APPENDIX O: GIS DATA SOURCES AND DOCUMENTATION

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MAPS/GIS COVERAGES

HISTORIC VEGETATION OF WILLAMETTE VALLEY AND FOOTHILLS

We used a coverage depicting vegetation circa 1850 derived and interpolated from Government Land Office (GLO) survey notes dating to the mid to late 1800's (see Map 1, Historical Vegetation Types (circa 1850) of the Willamette Valley and foothills). This coverage is available from the GIS coordinator, Division of State Lands (503-378-3805).

We lumped vegetation attributes to arrive at dominant vegetation types. Burned lands were mapped on the coverage as well.

PLANT ASSOCIATION GROUPS

Plant Association Groups were used in a variety of processes, from current seral stage designations to fire regime distributions. A digital copy of grouped Plant Association Groups (PAGs) was obtained from the Northwest Oregon Ecology Group (Cindy McCain, Ecologist). Plant associations were grouped and named as detailed in Table O-1. Groups were determined based on relationships with fire history studies, or professional opinion of fire history relationships.

Table O-1. Plant Association Groupings and associated environments.

PAG Group #	Environment	Plant Series	Plant Association
1	Very dry	Douglas-fir/ Grand fir	**Douglas fir types:** ocean-spray – Oregon grape; /ocean-spray –snowberry; /ocean-spray – whipple vine; /ocean-spray/grass; California hazel-ocean-spray/swordfern; /poison oak **Grand fir types:** ocean-spray – swordfern
2	Well-drained	Western hemlock	**Douglas-fir types:** Oregon grape; /Oregon grape-salal; / Douglas-fir-western hemlock/Pacific rhododendron **Grand fir types:** /Oregon grape; kinnikinnick; /Oregon grape-salal
3	Well-drained		**Western hemlock types:** vanilla leaf; /Oregon grape/vanilla leaf; vine maple-salal/swordfern; /Oregon grape; /Oregon grape-salal; /Oregon grape/Oregon oxalis; /Oregon grape/swordfern; /salal; /twinflower
4	Moist	Western hemlock	**Western hemlock types:** vine maple/swordfern; /Oregon oxalis; /swordfern **Grand fir types:** vine maple/swordfern
5	Wet	Western hemlock	**Western hemlock types:** salmonberry
6	Cold	Western hemlock	**Western hemlock types:** / rhododendron-Oregon grape; / rhododendron-salal; / rhododendron/twinflower; /rhododendron/Oregon oxalis**;** rhododendron-Alaska huckleberry /dogwood bunchberry; / Alaska huckleberry -salal; / Alaska huckleberry / dogwood bunchberry; /big huckleberry /beargrass; / rhododendron/beargrass
7	Well-drained	Pacific silver fir	**Pacific silver fir types:** rhododendron-Oregon grape; / rhododendron-salal; / rhododendron/beargrass; /Oregon grape **Pacific silver fir-western hemlock types:** rhododendron-salal
8	Moist	Pacific silver fir	**Pacific silver fir types:** rhododendron-Alaska huckleberry / dogwood bunchberry; / Alaska huckleberry-salal; / Alaska huckleberry/ dogwood bunchberry; /vine maple/coolwort foamflower; /Oregon oxalis; / coolwort foamflower **Pacific silver fir-grand fir types:** /starry solomonplume
9	Cold	Pacific silver fir	**Pacific silver fir types:** big huckleberry/queencup beadlily; / big huckleberry/beargrass; /fool's huckleberry; /Cascades azalea/ queencup beadlily; /Cascades azalea/ beargrass
10		Mountain hemlock	**Mountain hemlock types**: rhododendron; /woodrush; /big huckleberry/beargrass; /grouse huckleberry; big huckleberry/ queencup beadlily
11		Sitka spruce	**Sitka spruce types:** salal; /salmonberry-salal; fool's huckleberry-red huckleberry; /Oregon oxalis; /swordfern; /salmonberry; /devil's club

CURRENT SERAL STAGES

Current vegetation was described and mapped by seral stages (early, mid and late). We used the Willamette National Forest's VEG6 polygon coverage, Eugene BLM's FOI polygon coverage, Western Oregon Digital Imagery Project (WODIP, satellite imagery from 1993), the grouped PAG layer (described above).

Willamette National Forest dominant diameter (DBH) classes, BLM age classes and WODIP diameter (DBH) classes were overlayed with the grouped PAG layer to determine seral stages across the entire project area. Table O-2 displays the crosswalk used to arrive at seral stage designations. Age and size class groups were derived using Ecology ecoplot data and professional judgment.

