UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

Establishment Record

For

CACHE MOUNTAIN RESEARCH NATURAL AREA

Deschutes National Forest

Deschutes County, Oregon

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SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Cache Mountain Research Natural Area

Deschutes National Forest

Deschutes County, Oregon

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation and FSM 4063.41 5.e(3) in arriving at this recommendation.

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Maret Pajutee, District Ecologist
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Recommended by Sally Collins Date 12/30/96
Sally Collins, Forest Supervisor,
Deschutes National Forest

Concurrence of for Jerry D. Mueller Date 5/1/97
Thomas J. Mills, Director,
Pacific Northwest Research Station

TITLE PAGE

Establishment Record for
Cache Mountain Research Natural Area
within Deschutes National Forest
Deschutes County, Oregon

ESTABLISHMENT REPORT FOR
CACHE MOUNTAIN RESEARCH NATURAL AREA
DESCHUTES NATIONAL FOREST
DESCHUTES COUNTY, OREGON

INTRODUCTION

Cache Mountain Research Natural Area (RNA) occupies approximately 1400 acres (570 ha) on the Sisters Ranger District of the Deschutes National Forest. Located northeast of Mt. Washington in the Oregon Cascades and situated two miles (3.2 km) east of the crest of the Cascade Range, the area contains a diversity of habitats, including coniferous forests, lakes, wetlands, and rock outcrops. Moderate recreational use (primarily dispersed camping and fishing) has and continues to occur at most of the lakes in the RNA.

Land Management Planning

Cache Mountain RNA was proposed as a potential RNA in the Deschutes National Forest Land and Resource Managment Plan (USDA Forest Service 1990). The area is managed according to standards and guidelines outlined in the Forest Plan for Management Area 2 (Research Natural Areas).

OBJECTIVE

The objective of Cache Mountain RNA is to preserve representative examples of aquatic and terrestrial habitats along the eastern slopes of the Oregon Cascades. Habitats include mid-elevation lakes with aquatic beds and marshy shore and the following plant communities: 1) lodgepole pine/beargrass (Pinus contorta/Xerophyllum tenax), 2) lodgepole pine/grouse huckleberry (Pinus contorta/Vaccinium scoparium) and 3) white fir-Pacific silver fir/snowberry (Abies concolor-Abies amabilis/Symphoricarpos sp.) (Oregon Natural Heritage Advisory Council 1993).

JUSTIFICATION

Cache Mountain RNA contains lakes at moderate elevations surrounded by mixed-coniferous forest. This type of natural area had been identified as a high priority for protection based on the danger that all examples of this type would be lost to other uses (Dyrness et. al. 1975). The Oregon Natural Heritage Plan further defines the need to protect aquatic beds and marshy shores around mid-elevation lakes (Oregon Natural Heritage Advisory Council 1993). Cache Mountain RNA provides this opportunity and also includes several plant communities identified for protection in the Oregon Natural Heritage Plan: lodgepole pine/beargrass, lodgepole pine/grouse huckleberry, and white fir-Pacific silver fir/snowberry.

Cache Mountain RNA provides opportunities to study mid-elevation aquatic systems and mixed-conifer forest communities. Much of the Deschutes National Forest, including the Santiam Pass area and Cache Mountain RNA, is experiencing an unusually high mortality of trees, resulting from years of fire suppression and associated insect and disease outbreaks. This has resulted in high fuel

loads with the potential to burn at very high intensities. Should fire occur in the Santiam Pass area, Cache Mt. RNA provides an area to study the long-term affects on vegetation following high intensity fires.

The area offers a wide variety of microclimates and potential research might include the relationship of plant communities to changes in topography, soil depths, aspects, percent slope and soil moisture. Major vegetation studies could be directed toward fire climax versus climatic climax. Opportunities also exist in areas relative to recreation, fauna, and timber management. Because of this centralized location between east and west side ecosystems, incidental occurrences of species outside of their traditional ranges ~~is~~ are not uncommon in the RNA. This creates an ideal area to study ecological processes.

PRINCIPAL DISTINGUISHING FEATURES

Cache Mountain RNA contains high vegetative diversity due to a variety of habitats, including four lakes, a large sedge marsh, Englemann spruce bottomlands, swales, springs, seeps, boulder fields, rock gardens, and old growth forests.

Distinguishing features of the four lakes are:

1. **Cache Lake**, 8 acres (3.3 ha) in size, lies in the northeast corner of the RNA at an elevation of 4140 feet (1262 m). Significantly large and diverse wetlands are associated with Cache Lake, ranging from forested spruce bottomlands, dominated by Engelmann spruce (Picea engelmannii), to extensive, open, sedge-dominated (Carex spp.) mats. Submergent and emergent aquatic vegetation covers about two-thirds of the lake. A wood jam at the outlet has recently been washed out, lowering the lake level to a maximum depth of only 4 to 6 feet (1.2 to 2 ha). Cache Lake is moderately used for recreation. Fish habitat surveys conducted in 1987 by Oregon Department of Fish & Wildlife reported wildlife to be abundant around the lake. The northwest slope of Cache Mountain provides prime elk habitat.

2. **Noname Lake**, 2 to 5 acres (1 to 2 ha) in size, is about 1/4 mile (.4 km) southwest of Torso Lake at an elevation of approximately 4640 feet (1415 m). The lake is bordered by a narrow region of deciduous shrubs, sedges and mosses. The surrounding mixed-conifer forest contains lodgepole pine and the climax species is white fir. The lake can be reached only by foot.

3. **Four O'Clock Lake** is approximately 1/2 mile (.8 km.) south of Torso Lake. At 4720 feet (1440 m) it is the highest of the four lakes and apparently the least used. The lake covers 5 - 10 acres (2 to 4 ha) and has a wide margin of deciduous shrubs dominated by birch (Betula spp.). The encircling forest is marked by many large old growth Douglas fir (Pseudotsuga menziesii) among the other coniferous species. This lake is accessible only by foot.

4. A hiking trail leads into **Hortense Lake**, the most southerly lake. It is found at an elevation of about 4700 feet (1434 m) and is 10 acres (4 ha) in size. Both mixed-conifer and lodgepole pine communities occur in the nearby forests.

LOCATION

Figures 1, 2, and 3 show the location of Cache Mountain RNA. The RNA is located on the Sisters Ranger District of the Deschutes National Forest. It lies at North Latitude 44° 22′ and West Longitude 121° 48′. The tract is located in Deschutes County 14 air miles (23 km) west-northwest of Sisters, Oregon. The RNA includes portions of T13S, R8E, S33, T14S, R8E, S3, 4, 5, 6, 7, 8, 9, and T14S, R7-1/2E, S1 and 12., Willamette Meridian.

Boundaries

The RNA is bounded on the north by the Meadow Lakes Basin area, on the south by the Santiam Wagon Road; part of the east boundary follows the ridgeline of Cache Mountain, and the southeast boundary is the road leading to the top of Cache Mountain.

The boundary for Cache Mountain Research Natural Area as proposed by Forest Plan was expanded upon by Forest/District personnel; and begins at the southeast corner of section 33, Township 13 South, Range 8 East, Willamette Meridian. The boundary is based on a digitized State Plane Coordinate, NAD 1927, in the Oregon North Zone, on the aforementioned section corner and has the following values.

Latitude:	44°23′34.4" North
Longitude:	121°46′29.9" West
X-Coord. (Easting):	1,666,733 feet
Y-Coord. (Northing):	267,391 feet
Theta (mapping) Angle:	-00°54′15.1"
Scale Factor:	0.999985

The entire boundary was digitized from the Three Fingered Jack and Mount Washington 7-1/2 Minute Primary Base Series Quadrangle Maps. The narrative legal was written by the Deschutes National Forest Land Surveyor. All pertinent records and maps for future surveys on this administrative boundary will be on file in the Survey Section of Engineering located in the Supervisor's Office.

CACHE MOUNTAIN RESEARCH NATURAL AREA BOUNDARY DESCRIPTION

In the following description, bearings and distances shown are Grid Bearings and Grid Distances based on the Oregon Coordinate System of NAD 1927, North Zone. Where called, Public Land Survey System land boundaries; natural or semi-permanent features; record bearing, distances, and monuments; and X and Y coordinates as described in the narrative DESCRIPTION portion of this document will prevail.

POINT NO.	BEARING	DISTANCE FEET	POINT DESCRIPTION	QUAD SHEET NAME
			CACHE MOUNTAIN RESEARCH NATURAL AREA	
1 (POINT 1 ON MAP)			Beginning at the southeast corner, sec. 33, T. 13 S., R. 8 E., W.M., and a digitized coordinate value of 267391 (N), 1666733 (E) with an equivalent value of Latitude 44°23'34.4" North, Longitude 121°46'29.9" West.	Three Fingered Jack Map No. 1
	S11/16/18.1E	2010.03	Thence, southeasterly to;	
2 (POINT 2 ON MAP)			A point defined by coordinates 265420 (N) and 1667126 (E).	
	S31/48/41.0W	2371.07	Thence, southwesterly to;	
3 (POINT 3 ON MAP)			Intersection with a line 30 feet northerly from and perpendicular to the centerline of USFS Road 2067-900 at its most northerly extent.	
	N82/14/32.2W	58.62	Thence, westerly and southerly along a line parallel with said road 30 feet northwesterly from and perpendicular to the centerline to;	
4	S77/26/34.1W	164.79		
5	S52/46/12.0W	255.83		
6	S32/21/06.2W	116.51		
7	S16/37/33.3W	227.94		
8	S01/22/05.5W	80.02		
9	S43/33/18.6E	84.94		
10 (POINT 4 ON MAP)			A point 30 feet southerly of and perpendicular to the centerline of the said road and having a northing coordinate of 262764 (N).	
	S01/22/07.1W	340.07	Thence, southerly to:	

11 (POINT 5 ON MAP)			A point 30 feet northerly of and perpendicular to the centerline of the said road.
	S82/44/20.9W	262.90	Thence, westerly and southerly along a line parallel with said road at 30 feet northerly and westerly from and perpendicular to the centerline to;
12			
	S61/42/18.6W	161.07	
13			
	S31/38/38.7W	277.60	
14			
	S15/24/18.6W	82.43	
15			
	S46/25/00.4W	56.50	
16			
	S23/10/39.8W	107.64	
17			
	S01/22/05.5W	120.03	
18			
	S13/52/12.7E	228.19	
19			
	S01/22/08.2W	220.04	
20			
	S07/06/24.5W	401.91	
21			Mount Washington Map No. 2
	S04/06/36.7W	345.43	
22			
	S14/53/59.4W	164.86	
23			
	S42/04/49.8W	212.27	
24			
	S14/54/07.8W	82.43	
25			
	S52/15/36.2W	127.83	
26			
	S70/59/26.4W	233.67	
27			
	S79/41/12.5W	203.64	
28			
	N88/58/53.5W	399.53	
29			
	N88/58/53.5W	219.74	
30			
	S74/17/04.4W	208.44	
31 (POINT 6 ON MAP)			A point 30 feet northwesterly of and perpendicular to the centerline of said road, and 30 feet northeasterly of and perpendicular to the centerline of USFS Road No. 1028-550.

