

Appendix K - Fuel Model Definitions

Fuels have been classified into four groups: grasses, shrubs, timber, and slash. The differences in these groups are related to the fuel load and distribution of fuel among size classes. Size classes are: 0-1/4" (1 hour fuels), 1/4-1" (10 hour fuels), 1-3" (100 hour fuels), and 3" and greater (1,000 hour fuels). A description of the fire behavior fuel models documented by Albini (1976) is contained in the following table:

Table AK-1. Description of fire behavior fuel models					
FUEL MODEL Typical Fuel Complex	FUEL LOADING (tons/acre)				FUEL BED DEPTH (in.)
	1 Hr	10 Hr	100 Hr	Live	
GRASS AND GRASS-DOMINATED					
1-Short Grass (1 ft.)	0.74	0.00	0.00	0.00	1.0
2-Timber (Grass and understory)	2.00	1.00	0.50	0.50	1.0
3-Tall Grass (2 ft.)	3.01	0.00	0.00	0.00	--
CHAPARRAL AND SHRUB FIELDS					
4-Chaparral (6 ft.)	5.01	4.01	2.00	5.01	6.0
5-Brush (2 ft.)	1.00	0.50	0.00	2.00	2.0
6-Dormant Shrub & Hdwd. Slash	1.50	2.50	2.00	0.00	2.5
7-Southern Rough	1.13	1.87	1.50	0.37	2.5
TIMBER LITTER					
8-Closed Timber Litter	1.50	1.00	2.50	0.00	0.2
9-Hardwood Litter	2.92	0.41	0.15	0.00	0.2
10-Timber (Litter and Understory)	3.01	2.00	5.01	2.00	1.0
SLASH					
11-Light Logging Slash	1.50	4.51	5.51	0.00	1.0
12-Medium Logging Slash	4.01	14.03	16.53	0.00	2.3
13-Heavy Logging Slash	7.01	23.04	28.05	0.00	3.0

The following is a brief description of each of the 13 fire behavior fuel models.

GRASS GROUP

Fire Behavior Fuel Model 1 - Fire spread is governed by the very fine, porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass. Very little timber or shrub are present.

Fire Behavior Fuel Model 2 - Fire spread is primarily through cured or nearly cured grass where timber or shrubs cover one to two-thirds of the open area. These are surface fires that may increase in intensity as they hit pockets of other litter.

Fire Behavior Fuel Model 3 - Fires in this grass group display the highest rates of spread and fire intensity under the influence of wind. Approximately one-third or more of the stand is dead or nearly dead.

SHRUB GROUP

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 over story. Stands of mature shrubs six feet tall or more are typical candidates. Besides flammable foliage, dead woody material in the stands contributes significantly to the fire intensity. A deep litter layer may also hamper suppression efforts.

Fire Behavior Fuel Model 5 - Fire is generally carried by surface fuels that are made up of litter cast by the shrubs and grasses or forbs in the understory. Fires are generally not very intense because the fuels are light and shrubs are young with little dead material. Young green stands with little dead wood would qualify.

Fire Behavior Fuel Model 6 - Fires carry through the shrub layer where the foliage is more flammable than Fuel Model 5, but requires moderate winds greater than eight miles per hour.

Fire Behavior Fuel Model 7 - Fires burn through the surface and shrub strata with equal ease and can occur at higher dead fuel mixtures because of the flammability of live foliage and other live material.

TIMBER GROUP

Fire Behavior Fuel Model 8 - Slow burning ground fuels with low flame lengths are generally the case, although the fire may encounter small "jackpots" of heavier concentrations of fuels that can flare up. Only under severe weather conditions do the fuels pose a threat. Closed canopy stands of short-needled conifers or hardwoods that have leafed out support fire in the compact litter layer. This layer is mostly twigs, needles, and leaves.

Fire Behavior Fuel Model 9 - Fires run through the surface faster than in Fuel Model 8 and have a longer flame length. Both long-needle pine and hardwood stands are typical. Concentrations of dead, down woody material will cause possible torching, spotting, and crowning of trees.

Fire Behavior Fuel Model 10 - Fires burn in the surface and ground fuels with greater intensity than the other timber litter types. A result of over maturing and natural events create a large load of heavy down, dead material on the forest floor. Crowning out, spotting, and torching of individual trees are more likely to occur, leading to potential fire control difficulties.

SLASH GROUP

Fire Behavior Fuel Model 11 - Fires are fairly active in the slash and herbaceous material intermixed with the slash. Fuel loads are light and often shaded. Light partial cuts or thinning operations in conifer or hardwood stands. Clearcut operations generally produce more slash than is typical of this fuel model.

Fire Behavior Fuel Model 12 - Rapidly spreading fires with high intensities capable of generating fire brands can occur. When fire starts, it is generally sustained until a fuel break or change in conditions occur. Fuels generally total less than 35 tons per acre and are well distributed. Heavily thinned conifer stands, clearcuts, and medium to heavy partial cuts are of this model.

Fire Behavior Fuel Model 13 - Fire is generally carried by a continuous layer of slash. Large quantities of material three inches and greater is present. Fires spread quickly through the fine fuels and intensity builds up as the large fuels begin burning. Active flaming is present for a sustained period of time and firebrands may be generated. This contributes to spotting as weather conditions become more severe. Clearcuts are depicted where the slash load is dominated by the greater than three inch fuel size, but may also be represented by a "red slash" type where the needles are still attached because of high intensity of the fuel type.

Appendix L - Fire Suppression Tactics

During suppression activities on all BLM lands within the Cascade-Siskiyou National Monument the following guidelines would be followed:

- BLM resource advisors will be dispatched to all fires which occur on BLM land. These resource advisors are utilized to ensure that suppression forces are aware of all sensitive areas and to insure damage to resources is minimized from suppression efforts.
- When feasible, existing roads or trails will be used as a starting point for burn-out or backfire operations designed to stop fire spread. Backfires will be designed to minimize fire effects on habitat. Natural barriers will be used whenever possible and fires will be allowed to burn to them.
- In the construction of fire lines, minimum width and depth will be used to stop the spread of fire. The use of dozers should be minimized and resource advisors will be consulted when appropriate. Live fuels will be cut or limbed only to the extent needed to stop fire spread. Rehabilitation of fire lines will be considered.
- The felling of snags and live trees will only occur when they pose a safety hazard or will cause a fire to spread across the fire line.
- The construction of helispots should be minimized. Past locations or natural openings should be used when possible. Helispots will not be constructed within riparian reserves, or areas of special concern.
- Retardant or foam will not be dropped on surface waters, or on occupied spotted owl or eagle nests.
- Resource advisors will determine rehabilitation needs and standards in order to reduce the impacts associated with fire suppression efforts.

Within the CSNM, several areas have been identified which limit suppression methods to assure that damage to all unique habitat is minimized. Maps identifying these areas are made available to suppression forces before the start of each fire season. Areas of special concern which require specific fire suppression tactics or limit tactics within the Cascade Siskiyou National Monument are displayed in the following table.

Table AL-1. Suppression tactics for designated special management areas within the CSNM.	
Designation	Fire Suppression Tactics
Owl Core Areas	<ul style="list-style-type: none"> • Protect nest tree and adjacent trees from felling or any type of damage. • Minimize fire damage to owl core area.
Archaeological Sites	<ul style="list-style-type: none"> • No use of tractors or hand line construction on sites
Scotch Creek RNA	<ul style="list-style-type: none"> • Confine use of vehicles to existing roads which are adjacent to the RNA. • No use of retardant adjacent to Scotch Creek or other wet areas. • No use of tractors within the RNA boundary.
Oregon Gulch RNA	<ul style="list-style-type: none"> • Confine use of vehicles to existing roads adjacent to the RNA. • No use of tractors within the boundary of the RNA. • No use of retardant adjacent to creeks or wet areas.
Bean Cabin	<ul style="list-style-type: none"> • Minimize disturbance to recreation site.
Pacific Crest Trail	<ul style="list-style-type: none"> • Minimize impacts due to suppression efforts to trail and the immediate area that is visible from the trail. • Allow fire to burn across trail and in surrounding area rather than to put in major tractor lines to suppress fire.
Soda Mountain Wilderness	<ul style="list-style-type: none"> • Refer to Fire suppression guidelines which follows this table

The following are Fire Suppression Guidelines for the Soda Mountain Wilderness Study Area.

- Protection agencies will notify the BLM immediately when a fire is reported in, or has the potential to enter the WSA.
- A BLM resource advisor shall be dispatched to all fires within the WSA. This individual will assist in identifying threatened resource, cultural or social values within the WSA. They will act as a liaison between the protection agency and the BLM Medford District.
- Earth moving equipment shall not be used without prior approval of the Medford District Manager. This authority may not be delegated and there will be no exceptions.
- Fire lines will be located to take advantage of natural barriers such as rock outcrops, streams and changes in vegetation.
- Unburned material may be left inside the fire line. All such material will be felt / tested with bare hands to ensure no sparks or glowing embers remain. Limbs, logs or other material turned parallel to the slope to prevent rolling will be placed or scattered to resemble natural conditions.
- Water barring of fire lines will be done to prevent accelerated erosion.
- Limbing of trees adjacent to fire lines will be done only if needed for fire suppression and/or fire fighter safety.
- Burning snags or trees will only be felled when they pose a definite threat to the containment of the fire or the safety of fire fighters.
- Logs within the proposed fire line location will be rolled out of their beds. If rolling is not possible fire lines shall be constructed around these logs where possible.
- Helispots should use natural openings where only minimal improvements are necessary. Helispots should be constructed outside the WSA when possible.
- With the exception of removing obstructions, trails and waterways should not be improved. If improvement is necessary they should be restored to pre-fire conditions if possible.
- Fire engines and other non-earth moving equipment used in suppression efforts should use existing roads which are adjacent to the WSA. When this is not feasible efforts shall be taken to minimize crossings of streams, springs or wet areas. Steep slopes should be avoided.
- Use of fire retardant may be used but their use adjacent to existing water sources should be avoided.

Appendix M- Statistical and Demographic Data

A Statistical Overview of Selected Social and Economic Characteristics of the CSNM and of Jackson County

This appendix presents statistical and demographic data related to social and economic conditions in the CSNM area and in Jackson County, Oregon. Much of the discussion and conclusions related to these data is contained in Chapter 2.

Appendix M1--Data Census

Table AM - 1. 1990 Census Data						
Category	Pinehurst/Greensprings		Jackson County		State of Oregon	
	#	(%)	#	(%)	#	(%)
Population	1205		146,389		2,842,321	
Population by Ethnic Group						
White	1182	99	140,188	95.8	2,636,787	92
Black	4	<1	340	<1	46,178	<1
American Indian	4	<1			38,496	<1
Asian/Pac Islander	7	<1			69,269	2
Hispanic	25	2.1	5861	4.0	112,707	4
Other	8	<1			51,591	1.8
Age Group Distribution						
0-17	335	27.8	36,705	25.1	724,130	25.8
18-64	744		85,972		1,726,867	
65+	126	10.5	23,712	16.2	391,324	13.8
Median age	38.7		36.7		34.5	
Education						
Postgraduate	125	15.5	5,806	5.9	129,545	6.9
College Degree	135	16.7	11,389	11.7	252,626	13.4
Some College	261	32.3	29,414	30.1	592,902	31.4
High School Diploma	145	17.8	31,547	32.3	536,687	28.5
Less than High School	143	17.7	19,448	19.9	343,609	18.2
Total 25+	809		97,604		1,885,369	
Household Income (1989)						
Households	409		57,400		1,105,362	
Less than \$5,000	6	1.5	3,467	6.0	60,824	5.5
\$5,000 to \$9,999	36	8.8	6,511	11.3	108,006	9.8
\$10,000 to \$14,999	17	4.2	6,786	11.8	112,425	10.2
\$15,000 to \$24,999	74	18.1	11,856	21.0	222,693	20.1
\$25,000 to \$34,999	75	18.3	10,090	17.6	194,886	17.6
\$35,000 to \$49,999	93	22.7	10,191	17.8	194,702	18.1
\$50,000 to \$74,999	54	13.2	5,841	10.2	138,482	12.5
\$75,000 to \$99,999	30	7.3	1,427	2.5	37,088	3.4
\$100,000 to \$149,999	8	2.0	765	1.3	19,624	1.8
\$150,000 or more	16	3.9	466	0.8	11,632	1.1
Median HH Income (\$)	34,375		25,069		27,250	

Table AM - 1. 1990 Census Data						
Category	Pinehurst/Greensprings		Jackson County		State of Oregon	
	#	(%)	#	(%)	#	(%)
Income Type in 1989						
Households	409		57,400		1,105,362	
With wage/salary income	327	80.0	40,551	70.6	885,621	75.6
With nonfarm self-emp.	96	23.5	8,700	15.2	159,941	14.5
With farm self-emp inc.	38	9.3	1,392	2.4	33,146	3.0
With Social Security inc.	86	21.0	18,276	31.8	306,040	27.7
With public assistance inc	29	7.1	3,799	6.6	66,998	6.1
With retirement income	70	17.1	10,905	19.0	185,721	16.8
Poverty Rate/Persons						
	55 of 1,246	4.4	18,925/ 143,025	13.2	344,867/ 2,775,907	12.4
Housing						
Total Occupied Units	430		57,238		1,103,313	
Owner Total	346	80.5	37,920	66.2	695,957	63.1
Rental Total	84	19.5	19,318	33.8	407,356	36.9
Monthly Owner Cost as Percent of Household Income in 1989						
Total specified housing units	197		25,057		516,057	
Less than 20%	102	51.8	13,348	53.3	290,891	56.4
20-24%	0	0	3,988	15.9	79,398	15.4
25-29%	40	20.3	2,407	9.6	49,947	9.7
30-34%	13	6.6	1,309	5.2	28,884	5.6
35% or more	42	21.3	3,810	15.2	63,948	12.4
Not computed	0		195	0.8	2,989	0.6
Gross Rent as Percent of Household Income in 1989						
Total specified units	58		18,549		394,927	
Less than 20%	43	74.1	5,165	27.8	127,587	32.3
20-24%	7	12.1	2,449	13.2	56,614	14.3
25-29%	0		2,211	11.9	45,026	11.4
30-34%	0		1,532	8.3	30,105	7.6
35% or more	0		6,200	33.4	117,192	30.0
Not computed	8	13.8	992	5.3	18,403	4.7
Persons per Household (Housing units / pop)						
		2.94		2.55		2.57
Mean travel to work (min)						
		19.7		16.7		19.6
Self-employed						
	89 of 535		6,922/ 62,704		122,886/ 1,319,960	9.3

Source: 1990 Census Data, with assistance from Southern Oregon University Regional Services Institute and <http://govinfo.orst.edu/stateis.html>.