Table O-2. Seral Stages and associated Plant Association (PAG) groups, age class and size class ranges.

Early Seral Stage	**PAG Groups**	**Age / Size Class**
	Very dry Douglas-fir / Grand fir	0 - 50 yrs., <10 in.
	Well-drained Douglas-fir / Grand fir	0 – 40 yrs., 10-19 in.
	Well-drained western hemlock	0 – 40 yrs., < 10 in.
	Moist western hemlock	0 – 40 yrs., < 10 in.
	Wet western hemlock	0 – 25 yrs., < 10 in.
	Cold western hemlock	0 – 40 yrs., < 10 in.
	Well- drained Pacific silver fir	0 – 50 yrs., < 5 in.
	Moist Pacific silver fir	0 – 50 yrs., < 10 in.
	Cold Pacific silver fir	0 – 50 yrs., < 5 in.
	Mountain hemlock	0 – 50 yrs., < 5 in.
	Sitka spruce	0 – 40 yrs., < 10 in.
Mid Seral Stages	**PAG Groups**	**Age / Size Class**
	Very dry Douglas-fir / Grand fir	50 – 125 yrs., 10 – 19 in.
	Well-drained Douglas-fir / Grand fir	40 – 100 yrs., 10 – 19 in.
	Well-drained western hemlock	40 – 100 yrs., 10 – 19 in.
	Moist western hemlock	40 – 80 yrs., 10 – 19 in.
	Wet western hemlock	25 – 125 yrs., 10 – 29 in.
	Cold western hemlock	40 – 100 yrs., 10 – 19 in.
	Well-drained Pacific silver fir	50 – 175 yrs., < 10 in.
	Moist Pacific silver fir	50 – 150 yrs., 10 – 19 in.
	Cold Pacific silver fir	50 – 175 yrs., < 10 in.
	Mountain hemlock	51 – 175 yrs., < 10 in.
	Sitka spruce	40 – 80 yrs., 10 – 19 in.

Table O-2. Seral Stages and associated Plant Association (PAG) groups, age class and size class ranges *(continued)*.

Late Seral Stage	PAG Groups	Age/Size Class
	Very dry Douglas-fir/Grand fir	> 125 yrs., > 20 in.
	Well-drained Douglas-fir/ Grand fir	> 100 yrs., > 20 in.
	Well-drained western hemlock	> 100 yrs., > 20 in.
	Moist western hemlock	> 80 yrs., > 20 in.
	Wet western hemlock	> 125 yrs., > 30 in.
	Cold western hemlock	> 100 yrs., > 20 in.
	Well-drained Pacific silver fir	> 175 yrs., > 10 in.
	Moist Pacific silver fir	> 150 yrs., > 20 in.
	Cold Pacific silver fir	> 175 yrs., > 10 in.
	Mountain hemlock	> 175 yrs., > 10 in.
	Sitka spruce	> 80 yrs., > 20 in.

FIRE ZONES AND FIRE REGIMES

Climate, topography and fuels affect the frequency, severity and size of fires at many spatial and temporal scales. Climate, landform and vegetation distribution patterns are best seen at larger scales, whereas site- specific weather, topography and fuels influence fire regimes a finer spatial scale. We used these two spatial scales to develop fire zones and fire regimes.

Fire Zones

Fire zones were created to capture the variability in large-scale patterns of climate (including potential lightning patterns), landforms and vegetation distribution. We used the process outlined in the Mid-Willamette LSR Assessment (USDA 1998) to determine fire zones. Statewide precipitation coverage and a 25 year lightning activity distribution layer (of federal land only) was used as a proxy for climate (see Map 5, Current Ignition Risk). Physiographic zones from the statewide geology layer and landtype distribution was used as a proxy for topography (and to interpret patterns in temperature). A plant association group layer (see Map 2, Plant Association Groups and discussion in process paper) was used as a proxy for vegetation distribution.

Five fire zones were described: High Cascades, Low Cascades, South Cascades, Valley and Foothills and Coast Range. Each zone has a unique pattern of climate, landforms and vegetation. The hypothesis is these patterns will influence fire regime distribution differently.

Fire Regimes

Fire regimes were described (named for the most common historic fire severity and associated frequency) using fire history information from the INFMS and surrounding areas (see Appendix C Fire Zones and Fire Regimes) and professional judgment. Five fire regimes were designated (Table O-3). These regimes are consistent with Region 6 direction following the National Fire Strategy (1999).

