches and reservoirs used in connection with such water rights,"

Feb. 26, 1897	335		29: 599	664.
Mar. 3, 1899	427	1	30: 1233	665, 958, (16 U.S.C. 525).

The following words only: "that in the form provided by existing law the Secretary of the Interior may file and approve surveys and plots of any right-of-way for a wagon road, railroad, or other highway over and across any forest reservation or reservoirs site when in his judgment the public interests will not be injuriously affected thereby."

Mar. 3, 1875	152		18:482	934-939.
May 14, 1898	299	2-9	30:409	942-1 to 942-9.
Feb. 27, 1901	614		31:815	943.
June 26, 1906	3548		34:481	944.
Mar. 3, 1891	561	18-21	26:1101	946-949.
Mar. 4, 1917	184	1	39:1197	
May 28, 1926	409		44:668	
Mar. 1, 1921	93		41:1194	950.
Jan. 13, 1897	11		20:484	952-955.
Mar. 3, 1923	219		42:1437	
Jan. 21, 1895	37		28:635	951, 956, 957.
May 14, 1896	179		29:120	
May 11, 1898	292		30:404	
Mar. 4, 1917	184	2	39:1197	
Feb. 15, 1901	372		31:790	959 (16 U.S.C. 79, 522).

Act of	Chapter	Section	Statute at Large	43 U.S. Code
Mar. 4, 1911	238		36:1253	951 (16 U.S.C. 5, 420, 523).

Only the last two paragraphs under the subheading "Improvement of the National Forests" under the heading "Forest Service."

May 27, 1952	338		66: 95	
May 21, 1896	212		29: 127	962-965.
Apr. 12, 1910	155		36: 296	966–970.
June 4, 1897	2	1	30: 35	16 U.S.C. 551.

Only the eleventh paragraph under Surveying the public lands.

July 22, 1937	517	31, 32	50:525	7 U.S.C. 1010-1012.
Sept. 3, 1954	1255	1	68:1146	931c.
July 7, 1960	Public Law 86-608.		74:363	40 U.S.C. 345c
Oct. 23, 1962	Public Law 87-852.	1-3	76:1129	40 U.S.C 319-319c.
Feb. 1, 1905	288	4	33:628	16 U.S.C. 524.

(b) Nothing in section 706(a), [43 U.S.C. 1701 note] except as it pertains to rights-of-way, may be construed as affecting the authority of the Secretary of Agriculture under the Act of June 4, 1897 (30 Stat. 35, as amended, 16 U.S.C. 551); the Act of July 22, 1937 (50 Stat. 525, as amended, 7 U.S.C. 1010–1212); or the Act of September 3, 1954 (68 Stat. 1146, 43 U.S.C. 931c).

SEVERABILITY

Sec. 707. If any provision of this Act [43 U.S.C. 1701 note] or the application thereof is held invalid, the remainder of the Act and the application thereof shall not be affected thereby.

Approved October 21, 1976.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 94–1163 accompanying H.R. 13777 (Comm. on Interior and Insular Affairs) and No. 94–1724 (Comm. of Conference).

SENATE REPORT No. 94–583 (Comm. on Interior and Insular Affairs).

CONGRESSIONAL RECORD, Vol. 122 (1976): Feb. 23, 25, considered and passed Senate. July 22, considered and passed House, amended, in lieu of H.R. 13777. Sept. 30, House agreed to conference report. Oct. 1, Senate agreed to conference report.

PL 94-579, 1976 S 507

Remembering Eleanor Schwartz

(1912–2000)

Commemoration of the 25th anniversary of the passage of FLPMA would be incomplete without also celebrating the life and contributions of a woman who helped legislators craft the bill that would fundamentally change the way our public lands are managed. Eleanor Schwartz, who worked with the Bureau of Land Management (BLM) until her death in December 2000 at age 88, was head of the BLM's Office of Legislative and Regulatory Management for many years, including the period during which FLPMA was initially conceived, drafted, and eventually passed.

Schwartz, an attorney who joined the Department of the Interior in 1962, was instrumental in assisting legislators on the technical and legal aspects of the Act. Her work ethic and ability to assimilate into what was then a male-dominated agency paid off when she became the first woman GS-15 in BLM history.

Throughout her tenure at Interior, she remained active in the field of Equal Employment Opportunity, serving as the Federal Women's Coordinator for the BLM. She was honored twice with Interior's highest commendation, the Distinguished Service Award, which recognized, among other accomplishments, her work on the Federal Land Policy and Management Act.

In her passing, the BLM not only lost a devoted worker but also an institutional memory that can not be replaced.

BLM Photo

Eleanor Schwartz receives a Federal Women's Award from Boyd Rasmussen (BLM Director 1966–1971).

A Capsule Examination of the Legislative History of the Federal Land Policy and Management Act of 1976

Eleanor R. Schwartz*

Eleanor Schwartz, A Capsule Examination of the Legislative History of the Federal Land Policy and Management Act (FLPMA) of 1976, 21 ARIZ. L. Rev. 285 (1979). Copyright © 1979 by the Arizona Board of Regents. Reprinted by permission.

The "organic act" originally proposed by the Administration in 1971 for the Bureau of Land Management (BLM) was a relatively simple document.[1] The proposed legislation would have repealed several hundred outdated and duplicative laws, provided BLM with broad policy guidelines and management tools, and given BLM disposal and enforcement authority. However, by the time the Federal Land Policy and Management Act (FLPMA) was passed in 1976, it had become a lengthy, complex document, much more than an organic act.[2] In addition to broad management guidelines and authority, FLPMA provides legislative direction to numerous specific interests and areas of management.