N82/38/03.1W	180.95	Thence, northerly and westerly along a line parallel with said road at 30 feet northerly and westerly from and perpendicular to the centerline to;
32		
N88/58/53.5W	99.88	
33		
S72/32/38.1W	252.53	
34		
S53/02/58.0W	227.63	
35		
S24/49/54.3W	196.81	
36		
S45/54/17.5W	56.47	
37		
S10/19/53.1W	121.64	
38		
S27/26/09.6W	89.36	
39		
S08/34/00.0E	243.47	
40		
S31/02/58.0E	188.87	
41		
S00/52/40.4W	160.05	
42		
S30/37/15.4W	161.07	
43		
S69/10/08.5W	107.51	
44		
N88/58/53.5W	139.84	
45		
N65/46/27.2W	152.31	
46		
N76/26/30.0W	184.29	
47		
N59/14/05.1W	322.57	
48		
N74/56/00.7W	247.26	
49		
N88/58/53.5W	239.72	
50		
N78/39/59.2W	446.91	
51		
N62/24/37.8W	223.63	
52		
N44/00/28.9W	169.84	
53		
N70/32/06.7W	252.91	
54		
N54/17/29.2W	316.36	
55		
N65/00/35.2W	196.97	
56		
N70/32/05.2W	316.13	
57		
N77/39/38.4W	203.83	
58		
N60/22/00.7W	250.64	

59		Thence, northerly and westerly along
N82/38/00.0W	180.95	a line parallel with said road at 30
60		feet northerly and westerly from and
S59/58/50.5W	116.41	perpendicular to the centerline to;
61 (POINT 7 ON MAP)		A point 30 feet westerly of and perpendicular to the centerline of said road, and 30 feet northerly of and perpendicular to the centerline of USFS Road No. 1028-500.
N61/55/27.4W	1055.55	Thence, northwesterly along a line parallel with said road at 30 feet northerly from and perpendicular to the centerline to;
62		
N44/00/27.5W	56.61	
63		
N73/01/26.1W	145.54	
64		
N82/23/29.4W	522.98	
65		
N71/02/26.8W	714.44	
66		
N54/17/21.7W	316.35	
67		
N71/36/54.5W	335.13	
68		
S88/24/42.9W	439.88	
69		
N65/31/48.7W	172.69	
70		Three Fingered Jack Map No. 1
N73/17/42.9W	135.47	
71		
N55/21/10.9W	621.81	
72		
N67/28/36.3W	278.70	
73		
N82/09/57.7W	362.19	
74		
N43/33/22.7W	28.31	
75		
S88/18/34.9W	360.40	
76		
N43/32/47.1W	28.32	
77		
N83/32/12.3W	461.68	
78		
N61/57/20.0W	134.25	
79		
N81/43/02.5W	845.89	
80		
S69/39/46.8W	215.19	
81		
N88/30/33.1W	119.96	

82			Thence, northwesterly along a line
	N70/45/57.7W	1050.34	parallel with said road at 30 feet
83			northerly from and perpendicular to
	N88/30/31.1W	99.97	the centerline to;
84			
	N54/50/31.0W	144.35	
85			
	N25/09/36.5W	44.77	
86			
	N27/56/49.0E	44.69	
87 (POINT 8 ON MAP)			A point 30 feet northerly of and perpendicular to the centerline of said road, and 30 feet southerly of and perpendicular to the centerline of USFS Road No. 1028-599.
	N71/29/03.4E	233.87	Thence, northerly and easterly along a line parallel with said road at 30 feet southerly from and perpendicular to the centerline to;
88			
	N61/42/11.2E	161.07	
89			
	N36/23/12.1E	487.78	
90			
	N78/23/13.6E	882.28	
91			
	N46/24/54.0E	339.03	
92			
	S83/44/32.6E	240.80	
93			
	N85/08/47.2E	181.01	
94			
	N61/42/11.0E	161.07	
95			
	S86/07/14.8E	480.31	
96			
	N46/25/08.4E	28.25	
97			
	S88/30/33.1E	119.96	
98			
	S80/22/34.5E	282.84	
99			
	N73/02/11.1E	63.19	
100			
	S57/33/47.5E	116.71	
101			
	S83/44/32.5E	240.80	
102			
	N73/02/11.1E	63.19	
103			
	N46/24/51.5E	169.52	
104			
	N73/02/10.4E	126.38	
105			
	S51/40/05.9E	200.18	
106			
	S88/30/26.3E	139.96	
107			
	N79/23/08.9E	286.15	

108		Thence, northerly and easterly along
N59/50/15.3E	304.94	a line parallel with said road at 30
109		feet southerly from and perpendicular
S88/30/42.6E	39.99	to the centerline to;
110		
N46/24/57.4E	113.01	
111		
N01/22/06.7E	40.01	
112		
S82/09/57.8E	181.10	
113		
N84/46/39.1E	342.16	
114		
S49/52/58.7E	128.18	
115		
S17/02/42.8E	63.30	
116		
S75/58/42.4E	184.42	
117		
S66/42/46.6E	215.52	
118		
N46/24/57.3E	113.01	
119		
N01/22/06.6E	80.02	
120		
N46/25/08.2E	28.25	
121		
N78/29/06.1E	266.63	
122		
N35/04/57.6E	144.09	
123		
N01/22/06.5E	40.01	
124 (POINT 9 ON MAP)		A point 30 feet easterly of and perpendicular to the centerline of said road, and 30 feet southerly of and perpendicular to the centerline of USFS Road No. 2076-930.
N70/54/42.7E	170.72	Thence, northeasterly along a line parallel with said road at 30 feet southeasterly from and perpendicular to the centerline to;
125		
N58/49/24.1E	592.96	
126		
N46/24/59.8E	197.76	
127		
N32/21/01.8E	116.52	
128		
N01/22/06.6E	40.00	
129		
N59/26/19.4E	188.47	
130		
N77/26/27.7E	164.80	
131		
N46/24/57.1E	113.01	
132		
N85/08/53.5E	181.01	

133 (POINT 10 ON MAP)		A point 30 feet southerly of and perpendicular to the centerline of said road and having a northing coordinate of 264549 (N).
S88/28/28.2E	616.23	Thence, easterly to;
134 (POINT 11 ON MAP)		A point defined by coordinates 264533 (N) and 1658922 (E).
S43/53/06.4E	483.61	Thence, southeasterly to;
135 (POINT 12 ON MAP)		A point defined by coordinates 264184 (N) and 1659257 (E).
N73/02/10.7E	568.70	Thence, northeasterly to;
136 (POINT 13 ON MAP)		A point defined by coordinates 264350 (N) and 1659801 (E).
N12/11/19.1W	597.05	Thence, northwesterly to;
137 (POINT 14 ON MAP)		A point defined by coordinates 264933 (N) and 1659675 (E).
N84/21/40.5E	161.15	Thence, northeasterly to;
138 (POINT 15 ON MAP)		A point defined by coordinates 264950 (N) and 1659835 (E).
S19/09/45.1E	171.02	Thence, southeasterly to;
139 (POINT 16 ON MAP)		A point defined by coordinates 264788 (N) and 1659891 (E).
S88/30/25.4E	199.94	Thence, easterly to;
140 (POINT 17 ON MAP)		A point defined by coordinates 264783 (N) and 1660091 (E).
N50/03/21.8E	476.37	Thence, northeasterly to;
141 (POINT 18 ON MAP)		A point defined by coordinates 265089 (N) and 1660457 (E).
N29/13/07.7W	483.26	Thence, northwesterly to;
142 (POINT 19 ON MAP)		A point defined by coordinates 265511 (N) and 1660220 (E).
N60/09/18.0E	200.10	Thence, northeasterly to;
143 (POINT 20 ON MAP)		A point defined by coordinates 265610 (N) and 1660394 (E).
S56/58/07.9E	372.18	Thence, southeasterly to;
144 (POINT 21 ON MAP)		A point defined by coordinates 265407 (N) and 1660706 (E).

S16/07/46.3E	353.42	Thence, southeasterly to;
145 (POINT 22 ON MAP)		A point defined by coordinates 265068 (N) and 1660804 (E).
N73/14/06.4E	308.96	Thence, northeasterly to;
146 (POINT 23 ON MAP)		A point defined by coordinates 265157 (N) and 1661100 (E).
N01/46/30.3W	445.49	Thence, northerly to;
147 (POINT 24 ON MAP)		A point defined by coordinates 265602 (N) and 1661086 (E).
N49/45/27.3E	353.57	Thence, northeasterly to;
148 (POINT 25 ON MAP)		A point defined by coordinates 265831 (N) and 1661356 (E).
N74/22/15.1E	815.38	Thence, northeasterly to;
149 (POINT 26 ON MAP)		A point defined by coordinates 266050 (N) and 1662142 (E).
N61/07/29.6E	1226.63	Thence, northeasterly to;
150 (POINT 27 ON MAP)		A point defined by coordinates 266643 (N) and 1663216 (E).
N68/55/16.5E	1146.55	Thence, northeasterly to;
151 (POINT 28 ON MAP)		A point defined by coordinates 267055 (N) and 1664285 (E).
N38/15/26.9W	345.85	Thence, northwesterly to;
152 (POINT 29 ON MAP)		A point defined by coordinates 267327 (N) and 1664071 (E).
N44/29/02.3E	703.03	Thence, northeasterly to;
153 (POINT 30 ON MAP)		A point 30 feet easterly of and perpendicular to the centerline of USFS Road No. 2076-660, and 30 feet southerly of and perpendicular to the centerline of USFS Road No. 2076-600.
S70/04/43.8E	63.27	Thence, northeasterly along a line parallel with said road at 30 feet southeasterly from and perpendicular to the centerline to;
154		
N66/41/08.9E	286.06	
155		
N35/05/01.7E	360.21	
156		
N27/56/50.5E	223.43	
157		
N74/46/33.3E	208.63	

158		Thence, northeasterly along a line
N57/45/02.0E	72.03	parallel with said road at 30 feet
159		southeasterly from and perpendicular
N39/16/39.5E	227.79	to the centerline to;
160		
N21/55/50.7E	170.78	
161		
N54/33/55.0E	99.88	
162		
N67/29/54.6E	196.78	
163		
N38/16/12.6E	99.90	
164		
N55/54/02.8E	171.84	
165		
S88/30/26.3E	139.96	
166		
S70/04/36.7E	126.54	
167 (POINT 31 ON MAP)		A point 30 feet southerly of and perpendicular to the centerline of said road, and 30 feet westerly of and perpendicular to the centerline of USFS Road No. 2068-000.
S11/13/09.5E	1743.04	Thence, southeasterly to;
168 (POINT 1 ON MAP)		The Point of Beginning.

traverse length = 47881.07 feet
traverse area = 67796542 sq. feet = 1556.39 acres

Area

Total area for the Cache Mountain RNA is approximately 1400 acres (570 ha).