Table O-3. Fire Regimes in the INFMS Area

Fire Regime	Severity	Frequency (Mean Fire Return Interval)
1	Low	High (< 35 years)
2	Variable	High (<50 years)
3	Variable	Moderate (50-100 years)
4	Variable	Low (> 100 years)
5	High (stand replacement)	Very Low (>200 years)

Fire history results were related to the patterns of potential vegetation (plant association group distribution; Map 2 and Process Paper discussion) outlined in each zone to develop models for fire regime distribution. Professional judgment was used to extrapolate and interpolate fire history results to appropriate plant association groupings. Fire regimes were assigned for each combination of PAG group and Zone (Table O-4). A coarse scale (cell size 100 acres) north and south aspect was used in some cases to account for the effects of aspect on fire regime designations.

Table O-4. Fire regime designations* for each Plant Association grouping (PAG) and Fire Zone and broad scale aspect (N = north slope; S= south slope)

Fire Zone	**PAG Group +**										
	Douglas-fir/ Grand fir		**Western hemlock**				**Pacific Silver fir**			**Mountain hemlock**	**Sitka spruce**
	VD (1)	**WD (2)**	**WD (3)**	**Moist (4)**	**Wet (5)**	**Cold (6)**	**WD (7)**	**Moist (8)**	**Cold (9)**	**(10)**	**(11)**
High Cascades	2	3	3-S 4-N	4	X	3-S 4-N	4	4-S 5-N	5	5	X
Low Cascades	2	3	3-S 4-N	4	X	4	4	5	5	5	X
South Cascades	2	2	2-S 3-N	3-S 4-N	X	3-S 4-N	3-S 4-N	3-S 4-N	4	4	X
Valley/Foothills	1	1	2	2	3	3-S 4-N	X	X	X	X	X
Coast Range	3	3	4	4	4	4	4	5	5	4	5

* 1 = Low Severity/High Frequency
2 = Variable Severity/High Frequency
3 = Variable Severity/Moderate Frequency
4 = Variable Severity/Low Frequency
5 =High Severity/Very Low Frequency
+ = VD-Very dry; WD- Well-drained; see Table O-1

CURRENT POTENTIAL FIRE RISK

Major goals of current wildland fire policy require development of hazardous fuel treatment strategies on the geographic area scale. Prioritization of projects needs to occur within the context of ecosystem health and restoration. This section describes the process for rating the potential fire risk of an area to help in deciding if and where hazardous fuel treatments should occur.

An important step in developing a fuels management strategy is to assess the current levels and distribution of risk across the landscape. Land at higher risk for catastrophic wildfire can then be prioritized for appropriate management activities to reduce that risk. Factors related to fire occurrence, fuel loading and fire behavior potential have been combined to determine the distribution of risk levels within the project area.

CURRENT IGNITION RISK

We used fire occurrence information over 25-year period (1970-1994) to assess the risk of fire starts for the assessment area. Fire starts from FS and BLM records were recorded and mapped by section. A fire occurrence risk rating was developed using the number of fire starts per 1,000 acres per year. Low risk was associated with 0-.06 starts/1,000 acres/year (roughly 0-1 fire per section per 25 years); moderate risk levels were .07-.29 starts/1,000 acres/year (roughly 2-4 fires/section per 25 years); and high-risk levels were greater than .29 starts/1,000 acres/year (roughly greater than 4 fires/section per 25 years). Fire occurrence risk distribution is contained in Map 5

CURRENT FIRE BEHAVIOR POTENTIAL

We assessed current fuel loading and associated fire behavior under severe burning conditions to evaluate the risk of fire severity and spread. A fuel model layer was developed using vegetative class typing from satellite imagery (WODIP, 1993), correlating it to National Forest Fire Laboratory (NFFL) fuel models and fitting the needs of Farsite for future modeling (Table O-5 displays recoding results).