Appendix M2--Intercensal Estimate of Poverty

Table AM - 2. Estimates of Poverty by School District: 1995		
Area/District Name	Poverty rate for children, 5 to 17 years of age	Statewide Rank*
Oregon	13.0	—
Jackson County	14.9	—
Eagle Point	21.4	208
Rogue River	17.9	189
Pinehurst	16.7	170
Ashland	15.4	149
Medford	14.8	138
Phoenix-Talent	13.9	127
Butte Falls	13.3	115
Prospect	9.4	67
Central Point	7.0	39
Josephine County	23.1	—
Grants Pass	22.6	218
Three Rivers	22.4	214

*Out of 236 districts reported

Source: U.S. Census Bureau, February 1999

Appendix M3--Occupational Census

Table AM - 3. A Comparison of Occupational Structures, Pinehurst/Greensprings, Jackson County and State of Oregon Using 1990 Census Data						
Industry Category	Pinehurst/ Greensprings CT25, BG1		Jackson County		State of Oregon	
	#	%	#	%	#	%
Employed persons 16 yrs & over	535		62,704		1,319,960	
Agriculture, forestry, & fisheries	25	4.7	3,101	4.9	66,730	5.1
Mining	15	2.8	121	0.2	2,479	0.2
Construction	45	8.4	3,908	6.2	74,206	5.6
Manufacturing, nondurable goods	25	4.7	1,740	2.8	61,873	4.7
Manufacturing, durable goods	36	6.7	7,724	12.3	171,335	13.0
Transportation	8	1.5	2,527	4.0	55,283	4.2
Communication & othr pub util	9	1.7	1,261	2.0	31,006	2.3
Wholesale trade	9	1.7	2,667	4.3	61,938	4.7
Retail trade	88	16.4	14,094	22.5	239,010	18.2
Finance, insurance, real estate	25	4.7	3,319	5.3	78,671	6.0
Business and repair services	21	3.9	2,775	4.4	60,660	4.6
Personal services	41	7.7	2,245	3.6	40,768	3.1
Entertainment & recreation serv.	14	2.6	1,114	1.8	17,650	1.3
Health services	50	9.3	5,404	8.6	103,623	7.9
Educational services	81	15.1	4,840	7.7	112,018	8.4
Other professional, rel. services	37	6.9	3,482	5.6	88,577	6.7
Public administration	6	1.1	2,382	3.8	54,133	4.1

Source: 1990 Census, obtained through Southern Oregon Regional Services Institute (SORSI).

The Regional Economic Picture

The regional economy of southern Oregon has been undergoing profound shifts in the last thirty years. The traditional economic sectors of timber production, agriculture, fishing and mining have experienced modest to significant decline, while the trades and services sectors related to recreation, tourism, retirement and computer technology have shown dramatic increases. Regional economists have generally come to believe that the Northwest economy has diversified and matured because of these developments. The traditional sectors will continue to play an important role in the regional economy, while economic choices for average people are widening in significant ways.

A 1995 paper by over 30 economists of the Northwest, almost all affiliated with academic institutions, outlined a consensus position on economic well-being and environmental protection in the Northwest (Pacific Northwest Economists, 1995). They presented information that showed that personal income (labor income, dividends, rent, interest and retirement income) in the region as a whole grew 2.2 times faster than the national average between 1988 and 1994. They also pointed to migration studies that show people moving to this area for quality of life reasons.

Appendix M4 - - Jackson County Economy

Table AM - 4. Jackson County Occupational Structure, 1970-1998									
	1970	1980	1981	1982	1983	1984	1985	1986	1987
Civilian Labor Force	37,240	63,070	65,120	63,820	63,800	64,380	64,060	66,560	69,430
Unemployment	3,040	6,510	8,260	9,220	7,670	6,460	6,000	5,690	4,460
Total Wage and Salary Emp.	26,500	43,500	42,140	39,390	40,790	43,260	44,620	46,770	49,380
Total Manufacturing	6,010	7,690	7,240	6,280	7,550	8,430	8,240	8,390	8,990
Lumber & Wood Products	4,570	5,030	4,700	3,880	4,750	5,100	5,290	5,440	5,910
Other Manufacturing	1,440	2,660	2,540	2,400	2,800	3,330	2,950	2,950	3,080
Total Non-Manufacturing	20,490	35,810	34,900	33,110	33,240	34,830	36,380	38,380	40,390
Const. & Mining	810	1,960	1,320	990	1,040	1,120	1,470	1,780	1,700
Trans., Comm. & Utilities	1,590	2,240	2,160	2,090	2,160	2,350	2,550	2,720	2,790
Trade	6,600	11,890	11,840	11,000	11,280	11,970	12,450	13,240	14,160
Finance, Ins. & Real Est.	980	2,230	2,230	2,170	2,160	2,250	2,190	2,260	2,420
Services & Misc.	4,500	8,040	8,370	8,200	8,460	8,970	9,250	9,730	10,460
Government	6,010	9,450	8,980	8,660	8,140	8,170	8,480	8,650	8,860

Table AM - 4. Jackson County Occupational Structure, 1970-1998									
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Civilian Labor Force	37,240	63,070	65,120	63,820	63,800	64,380	64,060	66,560	69,430
Unemployment	3,040	6,510	8,260	9,220	7,670	6,460	6,000	5,690	4,460
Total Wage and Salary Emp.	26,500	43,500	42,140	39,390	40,790	43,260	44,620	46,770	49,380
Total Manufacturing	6,010	7,690	7,240	6,280	7,550	8,430	8,240	8,390	8,990
Lumber & Wood Products	4,570	5,030	4,700	3,880	4,750	5,100	5,290	5,440	5,910
Other Manufacturing	1,440	2,660	2,540	2,400	2,800	3,330	2,950	2,950	3,080
Total Non-Manufacturing	20,490	35,810	34,900	33,110	33,240	34,830	36,380	38,380	40,390
Const. & Mining	810	1,960	1,320	990	1,040	1,120	1,470	1,780	1,700
Trans., Comm. & Utilities	1,590	2,240	2,160	2,090	2,160	2,350	2,550	2,720	2,790
Trade	6,600	11,890	11,840	11,000	11,280	11,970	12,450	13,240	14,160
Finance, Ins. & Real Est.	980	2,230	2,230	2,170	2,160	2,250	2,190	2,260	2,420
Services & Misc.	4,500	8,040	8,370	8,200	8,460	8,970	9,250	9,730	10,460
Government	6,010	9,450	8,980	8,660	8,140	8,170	8,480	8,650	8,860

Appendix M5--Cattle Numbers in Jackson County

Table AM - 5. Number and Value of Cattle and Calves in Jackson County and Oregon for Selected Years		
Year	Head All Cattle and Calves	
	Jackson	Oregon
1960	49,000	1,421,000
1970	44,000	1,514,000
1993	34,000	1,380,000
1994r	35,000	1,410,000
1995r	40,090	1,470,000
1996p	42,770	1,460,000
Year	Value of Cattle and Calves Sold (000's)	
	Jackson	Oregon
1960	2,446	80,324
1970	4,245	140,284
1993	9,874	402,700
1994r	8,783	376,683
1995r	8,783	376,683
1996p	7,906	252,141

Source: Oregon State University. August, 1997. Commodity Data Sheet, Cattle, Extension Economic Information Office. Publication 9140-96. Corvallis, OR. Also available on the web at: <http://osu.orst.edu/dept/EconInfo/>.

Recreation and Tourism

Unlike many other sectors, tourism is a category of economic activity that incorporates several Standard Industrial Classifications (SIC), and furthermore, it is derived not by the goods and services purchased, but by the residence of the consumer. Consequently, it is a sector whose contribution to the economy has always been difficult to measure. Estimates of tourism-related employment are based on the analysis of tourism expenditures and the allocation of such spending across several industrial categories, typically lodging, eating / drinking establishments, food stores, auto / transport expenses, recreation, and retail sales. In both Jackson and Josephine Counties, the overall rate of tourism employment was 4.5% of total employment in 1992. Tourism employment expanded by 16% in Jackson County between 1987 and 1992, comparable to the state's overall employment increase for the same period. Tourism employment in Jackson County increased its share of employment from 3.8% in 1987 to 4.5% in 1992 (Reid and Flagg 1995: 34).

SORSI developed a profile of summer visitors in 1996 based on interviews at Lithia Park, the Oregon Caves, Jacksonville, State and County Parks and other sites throughout the two-country region (Reid and Lucas 1997b). They compared results of this survey to a similar one of 1990 to determine if visiting patterns had changed. They had. The share of California visitation dropped from 51% to 46% and the share of visitation from Oregon and Washington correspondingly rose. Both surveys pointed to the preponderance of visitors from couple households and households without children. The share of repeat visitors increased from 71% to 80% between 1990 and 1996. Both studies showed a predominance of visitors who lived within a day's drive of the region. One third of summer visitors used motel accommodations, followed in order of importance by reliance on camping / RV, friends / relatives, day use, and bed and breakfast inns.

SORSI conducted a study of motel visitors to the cities of Jackson and Josephine Counties (Reid and Lucas 1997c) and found that travelers in the off season were more often without children, were senior citizens, or were business travelers. Off-season visitors were also wealthier and better educated than their summer counterparts. In terms of repeat business, 88% of off-season visitors had visited the area before, reflecting their business and pass-through reasons. Ashland had the highest percentage of repeat visitors, and Grants Pass the lowest. The primary reasons for off season visits were ranked as follows: traveling through, vacation / pleasure, business / work, friends / relatives, relocation, and shopping. Median length of stay for both summer and off-season visitors was 2 nights. Activities enjoyed most by visitors were ranked from most to least favorite: cultural, historic, passive outdoor, active outdoor, water-related, relax / sightseeing, and shopping and eating out. Visitors relied most on past experience and word of mouth in deciding to visit the area, but over 30% relied on automobile clubs, travel literature and chambers of commerce / visitors centers.

Appendix N - Other Economic Sectors

The health services sector increased by 2,500 jobs (44%) from 1987 to 1997 in the two county region, in such areas as managed care, specialty clinics, outpatient services, as well as physicians' and other practitioners' offices (Anderson 1998: 25).

Although state employment in health services averages 7% of the labor force, in Jackson County it was 9% in 1993, exceeding lumber and wood products employment. The average wages paid to a health services worker is 19% above the county overall per capita wage, more than keeping up with the inflation rate. Health services employment in Jackson County increased by 73% from 1986 to 1993, while the sector increased 61% for the state as a whole (Reid and Flagg 1995: 31).

Health services can have an important influence on the local economy. In addition to the direct jobs they generate, they generate a high number of secondary jobs, relatively speaking. One study reported a multiplier effect in Oregon of 3.75 for every physician and physician employee, so a community with 20 medical personnel could generate an additional 75 jobs (Doeksen et.al. n.d.). By contrast, a grocery store employee has a multiplying effect of 1.33 in the Rogue Valley and a worker in a plywood mill worker in the Rogue Valley will generate an additional 2.84 jobs (personal communication, Mary Wright, Oregon Employment Department [OED])

Modem cowboys and "lone eagles" are terms in the literature referring to the growing number of entrepreneurs who make their living linked to the global marketplace and who are not dependent on the local economy. A key feature of this economic activity is that it involves the export of goods and services in some way. Hence, some artists sell only to a local tourism market, while others sell to national or international markets. Another feature is reliance on telecommunications. The use of computer modems and the internet have opened the doors to commercial activity for many that would have no outlet otherwise. The term, "modem cowboy," can be misleading too because transportation (UPS, airports) educational institutions and other telecommunications are important also. Socially and economically, modem cowboys are changing the face of the rural landscape. Economists are calling it "the declining disadvantage of distance." A University of Washington study found that they contributed 2600 jobs in a one-year period, and were responsible for 3% of the state's economy (Fossum 1996). Byers and his associates (1995) found that these entrepreneurs rated quality of life as extremely important, and ranked as relatively less important more traditional factors of labor and land costs, the tax base and so on. Byers et.al. estimate that modem cowboys contribute up to 17% of the rural counties that they analyzed.

Appendix O - Soda Mountain Communication Site Photos



Fig. 1) View of Soda Mtn. Lookout owned by Oregon Dept. of Forestry. Communications building and tower owned by AT&T Wireless.

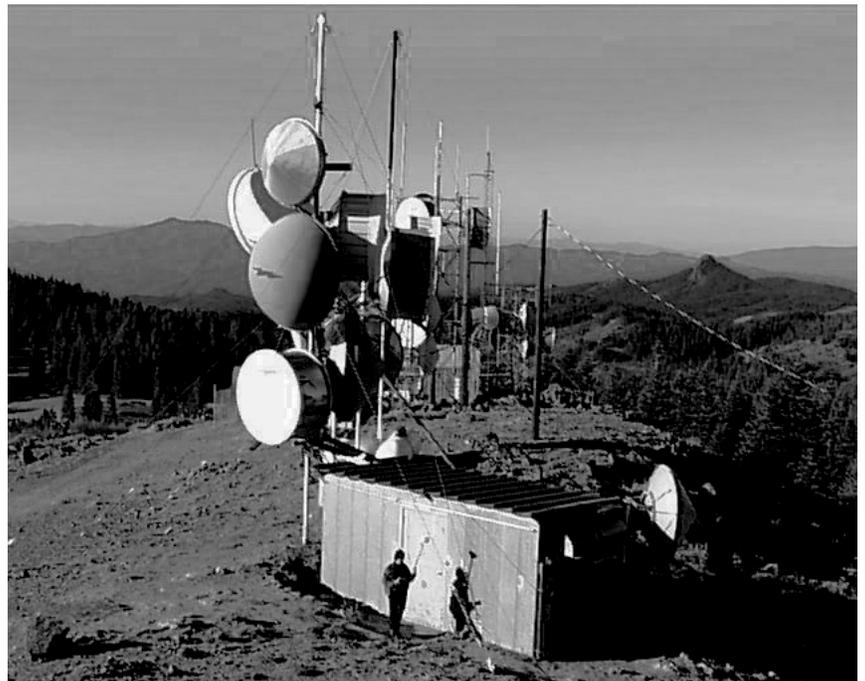


Fig. 2) View of communication facilities from Soda Mtn. Lookout. View is looking down main ridge (SW). Pilot Rock on right.