Perhaps in recognition of the importance of the Act, particularly to the western states and because of its complex origins, the Senate Committee on Energy and Natural Resources in 1978 published a committee print, Legislative History of the Federal Land Policy and Management Act of 1976.[3] Prefacing the document is a memorandum in which Senator Henry M. Jackson, Chairman, summarizes for fellow committee members the background and need for the Act. He concludes with this statement:

> The Federal Land Policy and Management Act of 1976 represents a landmark achievement in the management of the public lands of the United States. For the first time in the long history of the public lands, one law provides comprehensive authority and guidelines for the administration and protection of the Federal lands and their resources under the jurisdiction of the Bureau of Land Management. This law enunciates a Federal policy of retention of these lands for multiple use management and repeals many obsolete public land laws which heretofore hindered effective land use planning for and management of public lands. The policies contained in the Federal Land Policy and Management Act will shape the future development and conservation of a valuable national asset, our public lands.[4]

Much has been written about the significance of the Federal Land Policy and Management Act, its meaning and impact, and its relationship to the report, *One Third of the Nation's Land,* issued in June 1970 by the Public Land Law Review Commission. This Article will discuss briefly the legislative history of the policies and provisions set forth in the Act.

Curiously, recreation was the subject of the first piece of public land legislation that might be considered a predecessor of FLPMA. In February 1970, Senators Jackson and Moss introduced into the 91st Congress a bill designed to improve outdoor recreation activities on the public lands administered by the Bureau of Land Management. The bill, S.3389, was passed by the Senate on

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1. *See* S. 2401, 92d Cong., 1st Sess., 117 CONG. REC. 28956, 28957 (1971).

2. *See* 43 U.S. C. __ 1701-1782 (9176).

3. SENATE COMMITTEE ON ENERGY & NATURAL RESOURCES, 95TH CONG., 2D SESS., LEGISLATIVE HISTORY OF THE FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (1978).

4. *Id*. at vi.

October 7, 1970,[5] about four months after the report by the Public Land Law Review Commission was released. The Senate committee's report on S.3389 acknowledged that the bill embodied some of the recommendations made by the Public Land Law Review Commission. The report identified needs of the public lands and shortcomings of management:

> Years of neglect have created many problems on the public lands administered by the Bureau of Land Management. Lack of regulations and enforcement authority have resulted in wanton vandalism and destruction of resources. Lack of sanitation facilities has created health hazards. Littering, overuse, and neglect have created unsightly blights on the landscape. Lack of public access has locked up millions of acres of public land for the private use of but a few, and many outstanding hunting, fishing, and other recreation opportunities are not available. As a result of the lack of enforcement authority and interpretive and restoration work, irreplaceable archeological values have been lost.[6]

S. 3389 recognized that the public lands administered by BLM are vital national assets that contain a wide variety of natural resource values, including outdoor recreation value, which should be developed and administered "for multiple use and sustained yield of the several products obtainable therefrom for the maximum benefit of the general public."[7] The bill contained a definition of multiple use,[8] which in substantial parts is the same as the definition in FLPMA,[9] and a definition of sustained yield[10] also similar to that in FLPMA.[11]

S. 3389 would have given the Secretary of the Interior the authority to acquire lands or interests necessary to provide access by the general public to public lands for outdoor recreational purposes. It also would have authorized allocation of Land and Water Conservation Fund money for this purpose.[12] Of more interest perhaps is the fact that S. 3389 would have provided comprehensive enforcement authority to the Bureau of Land Management. It made violations of public land laws and regulations of the Secretary relating to the protection of the public lands a violation punishable by a fine of not more than $500 or imprisonment for not more than six months or both.[13] It also provided that the Secretary could authorize BLM personnel to make arrests for violations of laws and regulations.[14]

No action was taken on S. 3389 by the House of Representatives.

In the 92d Congress, the Interior and Insular Affairs Committees of both the House and the Senate reported out bills relating to the management of the public lands. The Senate committee had before it two bills: Senators Jackson, Anderson, Cranston, Hart, Humphrey, Magnuson, Metcalf, and Nelson co-sponsored a bill, S. 921, "[t]o provide for the management, protection, and development of the national resource lands, and for other purposes."[15] At the same time, Senators Jackson and Allott co-sponsored at the Administration's request S. 2401 "[to provide for the management, protection and development of the national resource lands, and for other purposes."[16]

As its title indicated, S. 921 addressed not only the management of the public lands but also the disposal of federally owned minerals. Title II of

5. S. 3389, 91st Cong., 2d Sess., 116 CONG. REC. 35401 (1970).
6. S. REP. No. 91-1256, 91st Cong., 2d Sess. 2 (1970).
7. S. 3389, 91st Cong., 2d Sess. § 2, 116 CONG. REC. 35401 (1970).
8. *Id* § 3(b), 116 CONG. REC. at 35402.
9. 43 U.S. C. § 1702(c) (1976).
10. S. 3389, 91st Cong., 2d Sess § 3(c), 116 CONG. REC. 35401, 35402 (1970).
11. 43 U.S.C. § 1702(h) (1976).
12. S. 3389, 91st Cong., 2d Sess § 4(b), 116 CONG. REC. 35401, 35402 (1970).
13. *Id*. § 5, 116 CONG. REC. at 35402.
14. *Id*. § 6, 116 CONG. REC. at 35402.
15. S. 921, 92d Cong., 1st Sess., 117 CONG. REC. 3558-61 (1971).
16. S. 2401, 92d Cong., 1st Sess., 117 CONG. REC. 28956 (1971). S. 2401 referred to the lands administered by the Bureau of Land Management as "national resource lands." This term was being used at the time by the Bureau and the Department of the Interior in an effort to establish a more representative and mission-oriented identification for the lands than the less specific expression "public lands."

that bill would have been cited as the "Federal Land Mineral Leasing Act of 1971." It would have replaced and repealed both the Mining Law of 1872 and the Mineral Leasing Act of 1920, as well as several other mineral-related laws. Since S. 2401 was the Administration's proposal, it will be described in somewhat more detail than other forerunners of FLPMA. This fuller analysis will afford a basis for comparison between what the Administration sought as an organic act for the Bureau of Land Management and what Congress finally enacted.