Table O-5. WODIP to NFFL Fire Behavior Fuel Model

Value	Cover Type	Species	Structural Layers	Size Class	Crown Closure	Closure Group	NFFL Model
1	water			0	0	0	98
2	urban-ag			0	0	0	0
3	non-for_veg			0	0	0	4
4	barren			0	0	0	0
5	other			0	0	0	99
6	clearcut			0	0	0	5
7	forest	conifer	one	1	5	1	1
8	forest	conifer	one	1	15	1	1
9	forest	conifer	one	1	25	2	1
10	forest	conifer	one	1	35	2	1
11	forest	conifer	one	1	45	2	1
12	forest	conifer	one	1	55	3	1
13	forest	conifer	one	1	65	3	5
14	forest	conifer	one	1	75	3	5
15	forest	conifer	one	1	85	4	5
16	forest	conifer	one	1	95	4	5
17	forest	conifer	one	2	5	1	1
18	forest	conifer	one	2	15	1	2
19	forest	conifer	one	2	25	2	8
20	forest	conifer	one	2	35	2	8
21	forest	conifer	one	2	45	2	8
22	forest	conifer	one	2	55	3	8
23	forest	conifer	one	2	65	3	8
24	forest	conifer	one	2	75	3	8
25	forest	conifer	one	2	85	4	8
26	forest	conifer	one	2	95	4	8
27	forest	conifer	one	3	5	1	1
28	forest	conifer	one	3	15	1	2
29	forest	conifer	one	3	25	2	2
30	forest	conifer	one	3	35	2	2
31	forest	conifer	one	3	45	2	10

Table O-5. WODIP to NFFL Fire Behavior Fuel Model *(continued).*

Value	Cover Type	Species	Structural Layers	Size Class	Crown Closure	Closure Group	NFFL Model
32	forest	conifer	one	3	55	3	10
33	forest	conifer	one	3	65	3	10
34	forest	conifer	one	3	75	3	10
35	forest	conifer	one	3	85	4	10
36	forest	conifer	one	3	95	4	10
37	forest	conifer	one	4	5	1	1
38	forest	conifer	one	4	15	1	2
39	forest	conifer	one	4	25	2	2
40	forest	conifer	one	4	35	2	5
41	forest	conifer	one	4	45	2	10
42	forest	conifer	one	4	55	3	10
43	forest	conifer	one	4	65	3	10
44	forest	conifer	one	4	75	3	10
45	forest	conifer	one	4	85	4	10
46	forest	conifer	one	4	95	4	10
47	forest	conifer	multi	1	5	1	4
48	forest	conifer	multi	1	15	1	4
49	forest	conifer	multi	1	25	2	11
50	forest	conifer	multi	1	35	2	11
51	forest	conifer	multi	1	45	2	11
52	forest	conifer	multi	1	55	3	5
53	forest	conifer	multi	1	65	3	5
54	forest	conifer	multi	1	75	3	5
55	forest	conifer	multi	1	85	4	5
56	forest	conifer	multi	1	95	4	5
57	forest	conifer	multi	2	5	1	1
58	forest	conifer	multi	2	15	1	1
59	forest	conifer	multi	2	25	2	5
60	forest	conifer	multi	2	35	2	5
61	forest	conifer	multi	2	45	2	8
62	forest	conifer	multi	2	55	3	8

Table O-5. WODIP to NFFL Fire Behavior Fuel Model *(continued)*.

Value	Cover Type	Species	Structural Layers	Size Class	Crown Closure	Closure Group	NFFL Model
63	forest	conifer	multi	2	65	3	10
64	forest	conifer	multi	2	75	3	10
65	forest	conifer	multi	2	85	4	10
66	forest	conifer	multi	2	95	4	10
67	forest	conifer	multi	3	5	1	1
68	forest	conifer	multi	3	15	1	5
69	forest	conifer	multi	3	25	2	5
70	forest	conifer	multi	3	35	2	8
71	forest	conifer	multi	3	45	2	8
72	forest	conifer	multi	3	55	3	8
73	forest	conifer	multi	3	65	3	10
74	forest	conifer	multi	3	75	3	10
75	forest	conifer	multi	3	85	4	10
76	forest	conifer	multi	3	95	4	10
77	forest	conifer	multi	4	5	1	1
78	forest	conifer	multi	4	15	1	5
79	forest	conifer	multi	4	25	2	5
80	forest	conifer	multi	4	35	2	8
81	forest	conifer	multi	4	45	2	8
82	forest	conifer	multi	4	55	3	8
83	forest	conifer	multi	4	65	3	10
84	forest	conifer	multi	4	75	3	10
85	forest	conifer	multi	4	85	4	10
86	forest	conifer	multi	4	95	4	10
87	forest	hardwood	one	1	5	1	5
88	forest	hardwood	one	1	15	1	5
89	forest	hardwood	one	1	25	2	5
90	forest	hardwood	one	1	35	2	5
91	forest	hardwood	one	1	45	2	5
92	forest	hardwood	one	1	55	3	5
93	forest	hardwood	one	1	65	3	5

Table O-5. WODIP to NFFL Fire Behavior Fuel Model *(continued)*.