Appendix P - Linear and Site Authorization Table

Table AP-1. Authorized Uses Occurring in the Cascade-Siskiyou National Monument			
OR/ORE #	HOLDER	TYPE or USE	REMARKS
20137	US West	Communication Site	
34999	Or. Highway Dept.	Communication Site	
36203	COBI*	Communication Site	with sub-lessee
38053	PP&L	Communication Site	
44980	ODF	Lookout & Communication Site	with sub-lessee
48563	AT&T Wireless	Communication Site	with sub-lessee
49604	US Cellular	Communication Site	
54336	SOU (JPR)**	Communication Site	with sub-lessees
17317	PP&L	Utility Line	
20544	PP&L	Utility Line	Line 19 (115 kV)
24416	PP&L	Utility Line	Line 59 (230 kV)
24876	US West	Utility Line	
26313	C. & H. Honingford	Road	Soda Mtn. Road
34269	US West	Utility Line	
37585	R. Taylor	Ditch	
42014	US Sprint	Fiber Optic Line	
43005	S. Young	Water Line	
43975	AT&T	Fiber Optic Line	
45363	L. Tynes	Road	Private Access Road
46542	PP&L	Fiber Optic Line	
47421	MCI	Road	Soda Mtn. Road
47454	PP&L	Utility Line	
48560	PP&L	Utility Line	
50516	C. & M. McLaughlin	Road	BLM Road #40-3E-3
54223	MGeorge\K Freeman	Road	Soda Mtn. Road
0497	US West	Utility Line	

Table AP-1. Authorized Uses Occurring in the Cascade-Siskiyou National Monument			
OR/ORE #	HOLDER	TYPE or USE	REMARKS
03235	R. Taylor	Water Facility	
06936	Bur. of Reclamation	Canal & Laterals	Serves T.I.D.
013754	Or. Highway Dept.	Interstate Highway	I-5
R011947	US West	Utility Line	
R022462	Or. Highway Dept.	State Highway	Old Highway 99
R023045	Or. Highway Dept.	Interstate Highway	I-5
5439	US West	Utility Line	
13745	PacifiCorp	Transmission Line	500 kv line
14956	US West	Utility Line	
18550	SOPTV***	Communication Site	Chestnut Mtn.
23467	State of Oregon	Communication Site	Chestnut Mtn.
24498	M. McLaughlin	Water Line	
35917	US West	Utility Line	
36695	US West	Utility Line	
36784	State of Oregon	Airport Lease	Pinehurst Airstrip
37836	M. McLaughlin	Water Line	
41384	Grant Willey	Road	
42492	Corral Cr. HOA****	Road	
44943	D. Rowlett	Agricultural Lease	
44944	Don Rowlett	Road	
45379	Bur. of Reclamation	Canal	
45385	D. Cleland	Road	
45495	Roskamp Services	Water Line	
45999	Kurt Stark	Road	
46052	C. Russell	Road	
46135	J. Walt	Road	
48248	Don Rowlett	Ditch	
49214	D. Ragnell	Road	

Table AP-1. Authorized Uses Occurring in the Cascade-Siskiyou National Monument			
OR\ORE #	HOLDER	TYPE or USE	REMARKS
49413	Ed Milsom	Road	
50516	M. McLaughlin	Road	
50673	Roskamp Services	Road	
50687	H. Cassells	Road	
53772	S. Tall Hunter	Road	
53615	P. Smeenk	Water Line	
03490	PacifiCorp	Utility Line	
05569	US West	Communication Site	Chestnut Mtn.
05609	PacifiCorp	Utility Line	
55148	L.Neale	Event Permit	Sundance Group
06936	Bur. of Reclamation	Canal and Laterals	
012019	PacifiCorp	Utility Line	
013626	Pinehurst School	R&PP Lease*****	Elementary School
013794	Or. Highway Dept.	Maintenance Facility	Highway 66
R014637	Bur. of Reclamation	Hyatt Reservoir	

* California-Oregon Broadcasting, Inc.

*** Southern Oregon Public Television

***** Recreation and Public Purposes Act

* Southern Oregon University, Jefferson Public Radio

**** Home Owner's Association

“R” Roseburg General Land Office (GLO) cases

Appendix Q - Butterflies Identified in the CSNM

Table AQ-1. Butterfly Species recorded in the CSNM		
SKIPPERS	HESPERIIDAE	KNOWN LOCALES
Silver-spotted Skipper	<i>Epargyreus clarus californicus</i>	Scotch, Porcupine, & Keene Creeks, Soda Mtn Rd
Northern Cloudywing	<i>Thorybes pylades indistinctus</i>	Porcupine Gap, Pilot Rock, Keene Cr., Soda Mtn Rd
Dreamy Duskywing	<i>Erynnis icelus</i>	Scotch Cr. canyon, Pilot Rock, Porcupine Cr., Hyatt
Properius Duskywing	<i>Erynnis properius</i>	widespread
Dyar's Duskywing	<i>Erynnis pacuvius lilius</i>	Hobart Peak
Persius Duskywing	<i>Erynnis persius "persius"</i>	Soda Mtn Rd., Scotch Cr. canyon, Hyatt
Two-banded Checkered Skipper	<i>Pyrgus ruralis ruralis</i>	Soda Mtn Rd.
Common Checkered Skipper	<i>Pyrgus communis</i>	Soda Mtn Rd, Porcupine Cr., Keene Cr., Oregon Gulch
Arctic Skipper	<i>Carterocephalus palaemon skada</i>	Soda Mtn Rd., Hyatt, Scotch Cr. canyon
Juba Skipper	<i>Hesperia juba</i>	widespread
Oregon Comma Skipper	<i>Hesperia "colorado" oregonia</i>	Pilot Rock, Hobart Peak, Bocard Point
Columbian Skipper	<i>Hesperia columbia</i>	Hobart Peak
Lindsey's Skipper	<i>Hesperia lindseyi septentrionalis</i>	widespread, mostly southern
Sandhill Skipper	<i>Polites sabuleti aestivalis</i>	Siskiyou Summit
Klamath Mardon Skipper	<i>Polites mardon klamathensis</i>	Soda Mtn Rd.
Sonoran Skipper	<i>Polites sonora sonora</i>	riparian (Soda Mtn Rd, Oregon Gulch, Keene Cr.)
Woodland Skipper	<i>Ochlodes sylvanoides sylvanoides</i>	widespread
Dun Skipper	<i>Euphyes vestris vestris</i>	Keene Cr., Emigrant Cr. Rd., Oregon Gulch
Roadside Skipper	<i>Amblyscirtes vialis</i>	Soda Mtn Rd, Porcupine Cr., Keene Cr., Oregon Gulch
SWALLOWTAILS	PAPILIONIDAE	KNOWN LOCALES
Clodius Parnassian	<i>Parnassius clodius clodius</i>	Soda Mtn, Chinquapin Mtn, Hobart Peak, Keene Cr.
Sternitzky's Parnassian	<i>Parnassius smintheus sternitzkyi</i>	Pilot Rock, Soda Mountain, Scotch Cr. canyon
Anise Swallowtail	<i>Papilio zelicaon zelicaon</i>	widespread (mountaintops & ridges)
Indra Swallowtail	<i>Papilio indra shastensis</i>	Siskiyou Summit
Western Tiger Swallowtail	<i>Papilio rutulus rutulus</i>	widespread
Two-tailed Swallowtail	<i>Papilio multicaudatus</i>	Scotch Cr. canyon, Porcupine Cr., Soda Mtn Rd.
Pale Tiger Swallowtail	<i>Papilio eurymedon</i>	widespread

Table AQ-1. Butterfly Species recorded in the CSNM		
WHITES and SULFURS	PIERIDAE	KNOWN LOCALES
Pine White	<i>Neophasia menapia menapia</i>	widespread
Becker's White	<i>Pontia beckerii</i>	Siskiyou Summit
Spring White	<i>Pontia sisymbrii sisymbrii</i>	Pilot Rock, Soda Mountain, Hobart Peak
Checkered White	<i>Pontia protodice</i>	Siskiyou Summit
Western White	<i>Pontia occidentalis occidentalis</i>	Hobart Peak, Soda Mountain, Pilot Rock
Viened White	<i>Pieris marginalis castoria</i>	widespread
Cabbage White	<i>Pieris rapae</i>	widespread
Large Marble	<i>Euchloe ausonides ausonides</i>	widespread
Sara Orangetip	<i>Anthocharis sara ssp.</i>	widespread
Gray Marble	<i>Anthocharis lanceolata</i>	widespread
Clouded Sulfur	<i>Colias philodice eriphyle</i>	Scotch Cr., Keene Cr., Pilot Rock
Orange Sulfur	<i>Colias eurytheme</i>	widespread
Western ("Golden") Sulfur	<i>Colias occidentalis chrysomelas</i>	widespread
GOSSAMER-WINGS	LYCAENIDAE	KNOWN LOCALES
Tailed Copper	<i>Lycaena arota arota</i>	Scotch Cr. canyon
Great Copper	<i>Lycaena xanthoides xanthoides</i>	Hobart Peak, Oregon Gulch
Edith's Copper	<i>Lycaena editha pseudonexa</i>	Hobart Peak
Gorgon Copper	<i>Lycaena gorgon dorothea</i>	Scotch Cr., Cottonwood Cr., Hobart Peak, Pilot Rock

Table AQ-1. Butterfly Species recorded in the CSNM		
GOSSAMER-WINGS	LYCAENIDAE	KNOWN LOCALES
Blue Copper	<i>Lycaena heteronea blend</i>	Scotch Cr. canyon, Hobart Peak, Pilot Rock
Purplish Copper	<i>Lycaena helloides helloides</i>	Soda Mtn Rd, Keene Cr., Hyatt
Nivalis Copper	<i>Lycaena nivalis blend</i>	widespread
Golden (Chinquapin) Hairstreak	<i>Habrodais grunus lorquini</i>	Boccard Point, Scotch Cr.
Sooty Hairstreak	<i>Satyrium fuliginosum blend</i>	Pinehurst, Boccard Point
California Hairstreak	<i>Satyrium californicum</i>	Scotch Cr., Oregon Gulch, Siskiyou Summit
Sylvan Hairstreak	<i>Satyrium sylvinum nootka</i>	widespread
Mountain-Mahogany Hairstreak	<i>Satyrium tetra</i>	Scotch Cr. canyon, Oregon Gulch
Hedgerow Hairstreak	<i>Satyrium saepium saepium</i>	widespread
Nelson's Hairstreak	<i>Callophrys grynea nelsoni</i>	widespread
Johnson's Hairstreak	<i>Callophrys johnsoni</i>	Hyatt
Thicket Hairstreak	<i>Callophrys spinetorum spinetorum</i>	Keene Creek
Bramble Hairstreak	<i>Callophrys perplexa</i>	Hobart Peak, Pilot Rock
Brown Elfin	<i>Callophrys augustinus iroides</i>	Scotch Cr., Soda Mtn Rd., Keene Cr.
Western Pine Elfin	<i>Callophrys eryphon eryphon</i>	Hyatt Lake, Scotch Cr., Oregon Gulch
Gray Hairstreak	<i>Strymon melinus atrofasciatus</i>	Scotch Cr. canyon, Soda Mtn Rd, Porcupine Cr.
Eastern Tailed Blue	<i>Everes comyntas sissona</i>	widespread
Western Tailed Blue	<i>Everes amyntula amyntula</i>	widespread
Spring Azure	<i>Celastrina "ladon" echo</i>	widespread
Square-spotted Blue	<i>Euphilotes battoides oregonensis</i>	Hobart Peak, Pilot Rock, Porcupine Cr.
Intermediate Dotted Blue	<i>Euphilotes intermedia</i>	Hobart Peak
Dotted Blue	<i>Euphilotes enoptes enoptes</i>	Scotch Cr. canyon, Oregon Gulch
Columbian Silvery Blue	<i>Glaucopsyche lygdamus columbia</i>	widespread
Rice's Blue	<i>Plebejus idas ricei</i>	Oregon Gulch, Pilot Rock, Soda Mtn Rd.
Greenish Blue	<i>Plebejus saepiolus rufescens</i>	widespread
Lupine Blue	<i>Plebejus icarioides icarioides</i>	widespread
Acmon Blue	<i>Plebejus acmon acmon</i>	widespread
Buckwheat Blue	<i>Plebejus lupini lupini</i>	widespread
METALMARKS	RIODINIDAE	KNOWN LOCALES
Mormon Metalmark	<i>Apodemia mormo mormo</i>	Scotch Cr. canyon, Siskiyou Summit, Boccard Point

Table AQ-1. Butterfly Species recorded in the CSNM

BRUSHFOOTS	NYMPHALIDAE	KNOWN LOCALES
Coronis Fritillary	<i>Speyeria coronis blend</i>	Soda Mtn Rd., Keene Creek
Zerene Fritillary	<i>Speyeria zerene conchylatus</i>	widespread
Callippe (Elaine's) Fritillary	<i>Speyeria callippe elaine</i>	widespread
Egleis Fritillary	<i>Speyeria egleis mattooni</i>	Siskiyou Summit
Northwest Fritillary	<i>Speyeria hesperis dodgei</i>	Soda Mtn Rd., Siskiyou Summit
Hydaspe Fritillary	<i>Speyeria hydaspe blend</i>	widespread
Western Meadow Fritillary	<i>Boloria epithore chermocki</i>	widespread
Oregon Leanira Checkerspot	<i>Thessalia leanira oregonensis</i>	Hobart Peak, Porcupine Creek
Northern Checkerspot	<i>Chlosyne palla palla</i>	widespread
Hoffmann's Checkerspot	<i>Chlosyne hoffmanni segregata</i>	Hyatt, Keene Creek Res., Pinehurst
Field Crescent	<i>Phyciodes pratensis pratensis</i>	widespread
California Crescent	<i>Phyciodes orseis orseis</i>	Keene Creek Ridge, Siskiyou Pass
Mylitta Crescent	<i>Phyciodes mylitta mylitta</i>	widespread
Chalcedon Checkerspot	<i>Euphydryas chalcedona blend</i>	widespread
Edith's Checkerspot	<i>Euphydryas editha rubicunda</i>	Hobart Peak, Pilot Rock, Porcupine Cr.
Satyr Anglewing	<i>Polygonia satyrus</i>	Scotch Cr.
Green Anglewing	<i>Polygonia faunus rusticus</i>	Oregon Gulch, Soda Mtn Rd, Porcupine Cr.
Zephyr Anglewing	<i>Polygonia gracilis zephyrus</i>	widespread
Dark Anglewing	<i>Polygonia progne oreas</i>	Scotch Cr., Tubb Springs
California Tortoiseshell	<i>Nymphalis californica</i>	widespread
BRUSHFOOTS	NYMPHALIDAE	KNOWN LOCALES
Mourning Cloak	<i>Nymphalis antiopa antiopa</i>	widespread
Milbert's Tortoiseshell	<i>Nymphalis milberti milberti</i>	Hobart Peak, Pilot Rock
Red Admiral	<i>Vanessa atalanta rubria</i>	Soda Mountain
American Painted Lady	<i>Vanessa virginiensis</i>	widespread
Painted Lady	<i>Vanessa cardui</i>	widespread
West Coast Lady	<i>Vanessa annabella</i>	widespread
Buckeye	<i>Junonia coenia griseus</i>	Oregon Gulch, Hobart Peak
Lorquin's Admiral	<i>Limenitis lorquini lorquini</i>	widespread
California Sister	<i>Adelpha bredowii californica</i>	widespread
Ringlet	<i>Coenonympha tullia eryngii</i>	widespread
Large Wood Nymph	<i>Cercyonis pegala ariane</i>	widespread
Lesser Wood Nymph	<i>Cercyonis sthenele silvestris</i>	widespread
Dark Wood Nymph	<i>Cercyonis oetus oetus</i>	widespread
Great Arctic	<i>Oeneis nevadensis nevadensis</i>	widespread
Monarch	<i>Danaus plexippus plexippus</i>	widespread
Current Monument Total: 107 species		

Compiled by Erik Runquist 12/27/2000

Appendix R - Bureau’s RNA Guidelines in the CSNM

SUPPLEMENTAL PROGRAM GUIDANCE FOR LAND
RESOURCE

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Appendices

Memorandum of Understanding between the Bureau of Land Management,
Oregon/Washington State Office, and The Nature Conservancy, Oregon and Washington State Offices.

.01 Purpose

This Manual Section provides—basic guidance and information for the management of Research Natural Areas as part of the areas of critical environmental concern program in the States of Oregon and Washington.

.02 Objectives

The natural history resource management program responsibilities include identification, designation, and management of natural areas containing important scientific values located on appropriate lands administered by the BLM. The objectives of the Research Natural Area (RNA) program are to:

- A. Recognize the scholarly uses of natural history resources.
- B. Manage the public lands in a way that ensures attainment of appropriate uses of natural history resources.
- C. Protect and preserve designated values that fulfill recognized RNA cell needs for the benefit of scholarly use.