S. 2401 had a short two-paragraph declaration of Congressional policy: (1) that the national interest would best be served by retaining the national resource lands in federal ownership except where the Secretary of the Interior determined that disposal of particular tracts was consistent with the purposes, terms, and conditions of the Act, and (2) that the lands be managed under principles of multiple use and sustained yield in a manner which would, "using all practicable means and measures," protect the environmental quality of those lands to assure their continued value for present and future generations.[17]

The bill prohibited the use, occupancy, or development of the national resource lands contrary to any regulation issued by the Secretary or to any order issued under a regulation.[18] S. 2401 also specified that an inventory of all national resource lands and their resources be maintained and that priority be given to areas of critical environmental concern.[19] Development and maintenance of land use plans would be required and management of the lands would be in accordance with these plans. Specific guidelines were provided. These included, among others, a requirement for land reclamation as a condition of use and revocation of permits upon violation of secretarial regulations or state and federal air or water quality standards and implementation plans. Also included was a requirement for prompt development of regulations for the protection of areas of critical environmental concern.[20]

Another provision of S. 2401 authorized the Secretary to sell public lands if he found that the sale would lead to significant improvement in the management of national resource lands or if he found that it would serve important public objectives which could not be achieved prudently and feasibly on land other than national resource lands. Sales were to be made at not less than fair market value.[21] Generally, conveyances of title were to reserve minerals to the United States, together with the right to develop them. However, the Secretary could grant full fee title if he found there were no minerals on the land or that reservation of mineral rights would interfere with or preclude development of the land and that such development was a more beneficial use of the land than mineral development. The Secretary would also have been required to insert in document of conveyance terms and conditions he considered necessary to ensure proper land use, environmental integrity, and protection of the public interest. In the event an area which the Secretary identified as an area of critical environmental concern was conveyed out of federal ownership, the Secretary would be required to provide for the continued protection of the area in the patent or other document of conveyance.[22] Liberal acquisition and exchange authority was provided by the bill.[23]

S. 2401, as introduced, would have made violations of regulations adopted to protect national resource lands, other public property and public health, safety and welfare a misdemeanor punishable by a fine of not more than $10,000 or imprisonment for not more than one year or both. It would have allowed the Secretary to designate employees as special officers authorized to make arrests or serve citations for violations committed on the public lands.[24] The bill also provided for

17. S. 2401, 92d Cong., 1st Sess., § 3 (1971).
18. *Id*. § 4.
19. *Id*. § 5.
20. *Id*. § 7.
21. *Id*. § 8.
22. *Id*. § 9.
23. *Id*. § 10.
24. *Id*. § 11.

public hearings, where appropriate, to give federal, state, and local governments and the public an opportunity to comment on "the formulation of standards and criteria in the preparation and execution of plans and programs and in the management of the national resource lands."[25] It specifically required that any proposed "significant change in land use plans and regulations pertaining to areas of critical environmental concern be the subject of a public hearing."[26] Finally, the bill authorized the appropriation of such sums "as are necessary to carry out the purposes of this Act"[27] and repealed a long list of prior laws.[28]

As reported out by the Senate Committee on Interior and Insular Affairs, S. 2401 contained a few significant changes and additions. Specific examples of areas of critical environmental concern were deleted, leaving only a short definition of the term. The statement of congressional policy was expanded, and the fine for violation of a regulation was reduced to $1,000. There was a requirement that the Director of the Bureau of Land Management be appointed by the President, with the advice and consent of the Senate. The Director would have to possess a broad background and experience in public land and natural resources management.[29] There was no provision for repeal of any public land laws.[30]

Eight members voted for and four against reporting S. 2401 out of the Senate Committee on Interior and Insular Affairs. The minority statement of Senators Hansen, Fannin, Hatfield, and Bellmon expressed agreement with the comment of President Nixon in his 1972 Environmental Message that this type of legislation was "something which we have been without for too long."[31] However, these Senators felt that the legislation had been the subject of too little discussion by the Committee. They noted that the bill granted broad authority to the Secretary of the Interior, but just how broad this authority was had never been discussed. Their view was that the legislation was too important to deal with in a hasty manner, and that the Committee should have the opportunity to study and analyze the legislation during the next session of Congress.[32] As a matter of fact, the Committee studied, discussed, and analyzed the legislation for two more Congresses before an organic act was enacted into law. The full Senate did not consider S. 2401 in the 92d Congress. As will be seen, many provisions of S. 2401 considered by the 92d Congress were enacted in the Federal Land Policy and Management Act of 1976, sometimes with only subtle changes or differences in emphasis.