Elevations

Elevations range from about 4200 feet (1280 m) to 5579 feet (1700 m) at the top of Cache Mountain.

Access

It is possible to reach the RNA from several roads. The easiest access is from State Highway 20 near Sisters, Oregon. Travel northwest from Sisters along Highway 20 approximately 17 miles (27 km) to the Corbett Snopark (4 miles; 6.4 km) past the Suttle Lake road) and continue past the Snopark on Forest Service Road #2076. Proceed approximately 2 miles to Forest Service Road 2076-800 which enters the RNA. To access the RNA at the north end of Cache Lake, turn (east) onto Forest Service Road 2076-600. Then drive 1/2 mile (.8 km) past Hand Lake to reach Cache Lake.

Maps

Cache Mountain RNA is located on the USGS 7.5 minute topographic quadrangle maps, Three Fingered Jack and Mt. Washington, Oregon. The Deschutes National Forest Recreation Map (1988) is useful for ownership and general access information but does not delineate the RNA boundaries.

Photos

The following aerial photos of the Cache Mountain RNA site are available in the Deschutes National Forest Supervisor and District Ranger Offices:

1991 USDA nos. 1491-22 and 1491-46
1991 USDA nos. 1491-21 and 1491-47 (stereo pairs for above photos)

AREA BY COVER TYPES

The majority of the vegetation of the RNA has been surveyed and plant associations were mapped using Volland (1985) and Logan et. al. (1987). For areas not covered by field surveys, the Deschutes National Forest Plant Association GIS Layer was used to map plant associations. Figure 4 depicts the locations of the plant associations described below in the section entitled "Descriptions of Values". Cache Mountain RNA contains the following plant associations:

	Estimated Acres	Hectares
SAF Cover Types (Eyre 1980)		
205 Mountain hemlock	365	149
206 Engelmann spruce	110	45
211 White fir	989	402
Kuchler Types (Kuchler 1966)		
Fir-hemlock forest (Abies-Tsuga)	1464	596
Forested Plant Associations (Logan et al. 1987 and Volland 1985)		
1) Mixed conifer/snowberry/forb (Pseudotsuga menziesii-Abies concolor/ Symphoricarpos albus/forb; CDS6-13, Volland 1985)	645	262
2) Mixed conifer/snowbrush/sedge-brakenfern (Abies concolor/Ceanothus velutinus/ Carex pensylvanica/Pteridium aquilinum; CWC2-13; Volland 1985)	335	136
3) Mixed conifer/manzanita (Abies magnifica var. shastensis/ Arctostaphylos nevadensis; CRS1-11; Volland 1985)	9	4
4) Englemann spruce bottomlands (Picea englemannii/Abies concolor; CWS9-11; Volland 1985)	110	45
5) Mountain hemlock/big huckleberry/beargrass (Tsuga mertensiana/Vaccinium membranaceum/ Xerophyllum tenax; CMS2-16; Logan et.al. 1987)	230	94
6) Mountain hemlock/grouse huckleberry (Tsuga mertensiana/Vaccinium scoparium; CMS1-14; Logan et.al. 1987)	135	55

Non-Forested Plant Associations

7) Rock Garden (Steep, Moist) (NRL9 12; Logan et. al. 1987)	9	4
8) Boulder Fields	4	2
Total	**1477**	**602**

PHYSICAL AND CLIMATIC CONDITIONS

Physical Conditions

Cache Mountain RNA is located in the Lower Cascades ecological subsection (ecological subsections are broad areas characterized by similar topography, soils and climate) (USDA Forest Service 1995). The Lower Cascades subsection includes the Cascade Range below the furthest extent of glaciers. The land is dominated by gently sloping plains of glacial outwash and by hills and ridges of lava that rise above the outwash plains. Slopes vary from near zero to 70 percent. Elevation ranges from 4200 feet (1280 m) to 5579 feet (1700 m) at the top of Cache Mountain.

Climatic Conditions

Cache Mountain RNA lies just two miles east of the Cascade crest and almost directly on the Santiam Pass. This setting subjects the area to unique climatic variations. Because of the maritime influence from the west side of the Cascade range, the area supports more mesic plant communities than land normally associated with the east side of the crest.

About two-thirds of the annual precipitation falls between October and March. Winter storms bring heavy snowfalls to the Cascades. At lower elevations, the storms bring more rain than snow. A secondary peak of precipitation occurs in May and June due to thunderstorms and upper-level low pressure systems.

January nighttime temperatures average about 20 degrees F throughout the watershed while July daytime temperatures rise into the 80s and 90s (USDA Forest Service 1995). Daytime humidity is generally low in the summer and fall. Winters are long and relatively cold with considerable cloudiness. Occasionally, arctic air from Canada flows through the area and causes temperatures to drop to well below zero degrees. Summer days are usually warm with cool nights and low rainfall. Moist, subtropical air often brings thunderstorms and localized heavy rains.

The closest weather station is located at Santiam junction and is maintained by the Oregon Department of Transportation. The following climatic records were taken from data collected between 1961-1985, when the station was located at Santiam Pass. 6 mi (10km) away In 1987, the weather station was moved 970 feet (296 m) lower on the west side of the Cascade Mts. and placed at Santiam Junction (Ray Hatton, personal communication, 1996).

Climatic Records for Santiam Pass
1961-1985

Average January Maximum-Mean-Minimum Temperatures in degrees Fahrenheit	34-27-21
Average July Maximum-Mean-Minimum Temperatures in degrees Fahrenheit	73-58-43
Annual Precipitation (Inches)	86.7
Average January Precipitation (Inches)	14.2
Average July Precipitation (Inches)	1.4

DESCRIPTION OF VALUES

Flora - Description of Plant Associations

The Cache Mountain Research Natural Area (RNA) is comprised of coniferous forest, riparian communities, and rock gardens and boulder fields. The RNA is situated two miles (3.2 km) east of the Cascade Range and is exposed to Pacific Maritime climate regimes coming through Santiam Pass. This exposure to maritime climate is expressed in the mesic forest plant association types present in the RNA. The presence of four lakes, a large sedge marsh, Englemann spruce bottomland, swales, springs, seeps, boulder fields and rock gardens provides high vegetative diversity to the forest plant associations. Table I lists plant species present in the RNA by plant association type. Excellent old growth forest conditions are present throughout the RNA with the exception of two timber sale units (one shelterwood; one clearcut) totalling approximately 20 acres (8 ha) that are in the early (10 year old) stages of regeneration.

Figure 4 illustrates the known distribution of plant associations within Cache Mountain Research Natural Area. There are six forest plant association types which are described below:

Mixed conifer/snowberry/forb (CDS6-13, Volland, 1985)
Mixed conifer/snowbrush/sedge-brakenfern (CWC2-13, Volland, 1985)
Mixed conifer/manzanita (CRS1-11, Volland, 1985)
Englemann spruce bottomlands (CWS9-11, Volland, 1985)
Mountain hemlock/big huckleberry/beargrass (TSME/VAME/XETE, CMS2-16, Logan et.al., 1987)
Mountain hemlock/grouse huckleberry (TSME/VASC, CMS1-14, Logan et.al., 1987)

In addition, the following open, treeless plant association types occur:

Steep, xeric, rock garden (NRL9 11, Logan et. al., 1987)
Boulder Fields

The northwest facing slope and toe slope of Cache Mountain is dominated by the **mixed conifer/snowberry/forb** plant association type. The high elevation position and maritime climatic influence contributes to the highly diverse coniferous tree species present and the lush understory vegetation. Tree species present include Pacific silver fir, white fir, Douglas fir, and, on the lower slope positions, ponderosa pine (Pinus ponderosa) and white pine (Pinus monticola). Occassional Shasta red fir (Abies magnifica var. shastensis) were noted in this type. Vine maple (Acer circinatum), greenleaf manzanita (Arctostaphylos patula), and snowbrush (Ceanothus velutinus) are dominant shrubs in the overstory removal units adjacent to and within the RNA boundary. These shrubs are indicators of this plant association type as well as the plant association type common in west side forests classified as Pacific silver fir/dwarf oregon grape (Abies amabilis/Berberis nervosa). The presence of ponderosa pine and white pine as well as the absence of western hemlock (Tsuga heterophylla) lead us to classify this area as an east side forest plant association type. However the abundance of mesic site forbs and the predominence of Douglas fir is an expression of west side influences, enhancing the relative plant diversity of this forest type on Cache Mountain (Table I.).

With the exception of two timber harvesting units within the RNA (20 acres; 8 ha), the **mixed conifer/snowberry/forb** plant association is in the late seral stage with one or two layers of large diameter trees present. Most trees are within a range of 20 to 30 inches (51 to 76 cm) in diameter with scattered trees exceeding 30 inches (76 cm) (Douglas fir in particular). Volland (1974) reports Douglas fir trees with DBH measurements of 38.2, 27.8, 59.9, 32.1, and 44.0 inches (97, 71, 152, 82 and 112 cm) codominant with Pacific silver fir trees of 23.8,28.8, 24.7, and 21.3 inches (60, 73, 63, and 54 cm) DBH in a site index- growth plot established within this plant association on Cache Mountain. Old growth Douglas fir trees occur on the west side of Four O'Clock Lake. Volland (1985) reports that Pacific silver fir is the only regenerating tree species in the stand and that Douglas fir is successional to Pacific silver fir.