.03 Authority

- A. Federal Land Policy and Management Act of 1976 (P.L. 94-579; 90 Stat. 2743; 43 USC 1701) directs the BLM to manage public lands on the basis of multiple use, “in a manner that will protect the quality of scientific,... ecological, (and) environmental.. values... and where appropriate, will preserve and protect certain public lands in their natural condition.” The Act establishes that priority will be given to the designation and protection of areas of critical environmental concern (ACEC) in the development and revision of land use plans. The act also provides for the periodic inventory of public lands and resources, for long-range, comprehensive land use planning, and for enforcement of public land laws and regulations.
- B. National Environmental Policy Act of 1969 (P.L. 91-190; 83 Stat. 852; 42 USC 4321) establishes national policy for protection and enhancement of the environment. Part of the function of the Federal Government in protecting the environment is to “preserve important ... natural aspects of our national heritage.” The act is implemented by regulations of the Council on Environmental Quality, 40 CFR 1500-1508.
- C. Endangered Species Act of 1973 [16 U.S.C. 1531 et seq.; 87 Stat 884; P.L. 93-205, as amended, P.L. 94-359, 90 Stat 913 (1974); P.L. 95-212, 92 Stat 3751 (1978) P.L. 96-159(1979) requires all Federal departments and agencies to conserve species, subspecies, or populations of plants and animals officially listed by the Secretary of the Interior or Secretary of Commerce as threatened or endangered. The Act also requires Federal agencies to ensure that the continued existence of listed species is not jeopardized and that designated Critical Habitat of listed species is not destroyed or adversely modified.
- D. Executive Order No. 3 1988. Protection of Wetlands.
- E. Executive Order No. 11990. Flood plain Management.

.04 Responsibility

- A. State Director is responsible for guiding implementation of the research natural area program, providing technical direction for implementation of the program, and monitoring the progress and quality of work being completed at the field level.
- B. District Managers and Area Managers are responsible for directing the identification,

designation, and management of Research Natural Areas within their respective areas of authority.

C. Designated Resource Specialists are responsible for ensuring that inventory standards and recommended designations and management prescriptions are in conformance with accepted regional standards with appropriate coordination performed.

D. All personnel are responsible for complying with established management prescriptions in specific designated areas and avoiding inadvertent damage to the key identified natural values.

.05 References

A. Research Natural Area Needs in the Pacific Northwest, USDA Forest Service General Technical Report PNW-38, 1975.

B. Oregon Natural Heritage Plan, Natural Heritage Advisory Council to the State Land Board, March, 1981.

C. State of Washington Natural Heritage Plan, Washington State Department of Natural Resources, 1987.

D. 43 CFR 8223 - Research Natural Areas.

E. BLM Manual 1617.8

.06 Policy

A. Areas established as Research Natural Areas shall be of sufficient number and size to adequately provide for scientific study, research, and demonstration purposes.

B. RNAs will be managed to preserve and protect the key natural attributes for which the area was formally recognized.

C. All RNAs shall be designated ACECs and follow the ACEC designation guidance provided by BLM Manual 1617.8.

D. RNA management plans will normally be developed for each designated area, establishing detailed management objectives and prescriptions unless the degree of specificity is adequate in an RMP or plan amendment.

E. Formal withdrawal of designated areas from mineral entry, except by Congressional action, shall only be pursued in exceptional cases.

.07 Program Relationships

A. Relationship to BLM Programs

1. BLM Planning System. (See Manual Sections 1601 and 1623.5).

a. The designation, protection, management, and use of Research Natural Areas shall be guided by and in accordance with approved BLM land use plans, including but not limited to Resource Management Plans (RMP).

b. The BLM plain shall establish the appropriateness for designation of all potential Research Natural Areas, establish management objectives for those areas designated, consider the extent to which RNA objectives may affect other resource management programs and actions, and take into account the extent to which other potential land and resource uses may have effects on RNA values. The approved land use plan will also provide resource management objectives and include resource uses/allocations which are prohibited or conditionally permitted.

2. Recreation Management Program

a. Any recreational/educational use of RNAs must be compatible with RNA objectives established through planning.

b. Where recreational needs conflict with and take precedence over identified potential RNA values, the designation as an outstanding Natural Area should be considered.

c. Onsite interpretation of RNAs for public education may also satisfy the objective and have the effect of protecting the key scientific values identified in certain cases. The division of funding, staffing, and roles is determined on-a case specific basis, between the Recreation Management Program and the other program(s) involved.

3. Other Resource Programs.

a. BLM resource programs (Forestry, Wildlife, Range, Watershed, etc.) benefitting from the management of RNA values are responsible for providing funds as affected activities.

b. Other resource program obligations include support of inventory, identification, evaluation, designation, and management functions associated with Research Natural Area values.

B. Relationship to State and Other Federal Agencies. BLM actions are coordinated with other Federal agencies in the Pacific Northwest and the States of Oregon and Washington through participation in the interagency Pacific Northwest RNA Committee.

C. Relationship to Non-Governmental Organizations

1. BLM cooperates with The Nature Conservancy through a Memorandum of Understanding (Appendix A) which recognizes mutually benefitting results of natural area data sharing and special management of adjoining designated properties.

a. Through privately funded organizations, such as The Native Plant Society of Oregon, BLM receives volunteer assistance and participates on joint identification and protection projects as situations arise.

.3 (See BLM Manual)

.31,through .34 (See BLM Manual)

.35 Establishment of RNA

A. Identification of Potential RNA . Natural areas are normally considered for RNA designation on an ad hoc basis as they are identified by RNA committee members, BLM, and public-at-large, and recommended by letter to the appropriate District Manager.

B. Designation of RNA

1. Designation Process. Designation shall follow the ACEC designation process (see Manual 1617.8).
2. Land User Implications. Designation neither constitutes a formal withdrawal from certain actions, nor does it in itself increase requirements of public land users, except requiring mining plans of operations for operations of less than five acres extent (see 3809.1-4(b)(3)).
3. Recognition of RNA Values. Designation establishes recognition that a RNA has important scientific and educational values and a commitment that utmost importance be paid to the natural feature for which it was designated.
4. Review of Existing Designations. Designated areas will be reviewed during preparation of new RMPs or RMP revisions. The reviews will be conducted by an interdisciplinary team and summarized in the RMP/DEIS, RMP/FEIS and RMP/ROD. Confirmation of designation may include RNA/ACEC boundary adjustments as well as management prescriptions, priorities, and monitoring requirements. Where resource values for which the areas were originally designated are no longer present or better examples satisfying call needs have been located elsewhere, designations are appropriate. Designation will be documented through analysis in the RMP/DEIS and FEIS and decision making in the RMP/ROD.

.36 Management of RNA

- A. Planning Process. For each designated RNA, management prescription objectives for each designated RNA that permit natural processes to continue without interference shall be established and implemented through completion of a formal planning document, i.e., RMP, activity plan, or plan amendment.
- B. Monitoring. Essential to implementation of management prescriptions is an adequate system of long term monitoring tailored to the specific character of the area to determine if management objectives are being accomplished. A relatively simple, systematic form of baseline sampling should be adopted to document trends and conditions of relevant area characteristics.
- C. Compatibility of Other Uses. The appropriateness of various existing and foreseeable potential uses and impacts (including grazing, mineral exploration and development, fire, timber harvest, right-of-ways, public activities and other form of use) shall be addressed and specific conflict resolutions developed by a management plan.

.37 Use of RNA

- A. Scientific and Educational. RNAs are established primarily with scientific and educational activities intended as the principal form of resource use for the short and long term. Research proposals should be submitted to the appropriate BLM field office prior to commencing work. Studies involving manipulations of environmental or vegetational characteristics or plant harvest must be BLM approved.
- B. Manipulative Use. Because the overriding guideline for management of an RNA is that natural processes are allowed to dominate, deliberate manipulation such as experimental applications, is allowed only on a case specific basis when the actions either simulate natural processes or important information for future management of the RNA is gained.
- C. Compatibility of Other Resource Uses. The appropriateness of various existing and foreseeable potential uses shall be addressed and conflict resolutions developed by a management plan.

1. Livestock Grazing and Timber Harvests. Livestock, grazing and timber harvests should be managed within RNAs to promote maintenance of the key characteristics for which the area is recognized. These areas should be identified in a management plans as well as the appropriateness of mitigation measures (such as wind or shading buffers for nearby timber harvest units) for achieving management objectives.
2. Fire Management. Management plans should be coordinated with fire plans for identifying the following objectives:
 - a. The need for wildfire protection measures based on the key natural values to be protected (preserving undisturbed, advanced stages of ecological development as opposed to maintenance of a dynamic seral ecosystem) and other relevant factors.
 - b. The role of prescribed burns based on the fire history and past vegetative patterns known for the area. Application of prescribed burns normally should closely approximate the "natural" season of fire, frequency, intensity, and size of burn. The burn should have a carefully designed monitoring plan followed by a fire effects report.
 - c. Types of fire fighting, fire hazard reduction, burn site preparation, and post-fire rehabilitation activities appropriate for the area, scarification for fire breaks or lines, and application of retardants should be avoided.
3. Public Uses. Public uses, including recreation, camping, woodcutting, trapping, plant gathering, and ORV use, are generally not compatible with maintenance of key RNA values unless shown not to hinder achievement of specific plan objectives. Education use, such as class field studies are encouraged, but repetitive consumptive class activities must have BLM approval. Applications to build roads, pipelines, communication sites, powerlines and similar developments should avoid the designated area.
4. Mineral Exploration and Development. Withdrawal from mineral entry is allowed only when the most outstanding or unique resource values are involved which can tolerate no disturbance. Those areas not closed to location and entry under the mining laws are subject to Surface Management Regulations (43 CFR 3809). Protection from mineral leasing actions through non-surface occupancy stipulations or other measures, may be accomplished through the planning and approval process as provided by mineral leasing regulations and the Bureau planning system. The status of saleable minerals may be addressed through the planning system.

Appendix S - Integrated Weed Management Plan

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
for the
INTEGRATED WEED MANAGEMENT PLAN
EA OR-110-98-14

FONSI DETERMINATION

On the basis of the information contained in the Integrated Weed Management Plan Environmental Assessment (EA) signed by the District Manager on April 21, 1998, specialists reports, and discussions with interested publics, it is my determination that the proposed action and/or the alternative selected herein, when implemented with the Project Design Features and selected mitigating measures, does not constitute a significant impact affecting the quality of the human environment greater than those impacts previously addressed in the Northwest Area Noxious Weed Control Program EIS (December 1985), Supplement (March 1987), and ROD (May 1987), and the Western Oregon Program-Management of Competing Vegetation FEIS (February 1989), to which this document is tiered, and does not, in and of itself, constitute a major federal action having a significant effect on the human environment. Therefore, an environmental impact statement or a supplement to the existing environmental impact statement is not necessary, and will not be prepared.

Signed: _____ Date: _____
District Manager

DECISION RECORD
for the
INTEGRATED WEED MANAGEMENT PLAN
EA OR-110-98-14

DECISION

My decision is to implement the proposed action as described in the EA. No mitigating measures were proposed in addition to those included in the proposed action, except those included by reference. This plan is expected to be useful and viable for the next 5 years.

This decision will be stayed for a period of two weeks ending on June 22, 1998, to allow for a protest period. (43 CFR, Part 4)

DECISION RATIONALE

The decision stated above is consistent with the goals and objectives of the Medford District Resource Management Plan (RMP, June 1995), and the Northwest Area Noxious Weed Control Program EIS and Supplement. Two statutory mandates guide BLM in managing public lands. Section 302(b) of the Federal Land Policy and Management Act of 1976 directs BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands" (43 U. S.C. 1732(b)). Section 2(b)(2) of the Public Rangelands Improvement Act of 1978 adds that BLM will "manage, maintain, and improve the condition of the public rangelands so that they become as productive as feasible . . ." (43 U.S.C. 1901 (b)(2)). The impacts created by the above decision do not require further analysis as noted in the FONSI determination.

Signed: _____ Date: _____
District Manager

MEDFORD DISTRICT
Integrated Weed Management Plan (IWMP)
and
Environmental Assessment (EA) OR-1 10-98-14
Tiered to the
Northwest Area Noxious Weed Control Program EIS (December 1985)
and Supplement (March 1987)

I. NEED FOR THE PROPOSAL

The Medford District of the Bureau of Land Management proposes to implement an integrated noxious weed control program within the Ashland, Butte Falls, Glendale, and Grants Pass Resource Areas, which lie within portions of Jackson, Josephine, Douglas, Coos, and Curry Counties. Noxious weeds have become established and are rapidly spreading on both public and private rangeland, woodlands, and farm land. Economic and ecological loss from noxious weeds is considerable and runs into the millions of dollars annually in each state in the EIS area, posing a serious menace to the public welfare and the state's economic stability (Northwest Area Noxious Weed Control EIS, 1985, pg 2).

Noxious weeds are also a major threat to the native vegetation of the region. As weeds encroach upon native plant populations, their competitive nature depletes the natives, creating a monoculture or single species landscape. Not only are wildlife forage species threatened, but so too are listed rare and endangered species. These impacts will increase if control measures are not implemented.

This proposal is consistent with the Northwest Area Noxious Weed Control Record of Decision (ROD) for the Final Environmental Impact Statement (EIS), Supplement EIS (FSEIS) dated April 7, 1986 and May 5, 1987 respectively. Copies of the ROD, the EIS, and the FSEIS are available for review at the Medford District Office. This proposal would meet the objectives for active weed control measures as set forth in the Purpose and Need section of the Northwest Area Noxious Weed Control EIS (pg. 2).

In addition, this proposed action is subject to the following land use laws and/or acts: Federal Policy and Management Act (FLPMA), October 1976, Public Rangelands Improvement Act (PRIA), October 1978, Carlson-Foley Act of 1968, Federal Noxious Weed Act of 1974.

Priorities are described for all acreages at the county level, rather than that for BLM lands alone. BLM's program is integrated with other ownerships through the Oregon State Department of Agriculture, which furnishes overall priorities and treatment prescriptions. Weed species on the target list, as well as those on the "A" list are of high concern to the Oregon State Department of Agriculture, and therefore also with the Medford District.

II. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

A. OBJECTIVE OF THE PROGRAM

The objective of the Medford District Noxious Weed Program is to implement the Record of Decision of May of 1987, in accordance with the stipulated priorities for

weed control. Those weeds that are known to be established on the public lands within the district are shown on the maps (on file). The underlying objective of the Medford District Noxious Weed Program is to eliminate or eradicate outlying populations of Target and "A" listed weeds when and where possible, and to reduce the number of infestations in the remaining area to a lower level, which can be accepted or tolerated by management.

B. PROPOSED ACTION ALTERNATIVE

The proposed action is to implement an Integrated Weed Management Program (IWMP) for all federally managed lands in the Medford District, beginning in 1997 as described in the preferred alternative in the FEIS. This proposed action would emphasize a proactive ecosystem-based approach for control and/or eradication of noxious weeds on all public lands. The long-term goal of this program is to reduce populations of alien plant species by any or all of the means listed below, to a level which will allow for the restoration of native plant species, and provide for overall ecosystem health. These IWM control measures, that may be employed in varying degrees, include cultural or preventative (seed testing, vehicle washing, etc), physical (handpulling, competitive planting, burning, etc), biological (insects, etc.), and chemical (herbicide), and may be found in greater detail in the Northwest Area Noxious Weed Control Program EIS, December 1985. Some factors for determining which method is best suited for use on a particular site can be found in Noxious Weed Strategy for Oregon/Washington, August 1994, Appendix 4, pgs. 29-31. An appropriate combination of methods, including manual, mechanical, biological, and chemical methods would be used to control noxious weed species. Any herbicide use will be in accordance with the program design features outlined on pages 1-7 of the ROD for the FEIS, and those listed in the Appendix of this document. Control actions will be implemented on the basis of the priorities addressed in the Need for the Proposal section of this document.