The Interior and Insular Affairs Committee of the House of Representatives followed a different approach in the 92d Congress. That committee did not consider the Administration proposal but considered and reported out instead H.R. 7211,[33] a bill that had been introduced by Chairman Wayne Aspinall on behalf of himself and Congressmen Baring, Taylor, Udall, and Kyl. Although as introduced, H.R. 7211 would have been cited as the "Public Land Policy Act of 1971," when it was reported out its title was changed to "National Land Policy, Planning, and Management Act of 1972." The reported bill was a comprehensive piece of legislation designed to reflect as many as possible of the policies and recommendations of the Public Land Law Review Commission.[34] Included was an extensive statement of findings, goals, and objectives.[35]

The stated objective of H.R. 7211 was to provide for an overall land use planning effort on the part of all public land management agencies and to

25. *Id.*
26. *Id.* § 15.
27. *Id.* § 18.
28. *Id* § 19.
29. *Id*
30. S. REP. No. 92-1163, 92d Cong., 2d Sess. § 19, at 5 (1972).
31. *Id.* at 51.
32. *Id.*
33. H.R. 7211, 92d Cong., 2d Sess., 118 CONG. REC. 27179 (1972).
34. *See* PUBLIC LAND LAW REVIEW COMMISSION, ONE THIRD OF THE NATION'S LAND (1970).
35. H. R. 7211, 92d Cong., 2d Sess. § 101, 118 CONG. REC. 27179 (1972).

strengthen management by providing statutory guidelines applicable to all agencies having jurisdiction over the public lands. The goal was management practices that would be more uniform, more easily administered, and more easily understood by the public.[36] Title II of the bill, "National Land Use Planning," provided for federal grants to eligible states to be used in developing comprehensive land use planning. The bill contained detailed descriptions of the requirements to be met, specific provision as to how and for what the funds allotted could be expended, specifications for financial record keeping, and provisions for termination or suspension of the grants if the Secretary found that the state's comprehensive land use planning process no longer met the requirements of the bill or that the state was making no substantial progress toward the development of a comprehensive land use planning process.[37]

Title III of H.R. 7211 addressed "Coordination of Land Use Planning and Policy." It would have established within the Department of the Interior an Office of Land Use Policy and Planning to administer the grant-in-aid program under Title II and to coordinate between Title II programs with the planning responsibilities of the federal government spelled out in Title IV. The Committee report on H.R. 7211 stated: "To insure the absence of any mission-orientation in such administration and coordination, the Office is separate from any existing bureau or agency in the Department."[38] The bill as reported out of Committee also would have established a complex advisory system that included a National Land Use Policy and Planning Board,[39] land use policy coordinators appointed by the Board members,[40] Departmental Advisory Committees,[41] and local advisory councils.[42]

Title IV of H.R. 7211 was "Public Land Policy and Planning." The term "public lands" was defined as "any lands owned by the United States without regard to how the United States acquired ownership, and without regard to the agency having responsibility for management thereof."[43] Excluded were lands held in trust for the Indians, Aleuts, and Eskimos and certain lands acquired by the General Services Administration and other federal agencies.[44] Thus, the coverage of H.R. 7211 was far broader than had been proposed in any other of the public land bills before the Congress. Because many of the lands encompassed by its definition were covered by existing statutes, the bill declared specifically that the policies therein were supplemental to and not in derogation of the purposes for which units of the National Park System, National Forest System, and National Wildlife Refuge System were established and administered and for which public lands were administered by departments other than Agriculture and the Interior in the fulfillment of their statutory obligations.[45]

Title IV of H.R. 7211 contained sixteen declarations of policy that were based generally on recommendations of the Public Land Law Review Commission. The House Committee in its report recognized that each of the declarations would require additional legislative and administrative action.[46] An anticipated five to ten years would be required for the Congress to consider all the recommendations of the Commission and to develop the specific and detailed statutory language necessary to implement the recommendations that Congress agreed to. H.R. 7211 was designed to establish a "policy framework" within which the legislation to implement each policy could be

36. H.R. REP. No. 1306, 92d Cong., 2d Sess. 39 (1972).
37. H.R. 7211, 92d Cong., 2d Sess. tit. II, 118 CONG. REC. 27179 (1972).
38. H.R. REP. No. 92-1306, 92d Cong., 2d Sess. 30 (1972).
39. H.R. 7211, 92d Cong., 1st Sess. § 303, 118 CONG. REC. 27179 (1972).
40. *Id.* § 304, 118 CONG. REC. at 27179.
41. *Id.* § 306, 118 CONG. REC. at 27179.
42. *Id.* § 307, 118 CONG. REC. at 27179.
43. *Id.* § 503(n), 118 CONG. REC. at 27179.
44. *Id.* § 503(n)(3), 118 CONG. REC. at 27179.
45. *Id.* § 401, 118 CONG. REC. at 27179.
46. H.R. REP. No. 92-1306, 92d Cong., 2d Sess. 35 (1972).

contained, so that future congressional action could be on a coordinated basis.[47]

The sixteen statements of policy are interesting as a reflection of the recommendations of the Public Land Law Review Commission and in the light of the legislation finally enacted by Congress. Stated briefly, as they appear in the report of the House Committee, these recommended policies are:

(1) Public lands generally be retained in federal ownership;

(2) public land classifications be reviewed to determine the type of use that will provide maximum benefit for the general public in accordance with overall land use planning goals;

(3) Executive withdrawals be reviewed to ascertain if they are of sufficient extent, adequately protected from encroachment, and in accordance with the overall land use planning goals of the Act, with a view toward securing a permanent statutory base for units of the National Park, Forest, and Wildlife Refuge Systems;

(4) Congress exercise withdrawal authority generally and establish specific guidelines for limited Executive withdrawals;

(5) public land management agencies be required to establish and adhere to administrative procedures;

(6) statutory land use planning guidelines be established providing for management of the public lands generally on the basis of multiple use and sustained yield;