Evidence of spruce budworm and possibly other disease factors have killed the smaller diameter white fir and Douglas fir (generally less than 20 inches, or 51 cm, DBH) although some large diameter trees have been lost as well. This currently has created a more open canopy, increasing light to the forest floor, stimulating understory shrub and forb growth. The forb, windflower (Anenome deltoidea), is worthy of note in this regard. Spring blooms of this species along the toe slopes of Cache Mountain are spectacular. Occasional windthrow openings provide outstanding forb diversity including red columbine (Aquilegia formosa), wild ginger (Asarum caudatum), bleeding heart (Dicentra formosa), threetooth miterwort (Mitella trifida), candyflower (Montia siberica), and American speedwell (Veronica americana). Occasional springs add ferns such as lady fern (Athyrium felix-femina) and swordfern (Polystichum munitum), and the forb brook saxifrage (Saxifraga arguta) to the species diversity. Mountain alder (Alnus incana) seeps include slender bog-orchid (Habenaria saccata), red baneberry (Actea rubra), leafy mitrewort (Mitella caulescens) and the lady fern.

At the ridgeline of Cache Mountain and continuing east outside the RNA boundary the **mixed conifer/snowbrush/sedge-brakenfern** plant association occurs. On the summit of Cache Mountain, the **mixed conifer/manzanita** is present. These are

minor forest components of the RNA. The southwest facing slope of the summit of Cache Mountain is a talus/cinder/pumice opening which provides habitat for alpine collomia (Collomia larsenii) (see Sensitive Plants), gland oceanspray (Holodiscus dumosus), and Davidson's penstemon (Penstemon davidsonii) and other dry site plants of volcanic substrates.

The west half of the RNA is dominated by two mountain hemlock plant association types: the **mountain hemlock/big huckleberry/beargrass** and the **mountain hemlock/grouse huckleberry** types. The **mountain hemlock/big hucklberry/ beargrass** type occupies the mid-elevation benches of the center one third of the RNA. The overstory tree species include lodgepole pine, white pine, white fir, subalpine fir (Abies lasiocarpa), and mountain hemlock (Tsuga mertensiana). Big huckleberry (Vaccinium membranaceum) and beargrass are dominate indicators of this type but numerous swales and moist depressions add floristic diversity, particularly in the forb layer. Closed canopy, single layer old growth mountain hemlock dominates the area just west of Hortense Lake, otherwise this type is a multilayered mixed conifer stand progressing towards late successional/old growth conditions. Lodgepole pine is dying of mountain pine beetle attack and providing much down wood in the stand. Small openings in the stand are common with advanced regeneration of white fir, subalpine fir and mountain hemlock. Mountain hemlock appears to be the dominant late successional tree species in this stand.

Farther west in the RNA, the **mountain hemlock/grouse huckleberry** plant association type dominates as the topography forms a broad shallow swale that may experience colder air flows than other areas of the RNA. Lodgepole in this type has also succumbed to mountain pine beetle attack and provides much down woody debris in the stand. Mountain hemlock, white fir, subalpine fir, and remaining white pine are progressing towards large diameter late seral stages. This stand tends to be a single layer forest canopy. Mountain hemlock appears to be the dominant late successional tree species in this stand. Understory vegetation is less diverse, except in a moist swale that is dominated by western huckleberry (Vaccinium occidentale) and arrowleaf groundsel (Senecio triangularis).

On the perimeter of Hortense Lake and the elongated sedge marsh at the north end of the RNA, the **Englemann spruce bottomlands** plant association type occurs. Large diameter, old growth spruce are common at the east end of Hortense Lake where down logs, and carpets of dogwood bunchberry (Cornus canadensis) and coolwort foamflower (Tiarella trifoliata var. unifoliata predominate. Hortense Lake has the most extensive border of sedges of the lakes within the RNA. Western serviceberry (Amelanchier alnifolia), purple-flowered honeysuckle (Lonicera conjugialis), Lemmon's willow (Salix lemmonii), Sitka willow (Salix sitchensis), and western huckleberry are the most common shrubs in the moist ecotone between the sedge mats and conifer forest.

The most extensive Englemann spruce bottomland is found on the north end of the RNA encircling and intruding on islands of an elongated (3/4 mile, .5 ha long) sedge wetland. A pond is located at the north outlet to the wetland where a small stream extends beyond the boundary of the RNA. This spruce bottomland contains skunk cabbage (Lysichitum americanum), mountain alder, and extensive sedge mats interspersed with channels of flowing water. The wetland is not a bog or fen, but most closely resembles a cold freshwater marsh. An inventory

of the plant species present in this wetland has not been completed or provided in Table I.

Two other plant association types occur within the RNA in small pockets of open treeless, steep slopes: **rock garden** and **boulder fields**. In the near center of the RNA a large outcrop of large boulders occurs. Several shrubs and forbs not found elsewhere in the RNA occur scattered in specialized microsites of this boulder field: Rocky Mountain juniper (Juniperus scopulorum), chickweed mimulus (Mimulus alsinoides) cliff penstemon (Penstemon rupicola), thimbleberry (Rubus parviflorus), and western saxifrage (Saxifraga occidentalis) (Table I.).

On the northwest facing slopes of the RNA surrounded by mixed conifer forest are two very steep rock garden plant associations which also contain forbs not found elsewhere in the RNA (Table I.). Montana mariposa (Calochortus subalpinus), scarlet paintbrush (Castilleja miniata var. miniata), small-leaved montia (Montia parvifolia var. flagellaris), Cardwell's penstemon (Penstemon cardwellii), and shrubby penstemon (Penstemon fruiticosus) are noteworthy.

Table I. Plant species list for Cache Mountain RNA. Species are listed by life form and plant association types, and compiled from 1994 field inventories by Cindi O'Neil, Botanist, Deschutes National Forest. **Codes are as follows: CDS6-13** = Mixed conifer/snowberry forb; **CMS2-16** = Mountain hemlock/big huckleberry/ beargrass; **CMS1-14** = Mountain hemlock/grouse huckleberry; **CWS9-11** = Englemann spruce; **NRL9-12** = Steep, xeric, rock garden). Information is lacking for the mixed conifer/snowbrush/sedge-brakenfern (CWC2-13) and mixed conifer/manzanita (CWS9-11) associations. Taxonomic authority for scientific names follows Hitchcock et. al. (1973) and Little (1979).

Plant Association	**1** **CDS6-13**	**2** **CMS2-16**	**3** **CMS1-14**	**4** **CWS9-11**	**5** **NRL9-12**	**6** **boulder field**
Species Name						
TREES						
Abies amabilis	X					
Abies concolor	X	X	X	X		
Abies lasiocarpa		X	X			
Abies magnifica var. shastensis	X					
Picea engelmannii			X	X		
Pinus contorta		X	X			
Pinus monticola	X	X	X	X		
Pinus ponderosa	X					
Pseudostuga menziesii	X					
Tsuga mertensiana		X	X	X		
SHRUBS						
Acer circinatum	X					
Alnus incana	X			X		
Amelanchier alnifolia			X	X		
Arctostaphylos nevadensis	X					
Arctostaphylos patula	X	X				
Berberis repens		X				
Berberis nervosa	X					
Castanopsis chrysophylla	X					
Ceanothus velutinus	X					
Cornus canadensis	X			X		
Cryptogramma crispa						X
Happlopappus bloomeri			X			
Holodiscus dumosus						X
Juniperus communis						X
Lonicera conjugialis				X		
Lonicera involucrata			X	X		
Pachistima myrsinites			X			X
Ribes lacustre	X			X		
Ribes viscosissimum	X	X				
Rosa gymnocarpa	X	X				X
Rubus lasiococcus	X	X	X	X		
Rubus parviflorus						X

Plant Association	1	2	3	4	5	6
	CDS6-13	CMS2-16	CMS1-14	CWS9-11	NRL9-12	boulder field
Species Name						
Rubus ursinus				X		
Salix boothii				X		
Salix eastwoodii	X			X		
Salix lemmonii				X		
Salix sitchensis				X		
Sambucus cerulea	X			X		
Spirea douglasii				X		
Symphoricarpos albus	X		X			
Symphoricarpos mollis	X	X	X			
Vaccinium membranaceum		X				
Vaccinium occidentale		X	X	X		
Vaccinium ovatum			X			
Vaccinium scoparium			X			
GRASSES						
Calamagrostis rubescens	X	X				
Festuca idahoensis		X				
Sitanion hysterix						
Stipa occidentalis						
SEDGES and RUSHES						
Carex nigricans				X		
Carex pennsylvanica		X			X	
Carex rostrata				X		
Juncus balticus				X		
FORBS						
Achillea millefolium					X	
Actea rubra	X					
Adenocaulon bicolor	X					
Anaphalis margaritacea	X	X				
Anenome deltoidea	X	X				
Anenome lyalli		X				
Antennaria sp.					X	
Aquilegia formosa	X					
Arabis sp.						
Arnica latifolia	X	X				
Asarum caudatum	X					
Aster subspicatus						
Athyrium filix-femina	X					
Calochortus subalpinus					X	
Castilleja miniata var. miniata					X	
Chimaphila menziesii	X	X				
Chimaphila umbellata	X	X	X	X		
Cirsium vulgare	X	X	X			

Plant Association	1 CDS6-13	2 CMS2-16	3 CMS1-14	4 CWS9-11	5 NRL9-12	6 boulder field
Species Name						
Clintonia uniflora	X	X	X	X		
Cheilanthes gracillima						X
Cornus canadensis	X			X		
Delphinium sp.					X	
Dicentra formosa	X					
Disporum hookeri	X					
Epilobium angustifolium	X	X	X	X		
Equisetum arvense				X		
Fragaria vesca	X	X	X			
Fragaria virginiana		X				
Galium asperrimum	X	X	X			
Galium triflorum	X					
Gaultheria humifusa				X		
Geum macrophyllum var. macrophyllum	X					
Gilia aggregata		X				
Goodyeria oblongifolia	X					
Habenaria saccata	X					
Hieraceum albiflorum	X	X	X			
Hypopitys monotropa	X					
Lilium columbianum				X		
Linnea borealis	X					
Listeria caurina	X	X				
Lomatium martindalei					X	
Luzula divaricata		X	X			
Lupinus albicaulis		X	X			
Mimulus alsinoides						X
Microseris alpestris		X	X			
Mitella caulescens	X					
Mitella pentandra				X		
Mitella trifida					X	
Montia parviflora var. flagellaris						X
Montia siberica	X					
Ozmorhiza purpurea	X	X	X	X		
Pedicularis racemosa				X		
Penstemon cardwellii					X	
Penstemon cinicola		X	X			
Penstemon fruiticosus var. fruiticosus					X	
Penstemon rupicola						X
Phacelia hastata		X	X			
Potentilla drummondii				X		
Pteridium aquilinum	X	X		X		
Polystichum munitum	X					
Pyrola secunda	X	X	X	X		
Pyrola picta	X	X				
Ranunculus sp.				X		
Saxifraga arguta	X					