General features of the weed management treatments, monitoring, and interrelationships with state and local governments are described in pages 1-11 and 14-18 of the EIS, and on pages 2-9 of the 1987 ROD. Close cooperation will be maintained with the Oregon Department of Agriculture, the adjacent National Forests, and the noxious weed coordinators in each of the five counties in which the Medford District resides, to ensure cooperation and coordination in noxious weed control efforts. At this time, the Medford District is working with members of Jackson County to prepare a regional roadside vegetation control plan, a part of which will address noxious weeds.

Noxious weed species, listed by priority, may be found in the Noxious Weed Strategy for Oregon/Washington, August 1994, Appendix 3, pgs. 27-28. The priority categories are as follows:

Priority 1 - Potential New Invaders

Emphasize education of BLM employees and the general public to create an awareness of species which are potential new invaders into southern Oregon. On an annual basis, share information on noxious weed control programs and potential needs with the Oregon State Department of Agriculture and county weed control personnel. Once a population of a priority 1 invader is documented, it will be placed in priority 2 (as it is no longer a "potential" invader, and is actually here), and appropriate action would be taken as described in priority 2.

Priority 2 - Eradication of New Invaders

Emphasize appropriate and prompt action, including appropriate multi-year follow-up action, to eradicate infestations of new invading noxious weeds before they spread to the point where eradication is not possible.

Priority 3 - Established Infestations

Weed species in this category have become established to the extent that eradication is not practical or economically possible. Treatment emphasis would be on containing existing populations and treatment of small, outlying populations. Treatment will also emphasize biological control when effective agents are available. Other control measures may be considered if those measures are practical and cost effective.

Noxious weed control treatment, inventory and monitoring on the public land will be conducted in the following order of priority and zones:

1. Areas adjacent to private agricultural lands, major reservoirs and natural bodies of water, perennial drainways, timber sale units, and BLM and privately owned roads (see Appendix II for water quality / watershed project design features (PDF's).
2. Major public rights-of-way: Federal, state, and county highways and associated quarries and gravel stockpile sites, railroads, ditches, canals, pipelines, and powerlines.
3. Congressionally Reserved Areas (Rogue Wild and Scenic River, Pacific Crest National Scenic Trail), designated RNA'S, LSR'S, ACEC'S, and WSA'S.
4. Major BLM administrative sites: Developed recreation sites, office / warehouse / storage complexes, and aerial landing strips.
5. All other rights-of-ways, BLM and private roads, reservoirs and springs, perennial drainways, and administrative and recreation sites.
6. All remaining affected public lands.

The type of treatment may be limited on lands containing special Management Area designation, special status (including threatened and endangered) plants or animals, critical wildlife habitat, riparian-wetland areas, and where domestic water may be contaminated or sensitive row crops (organic gardens) damaged.

Only treatment methods that target individuals of noxious weed species will be performed in riparian and wetland areas. Generally, picloram will not be used within these treatment areas. Herbicides approved for aquatic use will be used where appropriate. Mechanical, biological, and manual treatments will be the preferred methods in these areas and their buffers where noxious weeds are present and control is required.

A cultural clearance would be conducted on any proposed treatment area that would require extensive digging or surface disturbance.

The U.S. Fish and Wildlife Service would be consulted for chemical use in proposed treatment areas containing proposed, threatened or endangered plant or animal species.

Chemicals would be applied in strict accordance with EPA approval label instructions.

Program Implementation

The Medford District IWMP would be implemented in accordance with the ROD priorities as follows:

1. Prevention and Detection of Potential New Invaders

Increased and continued efforts will be directed toward training district personnel, adjacent land management personnel (U.S.F.S., S.C.S., O.D.O.T., etc), and public land users to recognize noxious weed species, and the importance of preventing the spread of, and reporting the locations of new invaders. Usually, this is accomplished through forums such as Interagency Noxious Weed Workshops. The Oregon State Department of Agriculture weed specialists, through their contract with the Oregon BLM, will assist in the education effort for priority weeds. The BLM will notify the Oregon Department of Agriculture and local county weed agents of new locations of priority weeds in order to minimize and prevent the spread of noxious weeds. Techniques that could be implemented to accomplish this objective are found in the Appendix.

2. Eradication of New Invaders

The highest priority for treatment after prevention efforts, will be early detection, control and eradication of new invader populations. All methods described in this document, and those described in the EIS, FEIS, and ROD can and may be utilized. The selection of control methods will vary depending on species, as well as location.

As new techniques are developed, evaluations are conducted, or management emphasis changes, additional methods may be utilized. Personnel will continue to be trained and educated on state of the art weed control methods and procedures.

3. Control of Established Infestations

The next highest priority for treatment under the Medford District IWMP will be the containment of large populations, and treatment of outlying populations of established noxious weed species in order to prevent their further spread. Although all acceptable control methods are available, biological control (BC) agents will be the preferred method of treatment. Only those BC agents approved for use in the Medford District may be utilized. Manual, mechanical, and chemical control methods will be the primary methods of control for all outlying weed populations. Table 1 shows the weed species and sites targeted for herbicide application in the Medford District in 1998.

4. New Discoveries

Inventory and monitoring by weed specialists, as well as program administration by other district personnel, will disclose new populations of previously classified, yet un-mapped noxious weed species within the district. These efforts may also detect new noxious weed species not yet mapped or classified. As these sites are discovered and reported, their locations and unique characteristics will be logged into the district database, including species name, township, range and section, square footage, percent cover, and date of discover or Control actions would then be implemented in accordance with the general control plan and stipulated priorities for each weed in question. The control methods will be governed by site specific conditions, occurrences of threatened or endangered plants and animals, special management

areas, proximity to croplands and surface waters, etc. Proper chemical selection for treatment will be governed by the effectiveness of control on the subject weeds, and the potential for impacting the above mentioned site factors / special conditions. All control efforts will be limited to the project design features listed in the Appendix.

5. Monitoring

See FSEIS, page 122 for Herbicide Application Monitoring Plan. Additional monitoring criteria involving permanent plots or transect plots may be developed. Photographs of treatment sites will be kept in the Medford District Office.

C. NO ACTION ALTERNATIVE

The alternative of no action is not consistent with Federal, state, and county regulations, which mandate active control measures for known and newly discovered noxious weed populations. The no action alternative would also be in direct conflict with the Oregon/Washington BLM Director's Records of Decision of April 1986 and May 1987. BLM policy relating to integrated weed management has been set forth in Manual Section 9015. However, if the no action alternative were selected, weed management and control actions would be governed by existing documents.

D. ALTERNATIVES CONSIDERED BUT NOT ANALYZED

The alternatives of no aerial herbicide application, no use of herbicides, and no action have been thoroughly analyzed in the Northwest Area Noxious Weed Control Record of Decision (ROD) for the Final Environmental Impact Statement (EIS), Supplement EIS (FSEIS) dated April 7, 1986 and May 5, 1987 respectively. Further discussion in this EA is unnecessary at this time since site specific conclusions and impacts would be essentially the same.

The no aerial herbicide application and no use of herbicides alternatives were analyzed. In the Medford District, the aerial herbicide application method will not be considered for use. Other herbicide application methods as listed in this document as well as in the Northwest Area Noxious Weed Control Environmental Impact Statement (EIS), and Supplement EIS (FSEIS) may be considered depending on weed species and location.

III. AFFECTED ENVIRONMENT

The Medford District is located in the southwest portion of Oregon, and includes approximately 859,100 acres of BLM-administered lands. A general description of the affected environment may be found in the Medford District RMP/EIS, October 1994, starting on page 3-3. More detailed descriptions of lands administered by the Medford District may be found in various watershed analysis documents. Both the Medford District RMP/EIS, and the various watershed analysis plans may be found in the Medford District Office.

The General Location Map (attached) shows the general location of the Medford District, and the area of affected environment covered by the cited planning and environmental documents.

IV. ENVIRONMENTAL CONSEQUENCES

The impacts of the actions described under section II of this document are analyzed in Chapter 3, and summarized in Table 1- 4 (Alternative 1) of the FSEIS. Analysis discussions within the FSEIS have no impacts of importance upon the following resources: topography, utilities, energy and mineral resources, or climate.

No impacts have been identified which exceed those already addressed in the FSEIS and noxious weed control decision referenced in Section I of this assessment. Site specific components of the environment which may be affected as the plan is implemented in the known and mapped treatment areas and new discoveries are as follows:

A. VEGETATION

Terrestrial broad-leafed plants may be mostly affected by the application of 2,4-D, dicamba, glyphosate, and picloram as proposed. These herbicides are non-selective for most broad-leafed plants (2,4-D is selective for only broad-leafed plants), and both target species and non-target species will be killed where herbicides are applied. Grasses may suffer slightly, but will recover and should increase due to the reduced competition by impacted weeds. The effects of killing non-target species will be inconsequential because only patches and small sites of noxious weeds will be targeted for spraying with ground equipment or hand spray, and the extensive occurrence of native species will largely remain unaffected.

The use of selective herbicides will affect only the area actually sprayed, and only the vegetation that is susceptible to the chemicals used in the area sprayed.

Manual treatments will generally only affect the targeted noxious weeds in the treatment area.

No known potential exists for biological control agents to damage crops, non-target native plant species, or other environmental values. In no instances have insects introduced against an exotic weed in North America become a pest itself or endangered a native plant species (Harris, 1988).

Much of the vegetation along rights-of-ways to be treated has been, and is continually being disturbed as a result of maintenance / use actions, and contains very little of the original native vegetation. Many weed species occupy sites along these roads.

B. SPECIAL STATUS SPECIES

No impacts to special status species (plant or animal) would be expected, since the project design features (PDF's) as outlined in the EIS and FSEIS, as well as those in this document will be implemented and strictly adhered to. These recommendations would be designed to avoid any negative effects to special status species.

C. RIPARIAN, WETLANDS, AND WATERSHEDS

The extent of any impacts to non-target riparian-wetland vegetation would depend on the closeness of desirable species to treated weeds, method and rate of herbicide application, and formulation of herbicide. Because herbicide application rates would

be reduced in riparian/wetland areas, and/or herbicides approved for aquatic use would be applied, injury to non-target plants in these areas is expected to be minimal.

The proposed application of herbicides would involve relatively small, widely dispersed areas whose sizes would rarely exceed one (1) acre. Ephemeral stream channels in the upper reaches of watersheds, which range from a couple of feet to several yards wide, would not necessarily be excluded from herbicide application, but may be depending on specific site conditions. In these channels, one of two situations usually apply to preclude the flushing of herbicides downstream in amounts likely to cause impacts: 1) enough rain falls to induce runoff but not enough for the stream-flow to reach the next order stream, or 2) if the stream-flow is great enough to reach the next order stream, enough water flows to dilute the herbicide.

In addition, impacts to other resources due to the amount of overland water flow itself are more likely to cause damage more than the impacts from the herbicide. Larger ephemeral stream channels, typically near or in valley bottoms would be protected by restrictions similar to those that apply to other areas such as riparian zones or wetlands.

Under the proposed action, significant impacts to surface water quality are unlikely to occur from the normal use of herbicides. In herbicide spraying operations without riparian-wetland restrictions, the amount of herbicide entering the water has been in the parts-per-billion range, and not in the parts-per-million range that appears to be the level for most adverse effects (FSEIS, pgs. 86-87). Since most treatments would be applied not more than one time per year, little potential exists for herbicides to accumulate in harmful amounts.

Along streams and wetlands, ground water is often close to the surface. Depending on the hydraulic head of the aquifer, these areas can be gaining or losing head. If they are losing water to the aquifer, a potential exists for herbicides that are rushed into these areas from overland flow to be introduced into the ground water. Studies have shown the concentration of herbicides in surface flow to be in parts-per-billion, and with the further dilution from entering into the stream or wetlands the concentration would be even lower. Also, streams and wetlands are normally high in microorganisms, the main agents for bio-degradation of herbicides.

No municipal watersheds will be impacted.

D. WILDERNESS STUDY AREAS

It is not anticipated that herbicides will be applied in any wilderness study areas (WSA's). The spraying of poisonous plants is not prohibited under limited circumstances, and it is not unreasonable to expect that noxious weeds might be discovered in these areas and be treated. The impacts of spraying would be consistent with the discussion on page 48 of the FEIS.

E. HUMAN HEALTH

Potential occupational and environmental human health impacts of the proposed action were fully analyzed in the FEIS, and considered in the ROD for the FSEIS. No further analysis is needed in this document.

V. AGENCIES, GROUPS, AND INDIVIDUALS CONSULTED

Oregon Department of Agriculture
Jackson County
Josephine County
Douglas County
Coos County
Curry County

VI. PARTICIPATING BLM EMPLOYEES

Bob Budesá - District Noxious Weed Coordinator, Rangeland Management Specialist
Nabil Atalla - District Forest Health Specialist, Weed Science
Tom Jacobs - District Rangeland Management Specialist
Joan Seevers - District Botanist
Dave Reed - District Forester
Jim Keeton - Human Resource Coordinator
Kate Winthrop - District Archaeologist
Dale Johnson - District Fisheries Biologist
Ron Laber - District Hazardous Materials Specialist
Jim McConnell - District Environmental Coordinator

Appendix S-II

WATER QUALITY / WATERSHED PROJECT DESIGN FEATURES FOR NOXIOUS WEED CONTROL

1. Cultural (prevention) activities such as inspection (weed surveys), regulation (Right of Ways), sanitation (wash and clean vehicles) and education will be encouraged and enforced for all high priority multi-use areas, especially those along the Rogue River. Cultural practices include:

- a. Clean all heavy equipment used on BLM-administered lands (including Rights-of-Ways) prior to moving onto BLM administered lands. This removes most of the dirt which may contain weed seeds.
- b. Use only certified seed or straw mulch that has been checked for noxious weed seed prior to restoration projects on public lands (Cook 1 99 1).
- c. Reclaim disturbed sites/ areas as soon as practical with :
 - 1) native seed, or if native seed is not available,
 - 2) a BLM approved seed mixture. Temporary fencing of newly seeded sites within grazing allotments may be required to assure establishment of new seeding. Sites should be rested from grazing for at least two growing seasons after planting.
- d. Monitor all vegetation manipulation and revegetation projects, i.e. prescribed fire areas, timber harvest activities, seeding, and other disturbed sites like rock (material) pits for noxious weed infestations
- e. To reduce areas favorable for potential noxious weed invasion, evaluate sites for vegetative management practices and initiate changes in management in those areas where native or seeded vegetation is in a downward trend.

f. Limit, restrict or discourage recreational, especially Off Highway Vehicle (OHV) use in weed infested areas.

g. Require washing of all BLM vehicles at least twice per month in order to reduce the possibility of spreading weed seeds. Washing of vehicles would be expected to increase if vehicles are driven off road through weed infested sites more often.