(7) public lands be managed for protection of quality of scientific, scenic, historical, ecological, and archeological values; for preservation and protection of certain lands in their natural conditions; to reconcile competing demands; to provide habitat for fish and wildlife; and to provide for outdoor recreation;

(8) fair market value generally be received for the use of the public lands and their resources;

(9) equitable compensation be provided to users if use is interrupted prior to the end of the period for which use is permitted;

(10) an equitable system be devised to compensate state and local governments for burdens borne by reason of the tax immunity of the federal land;

(11) when public lands are managed to accomplish objectives unrelated to protection or development of public lands, the purpose and authority therefore be provided expressly by statute;

(12) administration of public land programs by various agencies be similar;

(13) uniform procedures for disposal, acquisition, and exchange be established by statute;

(14) regulations for protection of areas of critical environmental concern be developed; and that authorizations for use of the public lands provide for revocation upon violation of applicable regulations;

(15) persons engaging in extractive or other activities “likely to entail significant disturbance” be required to have a land reclamation plan and a performance bond guaranteeing such reclamation; and

(16) the public lands be administered uniformly as to use and contractual liability conditions, except when otherwise provided by law.[48]

In addition to the extensive declaration of policy, Title IV of H.R. 7211 contained provisions relating to inventory, planning, public land use, management directives, and executive withdrawals. The bill also provided enforcement authority to land managing agencies and made violations of regulations issued by an agency head with reference to public lands administered by him punishable by fine or imprisonment or both. Title V of H.R. 7211 contained appropriation authorization, the repeal of many prior public land laws, and a series of definitions of terms used.

Time did not permit consideration of H.R. 7211 by the full House before the 92d Congress ended.

47. *See id*. at 36.
48. *Id*. at 36-39.

In the 93d Congress, the Senate had before it S. 424,[49] which Senator Jackson introduced on behalf of himself and Senators Bennett, Church, Gurney, Haskell, Humphrey, Inouye, Metcalf, Moss, Pastore, and Tunney. The Senate also had the Administration's proposal, S. 1041.[50] On July 8, 1974, S. 424 was passed by the Senate by a vote of 71 to 1, with 28 members not voting.[51] S. 424, with very few changes, was reintroduced in the 94th Congress as S. 507.[52] The new bill applied only to national resource lands—those lands administered by the Bureau of Land Management except the Outer Continental Shelf.

S. 507 contained these basic provisions relating to land management:

(1) management of the national resource lands under principles of multiple use and sustained yield;

(2) a return of fair market value to the federal government for the use or sale of lands;

(3) inventory;

(4) emphasis on planning;

(5) authority to issue regulations;

(6) public participation;

(7) advisory boards;

(8) annual reports;

(9) general management authority with specific guidelines;

(10) sales authority;

(11) expanded exchange authority;

(12) authority to convey reserved mineral interests;

(13) reenactment of the Public Land Administration Act of 1960 to put all land managing authorities into one statute;

(14) authority to issue recordable disclaimers of interest and to issue and correct patents;

(15) to afford an opportunity to zone or otherwise regulate the use of land, a requirement to notify states and local governmental units with zoning authority of any proposal to convey lands;

(16) authority to acquire land;

(17) creation of a working capital fund;

(18) enforcement authority;

(19) authority in the Secretary to cooperate with state and local governments in the enforcement of state and local laws on national resource lands;

(20) special provisions for cadastral survey operations and resource protection;

(21) special provisions for long-range planning for the "California Desert Area";

(22) provisions for oil shale revenues;

(23) a complete consolidation and revision of the authority to grant rights-of-way; and

(24) repeal of disposal, rights-of-way, and other statutes which this law was replacing.

S. 507, as passed by the Senate in the 94th Congress on February 25, 1976,[53] had these additional provisions that were not in S. 424 in the 93d Congress:

(1) provisions for disposal of "omitted" lands;

(2) amendments to the Mineral Leasing Act of 1920 to increase the percentage of revenues paid to states;

(3) provision for mineral impact relief loans; and

(4) provisions for recordation of mining claims and a conclusive presumption that any recorded claim for which the claimant did not make application for a patent within ten years after recordation is abandoned and therefor void.

There were two points of particular interest in the Senate floor debate on S. 507. The first point involved an amendment by Senator McClure that would have deleted from the provisions relating to

49. S. 424, 93d Cong., 1st Sess., 119 CONG. REC. 1339 (1973).
50. S. 1041, 93d Cong., 1st Sess., 119 CONG. REC. 5741 (1973).
51. 120 CONG. REC. 22296 (1974).
52. S. 507, 94th Cong., 1st Sess., 121 CONG. REC. 1821 (1975).
53. 122 CONG. REC. 4423 (1976).

mining claims the requirement that application for patents for mining claims be made within ten years.[54] The second point of particular interest involved grazing fees. Senator Hansen introduced an amendment that incorporated a formula for establishing a fee for grazing of domestic livestock on the public lands. The issue was vigorously debated on February 23 and again on the 25th. The grazing fee was opposed by Senators Jackson and Metcalf and by the National Wildlife Federation and the American Forestry Association, all of whose letters of opposition appear in the Congressional Record.[55] The amendment was also opposed by the Administration and eventually was rejected 36 to 53.[56] On February 25, after this amendment was rejected, S. 507 was passed by the Senate 78 to 11, with 11 members not voting.[57]

During the 93d and 94th Congresses, the Interior and Insular Affairs Committee of the House of Representatives was taking a different approach to public land legislation. Under the leadership of Representative John Melcher as Chairman, the Subcommittee on Public Lands held a series of meetings during which the members discussed and debated what they believed should be included in a bill. The Committee staff put proposed provisions into legislative language as the sessions went along. Committee prints were prepared and circulated for comment. By the end of the 93d Congress, eight prints had been prepared. Congressman John Dellenback had prepared a series of correcting amendments to the last print, but Congress adjourned before all the amendments could be incorporated into a bill. Two bills were actually introduced – H.R. 16676 and then H.R. 16800, a clean bill which corrected some errors discovered in the earlier bill.