Value	Cover Type	Species	Structural Layers	Size Class	Crown Closure	Closure Group	NFFL Model
94	forest	hardwood	one	1	75	3	5
95	forest	hardwood	one	1	85	4	5
96	forest	hardwood	one	1	95	4	5
97	forest	hardwood	one	2	5	1	5
98	forest	hardwood	one	2	15	1	5
99	forest	hardwood	one	2	25	2	8
100	forest	hardwood	one	2	35	2	8
101	forest	hardwood	one	2	45	2	5
102	forest	hardwood	one	2	55	3	5
103	forest	hardwood	one	2	65	3	5
104	forest	hardwood	one	2	75	3	5
105	forest	hardwood	one	2	85	4	5
106	forest	hardwood	one	2	95	4	5
107	forest	hardwood	one	3	5	1	1
108	forest	hardwood	one	3	15	1	5
109	forest	hardwood	one	3	25	2	5
110	forest	hardwood	one	3	35	2	5
111	forest	hardwood	one	3	45	2	5
112	forest	hardwood	one	3	55	3	8
113	forest	hardwood	one	3	65	3	8
114	forest	hardwood	one	3	75	3	9
115	forest	hardwood	one	3	85	4	9
116	forest	hardwood	one	3	95	4	9
117	forest	hardwood	one	4	5	1	1
118	forest	hardwood	one	4	15	1	1
119	forest	hardwood	one	4	25	2	5
120	forest	hardwood	one	4	35	2	5
121	forest	hardwood	one	4	45	2	5
122	forest	hardwood	one	4	55	3	5
123	forest	hardwood	one	4	65	3	9
124	forest	hardwood	one	4	75	3	9

Table O-5. WODIP to NFFL Fire Behavior Fuel Model *(continued)*.

Value	Cover Type	Species	Structural Layers	Size Class	Crown Closure	Closure Group	NFFL Model
125	forest	hardwood	one	4	85	4	9
126	forest	hardwood	one	4	95	4	9
127	forest	hardwood	multi	1	5	1	1
128	forest	hardwood	multi	1	15	1	5
129	forest	hardwood	multi	1	25	2	5
130	forest	hardwood	multi	1	35	2	5
131	forest	hardwood	multi	1	45	2	5
132	forest	hardwood	multi	1	55	3	5
133	forest	hardwood	multi	1	65	3	5
134	forest	hardwood	multi	1	75	3	5
135	forest	hardwood	multi	1	85	4	5
136	forest	hardwood	multi	1	95	4	5
137	forest	hardwood	multi	2	5	1	1
138	forest	hardwood	multi	2	15	1	5
139	forest	hardwood	multi	2	25	2	5
140	forest	hardwood	multi	2	35	2	5
141	forest	hardwood	multi	2	45	2	5
142	forest	hardwood	multi	2	55	3	5
143	forest	hardwood	multi	2	65	3	5
144	forest	hardwood	multi	2	75	3	5
145	forest	hardwood	multi	2	85	4	5
146	forest	hardwood	multi	2	95	4	5
147	forest	hardwood	multi	3	5	1	1
148	forest	hardwood	multi	3	15	1	5
149	forest	hardwood	multi	3	25	2	5
150	forest	hardwood	multi	3	35	2	5
151	forest	hardwood	multi	3	45	2	5
152	forest	hardwood	multi	3	55	3	5
153	forest	hardwood	multi	3	65	3	5
154	forest	hardwood	multi	3	75	3	5
155	forest	hardwood	multi	3	85	4	9

Table O-5. WODIP to NFFL Fire Behavior Fuel Model *(continued)*.

Value	Cover Type	Species	Structural Layers	Size Class	Crown Closure	Closure Group	NFFL Model
156	forest	hardwood	multi	3	95	4	9
157	forest	hardwood	multi	4	5	1	1
158	forest	hardwood	multi	4	15	1	5
159	forest	hardwood	multi	4	25	2	5
160	forest	hardwood	multi	4	35	2	5
161	forest	hardwood	multi	4	45	2	5
162	forest	hardwood	multi	4	55	3	5
163	forest	hardwood	multi	4	65	3	5
164	forest	hardwood	multi	4	75	3	9
165	forest	hardwood	multi	4	85	4	9
166	forest	hardwood	multi	4	95	4	9
167	forest	mixed	one	1	5	1	5
168	forest	mixed	one	1	15	1	5
169	forest	mixed	one	1	25	2	5
170	forest	mixed	one	1	35	2	5
171	forest	mixed	one	1	45	2	5
172	forest	mixed	one	1	55	3	5
173	forest	mixed	one	1	65	3	8
174	forest	mixed	one	1	75	3	8
175	forest	mixed	one	1	85	4	8
176	forest	mixed	one	1	95	4	8
177	forest	mixed	one	2	5	1	5
178	forest	mixed	one	2	15	1	5
179	forest	mixed	one	2	25	2	5
180	forest	mixed	one	2	35	2	5
181	forest	mixed	one	2	45	2	8
182	forest	mixed	one	2	55	3	8
183	forest	mixed	one	2	65	3	8
184	forest	mixed	one	2	75	3	8
185	forest	mixed	one	2	85	4	8
186	forest	mixed	one	2	95	4	9

Table O-5. WODIP to NFFL Fire Behavior Fuel Model *(continued)*.