2. Physical control practices (mechanical) such as mowing, tilling, discing, seedbed preparation, and prescribed burning treatments (because of the possible soil disturbing nature) will require a separate EA, specifically to assess the physical impacts to the land.

3. All manual control practices (hand pulling and hand tools) will be done before seed ripe or seed dispersal, and the plant residue collected as needed for burning (piles) or bagged and removed from site(s). On small isolated sites manual control may be given priority consideration dependent upon weed species and site requirements, before any herbicide application especially, in WSAs, WAs and ACECs.

4. IWM biological control methods such as introduced insects, competitive seeding, pathogens, or livestock grazing will be given consideration district-wide. ODA approved biocontrol agents (insects or pathogens) will be given emphasis for release to control/contain larger infestations where containment is the major goal. The approval for release of beneficial insects or pathogens must complete a Biological Control Agent Release Proposal (BCARP) and Record (BCARR). Only ODA approved biological control agents will be allowed for release after District and State Office approval.

a. Domestic grazing as a control practice would have to meet specific allotment management resource and grazing objectives and approved District Plans.

b. Competitive seeding using either native or introduced species are subject to a separate site specific analysis if using mechanical seedbed preparation or seeding practices.

c. Those competitive seeding sites less than 5 acres in size using only manual methods of seeding are covered by this document. Seeding these small sites may be permitted after resource area staff review of the same site specific information and/or mitigation stipulations, as required for Pesticide Use Proposals (PUPs) and resource area management approval.

d. The District's use of its approved Biological Control Agents for treatment priorities will be coordinated closely with the ODA to introduce biological control agents to weed populations where site specific criteria meets management goals. Most BLM priority weeds do not have ODA approved biological control agents available for control efforts. All of the insects introduced as biological control have been through a battery of tests to determine their specificity to the target plant. If any insect is known or observed to migrate towards other plants during these tests, they are not introduced to the U.S.

e. The list of currently approved District Biological Control Release Proposals (1993) submitted by ODA for this District under BLM/ODA contract #1422h952-C-22073 are on file with USDA and Oregon State Dept. of Agriculture, and at the Medford District Office.

5. A Special Status and FSEIS Survey and Managed Plant and Animal survey or clearance will be done prior to any treatment.

6. A cultural survey or clearance is required before any soil surface disturbing activity (including Categorical Exclusions) from physical weed control practices (manual, mechanical or prescribed fire) occurs. Physical practices include:
 - a. Manual control practices (hand pulling and hand grubbing with hand tools such as shovel, hoe, pulaski) are covered by the above mentioned documents.
 - b. Manual control efforts (hand pulling and hand tools) would be limited to less than 5 acres per infestation site. Control efforts may be permitted after Resource Area staff review of the same site specific information and/or mitigation stipulations as required for Pesticide Use Proposals (PUP's) and Resource Area management approval.
 - c. Manual control practices may be used immediately, to prevent or reduce establishment of a weed seed source, where newly discovered sites involve just a few plants.
 - d. Mechanical control practices such as mowing, tilling, discing, plowing or competitive seedbed preparation activities may occur on slopes less than 10%.
 - e. All mechanical control with surface soil disturbing practices, such as mowing, tilling, discing, plowing or competitive seedbed preparation, would require a separate site specific environmental analysis.
 - f. Fire will be used as a clean up tool for piles of weeds collected for proper disposal under manual or mechanical methods.
 - g. All prescribed fire activities would be conducted in accordance with BLM's Fire Management Policy (BLM Manual 92 1 0). All prescribed fires would require the preparation of an approved prescribed bum plan before every bum. All prescribed fire over 5 acres in size would require a separate site specific analysis. The bum plan must be approved by the District Fire Management Officer and Resource Area Management. In addition, all required smoke management stipulations or burning permit requirements would be part of the approved prescribed bum plan.
7. All herbicide use will comply with USDI rules and policy, BLM policy and guidelines, Oregon State laws and regulations, Oregon Department of Agriculture (ODA) laws and regulations, Environmental Protection Agency (EPA), federal pesticide laws (FIRCA), Oregon Department of Environmental Quality (DEQ) regulations, Local County Weed District Priorities and requirements, as well as product label requirements, and in strict accordance with the guidelines established in Managing Competing and Unwanted Vegetation Final Environmental Impact Statement (Nov. 1988).
8. All pesticide (herbicide) applicators are required to submit a Pesticide Use Proposal (PUP) form, which BLM may approve for use of up to 3 years, if same chemical, same target weed, and same area are applicable.
9. All herbicide applications will be applied by a Oregon State licensed and certified applicator.
10. Material Safety Data Sheets (MSDS) for each herbicide being applied will be at each project site with the applicator. Guidelines and information found in "Oregon Pesticide Applicator Manual" (Miller 1993) as updated, will be followed.
11. Areas of known or suspected sensitive amphibians will have as a minimum 100 foot buffer strip from live water for all herbicide applications, with the exception of the use of Rodeo, which is allowed immediately adjacent to water.

12. Herbicide Use Restrictions are as follows:

- a. No vehicle mounted boom sprayers or vehicle mounted handguns will be used within 20 feet of surface (live) water. (Western Oregon Program - Management of Competing Vegetation ROD, pg. 55). All buffer strips will be delineated on the ground by means of flagging or other similarly effective physical delineation.
- b. No vehicle mounted booms will be used in riparian areas where weeds are closely intermingled with trees and shrubs.
- c. Liquid herbicides may be applied (at a height of 0.5 ft to 2.5 ft. above ground) to areas for spot treatments with hand spraying (backpack) equipment (single nozzle, low pressure and volume) to within 10 feet of live water. (Northwest Area Noxious Weed Control Program ROD, pg. 2). Use of mule or horse mounted equipment would also be allowed.
- d. Spreader equipment (broadcast) could be used to apply granular formulations applied at a height of about 3.5 feet, to within 10 feet of the high water line of live water.
- e. Contact Systemic Herbicides (such as Glyphosate - Rodeo or Accord) may be allowed using hand wipe applications on individual plants up to the existing high waterline. No aerial application of Glyphosate is allowed. (Northwest Area Noxious Weed Control Program ROD, pg. 2).
- f. When wind speeds exceed 5 mph, no spray equipment will be used in riparian areas or near water, and no aerial applications are allowed in riparian or wetland areas.
- g. No application of herbicides will occur if wind speeds exceed 8 mph, with the exception of hand wipe applications.
- h. Only 2,4-D, picloram (Tordon), dicamba, and glyphosate (Rodeo and Accord only) and approved combinations will be allowed as per ROD (1987) from Supplemental FEIS (1987). Acceptable formulations, EPA registration #s, maximum rates of application, and mixture stipulations are referenced from BLM Instruction Memo # OR-91-302 (as updated) and from Table 1-3 p. 9 FEIS (1985).
- i. None of the products may be applied within 500 feet of any residence or other place of human occupation unless the occupant or resident gives his/her consent in writing. (Northwest Area Noxious Weed Control Program ROD, pg. 2)
- j. All chemicals will be applied only in accordance with Environmental Protection Agency standards specified on the herbicide label, and the stipulations in this EA.
- k. Pesticide Use Proposals for herbicide application within boundaries of Wilderness Study Areas (WSA's), Wilderness Areas (WA's), and Research Natural Areas (RNA's) will be reviewed and evaluated by Resource Area staff on a year to year basis. Application of herbicide for second or third year of an approved 3 year PUP is dependent upon effectiveness and Resource Area Management approval.
- l. Monitoring pretreatment and post-treatment will be done yearly (pre and post spray applications) on all treated areas.

m. Additional herbicides (if approved) may be used subject to all the above mitigation measures, label restrictions and within limits of ROD or specific approval recommendations.

n. The maximum rates of application for the four approved herbicides are found in Table 3-1 (FEIS 1985): (ai = active ingredients of specific herbicide).

13. The provisions governing BLM's use of herbicides in this program require measures to mitigate possible environmental effects. More mitigation measures are included in the FEIS, the SEIS, and the policy statements and manuals they cite. All are incorporated by reference into this document. The purpose of the mitigation measures is to ensure the judicious use of the herbicide. The sites represented on the maps on file represent all the known sites that have been inventoried thus far, within the Medford District. The noxious weed sites depicted on the maps do not necessarily represent the sites that will be treated in fiscal year 1998. The sites that may be treated using herbicides are listed by township, range, section, square footage, and acreage towards the end of the document. Any other sites shown on the maps, not listed for herbicide treatment, may be treated using any or all other methods listed in this document.

Appendix T - OGEA Treatment Design based on Ecoregion Characteristics

Ecoregion Characteristics

Ecoregions are defined by a number of factors that include: physiography (including elevation and local relief), geology (surficial material and bedrock), soil (order, common soil series, temperature and moisture regimes), climate (mean annual precipitation, mean annual frost free days, mean January and July min/max temperature), potential natural vegetation, land use (recreation, forestry, watershed), and land cover (vegetation present). The following synopsis is based on Pater (1997a and 1997b). The ONHP plan lists important ecosystem cells by name and specifies the entity that protects them. [Note: In the CSNM, the Bureau's Oregon Gulch RNA represents a mixed conifer cell, not a white fir cell, as stated in the ONHP plan.] See Table 2-1 and Map 2-1 for CSNM Ecoregion IV locations and acreages.

Southern Cascades (4g)

The Southern Cascades Ecoregion (2,600-5,800 feet) in the southern portion of the Oregon Cascades is drier than the rest of the Cascades (4). It is characterized by gently sloping mountains, broad valleys, a long summer drought, and high vegetation diversity. White fir (*Abies concolor*) is common; at low elevations, Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) become prevalent. Compared to the other ecoregions in the CSNM, the South Cascades Ecoregion contains more white fir climax plant communities and the highest percentage of LSOG/NSO NRF habitat referred to as the Old-growth Emphasis Area.

Southern Cascade Slopes (9i)

The Southern Cascade Slope Ecoregion (3,600-6,300 feet) is a transitional zone between the Cascades (4) and the drier Eastern Cascade Slopes and Foothills (9). Forests of ponderosa pine blanket the mountainous landscape; white fir, and Douglas-fir grow at higher elevations. Much of the Southern Cascade Slope Ecoregion typically receives more precipitation than other Level IV Eastern Cascade Slopes and Foothills Ecoregions. The South Cascade Slope Ecoregion within the CSNM tends to be predominantly gently sloping ponderosa pine dominated landscapes which had historically more open canopies than at present. Meadows and grasslands are often found associated with forest stands.

Siskiyou Foothills (78b)

The Siskiyou Foothills Ecoregion (1,500-4,000 feet) is affected by a Mediterranean climate similar to that of the Rogue Valley. The driest area occurs east of Medford and is dominated by oak woodlands, ponderosa pine, and Douglas-fir. This ecoregion is the western most and lowest in elevation. Few white fir are present. Pacific Madrone is a common hardwood component of the forest in this ecoregion while generally absent from the other ecoregions of the CSNM.

Klamath River Ridges (78g)

The Klamath River Ridges Ecoregion (3,800-7,000 feet) has a dry continental climate and receives on average 25 to 35 inches of annual precipitation. Low elevation and south-facing slopes have a more drought resistant vegetation than elsewhere in the Klamath Ecoregion (78), such as juniper, chaparral, and ponderosa pine. Mid-elevation forests are composed of sugar and ponderosa pine as well as incense cedar and Douglas-fir. Higher and north-facing ridges are covered by Douglas-fir, and white fir. A significant portion of the Klamath River Ridges in the CSNM does not have the potential capacity to become NSO suitable habitat and therefore is not part of the OGEA because it is comprised of low elevation, south facing slopes. Most of this ecoregion is in the Diversity Emphasis Area.

LSOG Forest Stand Tables from Habitat Types 1 & 2

A 1998 inventory measured forest tree structure/size and density within habitat type 1 and 2 in the CSNM. Conifer and hardwood tree data, representative of the old-growth seral stage, is summarized in tables AT-1 through AT-3. The variability of tree sizes is representative of 3-5 distinct age classes. Tree stands generally consist of dense small shade tolerant conifers and a uneven-aged overstory of conifers with individual trees exceeding 35 inches dbh. These tables provide a modeling guide to be used during the prescription development process within the major plant communities and Ecoregions which may vary by aspect and elevation. The drier mixed conifer community is more representative of the lower elevation Klamath River Ridges and Southern Cascade Slopes Ecoregions. The more xeric mixed conifer is typical of higher elevation Klamath River Ridges and the South Cascades Ecoregion. The white fir is primarily located in the Southern Cascades Ecoregion. The species mix and size classes are particularly important for thinning small sized diameters and underburning to reach desirable stand structure and preferred densities during protection and maintenance activities.

Table AT-1. LSOG/Habitat Types 1 & 2 in Dry Douglas-fir/Pine Community (xeric)										
Species	Trees per Acre by Species and Size Class (dbh in inches)									
	00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34	35+	Total
Ponderosa Pine	16.0	39.5	7.7	17.5	10.6	1.1	1.3	1.4	0.0	95.1
Douglas-fir	78.0	54.9	24.6	11.5	8.4	2.4	0.5	0.4	1.1	181.8
Incense Cedar	25.0	0.0	0.0	1.5	1.7	1.1	0.4			29.7
Sugar Pine	0.0	0.0	0.0	4.1	1.6	1.4	0.9		0.8	8.8
White Fir	25.0	0.0	1.0							26.0
Summary	144.0	94.4	33.3	34.6	22.3	6.0	3.1	1.8	1.9	341.4
>10" dbh			33.3	34.6	22.3	6.0	3.1	1.8	1.9	103.0
>19" dbh					22.3	6.0	3.1	1.8	1.9	35.1
>30" dbh								1.8	1.9	3.7

Table AT-2. Mixed Conifer Plant Community –LSOG/Habitat Type 1 & 2 (mesic)										
Species	Trees per Acre by Species and Size Class (DBH in Inches)									
	00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34	35+	Total
Ponderosa Pine	25.0	0.0	0.0	2.9	3.6	0.6	1.3	0.3	2.3	36.0
Douglas-fir	166.0	47.6	41.6	25.2	11.6	2.5	0.9	0.4	0.9	296.7
Incense Cedar	8.0	4.5	0.0	2.7	4.1	0.6	0.5	0.0	0.8	21.2
Sugar Pine	4.0	0.0	4.4	1.6	0.0	0.0	0.0	0.0	0.0	10.0
White Fir	29.0	0.0	8.7	0.0	0.8	0.0	0.0	0.0	0.0	38.5
California Black Oak	45.0	0.0	8.4	3.7	0.0	0.0	0.0	0.0	0.0	57.1
Summary	277.0	52.1	63.1	36.1	20.1	3.7	2.7	0.7	4.0	459.5
>10" dbh			63.1	36.1	20.1	3.7	2.7	0.7	4.0	130.4
>19" dbh					20.1	3.7	2.7	0.7	4.0	31.2
>30" dbh								0.7	4.0	

Table AT-3. White fir Plant Community – LSOG/Habitat Type 1 & 2										
Species	Trees per Acre by Species and Size Class (DBH in Inches)									
	00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34	35+	Total
Ponderosa Pine	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.3	0.7
Douglas-fir	33.0	0.0	7.7	2.9	0.8	0.6	0.0	0.3	2.5	47.8
Incense Cedar	0.0	8.1	4.1	0.0	0.0	0.0	1.4	1.1	0.3	15.0
Sugar Pine	0.0	0.0	0.0	1.7	0.0	0.7	0.4	0.7	1.6	5.1
White Fir	132.0	32.7	21.0	17.5	9.2	7.3	3.6	2.0	4.4	229.7
Summary	165.0	40.8	32.8	22.1	10.0	8.6	5.8	4.1	9.1	298.3
>10" dbh			32.8	22.1	10.0	8.6	5.8	4.1	9.1	92.5
>19" dbh					10.0	8.6	5.8	4.1	9.1	37.6
>30" dbh								4.1	9.1	13.2

OGEA Treatment Designs

Treatment Guidelines for Habitat Types 3 & 5

Protection of LSOG forest habitat is the primary goal for managing habitat type 3 & 5 forest stands. Treating as many acres of these as possible within the next decade will be necessary to achieve this goal. Early seral forests are projected to diminish to approximately 15 percent of the federal landscape as these stands mature. Early seral conditions on interspersed private lands and non-forest vegetation types on BLM land are expected to provide varied habitats for the LSOG associated wildlife prey base.