During the 94th Congress, the Public Lands Subcommittee of the House Interior Committee conducted additional work sessions that culminated in the introduction of H.R. 13777.[58] This bill as reported out by the Committee not only granted management and enforcement authorities to the Bureau for public lands under its jurisdiction but also applied to public domain lands in the National Forest System. Some of the provisions relating to the Forest Service System were deleted when the bill was debated on the floor of the House. Passed by the House on July 22, 1976,[59] H.R. 13777 contained all the now familiar provisions of previous bills plus many new ones. The new provisions included:

(1) a grazing fee formula applicable to BLM-administered lands and lands in the National Forest System;

(2) provisions relating to duration of grazing leases applicable to BLM and National Forest System lands;

(3) requirements for grazing advisory boards, applicable to both BLM and Forest Service;

(4) provisions relating to wild horses and burros, also applicable to both BLM and Forest Service;

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54. Senator Haskell and Senator McClure debated the issue briefly. On the calling of the question, Senator Haskell noted the absence of a quorum. This led Senator McClure to withdraw his amendment saying:

> Mr. President, I know that the Senate as a whole will probably follow the lead of the committee. If we have a roll call on this, I would anticipate that the majority of them walking through these doors would never have heard of this question before and would be very apt to follow the lead of the committee under those circumstances. Under those circumstances, I think it is likely that the result can be forecast.
>
> In the expectation that this matter might be considered somewhat differently in the other body and with the full confidence that we can move forward on a comprehensive bill, perhaps before this bill has been passed and becomes law, I am suggesting, therefore, it might be varied by subsequent legislation or conference between the Senate and the other body on the Organic Act, and I will withdraw the amendment at this time.

112 CONG. REC. 4053 (1976). As Senator McClure anticipated, the provision was not in S. 507 as it passed the House. The conferees did not adopt the provision, and it is not in the Act.

55. 122 CONG. REC. 4419 (1976).

56. *Id*. at 4422.

57. *Id*. at 4423.

58. H.R. 13777, 94th Cong., 2d Sess., 122 CONG. REC. 13815 (1976).

59. 122 CONG. REC. 23483 (1976).

(5) amendment of what is frequently called the Unintentional Trespass Act;[60]

(6) provisions relating to the "California Desert Conservation Areas;" and

(7) the "King Range National Conservation Areas."[61] After the House passed H.R. 13777, S. 507 was considered, amended to read as H.R. 13777 did, and passed.[62]

As expected, the Senate disagreed to the amendments of the House and requested a conference. On July 30, 1976, Senate conferees were appointed: Jackson, Church, Metcalf, Johnston, Haskell, Bumpers, Hansen, Hatfield, and Fannin. Senator Fannin was replaced later by Senator McClure. Conferees from the House were Representatives Melcher, Johnson (California), Seiberling, Udall, Phillip Burton, Santini, Weaver, Steiger (Arizona), Clausen and Young (Alaska). At an organizational meeting held on August 30, 1976, Congressman Melcher was elected chairman. The conferees determined that because of all the primaries scheduled for early September, the first working session of the conferees could not be held until September 15. Staff were instructed to study the Senate and House versions of S. 407, identify areas of virtual agreement, outline areas of disagreement, and recommend alternatives for resolving those areas of disagreement.

The first difference in text addressed by the conferees was the short title of the Act. The title of the House amendment was "Federal Land Policy and Management Act of 1976." The title of the Senate amendment was "National Resource Lands Management Act." The Senate staff deferred to the House staff on the title, and the conferees concurred. The second issue involved the term to be used in referring to lands administered by the Bureau of Land Management. The conferees adopted the term used by the House—public lands—although they recognized, as the staff pointed out, that in the past that had been a confusing term, referring sometimes to public domain lands and other times to acquired lands. And so it went. During four sessions, on September 15, 20, 21, and 22 and spanning more than twelve hours, the conferees had extensive discussions but relatively little problem agreeing to language to be incorporated into the Act—with four major exceptions. These exceptions almost killed the Act.

The House version of the Act contained a grazing fee formula and a provision for ten-year grazing permits.[63] It also provided for grazing district advisory boards, as distinct from the multiple use advisory councils.[64] The Senate conferees, particularly Senator Metcalf, objected to these provisions. The Senate version of the Act contained a provision that required mining claimants to make application for patent within ten years after the date of recordation of the claim. If the claimant failed to do so, the claim would be conclusively presumed to be abandoned and would be void.[65] The House conferees, particularly Congressman Santini, objected to this.

These issues of grazing and mining were debated extensively on September 22nd. Before the end of that five-hour session, Senator Metcalf offered a "package compromise."[66] The proposed compromise required:

(1) that the grazing fee provisions be deleted from the bill—in effect that the House would accede to the Senate on Section 401;

(2) that the Senate agree with the House on the already adopted Metcalf/Santini amendment that all grazing leases be for ten years;

(3) that the conferees accept the grazing advisory boards with their functions limited to expenditure of range improvement fees;[67] and

60. 43 U.S. C. __ 1431-1435 (1976).

61. These add-ons have sometimes been called the "Christmas-tree amendments."

62. 122 CONG. REC. 23508 (1976).