Value	Cover Type	Species	Structural Layers	Size Class	Crown Closure	Closure Group	NFFL Model
187	forest	mixed	one	3	5	1	1
188	forest	mixed	one	3	15	1	5
189	forest	mixed	one	3	25	2	5
190	forest	mixed	one	3	35	2	5
191	forest	mixed	one	3	45	2	8
192	forest	mixed	one	3	55	3	10
193	forest	mixed	one	3	65	3	10
194	forest	mixed	one	3	75	3	10
195	forest	mixed	one	3	85	4	10
196	forest	mixed	one	3	95	4	10
197	forest	mixed	one	4	5	1	1
198	forest	mixed	one	4	15	1	5
199	forest	mixed	one	4	25	2	5
200	forest	mixed	one	4	35	2	5
201	forest	mixed	one	4	45	2	5
202	forest	mixed	one	4	55	3	8
203	forest	mixed	one	4	65	3	10
204	forest	mixed	one	4	75	3	10
205	forest	mixed	one	4	85	4	10
206	forest	mixed	one	4	95	4	10
207	forest	mixed	multi	1	5	1	5
208	forest	mixed	multi	1	15	1	5
209	forest	mixed	multi	1	25	2	5
210	forest	mixed	multi	1	35	2	5
211	forest	mixed	multi	1	45	2	5
212	forest	mixed	multi	1	55	3	5
213	forest	mixed	multi	1	65	3	5
214	forest	mixed	multi	1	75	3	5
215	forest	mixed	multi	1	85	4	5
216	forest	mixed	multi	1	95	4	5
217	forest	mixed	multi	2	5	1	5

Table O-5. WODIP to NFFL Fire Behavior Fuel Model *(continued).*

Value	Cover Type	Species	Structural Layers	Size Class	Crown Closure	Closure Group	NFFL Model
218	forest	mixed	multi	2	15	1	5
219	forest	mixed	multi	2	25	2	5
220	forest	mixed	multi	2	35	2	5
221	forest	mixed	multi	2	45	2	5
222	forest	mixed	multi	2	55	3	5
223	forest	mixed	multi	2	65	3	8
224	forest	mixed	multi	2	75	3	10
225	forest	mixed	multi	2	85	4	10
226	forest	mixed	multi	2	95	4	10
227	forest	mixed	multi	3	5	1	1
228	forest	mixed	multi	3	15	1	5
229	forest	mixed	multi	3	25	2	5
230	forest	mixed	multi	3	35	2	5
231	forest	mixed	multi	3	45	2	5
232	forest	mixed	multi	3	55	3	5
233	forest	mixed	multi	3	65	3	5
234	forest	mixed	multi	3	75	3	8
235	forest	mixed	multi	3	85	4	10
236	forest	mixed	multi	3	95	4	10
237	forest	mixed	multi	4	5	1	5
238	forest	mixed	multi	4	15	1	5
239	forest	mixed	multi	4	25	2	5
240	forest	mixed	multi	4	35	2	5
241	forest	mixed	multi	4	45	2	5
242	forest	mixed	multi	4	55	3	8
243	forest	mixed	multi	4	65	3	10
244	forest	mixed	multi	4	75	3	10
245	forest	mixed	multi	4	85	4	10
246	forest	mixed	multi	4	95	4	10
247	urbanized			0	0	0	0

Recent management activities have also been incorporated when possible to reflect changes in fuels composition. Fuel model characteristics are dynamic and can change over short periods of time, and changes need to be updated frequently to maintain the integrity of the fuel model layer and associated risk assessment. We created a fire behavior potential layer to display areas where fire behavior will likely be the most extreme under severe burning conditions. Five fire zones (High Cascades, Low Cascades, South Cascades, Valley and Foothills and Coast Range, displayed on Map 4, were developed to capture the variability in weather and then appropriate weather conditions were assigned. The Behave fire behavior modeling computer program used those 90th percentile weather conditions to determine expected flame lengths for three slope classes (0-30%; 31-60%; >60%) and six NFFL fuel models (1, 5, 8,9,10, and 11). Resulting flame lengths were assigned across the landscape. See Table O-6 for results.