Most of these young stands have become established and are developing under markedly different disturbance regimes than the older stands that currently represent LSOG habitats. Because of altered natural disturbance regimes, including fire suppression, the proliferation of pathogens, accelerated fragmentation, climate change, and shifts in species composition, many of these stands are on developmental trajectories that may not provide adequate or desirable structural LSOG characteristics. The overall objective of young stand manipulation is to create residual stands that will more closely pattern historic forest development to provide structure and habitat for LSOG associated species.

Treatments to reforest and/or promote desired revegetation which include site preparation, planting, release for survival, and animal damage control measures.

1. Release efforts that promote growth of desired species and usually occurs in young forest plantations (old harvest units).
2. Density management (precommercial thinning) in young plantations and young natural early seral (seedling/sapling) stands. Desired tree criteria provide for such things as culturing individual trees specifically for large crowns and limbs, disease resistance (sugar pine rust resistance), and other mortality or habitat attributes consistent with OGEA objectives.
3. Density management (commercial thinning) in habitat type 3 & 5 stands usually provides commercial produces and is risk reduction related.
 - Leave tree criteria provide for such things as culturing individual trees specifically for large crowns and limbs, disease resistance (sugar pine rust resistance), and other mortality or habitat attributes consistent with CSNM objectives.
 - Cutting older trees (80+ years) or trees 20+ inches in diameter would be the exception, not the rule. Most trees in Habitat 3 & 5 are younger trees anyway. Individual trees exceeding 20-inches dbh would not be harvested except for purpose of creating opening, providing other habitat structure such as down logs, elimination of a hazard from standing danger trees, or cutting minimal yarding corridors. Where trees larger than 20 inches dbh are cut, they will usually be left in place to contribute toward meeting the overall CWD objective.
 - Treatments include substantially varied spacing in order to provide for some very large trees as quickly as possible, maintain areas of heavy canopy closure and decadence, and encourage the growth of a variety of species appropriate to the site and the LSOG objectives.

Treatment Guidelines for Habitat Types 1 & 2

Either through wildfire control or harvest, the composition of overstory species has been shifting from Douglas-fir, sugar and ponderosa pine, and incense cedar toward a higher white fir percentage. Additionally, a dense understory of small white fir have filled gaps

created by harvesting, disease, windfall and other disturbance factors, and stands are shifting toward less stability and fire resistance.

Some form of intervention is generally needed to protect and maintain Habitat Type 1 & 2 stands by accomplishing the following actions:

- Creating a favorable situation for improved vertical and horizontal canopy structure, pre-fire suppression species composition, and gap occupancy.
- Increasing patch size to protect un-entered stands and existing owl cores adjacent to entered stands.
- Creating snags and CWD where deficient.
- Removing ladder fuels adjacent to large trees and reducing fire hazard.
- Selecting for vigorous long-term stand components by encouraging large trees of preferred species, size, and vigor.

Treatments are considered site specific treatments and before treatments are implemented they will require an effectiveness monitoring plan .

The general recommended treatment guidelines listed below are intended as standards and guidelines to be followed during the planning of projects in the CSNM.

Standards and Guidelines

1. Ladder fuels will be reduced by reducing white fir stocking levels while thinning from below. Pile burning and prescribed broadcast burning will be designed in a manner to protect and maintain large tree components.

2. As a byproduct of protection treatments large tree vigor will be increased so as to maintain large cohorts for the long-term within the stand and on the landscape, while reducing the risk of large scale losses to fire, insects, and disease.

3. Gaps (less than 1/4 acre) will be created around and adjacent to pines for regeneration opportunities, particularly in Habitat Types 1 and 2. Blister rust resistant sugar pine seedlings will be used when planting is necessary because blister rust has greatly reduced the pole, sapling, and seedling component in natural stands. Large white fir may be harvested in previously entered or unentered stands where they compete with sugar pine and ponderosa pine. Thinning will emphasize retaining and enhancing the existing pine components and promoting opportunities for pine regeneration while retaining adequate canopy cover throughout the stands treated.

4. To promote stand diversity and structure as a secondary effect of protection and maintenance treatments projects would include the following design features:

- Twenty percent or more of any stand being treated will remain as untreated patches.
- Gaps (less than 1/4 acre) around individual or groups of large pines may be created; except within NSO activity centers.
- Thinning will be conducted in a manner that varies tree spacing with approximately 10% of the areas left unthinned and 10% widely spaced. Canopy layers should not be totally removed when thinning from below.
- Green trees may be snagged or felled and left where CWD is below the standards and guidelines discussed in the section below.
- Only thinning from below, prescribed underburns, and large pine release would be attempted in owl cores or unentered old-growth, and only if the cores exhibit overstocking of understory white fir.

Treatment Recommendation by Ecoregion and Habitat Type

Ecoregion: Klamath River Ridge Ecoregion (78a)

Habitat Type 1: Nesting

Description

Mixed Conifer Forest stands with LSOG character are unentered or lightly entered. Two or three age classes are prominent within the multilayered stand. White fir occupies most of the understory in the form of intermediate and suppressed trees. The overstory is primarily large, old sugar pine, ponderosa pine and Douglas-fir. Some larger white fir are found, but are generally smaller and younger than the other species. Douglas-fir dwarf mistletoe is present. Coarse woody debris and snags are not generally lacking although class 1 and 2 snags and coarse woody debris may be low due to the predominance of small sized white fir which rots quickly.

Objectives

Protect and maintain nesting function while reducing risks to stand from fire and insects. Reduce small white fir stocking levels. Maintain large tree components.

Recommended Treatment

Alternative B.

No management activities would occur within this habitat type. Reduce fuel loading adjacent to and within 1/4 mile of nesting habitat in order to reduce risk of loss due to catastrophic fire.

Alternative C.

Reduce the white fir component by thinning and prescribed burning. Only trees less than 7" dbh would be removed manually. A few larger white fir would suffer mortality during prescribed broadcast burns. Small white fir stocking levels will be reduced, but maintained at acceptable levels for multistoried habitat. Canopy levels would be maintained. Reduce fuel loading within 1/4 mile of habitat type 1.

Alternative D.

Suppressed understory (0"-7" dbh classes), particularly white fir, would be thinned to remove an acceptable portion of small tree stocking while continuing to maintain diverse stand structure. Thinning of understory white fir would occur across all small diameter classes while maintaining desirable stocking levels. Douglas-fir with dwarf mistletoe would be left. Commercial sized trees less than average size stand dbh would be thinned. Some larger commercial sized trees would be girdled or dropped where CWD and snags are deficient and where they compete with overstory trees (particularly pine).

This would be done to increase individual tree vigor and to reduce competition to larger residual trees. Gaps for pine reproduction would not be created. Canopy would be maintained at or near existing levels. Light underburning will occur. Piling slash (small material only) and burning some or all piles would be an option as well.

Habitat Type 2: Roosting/Foraging

Description

Most mixed conifer stands have been entered, a few have not. LSOG characteristics are present in varying amounts. Gaps exist where large trees have been removed. White fir most commonly fills gaps to the exclusion of pine. Large trees are still present in these stands, however, Quadratic Mean Diameter and stand age is less than in Habitat Type 1. Many residual trees present are over 80 years old and often exceed 250 years of age. Canopy closure has been reduced. Canopy may or may not be single layer, but vertical forest structure is reduced and is more open and discontinuous than in un-entered

stands. White fir grow around residual old-growth conifers. Sugar and ponderosa pine vigor is decreased due to white fir competition. Snags and CWD are often deficient due to past logging and yarding practices.

Objectives

Maintain roost/forage functions. Reduce small tree (post fire ingrowth) component. Maintain tree vigor. Encourage development of the large tree component. Reduce risk of stand loss to fire and insects. Maintain canopy closure at 60% or greater.

Recommended Treatments

Alternative B.

No actions within habitat type 2.

Alternative C.

Reduce white fir component by thinning small trees less than 7" dbh and prescribed burning. Maintain multileveled habitat for LSOG species. These activities will reduce ladder fuels and competition to dominant mixed conifers.

Alternative D.

Thin from below to maintain the residual large tree component and reduce risk to individual pine trees. Thin predominantly white fir trees 100 years or less in age and 20 inches or less in diameter. Favor pine species, incense cedar and Douglas-fir over white fir. Some Douglas-fir with dwarf mistletoe would be favored and encouraged. Commercial sized trees would be girdled or felled and left where snags and CWD are deficient. Intermediate trees of all species and diameter classes would be retained in the stand. Canopy closure would not go below 60% and increase over time. Clumps of small trees in existing canopy gaps would be thinned to increase growth and hasten canopy closure. Sugar pine would be planted in suitable canopy gaps to encourage its presence in the stand. Underburning or slash piling will be an option for habitat protection.

Habitat Type 3: Potential Habitat

Description

This habitat type is represented by mixed conifer advanced reproduction and pine plantations originating from clearcuts in the Lincoln Creek and Rosebud area. Age is generally less than 25 years. Stocking levels are currently too high to develop into LSOG. Understory vegetation is either grasses or manzanita and ceanothus.

Objectives

Reduce fuel loading while accelerating tree growth in order to develop LSOG characteristics as soon as possible. Encourage multiple species development (mixed conifer) in pine plantations.

Recommended Treatments Common to Alternatives B, C, and D.

Thin from below, reduce stocking levels significantly, accelerate tree growth. Prescribe burn excess fuel if necessary. After thinning, monitor growth for future cultural practice. Maximize tree growth. Create gaps and conditions necessary for ingrowth of mixed conifer component under pine plantations. Maintain stands at density levels that will best promote LSOG development trend. Stands are on a trajectory for over 350 feet of basal area reduce to approximately 200 BA.

Alternative B. Concentrate on pine plantations. No commercial thinning.

Alternative C. Commercial thinning allowed where applicable in larger sized stands.

Alternative D. Commercial thinning will be heavier than in Alternative C.

Habitat Type 5: Dispersal Habitat with LSOG Potential

Description

Many of these stands were more heavily thinned and often are a result of shelterwood cuts, overstory removal or multiple entries. Some are younger stands or are stocked at lower levels due to disturbance, poor soils or low site forest lands. Canopy cover is limited, little layering exists and understory stocking levels are often poor. CWD and snags are almost always deficient.

Objectives

Protect LSOG and develop forest stands with LSOG characteristics. Reduce fuel loading and accelerate stand development to encourage the creation of roosting/foraging habitat. Increase average stand diameter. Encourage development of vigorous open grown trees that maintain dispersal functions.

Recommended Treatments

Alternative B.

No management activities.

Alternative C.

Reduce white fir component and small tree stocking levels by thinning commercial and non-commercial trees generally less than the average size stand dbh through a combination of prescribed burning and manual thinning. Maintain acceptable distribution stand diameter classes for multistoried LSOG habitat of some larger trees would be girdled and /or felled to contribute toward snags and CWD. Favor pine and other fire dependent species.

Alternative D.

Thin trees (generally less than 20" dbh), particularly white fir, to increase residual tree growth. Intermediate tree growth would be encouraged. Individual tree culturing would be performed particularly in the case of individual pines. Larger commercial sized trees that are selected for cutting would either be harvested and removed or left on site as snags or CWD. Planting of gaps would be standard to increase the pine component and canopy quality over time. Canopy closure would be maintained at 40%, and preferably increased over time. Prescribe burn where applicable.

Ecoregion: Siskiyou Foothills Ecoregion (78b)

Habitat Type 1: Nesting

Description

Mixed conifer forest stands are unentered or lightly entered. Two or three size and age classes are found in a multistoried stand. There is a significant amount of black oak and madrone in the intermediate canopy level. Hardwoods are often overtopped by large mature conifers such as Douglas-fir, ponderosa pine and incense cedar. Few sugar pine or white fir are found in these stands although some white fir are present as seedlings and intermediate suppressed trees in the understory. Douglas-fir and incense cedar are the most common seedlings and pole sized conifers. Dwarf mistletoe is often heavy on Douglas-fir. Stands occur on steep slopes and display riparian features. CWD and snags are not generally lacking for hardwoods or conifers.

Objectives

Maintain nesting functions while reducing risks to stands from fire and insects. Maintain large trees in the stand.

Recommended Treatment

Alternative B

No actions within habitat type 1.

Alternative C

Reduce the Doug-fir (replaces white fir in this ecoregion at lower elevations) component by thinning small trees less than 7" in diameter and prescribed burning. These activities will reduce ladder fuels and competition to dominant mixed conifers. Maintain multistoried canopy and hardwoods as preferred habitat for LSOG species.

Alternative D

Suppressed understory conifers would be thinned from around dominant conifers and black oak in a manner so as to maintain canopy and stand structure. White fir found would be removed while maintaining the other species components. Some commercial sized trees would be girdled or dropped where they compete with dominant ponderosa pine and black oak. Residual tree vigor would be encouraged. No gaps would be created. Underburning or pile burning of slash may occur but would not be a priority this decade.

Habitat Type 2: Roosting/Foraging

Description

Most mixed conifer stands have been entered, some have not been managed. LSOG characteristics are present in varying amounts. Gaps exist where large trees have been removed. Douglas-fir is usually filling these gaps. Dwarf mistletoe on Douglas-fir is common and sometimes heavy due to past selective logging practices that opened the stands up. Canopy closure has been reduced. Canopy is generally not single layered although forest structural diversity is reduced, more open and discontinuous than in un-entered stands. Mean stand diameter is less than in Habitat Type 1. Ponderosa pine and black oak vigor is decreased due to heavy stocking and competition from Douglas-fir and incense cedar. Snags and coarse woody debris are sometimes deficient due to past management practices.

Objectives

Maintain roost/forage functions. Maintain tree vigor. Encourage the development of large tree components. Reduce the risk of stand loss to fire and insects. Increase canopy closure or maintain it at 60%.

Recommended Treatments

Alternative B.

No actions within habitat type 2.

Alternative C.

Reduce Doug- fir and brush component by prescribed burning and thinning small trees less than 7" dbh and prescribed burning. These activities will reduce ladder fuels and competition to dominant mixed conifers.

Alternative D.