63. H.R. 13777, 94th Cong., 1st Sess. __ 210, 211, 122 CONG. REC. 23447-48 (1976).

64. *Id* § 212, 122 CONG. REC. at 23448.

65. S. 507, 94th Cong., 1st Sess., § 207, 122 CONG. REC. 23497 (1976).

66. The proposal actually was brought to the conferees by D. Michael Harvey, Staff Counsel, because Senator Metcalf was at a meeting of the Committee on Committees.

67. Mr. Harvey noted that this was as far as Senator Metcalf would go on an individual basis, but as part of the package he would add to the functions of the grazing advisory boards the development of the management allotment plans.

(4) with respect to the Senate language on mining claims, that the language be applicable only to mining claims filed after enactment of the Act, not pre-existing claims.

The conferees could not agree on the compromise that day but did agree to meet again on September 23rd just in advance of the Conference on the National Forest Management Act of 1976 that was due to start at 1:30 p.m. Several of the conferees on S. 507 were also on the Forest Act conference. The conferees convened at 1:10 p.m. on September 23rd. Congressman Santini offered a substitute compromise that would knock out advisory boards, have five-year leases in return for keeping grazing fees, and knock out the patent provisions. Senator Metcalf countered with a proposal to accept the first three amendments he had offered and knock out the Senate language on mining. This was rejected by the Senate conferees and at 1:20 p.m., the Conference was adjourned by Chairman Melcher who said he saw no point in prolonging the meeting. For the moment, hopes dimmed for passage of an Organic Act for the Bureau of Land Management. The 94th Congress was in its last-minute rush before adjournment. But as with many pieces of landmark legislation, a compromise was reached at the eleventh hour, reportedly as a result of behind-the-scenes lobbying by interested private parties.[68]

On September 28, Congressman Melcher made a last minute effort to reach a compromise and get a public land management act in the 94th Congress. He called a meeting of the Conference Committee to commence at 5:30 p.m. that evening. The meeting was held in a very small room in the Congress. Very few persons, other than conferees and staff, were permitted in the room. Dozens of interested persons filled the halls and corridors leading to the meeting room. Within a few minutes of coming together, the conferees took a thirty-minute break.

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68. The struggle to achieve an acceptable middle ground was reported in the October 7, 1976, issue of *Public Land News: How the BLM Organic Act came back from the grave in five days*

The final, fateful meeting of the House-Senate conference committee that revived the BLM Organic Act pitted two unyielding antagonists—Sen. Lee Metcalf (D-Mont.) And Rep. James Santini (D-Nev.).

Simply put, Santini wanted a statutory grazing fee he co-authored to stay in the bill. Metcalf didn't.

So, on September 23, the conference deadlocked over the grazing fee when the House refused by a 5-5 vote to give up the provision. At the same time, the Senate conferees refused to allow the grazing fee to stay in. The bill was effectively dead for 1976 . . . or so the conferees said.

The deadlock began to give way the following day when the mining industry, principally the American Mining Congress, realized the Senate would give up its provision on requiring patent in 10 years. But only if the House dropped the grazing fee. The mining industry abhors the patent requirement.

So, the mining industry started pressuring the ranching industry to ask its Congressional allies to yield on the grazing fee, said sources in the cattle industry.

And Rep. John Melcher (D-Mont.)—chief sponsor of the House bill, candidate for the U.S. Senate—continued to push for a further compromise.

Pressure was applied primarily to Reps. Don Young (R-Alaska) and Don Clausen (R-Calif.), *PLNews* sources said.

Then on Tuesday morning (September 28) a meeting was held among the House supporters of the statutory grazing fee. They decided to yield on the grazing fee, reasoning that a freeze was better than no bill at all.

With that a meeting of the full conference was held in room S 224 of the Capitol at 5:30 p.m, just minutes after a compromise timber management bill had been hammered out in conference down the hall.

The last BLM conference, with only a half dozen attendees other than Congressmen and their staff, started badly. Metcalf and Santini, almost shouting at times, argued forcefully that each had already compromised too much. But Santini eventually offered a compromise on the grazing fee. It called for a statutory grazing fee for two years while a study was conducted. The Senate conferees refused to even consider it.

Then Clausen offered a compromise calling for freezing the present grazing fee, developed administratively by BLM and the Forest Service, for two years while a study was conducted. Again, the Senate refused to consider it.

Then the conferees, with no one in particular sponsoring it, agreed to consider a one-year freeze with study. Santini asked for and received a 30-minute break.

During the break, *PLNews* talked to representatives of the American National Cattlemen's Association and the Public Lands Council. They said, resignedly, the one-year freeze plus study was the most they could hope for, given the Senate conferees adamant opposition to anything else.

Finally, at 7 p.m. on September 28, the conferees reassembled and Melcher asked for a show of hands from the House members. He, Rep. James Johnson (R-Colo.), Rep. Harold T. Johnson (D- Calif.), Clausen, and Santini voted for the compromise. Melcher said Reps. Mo Udall (D-Ariz.), Jim Weaver (D-Ore.), and John Seiberling (D-Ohio) also would have agreed to the compromise if they had been present.

Word spread among the assembled crowd that the meeting was going badly. However, when the conferees reassembled at 7 p.m., those present voted almost immediately for the compromise that had been suggested earlier. The conferees and staff walked quickly out of the conference room. As they made their way down the corridor, they received the quiet congratulations of the very interested group of people who had waited to hear the final outcome of the session.

In keeping with its somewhat stormy and cliff-hanger history, the conference report was passed by the House on September thirtieth, and by the Senate on October first, just hours before the 94th session ended. The Act was signed by the President on October 21, 1976, and became Public Law 94-579, 90 Stat. 2743.