Plant Association	1 CDS6-13	2 CMS2-16	3 CMS1-14	4 CWS9-11	5 NRL9-12	6 boulder field
Species Name						
Saxifraga occidentalis					X	X
Sedum oregana					X	
Senecio triangularis		X		X		
Smilacina racemosa	X					X
Smilacina stellata	X	X	X	X		
Streptopis roseus	X			X		
Tiarella trifoliata var. unifoliata	X			X		
Trillium ovatum	X	X		X		
Veronica americana	X					
Veronica serpilifolia	X					
Veronica wormskajoldii			X			
Viola glabella		X				
Viola nutallii var. bakeri		X	X			
Viola orbiculata	X	X		X		
Viola palustris				X		
Xerophyllum tenax	X	X		X		

Sensitive Plants

The RNA was inventoried for sensitive plants on 6/22, 6/23, 6/24, and 7/30 of 1994. No sensitive plants were found within the RNA boundary. Inventories were intensified in specialized habitats including seeps, springs, forest openings, swales, lakeshores, boulder fields, rock outcrops and rock gardens. One species on the Oregon Natural Heritage Program Watch List (1995) had been previously reported (Pajutee and Cooper 1990) on a southwest facing side slope of Cache Mountain: alpine collomia (Collomia larsenii). Approximately 1000 individuals, scattered below the summit of Cache Mountain, are rooted in talus/red cinder/pumice substrate.

Fire Ecology

The RNA contains plant associations which are grouped as "wet mixed conifer" or "high elevation forest" in the Metolius Watershed Analysis (USDA Forest Service 1995). Wet mixed conifer type forests have historic fire return interval of 9-80 years. High elevation forest types have a longer fire return interval of 100-300 years. Lightning ignitions are common in the RNA area. Historic fires in the RNA are suspected to have been highly variable in both size and intensity, dependent on slopes, aspect, riparian influences, and stand conditions. This has created a complex mix ranging from frequent, low intensity fires to infrequent, high intensity fires.

Wildfires, both human and lightning caused, have been actively suppressed in and around the RNA since the turn of the century. The exclusion of fire, changes in moisture regimes, and intensified cycles of insect outbreaks have significantly altered the appearance and structure of forest areas. Tree mortality is variable but in some areas (eg. northwest face of Cache Mountain) over 50% of the trees are dead or damaged.

Five percent of the 25,812 acre (10,502 ha) Cache Creek watershed has burned in large fires (over 100 acres in size) since 1908. There have been a total of 15 fires in the Cache Creek watershed since 1982, an average of 1.25 per year. Of these 60% were lightning caused and 33% were human caused. Most of these fires occurred in July and August. There have been 2 fires within the RNA since 1982. Both were lightning caused and one quarter acre or less in size.

In the last decade, there has been a shift in predicted fire regimes for the RNA from moderate to more high intensity due to increases in tree mortality, ladder fuels, and fuel buildup. Probability of a stand replacement event in or adjacent to the RNA is high. The RNA is particularly vulnerable to a stand replacement fire event because of inaccessibility which increases fire suppression response times.

Fauna

Wildlife species are abundant and characteristic of mixed stands of the central Cascades. Table 2 lists wildlife species that occur or may occur in the RNA.

The following methods were used to identify wildlife species that either inhabit or are likely to inhabit the RNA. Avian species were identified

through systematic ocular and auditory breeding bird surveys. The surveys were conducted during the crepuscular hours of the breeding period in 1994. Amphibian species were identified from data collected over a period of survey seasons conducted throughout the Sisters Ranger District including the RNA. Reptiles were identified by incidental sightings during the mammalian and amphibian surveys. They were not formally surveyed for because of the limited number of species capable of inhabiting the area. Mammalian species were identified from mammal surveys conducted during the summer of 1994. Live trapping, pitfall arrays, and aluminum track plates were used for small mammals. Larger mammals were identified by incidental sightings and identification of incidental tracks discovered during the survey period.

Two species, listed as Threatened by the U.S. Fish & Wildlife Service, are present or likely to be present in the RNA. The northern spotted owl, a Federally listed Threatened species, nests within the RNA. There are four spotted owl nest territories within four miles (6 km) and two within a mile and a half (2.4 km) of the RNA boundary. There is a northern bald eagle nest site three and a half miles (5.6 km) from the RNA boundary. Since there are three lakes within the RNA that have viable fish populations, it is reasonable to suspect that the eagles may either fish these waters or lay in wait and steal from the osprey that frequent the area to forage.

Possibly inhabiting the RNA are two species federally listed as Species of Concern: the western big-eared bat and the wolverine. Two known western big-eared bat hibernaculums are well within normal foraging range of the RNA. One is located five miles (8 km) from the RNA boundary; the other is seven miles (11 km). Since these species are nocturnal, there is little information on where they forage but suitable day roosting sites are abundant within the RNA boundaries. Of the last six sightings of wolverines on the Sisters District, two were recorded within two to three miles (3 to 5 km) of the RNA. Although the wolverine was not listed as a likely inhabitant of the RNA, it may occupy the adjacent lands and have a home range that overlaps the RNA. Much of the RNA is roadless, and in fact, the southern boundary is part of the northern boundary of the Mt. Washington Wilderness.

Species in Table 2 that are marked with an asterisk (*) were not actually seen or otherwise detected during surveys. These species are likely to be present in the RNA because: 1) they are known to inhabit areas close enough to the RNA to include it within their home ranges, or 2) suitable potential habitat occurs in the RNA. Some species are elusive and inherently difficult to detect even when known to inhabit an area.

Invertebrates

Preliminary surveys of invertebrates in Cache Mountain Research Natural Area located several species that typically occur on the west side of the Cascade Mountains (Table 3).

Table 2. Wildlife species list for Cache Mountain RNA. Wildlife field surveys were conducted in Cache Mountain RNA in 1994 by Tom Darden, Deschutes National Forest Biologist, and Deanna Olson, Forest Service Research Ecologist. The following list includes wildlife species known to occur, as well as species that may occur in the RNA. Species not actually seen or otherwise detected during surveys but that have a high probability of occurring in the RNA are marked with an asterisk (*). Species identifications were determined from Hall and Kelson (1959), Nussbaum et. al. (1983), and Robbins et al. (1966).

BIRDS

Accipiter cooperii*	Cooper's hawk
A. gentilis*	Northern goshawk
A. striatus*	Sharp-shinned hawk
Anas platyrhynchos	Mallard
Ardea herodias	Great blue heron
Bonasa umbellus*	Ruffed grouse
Bubo virginianus*	Great horned owl
Buteo jamaicensis*	Red-tailed hawk
Carduelis pinus	Pine siskin
Carpodacus cassinii	Cassin's finch
Catharus guttatus	Hermit thrush
Certhia americana	Brown creeper
Chordeiles minor	Common nighthawk
Colaptes auratus	Northern flicker
Contopus sordidulus	Western wood-peewee
Corus corax	Common raven
Cyanocitta stelleri	Stellar's jay
Dendragapus obscurus*	Blue grouse
Dendroica auduboni	Yellow-rumped warbler
D. occidentalis	Hermit warbler
D. townsendi	Townsend's warbler
Dendrocopos villosus	Hairy woodpecker
Dryocopus pileatus	Pileated woodpecker
Empidonax oberholseri	Dusky flycatcher
E. trailii	Willow flycatcher
Falco sparveriua*	American kestrel
Geothlypis trichas	Common yellowthroat
Haliaeetus leucocephalus*	Bald eagle
Hesperionana vespertina	Evening grosbeak
Junco hyemalis	Dark-eyed junco
Loxia curvirostra	Red crossbill
Megaceryle alcyon	Belted kingfisher
Melospiza melodia	Song sparrow
Nucifraga columbiana	Clark's nutcracker
Nuttailornis borealis	Olive-sided flycatcher
Oreortyx pictus	Mountain quail
Oporornis tolmiei	MacGillivray's warbler
Pandion haliaetus	Osprey
Parus atricapillus*	Black-capped chickadee
P. gambeli	Mountain chickadee
Passerina amoena	Lazuli bunting
Perisoreus canadensis	Gray jay
Picoides arcticus	Black-backed woodpecker

Piranga ludoviciana	Western tanager
Podiceps nigricollis	Eared grebe
Selasphorus rufus	Rufous hummingbird
Sitta canadensis	Red-brested nuthatch
Sphyrapicus ruber	Red-brested sapsucker
Spizella passerina	Chipping sparrow
Strix occidentalis*	Northern spotted owl
Troglodytes aedon	House wren
T. troglodytes	Winter wren
Turdus migratorius	American robin
Vireo gilvus	Warbling vireo
Vermivora celata	Orange-crowned warbler
Zenaida macroura	Morning dove
Zonotrichia leucophrys	White-crowned sparrow

AMPHIBIANS

Ambystoma macrodactylum	Long-toed salamander
A. gracile	Northwestern salamander
Ascaphus truei*	Tailed frog
Bufo boreas	Western toad
Dicamptodon tenebrosus*	Pacific giant salamander
Hyla regilla	Pacific treefrog
Rana cascadae	Cascades frog
R. pretiosa*	Spotted frog
Taricha granulosa	Rough-skinned newt

REPTILES

Eumeces skiltonianus*	Western skink
Gerrhonotus coeruleus*	Northern alligator lizard
Phrynosoma douglassi	Short-horned lizard
Sceloporus occidentalis*	Western fence lizard
S. graciosus*	Sagebrush lizard
Thamnophis elegans	Western terrestrial garter snake
T. ordinaoides*	Northwestern garter snake
T. sirtalis*	Common garter snake

MAMMALS

Canis latrans*	Coyote
Cervus canadensis	Elk
Clethrionomys gapperi	Boreal redback vole
Eptesicus fuscus*	Big brown bat
Erethizon dorsatum*	Porcupine
Eutamias amoenus	Yellow pine chipmunk
E. townsendi	Townsend chipmunk
Felis concolor*	Mountain lion
Glaucomys sabrinus*	Northern flying squirrel
Lasionycytris noctivagans*	Silver-haired bat
Lasiurus cinereus*	Hoary bat
Lynx rufus*	Bobcat
Marmota flaviventris	Yellowbelly marmot
Martes americana*	American marten