Thinning from below would be performed to maintain the residual large tree composition of ponderosa pine and Douglas-fir. Thinning for all species would select trees less

than 20" dbh. Thinning around individual black oak and subdominant pine would be accomplished to encourage vigor and development of old-growth trees. Douglas-fir with dwarf mistletoe would be favored across several size classes. Some infested trees would be removed where infection is heavy and threatens overall stand vigor. Intermediate trees of all species other than white fir would be maintained in the stand. Canopy cover would be maintained at 60% or increased above 60%. Clumps of small trees in existing canopy gaps would be thinned to increase growth and hasten canopy closure. Ponderosa pine would be planted in suitable gaps. Underburning and/or slash piling would be an option for habitat protection.

Habitat Type 3: Potential Habitat

Description

This habitat type is represented by mostly mixed conifer species, white fir is generally lacking. Black oak and madrone are common. A few pine plantations are present as well.

Objectives

Protect from catastrophic fire. Accelerate tree growth using the best management practices available in order to develop LSOG characteristics as soon as possible.

Recommended Treatments Common to Alternatives B, C, and D.

Thin from below, reduce stocking levels. Prescribe burn excess fuels if necessary. After thinning, monitor growth for future cultural practices and needs. Maximize tree growth. Maintain stands at density levels that will best promote LSOG development trends

Habitat Type 5: Dispersal Habitat with Potential

Description

Many of these stands were heavily and selectively thinned. These stands are now composed of heavy brush and hardwoods as well as residual conifers. Some stands are younger in age and/or are stocked at lower levels due to disturbance or poor soils. Residual Douglas-fir with dwarf mistletoe were often left in the stand. Canopy cover is limited, generally less than 40% and little layering exists at present. Coarse woody debris and snag numbers are usually limited.

Objectives

Maintain dispersal function while encouraging development of large trees. Increase or maintain canopy cover and structural diversity. Reduce risks to insects and catastrophic fires.

Recommended Treatments

Alternative B.

No management actions.

Alternative C.

Reduce the small conifer, hardwood and brush component stocking levels by noncommercially thinning trees less than 7" in diameter through a combination of prescribed burning and manual thinning. Some larger trees would be left on site for snags and CWD.

Alternative D.

Commercial and noncommercial thinning of small conifers, hardwoods and brush would encourage overall stand vigor. Individual tree culturing of ponderosa pine and black oak would be accomplished by thinning Douglas-fir from below. Canopy cover would always be maintained at or above 40%. Some larger trees selected for cutting would remain on site either as snags or CWD. Planting existing canopy gaps with ponderosa pine would be done to increase the stand pine component. Most dwarf mistletoe infected Douglas-fir would remain.

Ecoregion: Southern Cascades Ecoregion (4g)

Habitat Type 1: Nesting

Description

Forest stands are lightly entered or un-entered. The higher elevation stands are composed of almost pure, large old white fir stands. Gaps are common where *Phellinus weirii* has had a historical presence. White fir is filling these gaps as very dense clumps. Many white fir stands are associated with wet alpine meadows. Therefore, patch size may be smaller. Stand density is particularly high in association with meadow edges. White fir stands here have a greater tendency to be even-aged, single canopy where *Phellinus* is absent. At lower elevations individual large, sugar pine and ponderosa pine are older than white fir because they have remained as a stand component due to the pine's resistance to various root rots. Here sugar pine and ponderosa pine sometimes fills the canopy gaps along with incense cedar as white fir mortality occurs in root rot pockets. Douglas-fir trees are present as well. Douglas-fir dwarf mistletoe is not a factor as in the other ecoregions. Stocking density tends to be greater in the Southern Cascades than in the Klamath Ecoregion. CWD and snags are present in sufficient quantities. *Phellinus weirii* infection creates many snags and much coarse woody debris, although it is sometimes short lived.

Objectives

Maintain nesting functions while reducing competition on larger trees.

Recommended Treatment

Alternative B.

No management activities would occur within this habitat type.

Alternative C.

Reduce the white fir component by thinning and prescribed burning in mixed conifer stands. High elevation white fir stands would be less managed given that root rots are the primary disturbance factor. Only trees less than 7" on diameter would be removed. Reduce fuel loading within 1/4 mile of habitat type 1.

Alternative D.

Little thinning or other intervention would be proposed in the high elevation pure white fir stands. Lower elevation stands with a pine and Douglas-fir component would be thinned lightly around large old growth trees. Trees thinned would generally be less than 20" in diameter. Some commercial size trees would be girdled or fallen and left in place for snags and CWD. White fir would be the only species cut in these instances. Light underburning and pile burning would be a low priority option. Reduce fuel loading within 1/4 mile of this habitat type.

Habitat Type 2: Roosting/Foraging

Description

Most stands have been entered, or are younger in age and have smaller trees than Habitat Type 1 stands. Pure white fir stands that have been opened up by thinning suffer from wind throw and pockets of *Phellinus*. Additionally, they often have become infected with *Annosus* root rot through stumps from previous thinnings. Over time, all of these factors contribute to decreasing stocking levels and canopy cover. Seedling and intermediate tree stocking varies and depends on gap size. Understory stocking levels can be minimal. Intermediate canopy is usually not well developed.

Multi-species stands which includes sugar pine, incense cedar and white fir are more resilient and show some recovery with release of root rot resistant species after harvest. Multi-species composition stands tend to have more developed canopy levels. Stands are approaching 60% canopy cover. Canopy gaps are often filled with root rot resistant species. CWD and snags are sometimes deficient in numbers.

Objectives

Maintain roost/forage function while encouraging development of leave trees. Manage root rots to an acceptable level. Maintain canopy of at least 60%.

Recommended Treatments

Alternative B.

No management actions would occur.

Alternative C.

Reduce the white fir component in mixed conifer stands. High elevation white fir stands would receive less treatment. Noncommercial size trees less than 7" in diameter would be thinned. Reduce fuel loading within 1/4 mile of this habitat type.

Alternative D.

Little or no thinning of trees greater than 20" dbh would be recommended other than around root rot resistant species in order to reduce risk in stands dominated by white fir. Planting of root rot resistant species would occur in canopy gaps when these stands open up due to root rot infection and windthrow. Thinning of existing reproduction would occur in gaps in order to hasten canopy closure. These stands would always be managed to maintain maximum cover. Thin commercially in mixed conifer forests to maintain large pine component. CWD would be left in canopy gaps for cover to encourage and protect natural or planted seedling growth. Reduce fuel loading within 1/4 mile of this habitat type by prescribed burning.

Habitat Type 3: Potential Habitat

Description

Young pine plantations with generally low stocking levels are found at higher elevations in white fir forests. Stocking levels are generally medium or low and not always candidates for thinning. CWD and snags are always deficient due to burning during site preparation after harvest.

Objectives

Accelerate tree growth using the best management practices available in order to develop LSOG characteristics as soon as possible.

Recommended Treatments

Thin from below, replant where necessary. Prescribe burn exceeds fuel if needed. After thinning, monitor growth for future cultural practices. Maximize tree growth. Create favorable conditions for ingrowth of mixed conifer component in the understory. Maintain stands at density levels that will best promote LSOG development trends.

Habitat Type 5: Dispersal Habitat with Potential

Description

Forest stands have often been thinned as shelterwoods. Some stands may be open grown, intertwined with meadows or exhibit naturally low stocking levels. Stands are open with little canopy development and have few seedlings due to exposure on cold, harsh sites even though canopy cover is greater than 40%. Root rots are a problem, particularly in stands dominated by white fir. Windfall is common and stands decrease in stocking levels, canopy closure, and complexity over time especially in white fir dominated stands. CWD and snags are deficient due to past logging, yarding, and burning practices.

Objectives

Maintain dispersal functions while encouraging growth of open full-crown trees. Manage root rot to acceptable levels.

Recommended Treatments

Alternative B.

No management actions would be allowed.

Alternative C.

Reduce small tree stocking levels in clumps. Reduce density where needed by thinning commercial and noncommercial trees less than the average size stand diameter. Prescribe burn in mixed conifer communities, but generally not in high elevation white fir stands. Plant seedlings in understocked gaps.

Alternative D.

Light thinning of white fir clumps in the open and under root rot resistant species would occur. Planting of species other than white fir would be done in suitable canopy gaps. Some commercial sized trees to be marked for "harvest" would be girdled or fallen into canopy gaps for cover for seedlings and wildlife where CWD and snags do not meet targets.

Ecoregion: Southern Cascades Slope Ecoregion (9i)

Habitat Type 1: Nesting

Description

Stands are ponderosa pine dominated. A mixture of white fir and Douglas-fir understory has developed in the absence of fire. These stands are located on the lee side of the Cascades. They are on very dry sites on generally flat terrain.

Objectives

Maintain nesting function while reducing risks to stand from fire and insects. Maintain large tree component.

Recommended Treatment

Alternative B.

No management activities.

Alternative C. and Alternative D.

Very little of this habitat is found in this ecoregion at present. The only treatment recommended would be a light pre-commercial tree thinning from below and/or underburning in order to maintain ponderosa pine vigor. Reduce fuels within 1/4 mile of habitat type 1.

Habitat Type 2: Roosting/Foraging

Description

Ponderosa pine dominated stands occur on the lee side of the Cascades. The sites are flat and dry. Douglas-fir and white fir understory has developed in the absence of fire. Overall the stands tend to be more open grown than forest stands in the other ecoregions. Tree diameter is less than in Habitat Type 1. Most of these stands have been entered, a few have not. Canopy closure has been reduced. The canopy may or may not be single layer, however forest cover has been reduced and may or may not be more open and discontinuous than in un-entered stands. CWD and snags are generally deficient due to past logging and yarding practices.

Objectives

Maintain roost/forage functions. Maintain tree vigor. Encourage development of the large tree component. Reduce risk of stand loss to fire and insects. Maintain canopy closure at 60% or increase it.

Recommended Treatment

Alternative B.

No management activities would be allowed.

Alternative C. and D.

Thinning from below will be done to maintain the large tree component in the stand. It is expected that these stands will be more open than similar stands in the other ecoregions given that these are ponderosa pine dominated stands. Generally, white fir and Douglas-fir less than 16" in diameter and less than 100 years of age will be thinned. Ponderosa pine, sugar pine and incense cedar will be favored. Existing tree clumps in canopy gaps will be thinned to increase their growth and to hasten canopy closure. Ponderosa pine will be planted or encouraged to grow whenever possible. Commercial sized trees would be girdled or felled and left where snags and CWD are deficient. Acceptable levels will be as in the Klamath River Ridges Ecoregion. Reduce fuels within 1/4 mile of this habitat type. Underburning or slash piling would be an option for habitat protection and risk reduction.

Habitat Type 3: Potential Habitat

Description

Little of this habitat type exists in this ecoregion. Most of it is young pine plantations.

Objectives

Accelerate tree growth using the best management practices available in order to develop LSOG characteristics as soon as possible.

Recommended Treatments

Thin from below, reduce current stocking levels. Prescribe burn excess fuels where needed. After thinning, monitor growth for future cultural needs. Maximize tree growth. Maintain stands at density levels that will best promote LSOG development trends.

Habitat Type 5: Dispersal Habitat with Potential

Description

Many of these stands are heavily thinned and some were selectively cut. A few are younger stands or are stocked at lower levels due to disturbance, poor soils or are intermixed with natural meadows. Stands are open and canopy cover is generally limited, little layering exists and stocking levels are poor. CWD and snags are often deficient.

Objectives

Develop forest stands with LSOG characteristics. These stands would become roosting/foraging habitat. Encourage development of vigorous open grown trees that maintain dispersal functions.

Recommended Treatments

Alternative B.

No management activities would be allowed.

Alternative C. and D.

Stand character would be shifted more towards ponderosa pine. Light thinning of understory trees generally less than 20" in diameter would increase tree growth and vigor. Canopy gaps would sometimes result. Groups of pine in different age classes would be encouraged. Underburning and/or piling would be options. Canopy closure would be maintained at or above 40% encouraged in order to maintain diverse structure in ponderosa pine stands. Multistoried canopies would be encouraged and would have a full crowned pine character. Entries would favor a number of trees in several Dunning's pine classes (Dunning, 1928). Larger trees selected for cutting would be left on site where snags or CWD are deficient.

Salvage Guidelines

In all cases, planning for salvage should focus on long-range objectives, which are based on desired future condition of the forest. Because one monument goal is to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions. The rate of development of this habitat will vary among forest types and will be influenced by a complex interaction of stand-level factors that include site productivity, population dynamics of live trees and snags, and decay rates of coarse woody debris. Because there is much to learn about the development of species associated with these forests and their habitat, it seems prudent to only allow removal of conservative quantities of salvage material from the monument and retain management opportunities until the process is better understood. The following guidelines are general. Specific snag and CWD guidelines have been developed for each ecoregion in the Monument (see Appendix JJ). The ecoregion specific guidelines were developed as targets for managed stands developing into LSOG habitat. They should be considered minimum standards for salvage projects considered after a stand replacing event.

1. The potential for benefit to species associated with late-successional forest conditions from salvage is greatest when stand-replacing events are involved. Salvage in disturbed sites of less than 10 acres is not appropriate because small forest openings are an important component of old-growth forests. In addition, salvage would occur only in stands where disturbance has reduced canopy closure to less than 40 percent, because stands with more closure are likely to provide some value for species associated with these forests.
2. Surviving trees provide a significant residual component of larger trees in the developing stand. In addition, defects caused by fire or wind break in residual trees may accelerate development of structural characteristics suitable for LSOG associated species. Also, those damaged trees that eventually die will provide additional snags. Consequently, all standing live trees would be retained, including those injured (e.g., scorched) but likely to survive. Inspection of the cambium layer can provide an indication of potential tree mortality.
3. Following stand-replacing disturbance, management would focus on retaining snags that are likely to persist until late-successional conditions have developed and the new stand is again producing large snags.
4. Following a stand-replacing disturbance, management would retain adequate coarse woody debris quantities in the new stand so that in the future it will still contain amounts similar to naturally regenerated stands. The analysis that determines the amount of coarse woody debris to leave must account for the full period of time before the new stand begins to contribute coarse woody debris. Because coarse woody debris decay rates, forest dynamics, and site productivity undoubtedly vary among provinces and forest types, the specifications also will vary. This standard and guideline represents one item to be considered and may indeed result in no salvage following windthrow in low density stands.
6. Removal of snags and logs may be necessary to reduce hazards to humans along roads and trails, and in or adjacent to campgrounds. Where materials must be removed from the site, as in a campground or on a road, a salvage sale may be appropriate. In other areas, such as along roads, material would be left on site.
7. Where green trees, snags, and logs are present following disturbance, the green-tree and snag guidelines will be applied first, and completely satisfied where possible. The biomass left in snags can be credited toward the amount of coarse woody debris biomass needed to achieve management objectives.
8. These basic guidelines may not be applicable after disturbances in younger stands because remnant coarse woody debris may be relatively small. In these cases, diameter and biomass retention guidelines would be developed consistent with the intention of achieving late-successional forest conditions.
9. It seldom will be appropriate to remove logs present on the forest floor before a disturbance event. Where these logs are in an advanced state of decay, they will not be credited toward objectives for coarse woody debris retention developed after a disturbance event. Advanced state of decay is defined as logs not expected to persist to the time when the new stand begins producing coarse woody debris.
10. The coarse woody debris retained would approximate the species composition of the original stand to help replicate preexisting suitable habitat conditions.