The Senate members present—Metcalf, Floyd Haskell (D-Colo.), and Frank Church (D-ID)—also agreed without a formal vote.

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OWYHEE COUNTY RESOLUTION NO. 08-02
"OWYHEE COUNTY RECREATION TRAIL PLAN FOR THE OWYHEE FRONT, EXCLUDING THE WILSON SUB-REGION"

The map which is attached to this Plan as Attachment A shows the recreation trails which are included in this Plan which is to be treated by the BLM as a county plan with which its agency must coordinate for consistency as required by FLPMA. The map illustrates the trails and the various motorized and non motorized uses which are permitted.

To complete its coordination responsibility and achieve consistency, the BLM should use Attachment A to establish a GPS map showing the Recreation trails on the Owyhee Front, excluding the Wilson Sub-Region, as established by this Plan and Attachment A. The BLM should place its GPS map on a disc which is available for law enforcement health and safety efforts, enforcement efforts, and education and information for the recreation land users.

The BLM should sign the trails established by this Plan, with informative signs being placed at intersections of trails, and at regular intervals along each trail. Such signs should inform as to the type(s) of recreation use allowed, and should contain an alphabetical letter plus three numbers as trail identification similar to those signs already used in some recreation trail areas by the BLM. The planning for signs, and the signing itself shall be coordinated with the County through the Recreation Task Force. That coordination will allow participation by user groups and cost sharing by user groups.

In signing the trails, the BLM can move or change portions of the trails shown on Attachment A for purposes of taking consideration of sensitive species, wildlife, and/or water developments. The alterations shall be coordinated with the County through the Recreation Task Force.

The BLM should, in coordination with State Parks and Recreation and the County, develop and establish a plan for regular trail management.

The BLM should, in coordination with State Parks and Recreation, Idaho Fish and Game, and the County, develop and establish a process through which seasonal closure of trails or portions of trails can be effectively put in place for grazing, wildlife and public safety concerns.

The BLM should, in coordination with the County, develop and establish a process through which trails or portions of trails can be closed and/or limited to facilitate emergency services to deal with fire, natural disaster, and other emergencies related to public health and safety, and to facilitate implementation of preventive measures in the interests of public health and safety.

This plan and Attachment A are not intended to, and do not, foreclose the planning of, permitting by the BLM of, and conduct of, competitive events on routes other than the trail routes shown on Attachment A. The BLM permit process for such competitive events should consider the meaningful recreation advantage experienced through such sanctioned events in the past, and should consider approval of such permit applications in a timely fashion. The permit review and approval process and the monitoring process for evaluating the conduct of competitive events and their impact, if any, on the environment shall be performed in coordination with the County, State Parks and Recreation, and the user organization which sponsored the event. The County will include the sponsoring user organization(s) in their coordination process in order to assure that plans and all issue considerations are fully understood and discussed, and will execute a Memorandum of Understanding of coordination with a user or organization which in the past has conducted competitive events in Owyhee County.

The BLM should coordinate with the County and State Parks and Recreation to obtain funds necessary and available for regular maintenance of trails designated in this Plan and Attachment A. The County will assist in coordinating establishment of grants from State Parks and Recreation for such maintenance. The County will also involve recreational users in the search for and acquiring of grants for maintenance.

The BLM should coordinate with the County and State Parks and Recreation with regard to the need/desire for development of new trails when expanded recreation uses can be accomplished consistent with private property rights, the protection of sensitive species, protection of wildlife and protection of the overall environment which includes human interests and concerns. When a request for establishing a new trail is received by the County, and after it is analyzed by the County Recreation Task Force, the County will place the request, and the recommendation of its Task Force, on a coordination agenda for discussion with the BLM and State Parks and Recreation and the requesting user/organization. Before a new trail is allowed, other than in a temporary competitive event, an expansion plan must be discussed and coordinated by the BLM, the County, State Parks and Recreation. Users may be involved in the planning effort through participation with the Owyhee County Recreation Task Force.

The County, the BLM, and State Parks and Recreation shall coordinate in adopting a strategy and implementing action to encourage and reinforce volunteer efforts to maintain, sign and repair trails

This Plan and Attachment A are not intended to, and do not, show the existence or non existence of RS 2477 rights of ways.

All trails not identified in this Plan and Attachment A should be closed and the closed trail routes should be eliminated and the routes rehabilitated.

This Plan and Attachment A do not prevent, or even apply to, administrative use by BLM personnel, grazing permittees, and regular law enforcement and emergency efforts to protect the public health and safety.

The following specific BLM actions shall be taken:

1. In Sections 1, 2 and 11, T4S R3W, the BLM should reroute the trail shown on Attachment A as a dotted a line to make it accessible for ATV use.
2. In Section 33, T3S R3W, the BLM should develop a trail to go around and not conflict with private property owned by Paul Nettleton/Joyce Livestock.
3. In Section 3, 4, 9 and 10, T2S R3W, the BLM should bury the Windy Point pipeline to a deeper underground location so that motorized traffic can pass over the pipeline without damage to the pipeline. This action will eliminate serious conflicts of land use.

Implementation of coordination as provided for in this Resolution and plan shall be in the hands of the Owyhee County Recreation Task Force which developed and recommended this Plan as well as the Hemmingway Plan both of which will be parts of the overall Owyhee County Natural Resources Plan.

This Resolution adopting the Owyhee County Recreation Trail Plan for the Owyhee Front, excluding the Wilson Sub-Region is executed this 25th day of Febuary, 2008.

Jerry L. Hoagland

Richard Fuller

Harold Tolmie / absent

Attest: Charlotte Sherburn