Microtus oregoni	Oregon vole
Mustela frenata*	Longtailed weasel
Myotis californicus*	California myotis
M. evotis*	Long-eared myotis
M. lucifugus*	Little brown myotis
M. subulatus*	Small-footed myotis
M. thysanodes*	Fringed myotis
M. volans*	Long-legged myotis
M. yumanensis*	Yuma myotis
Neotoma cinerea*	Bushytail woodrat
Odocoileus hemionus	Mule deer
Peromyscus maniculatus	Deer mouse
Phenacomys intermedius	Mountain phenacomys
Pipistrellus hesperus*	Western pipistrel
Plecotus townsendi*	Western big-eared bat
Procyon lotor*	Raccoon
Sciurus griseus	Western gray squirrel
Sylvilagus nuttalli*	Mountain cottontail
Sorex merriami*	Merriam shrew
S. vagrans	Vagrant shrew
Spermophilus lateralis	Golden-mantled squirrel
Tamisciurus douglasi	Douglas' squirrel
Taxidea taxus*	Badger
Thomomys talpoides	Northern pocket gopher
Ursus americana	Black bear

Table 3. Butterfly species list for Cache Mountain RNA. The following butterfly species have been observed within Cache Mountain RNA. Field surveys were conducted in 1994 by Dr. Jeff Miller and Dr. Paul Hammond of Oregon State University's Entomology Department, and by Maret Pajutee, Deschutes National Forest Ecologist. An asterisk (*) denotes species that typically occur on the west side of the Cascade Mountains. Species identifications were determined from Dornfeld (1980) and Scott (1986).

	Boloria epithore	Western meadow fritillary
	Cercyonis oetus	Least woodnymph
	Cercyonis pegala	Large woodnymph
	Coenonympha tullia	Common ringlet
	Colias eurytheme	Orange sulfur
	Colias occidentalis	Western sulfur
	Everes amyntula	Western tailed blue
	Hesperia comma	Comma skipper
	Limenitis lorquini	Lorquin's admiral
*	Lycaena mariposa	Mariposa copper
*	Nymphalis californica	California tortoiseshell
	Ochlodes sylvanoides	Woodland skipper
	Oeneis nevadensis	Great arctic
*	Parnassius clodius	Clodius parnassian
	Phyciodes campestris	Field crescent
	Pieris napi	Veined white
*	Plebejus icariodes	Common blue
*	Plebejus idas	Northern blue
*	Polites sonora	
	Speyeria atlantis	Atlantis fritillary
	Speyeria hydaspe	Hydaspe fritillary
	Speyeria zerene	Xerene fritillary
	Thorybes pylades	Northern cloudywing

Geology

During the past 200,000 years, basaltic volcanic vents have erupted in and near the Cache Mountain RNA and directly affected its geology and geomorphology. Large and small shield volcanoes, stratovolcanoes, and cinder cones grew from these vents and include Mt. Washington, Cache Mountain, Little Cache Mountain, and vent complexes along the Cascade crest only 2 miles (3 km) to the west. Near these vents, some of which are in the RNA, eruptions produced complex deposits of lava, breccia, and cinders. At some distance they produced fields of basaltic lava that flooded and overlapped in the RNA.

Glaciers from at least two glaciations have greatly altered this volcanic landscape. During the last major glacial advance, known locally as the Suttle Lake advance, a continuous ice cap covered the crest of the Cascade Range from central to southern Oregon. The Suttle Lake advance culminated about 20,000 years ago and disappeared a few thousand years later.

Glaciers from the ice cap flowed down valleys draining both the east and west sides of the Cascades. Their maximum downslope extent is marked by a conspicuous belt of end moraines. For example, Suttle Lake is dammed by a glacial end moraine, which marks the eastern extent of glacial advance. As the glaciers receded, they left thin, discontinuous ground moraines on valley floors.

Glaciation of nearly the entire RNA has left a landscape of scoured basins, bedrock ridges, and limited thin glacial deposits. The northwest flank of Cache Mountain (area in RNA) has been heavily modified by glacial erosion resulting in much steeper slopes than occur on the rest of Cache Mountain. Most of the basins contain wetlands and small lakes. A significant surface drainage system has not yet been established. Drainage and movement of water is almost entirely subsurface.

About 7600 years ago, the eruption of Mt. Mazama (Crater Lake) deposited 2 to 3 inches (5 to 7 cm) of rhyolitic air-fall ash on the RNA. Then, beginning about 4200 years ago, the Sand Mountain volcanic chain, 6 miles (10 km) to the west of the RNA, erupted episodically for several centuries. Basaltic ash from these eruptions was spread eastward by winds. In the RNA this ash is about 3 feet (1 m) thick. Subsequently, water, wind, and frost action have redistributed much of the ash especially on the steeper slopes. Some of the smaller lake basins have been filled with it.

Soils

Soils information is based on the Order 4 Soil Resource Inventory for the Deschutes National Forest (Larsen 1976). Surface soils are derived from an ash and pumice tephra expelled from Sand Mountain approximately 3440 years ago. Various subsurface soils are present including glacial tills, older ash tephras and residuum from underlying basalts and andesites. Nine soil types are present within the RNA (Figure 5) and are described below:

Soil Type 5 - This soil type describes a wet meadow extending southwest from the shore of Cache Lake. The soil profile is generally wet for the majority of the year and consists of sands and loamy sands with high amounts of organic

material. The area supports a variety of herbaceous forb and shrub species, with a tree component present in the western portion.

Soil Type 9 - This soil type describes the upper slopes of Cache Mountain. The soil profile consists of coarse textured cinders and scoria with little soil development on the surface, low amounts of organic matter accumulation and sparse amounts of vegetation, primarily consisting of shrubs. The northern aspect within this soil type does have a forested component established.

Soil Type 12 - This soil type describes a generally northern aspect of a steep, complex and rocky landform in the center of the RNA. The soil profile consists of weakly developed loamy sands from Sand Mountain underlain by hard basalts and andesites. Tuffs, breccias and glacial till may also be present in the subsurface layers. This is a low productivity site supporting primarily mountain hemlock and true firs.

Soil Type 17 - This soil type describes an ephemeral draw within the glacially scoured ridgeline that comprises Cache Mountain. The soil profile consists of a moderately thick layer of ash tephra from Sand Mountain overlying glacial till. Subsurface material is often cobbly sandy loam overlying unweathered, compact glacial till located within 30 to 50 inches (76 to 127 cm) of the soil surface.

Soil Type 18 - This soil type describes the glacially scoured northern flank of Cache Mountain. The soil profile consists of ash tephra from Sand Mountain overlying glacial till comprised of cobbly sandy loams. Profile depth becomes shallower toward the top of this uniform slope where basaltic and andesitic bedrock is encountered closer to the surface.

Soil Type 69 - This soil type describes the lower slopes of two landforms comprised primarily of extrusive basalts and andesites. The soil profile consists of ash tephra from Sand Mountain and other, older volcanic events overlying residuum and colluvium from older subsurface material. Bedrock can be encountered within 24 to 60 inches (61 to 152 cm) of the soil surface.

Soil Type 85 - This soil type describes a small section of the RNA found on the easterly slopes of Little Cache Mountain. The soil profile consists of Sand Mountain tephra overlying older tephra on top of complex volcanics comprised of a combination of basalts, andesites, tuffs, breccias and cinders. This a noncommercial to marginal landtype for timber production.

Soil Type 94 - This soil type describes the glaciated upland section of the RNA found to the west of Hortense and Four O'Clock lakes. The soil profile consists of a thick layer of Sand Mountain ash tephra overlying glacial till. The landscape position of this area falls within a 50 to 80 inch (127 to 203 cm) annual rainfall zone and supports a variety of tree species including lodgepole pine, mountain hemlock and true firs.

Soil Type 95 - This soil type describes the uneven glaciated uplands in the northern section of the RNA. The soil profile consists of a moderately thick layer of Sand Mountain ash tephra overlying glacial till. The landscape position of this area falls within a 40 to 60 inch (102 to 152 cm) annual rainfall zone. This area has a variety of slope aspects and supports a diverse

population of conifers, shrubs and forbs. This soil type has the highest productivity of the nine soil types within the RNA.

Lands

All lands within and adjacent to the RNA are federally owned and managed by the Deschutes National Forest. T13S, R8E, S33 was acquired from Willamette Industries through a land exchange in 1993. Lands to the north of the RNA are in the Meadow Lakes Basin area and are managed for dispersed summer and winter recreation. The Mt. Washington Wilderness Area borders the southwest. Lands to the east and southeast are managed as multiple use forest lands termed as "matrix" or "late successional reserves" under the Northwest Forest Plan.

Cultural

One cultural resource site occurs along the southwest boundary of Cache Mountain Research Natural Area, along Forest Service Road 1028-500. This road, called Cache Toll Road, is one of the original wagon roads across Santiam Pass (Archeological Site #61500300). Other cultural resource sites occur outside of the RNA, in the Meadow Lakes Basin.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

There are no known locatable (e.g., gold or silver) or leasable (e.g., oil or gas) mineral resources in the RNA and there is a low probability of finding either of these types of resources.

The status of the following "salable" mineral resources (e.g., hard rock, gravel, cinders) is as follows:

1. Hard Rock - A potential hard rock resource has been identified in T14S, R8 1/2 E, S4, in the west 1/2 of the southwest 1/4, and in T14S, R8 1/2 E, S5, in the southeast 1/4 of the southeast 1/4. The resource area may extend into adjacent parts of Sections 8 and 9. No exploratory work has been done.

2. Cinders - The summit area of Cache Mountain is a cinder cone. A small cinder pit currently exists outside the proposed RNA in the northwest 1/4 of the southeast 1/4 of Section 9. It has seen only very minor use in the last 20 years. In addition, the fact that the summit is identified in the Forest Plan as being available for development as an electronic site makes it unlikely that the cone would be developed as a cinder source.

3. Gravels - No deposits have been identified. Large deposits of gravels are unlikely to occur in the RNA but small local deposits may be present.

Grazing

The Proposed Cache Mountain RNA is within the boundaries of the Cache Mountain Sheep Allotment. The allotment is currently vacant and will remain vacant until NEPA requirements are accomplished. Should the allotment become active, then the boundaries of the Research Natural Area will be marked and physical

barriers constructed around the area to prohibit livestock entry, if needed (USDA Forest Service 1990; Forest Plan Standard and Guideline M2-8, p. 4-92).