Table O-6. Results of BEHAVE fire modeling

Weather Element	South Cascades	Low Cascades	High Cascades	Coast/Valley
1-Hour FM%	6	7	6	6
10-Hour FM%	9	10	11	8
100-Hour FM%	11	14	15	12
Herbaceous FM%	40	49	58	58
Woody FM%	129	120	102	128
20' ; MFWS mph	9;4	7;3	7;3	7;3
1000-Hour FM%	14	17	18	17

Table O-7. South Cascades - Expected Flame Length by Fuel Model and Slope %, using combined 90%ile Weather

NFFL Fuel Model	Slope % 0.0	15.0	30.0	45.0	60.0	75.0	90.0
1	3.8	3.9	4.2	4.6	5.2	5.8	6.5
2	5.9	6.1	6.5	7.1	7.8	8.7	9.6
3	11.8	12.0	12.6	13.6	14.8	16.3	17.8
4	15.4	15.8	16.7	18.1	19.9	22.0	24.2
5	2.0	2.0	2.2	2.3	2.6	2.8	3.1
6	5.3	5.4	5.7	6.2	6.8	7.5	8.2
7	4.9	5.0	5.2	5.7	6.2	6.8	7.5
8	1.0	1.0	1.0	1.1	1.3	1.4	1.5
9	2.5	2.6	2.7	3.0	3.3	3.6	4.0
10	4.1	4.2	4.4	4.8	5.3	5.9	6.5
11	3.1	3.2	3.4	3.6	4.0	4.4	4.9
12	7.2	7.3	7.8	8.5	9.4	10.3	11.4
13	9.3	9.5	10.1	11.1	12.2	13.5	15.0

Table O-8. Low Cascades - Expected Flame Length by Fuel Model and Slope %, combined 90%ile Weather

NFFL Fuel Model	Slope % 0.0	15.0	30.0	45.0	60.0	75.0	90.0
1	2.8	3.0	3.3	3.9	4.5	5.2	5.9
2	4.6	4.7	5.2	5.9	6.7	7.7	8.6
3	9.5	9.7	10.4	11.5	12.8	14.3	15.9
4	13.1	13.5	14.6	16.2	18.3	20.5	23.0
5	1.7	1.7	1.9	2.1	2.3	2.6	2.9
6	4.3	4.4	4.8	5.3	5.9	6.6	7.4
7	4.1	4.2	4.5	5.0	5.6	6.2	6.9
8	0.8	0.8	0.9	1.0	1.1	1.2	1.4
9	2.0	2.0	2.2	2.5	2.8	3.2	3.6
10	3.4	3.5	3.9	4.3	4.9	5.5	6.1
11	2.6	2.7	2.9	3.2	3.6	4.1	4.5
12	6.1	6.3	6.8	7.5	8.4	9.4	10.5
13	7.8	8.1	8.7	9.7	10.9	12.2	13.7

Table O-9. High Cascades - Expected Flame Length by Fuel Model and Slope %, using Boulder 90%ile Weather

NFFL Fuel Model	Slope %						
	0.0	15.0	30.0	45.0	60.0	75.0	90.0
1	2.9	3.1	3.5	4.0	4.7	5.4	6.1
2	4.6	4.8	5.3	5.9	6.8	7.7	8.7
3	10.0	10.3	11.0	12.1	13.5	15.1	16.8
4	14.1	14.5	15.7	17.5	19.7	22.2	24.8
5	3.8	3.9	4.2	4.7	5.3	5.9	6.6
6	4.5	4.6	5.0	5.5	6.2	6.9	7.7
7	4.4	4.5	4.8	5.3	6.0	6.7	7.5
8	0.8	0.8	0.9	1.0	1.2	1.3	1.5
9	2.1	2.1	2.3	2.6	3.0	3.4	3.8
10	3.8	3.9	4.2	4.7	5.3	6.0	6.7
11	2.7	2.8	3.0	3.3	3.7	4.2	4.6
12	6.2	6.4	6.9	7.7	8.6	9.6	10.8
13	8.0	8.3	9.0	10.0	11.2	12.6	14.0

Table O-10. Coast/Valley - Expected Flame Length by Fuel Model and Slope %, using Goodwin Peak 90%ile Weather