Timber

The majority of lands in Cache Mountain RNA (1300 of the 1400 acres; 529 of 570 ha) are currently managed as a Late Successional (Old Growth) Reserve as mandated by the Northwest Forest Plan (USDA Forest Service and USDI Bureau of Land Management 1994). A small area of approximately 100 acres is designated as Matrix Lands and is largely associated with riparian reserves near Cache Lake.

Fire suppression

Current direction specifies that all wildfires within the RNA will be aggressively contained using low impact methods. High impact methods such as dozer line and retardant drops should only be used to prevent a significant loss of the RNA. Fire managers can use a flexible approach allowed by the "suppression cost plus net resource loss" concept (Forest Service Manual Section 5131), allowing confine, contain or control strategies.

Fire related activities in the RNA can be considered in three distinct categories: wildfire inside the RNA, wildfire outside the RNA which threatens to enter, and prescribed burning.

1. Wildfire inside the RNA

Under current direction, all fires within the RNA, both natural and human-caused, are to be put out quickly, minimizing costs. This approach is intended to protect fire sensitive resources in the RNA and to prevent fire from escaping the RNA, threatening adjacent recreational areas and private lands. Suppression techniques should follow District Guidelines for wilderness fires, as much as possible. However, because of the high probability of stand replacement events within the RNA and the risk of spread onto adjacent high use recreational areas and private lands, fire managers must use whatever suppression techniques are necessary to preclude loss of the RNA or escape from the RNA that threatens high value resources or life and property. As a rule of thumb, high impact methods should not be used where low impact methods will serve.

Waterbodies within the RNA need special consideration during fire suppression. Lake and wetland areas are a special feature of this RNA and and their aquatic life can be seriously affected by contamination with fire retardant. Removal of water from RNA lakes during fire suppression should try to avoid causing a visible drop in water level to protect aquatic species and minimize effects to aquatic research projects.

2. Wildfire outside the RNA

Wildfires that begin outside the RNA and threaten to enter will be aggressively suppressed, the objective being to reduce the impact of outside influences to a minimum. Where fires do cross the boundary, modified suppression techniques emphasizing low impact should be used.

3. Prescribed Fire

The present composition and structure of the RNA forests are largely a result of fire exclusion. The return of fire to the RNA would reintroduce an important natural disturbance factor and help restore historic conditions. The possibilities for using prescribed fire in the RNA should be assessed.

Watershed Values

The Meadow Lakes Basin which includes and surrounds the RNA is identified as a unique landscape area of the Metolius River Watershed (USDA Forest Service 1995). It is distinguished because it is a sub-alpine lake basin which contains many unique riparian and aquatic special habitats as well as late successional forest areas. Because of the position of the RNA near the crest of the Cascades, the area contains a unique mix of eastside and westside species. Vagile species may pass through the RNA while crossing the Cascade Crest. The area is likely to support much undiscovered biological diversity.

The major threats to these values in the RNA are related to catastrophic fire events, the effects of fire suppression, and uncontrolled access to sensitive riparian areas.

Recreation Values

The Meadow Lakes Basin which includes and surrounds the RNA is valued for its dispersed recreational opportunities, including fishing and camping at undeveloped lakeside campsites. This use can impact lakeside areas. Accessible Torso Lake, which was originally part of the proposed RNA, was removed from the final proposed boundary because of extensive lakeside damage caused by horse and vehicle camps and off-highway vehicle use.

Limited access helps protect RNA lakes from heavy use. The only lake within the RNA which can be accessed by road is Cache Lake which has one dispersed campsite. The campsite may require some rehabilitation to protect the lake from sedimentation. Hortense Lake can be accessed by a marked trail and receives some backpacking use and camping. One shoreline shows damage from this use. Other lakes within the RNA can be accessed by more primitive user trails and show some signs of human use. Four O'Clock Lake and NoName Lake appear to have the least use.

Cache Lake is popular with local fisherman. Some hunting use may occur along road boundaries of the RNA and along Forest Service Road 2076-800. Gating or closing access may conflict with hunters.

Off-highway vehicle (OHV) use in the area was identified as a trend of concern by the Metolius Watershed Analysis (USDA Forest Service 1995). Most of this use is along roads but there is a possibility of OHV trespass into some portions of the RNA. Though the hiking trail leading into Hortense Lake is closed to motor vehicles, some OHV trespass may occur in this area. However, much of the flatter portions of the RNA contain abundant downed wood which makes cross country travel by foot or OHV difficult to impossible.

On the eastern border of the RNA the unimproved road to the summit of Cache Mountain is used by snowmobiles, mountain bikers, OHV's and horse endurance riders.

Wildlife and Plant Values

Spotted owl nests within RNA need special consideration in the planning of research projects and management activities such as fire suppression. There is some incidental bald eagle use at some of the lakes that may also require consideration. Any caves or lava tubes discovered in the RNA may be habitat for Townsend's big eared bat and need to be evaluated before human entry because of the risk of disturbing maternity caves.

High floristic diversity, especially in wetland, meadow, and rock outcrop areas, may be at risk from uncontrolled access. The introduction of noxious weeds is of particular concern. Some incidental use of special forest products such as huckleberries occurs in the area. However, commercial harvest of special forest products (e.g., firewood, boughs, mushrooms, moss, lichens, and transplants) is not allowed. Deschutes National Forest Land and Resource Management Plan (USDA Forest Service 1990) states that special uses will only be allowed if they support the management objectives of the Research Natural Area and are approved by the Experiment Station Director and the Forest Supervisor (Standard and Guideline M2-20, p. 4-93).

Special Management Area Values

Establishment of the RNA does not impact any congressionally designated areas.

Transportation Plans

There is one existing trail in the RNA that is not part of the Forest Service trail system, and there are no plans to include it in the system. Impacts of the existing trail will be monitored to prevent damage to RNA values.

Most of the RNA is bordered by Forest Service roads, but there are no conflicts with the Forest's Transportation Plans.

Adjacent Private Lands

No adjacent private lands occur.

MANAGEMENT PRESCRIPTION

Vegetation Management

Develop a Fire Management Plan which allows natural fires to burn under certain specific conditions and introduces prescribed fire where feasible.

Monitor for the presence of noxious weeds along trails which enter the RNA and on adjacent roads and plantation areas. Early detection and prevention are critical.

Wildfire Management- Fuelbreak Strategy

The creation of fuelbreaks around the RNA area is included as a part of the Santiam Corridor and Santiam Restoration Projects and will help reduce the risk of fires escaping or entering the RNA. It is recommended that plantations adjacent to the RNA boundary should be managed as fuelbreaks by thinnings and reducing shrubs. Reductions of fuels in other adjacent areas (section 33,34) would also reduce risks.

Recreation Management

Develop signing which delineates the RNA boundary. Educational signing at key spots such as Cache and Hortense Lake should explain the unique purpose of Research Natural Areas and the sensitive features of the area.

Evaluate accessibility concerns to the RNA and close unneeded informal roads. Consider gating Forest Service Road 2076-800 to reduce recreational access but provide for fire suppression access.

Monitor horse and mountain bike use within the RNA and evaluate whether significant use occurs and whether this use requires some management to protect RNA values.

Monitor the trail used to access Hortense Lake to evaluate if damage is occur to RNA values.

Wildlife Management

Evaluate fish stocking with the Oregon Department of Fish and Wildlife to determine whether non-native fish/amphiphians conflicts exist.

ADMINISTRATION RECORDS AND PROTECTION

Administration and protection of Cache Mountain RNA will be the responsibility of the Deschutes National Forest. The District Ranger, Sisters Ranger District, P.O. Box 249, Sisters, Oregon 97759, has direct responsibility.

The Director of the Pacific Northwest Research Station, P.O. Box 3890, Portland, Oregon 97208, will be responsible for any studies or research conducted in the area, and requests to conduct research in the RNA should be referred to her/him. The RNA Scientist in the Research Station is designated as the lead contact person for all such requests. The Director will evaluate research proposals and coordinate all studies and research in the area with the District Ranger. All plant and animal specimens collected in the course of research conducted in the area will be properly preserved and maintained within university or federal agency herbaria and museums, approved by the Pacific Northwest Research Station.

Records for the Cache Mountain RNA will be maintained in the following offices:

District Ranger, Sisters Ranger District, P.O. Box 249, Sisters, Oregon 97759

Forest Supervisor, Deschutes National Forest, 1645 Highway 20 East, Bend, Oregon 97701

Director, Pacific Northwest Forest and Range Experiment Station, P.O. Box 3890, Portland, Oregon 97208

Region 6 Research Natural Area Database, Forest Science Databank, Forest Science Department, Oregon State University, Corvallis, Oregon 97330

Archiving

The Portland office of the Pacific Northwest Research Station will be responsible for maintaining the Cache Mountain RNA research data file and list of herbarium and species samples collected. The RNA Scientist has established a data base for maintaining research data and lists of species for all RNAs in the region. Computerized files for the RNA will be maintained at the Region 6 Research Natural Area Database, associated with the Oregon State University Forest Science Databank in Corvallis, Oregon.

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CACHE MOUNTAIN RESEARCH NATURAL AREA

I certify the enclosed boundary description of the Cache Mountain Research Natural Area was prepared under my direct supervision.

OREGON PLS #2111
State Reg. No.

Walt Miller
Walt Miller
Forest Land Surveyor

1/7/97
Date

Cover Page Info for Cover of RNA Establ. Record

Name: Cache Mountain RNA

Region: R06 Station: PNW

State: Oregon County: Deschutes

Boundary Certified on - After reference section

TMIS #: 00

Date Reg. Forester signed: _____

Lat.: 42 degrees 23' 34" N

Long.: 121 degrees 46' 29" W

1980 SAF	Acres	Ha
205 Mountain hemlock	365	149
206 Englemann spruce	110	45
211 White fir	989	402
Totals:	1464	596

1966 Kuchler	Acres	Ha
Fir-hemlock forest (Abies-Tsuga)	1464	596
Totals:	1464	596

Access (under "location"): map vs. description _both__

Original maps, or photocopies? Photocopies

Photos included? no

Abutted by non-FS land? No

SAF & Kuchler types consistent? no

Climate records: length of record 24 yr Distance to weather sta. 6 miles

Fauna & Flora authorities: Dornfiled 1980; Hall and Kelson 1959; Hitchcock and Cronquist 1973; Little 1979; Nussbaum et al. 1983; Oregon Natural Heritage Program 1995; Robbins and Zim 1966.

Land use conflicts? Grazing? Trails? Recreation? Some dispersed recreation. Off-road vehicle use could be a potential problem, especially around the lakes.

Commercial Forest Land: ___in Wilderness_____acres; P. _____

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* Classify at Subsection level if possible: a 5-digit code (or 6-digit, if beginning with "M"). If not possible, then at Section level.

DECISION NOTICE / DESIGNATION ORDER
and
FINDING OF NO SIGNIFICANT IMPACT

ESTABLISHMENT OF ELEVEN RESEARCH NATURAL AREAS

USDA Forest Service
Pacific Northwest Region
Oregon and Washington

By virtue of the authority vested in me by the Chief of the Forest Service, in Forest Service Manual Section 4063, I hereby establish the Research Natural Areas listed in Table 1 and as described in their respective Establishment Records in the section entitled "Location".

Table 1: Research Natural Area Locations

R N A	National Forest	Ranger District	County	Acres
Oregon				
Cache Mountain	Deschutes	Sisters	Deschutes	1400
Dry Mountain	Ochoco	Snow Mountain	Harney	2205
Gumjuwac/Tolo	Mt. Hood	Barlow	Hood River	3600
Hagan	Willamette	Blue River	Lane	1126
McKenzie Pass	Willamette	McKenzie	Lane	1187
Mokst Butte	Deschutes	Bend/Fort Rock	Deschutes	1250
Reneke Creek	Siuslaw	Hebo	Tillamook	480
Tenmile Creek	Siuslaw	Oregon Dunes NRA	Coos	1190
Vee Pasture	Fremont	Bly	Klamath & Lake	620
Washington				
Fish Lake Bog	Wenatchee	Lake Wenatchee	Chelan	206
Roger Lake	Okanogan	Tonasket	Okanogan	436

The Regional Forester recommended the establishment of these RNAs in the Record of Decision for their respective Land and Resource Management Plans (Forest Plans). That recommendation was the result of an analysis of the factors listed in 36 CFR 219.25 and Forest Service Manual 4063.2. Results of the Regional Forester's analysis are documented in the Forest Plans and Final Environmental Impact Statements which are available to the public.

and are not likely to be highly controversial.

4. There are no known effects on historical or cultural resources, park lands, prime farmlands, wetlands, or wild and scenic rivers. Effects of establishing the RNAs is to protect ecologically sensitive areas. No significant adverse effects area anticipated to any environmentally sensitive or critical area.

5. The action is not likely to establish a precedent for future actions with significant effects.

6. The proposed action will not adversely affect any federally listed or proposed endangered or threatened species or Regionally listed sensitive species of plants or animals or their critical habitats.

7. The proposed action is consistent with the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA, USDI 1994).

8. The proposed action is consistent with Federal, State, and local laws and requirements for protection of the environment.

NOTIFICATION and IMPLEMENTATION

Legal notice of this decision will appear in The Oregonian and The Seattle Post-Intelligencer. The Forest Supervisor of each National Forest shall notify the public of this decision and mail a copy of the Decision Notice/Designation Order to all persons on their Forest Plan mailing lists.

Implementation of this decision shall not occur within seven days following publication of the legal notice of the decision in The Oregonian and The Seattle Post-Intelligencer.

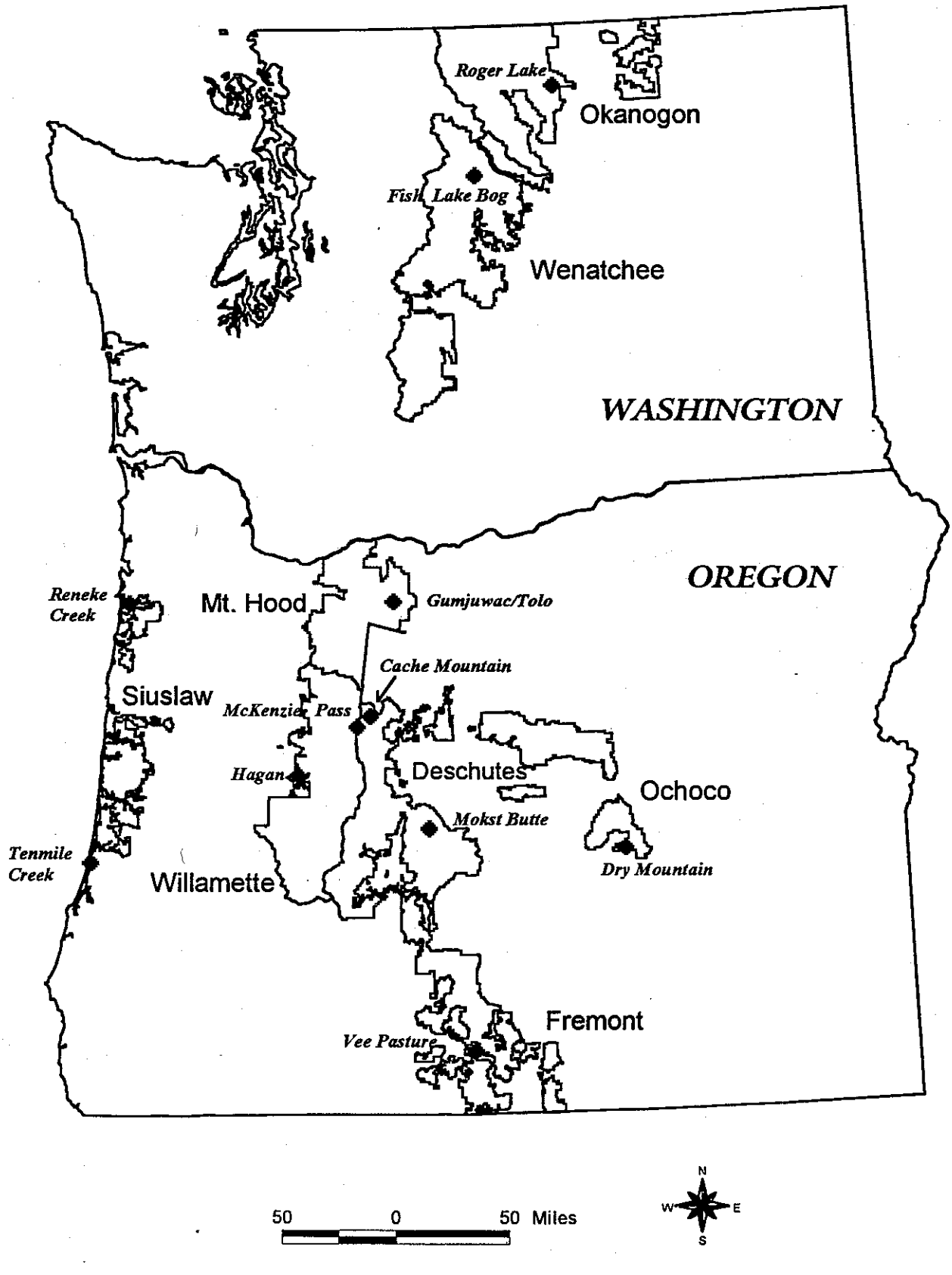
APPEAL RIGHTS

This decision is subject to appeal pursuance to 36 CFR Part 217. A copy of the Notice of Appeal must be in writing and must be submitted to:

Chief, USDA Forest Service
ATTN: NFS Appeals
14th and Independence Ave., S.W.
P.O. Box 96090
Washington, DC 20090-6090

Any written Notice of Appeal of this decision must be fully consistent with 36 CFR 217.9 (Content of a Notice of Appeal), must include the reasons for appeal, and must be submitted within 45 days from the date of legal notice of this decision in The Oregonian and The Seattle Post-Intelligencer.

Research Natural Area Locations



SELECTED ALTERNATIVE

The Regional Forester has reexamined the RNAs to ensure that the environmental effects of establishing the areas as RNAs have not changed since the Forest Plans were adopted. In three cases (Cache Mountain, Dry Mountain, and Gumjuwac/Tolo) areas were recommended for addition or deletion from the proposed RNA to better accomplish the original purpose of the RNA. Proposed Tenmile Creek RNA boundary adjustments were adopted by the Record of Decision for the Oregon Dunes National Recreation Area Management Plan in 1994. For the remaining RNAs no changes were found. This analysis is documented in the attached Environmental Assessment.

Based on the analysis in the Environmental Assessment, it is my decision to adopt Alternative 2 which establishes these eleven areas as Research Natural Areas. Alternative 2 is selected because it provides long-term protection of the research and educational values of these special areas and the ecosystem elements that they represent. The RNAs will be managed in compliance with all relevant laws, regulations and Forest Service Manual direction regarding RNAs and in accordance with the management direction identified in their respective Forest Plans.

Although this alternative is consistent with the management direction in each Forest Plan it does change the allocation for these areas from "Proposed RNA" to "Established RNA". This is a non-significant amendment of the Forest Plans [36 CFR 219.10(f)].

OTHER ALTERNATIVE CONSIDERED

The other alternative considered was Alternative 1, the "No Action" alternative which would continue management of the RNAs as "Proposed RNAs". Alternative 1 was not selected because it would provide only short-term protection of the research and educational values of the areas. Alternative 1 is consistent with the Forest Plans.

FINDING OF NO SIGNIFICANT IMPACT

Based on the environmental analysis documented in the Environmental Assessment, it has been determined that the proposed action is not a major federal action that would significantly affect the quality of the human environment, therefore, an environmental impact statement is not needed. This determination is based on the following factors [40 CFR 1508.27]:

CONTEXT

Although this is an addition to the national system of RNAs, both short-term and long-term physical and biological effects are limited to the local area.

INTENSITY

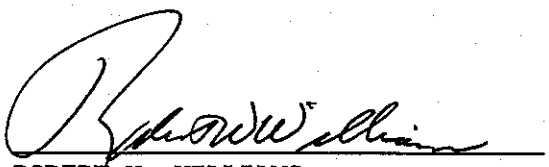
1. There are no known effects on public health and safety.

2. No significant direct, indirect or cumulative impacts to the natural resources or other components of the human environment are anticipated.

3. Effects on the human environment are not uncertain, do not involve unique or unknown risks,

CONTACT PERSON

For further information regarding this decision contact Sarah Greene, RNA Coordinator, Pacific Northwest Research Station, 3200 S.W. Jefferson Way, Corvallis, Oregon 97331, Phone 541-750-7360.



ROBERT W. WILLIAMS
Regional Forester

6/9/97
Date