NFFL Fuel Model	Slope %						
	0.0	15.0	30.0	45.0	60.0	75.0	90.0
1	2.9	3.1	3.5	4.0	4.7	5.4	6.1
2	4.6	4.8	5.3	6.0	6.8	7.7	8.7
3	10.0	10.3	11.0	12.1	13.5	15.1	16.8
4	13.1	13.5	14.6	16.2	18.3	20.6	23.0
5	1.7	1.7	1.9	2.1	2.3	2.6	2.9
6	4.5	4.7	5.0	5.6	6.2	7.0	7.8
7	4.2	4.3	4.6	5.1	5.7	6.4	7.1
8	0.8	0.8	0.9	1.0	1.2	1.3	1.5
9	2.1	2.2	2.3	2.6	3.0	3.4	3.8
10	3.5	3.6	3.9	4.4	4.9	5.5	6.2
11	2.7	2.8	3.0	3.3	3.7	4.2	4.7
12	6.4	6.5	7.1	7.8	8.8	9.9	11.0
13	8.3	8.5	9.2	10.2	11.5	12.9	14.4

Fire behavior potential was assigned values of low, medium or high using fire suppression limitations. Flame length is a product of fuel, weather and topographic conditions creating fireline conditions that can be attacked by hand (0-4 ft. lengths), mechanical (5-8 ft lengths), or indirect (> 8 ft lengths) methods (Rothermel 1983). Low risk was defined as areas displaying flame lengths of 0-4 ft.; moderate risk exhibited 5-8 ft. flame lengths; and greater than 8 ft flame lengths resulted in high risk areas. Table O-10 and Map 6 display the distribution and amount area in each risk level for each zone.

CURRENT COMPOSITE FIRE POTENTIAL

We overlaid the fire occurrence risk and fire behavior potential layer to develop a current Composite Fire Potential map (Map 7) using the fire occurrence risk and fire behavior risk combinations in Table O-11.

Table O-11. Fire Occurrence Risk and Fire Behavior Potential Combinations to Determine Overall Fire Potential Ratings

Fire Occurrence Risk	Fire Behavior Potential	Composite Fire Potential
Low – Moderate	Low	Low
Low – Moderate	Moderate	Moderate
High	Low	Moderate
High	Moderate	High

No high fire behavior potential in assessment area, based on surface fire models only

Table O-12 describes and displays the amount and distribution of composite fire potential across the area. High risk areas are uncommon and scattered across the area. Moderate risk occurs in all areas to varying extent, with highest percentages occurring

Table O-12. Composite Fire Potential Acres by Agency and Fire Zone

Owner	Fire Zone	Total Acres	Low	Medium	High	Urban/Ag	Water
Willamette Forest	High Cascades	926,794 100%	656,336 71%	217,035 23%	6,052 1%	37,441 4%	9,930 1%
Willamette Forest	Low Cascades	418,291 100%	305,091 73%	104,128 25%	1,943 0%	1,812 0%	5,316 1%
Eugene BLM	Low Cascades	130,276 100%	111,885 86%	14,453 11%		3,937 3%	
Salem BLM	Low Cascades	78,660 100%	72,369 92%	4,332 6%		1,577 2%	382 0%
Willamette Forest	South Cascades	342,042 100%	149,712 44%	176,258 52%	8,172 2%	5,009 1%	2,891 0%
Eugene BLM	Valley and Foothills	59,393 100%	54,708 92%	803 1%		3,680 6%	201 0%
Salem BLM	Valley and Foothills	2,545 100%	2,379 93%			162 6%	4 0%
Eugene BLM	Coast Range	125,309 100%	112,627 90%	9,341 7%		3,341 3%	

WILDLAND/URBAN INTERFACE

This coverage consists of homes, railroads, campgrounds, and transmission lines buffered with a one mile radius. Data sources include Linn, Lane, Marion, Benton and Douglas county tax lot databases, which inventory improvements made to properties and addresses. Railroads and transmission lines were mapped from USGS 1:100,000 quadrangles. Campgrounds were inventoried at the USFS. Table O-13 displays acres of federal land within the wildlandland/urban interface by agency and fire zone.

Table O-13. Acres of Federal land within 1 mile of Improvements by Agency and Fire Zone

Agency	Fire Zone	Acres
Eugene BLM	Coast Range	36561
Eugene BLM	Low Cascades	40638
Eugene BLM	Valley and Foothills	44631
Salem BLM	Low Cascades	20396
Salem BLM	Valley and Foothills	2325
Willamette Forest	High Cascades	156767
Willamette Forest	Low Cascades	110599
Willamette Forest	South Cascades	71930

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