SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Katsuk Butte 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, Establishment Record Content, in arriving at this recommendation

Prepared by _____ Date 4/19/15
Richard E. Brainerd, Senior Botanist, Carex Working Group, LLC

Reviewed by _____ Date 4/24/15
Robin Vora, RNA Program Manager, Deschutes National Forest

Recommended by _____ Date 4/27/15
Kevin Larkin, District Ranger, Bend-Fort Rock Ranger District

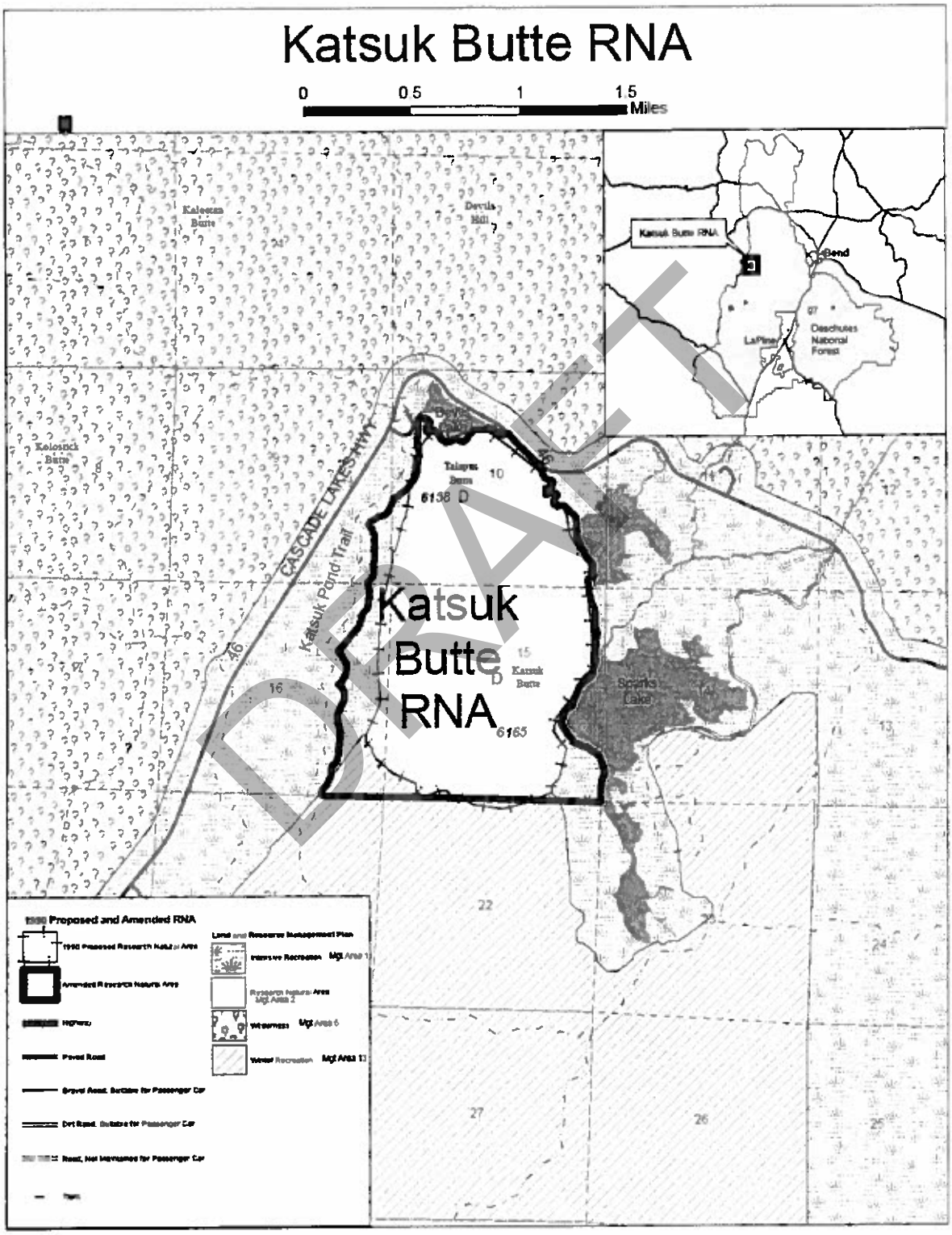
Recommended by _____ Date 4/29/15
John Allen, Forest Supervisor, Deschutes National Forest

Concurrence of _____ Date 5/5/15
Robert Mangold, Station Director, Pacific Northwest Research Station

Table of Contents

LOCATION AND BOUNDARY MAP

Figure 1. Location and boundary map of Katsuk Butte Research Natural Area, Deschutes National Forest.



LEGAL DESCRIPTION

KATSUK BUTTE RESEARCH NATURAL AREA BOUNDARY DESCRIPTION

The RNA boundary begins at the SE corner of Section 15, Township 18 South, Range 8 East, Willamette Meridian. At this time, there has only been one land survey corner recovered in the entire township and that corner is on the south range line. Therefore, coordinates describing dthe major angle points in the description were generated using GIS. The positions are given in the Oregon State Plane Coordinate System, South Zone, NAD 1983, and are to the nearest one foot (0.3048 meter). Where bearings are listed, they are to the nearest 10 seconds and distances are to the nearest foot (0.3048 meter). If this area is formally surveyed in the future, the GIS coordinates provided here may change slightly to meet the intended conditions on the ground (e.g. lake or stream edge, formal section corner). The area of the RNA is 1106 acres (448 hectares), more or less.

NARRATIVE

Point 1
Beginning at the map position for the SE corner of Section 15, Township 18 South, Range 8 East, Willamette Meridian, which has a coordinate value of N. 855707, E. 4593247;

Thence Northerly along the tree line along the West side of Sparks Lake, to a point on the tree line along Sparks Lake and the tree line southwesterly along the outlet of Satan Creek intersect; Thence Northwesterly along the tree line of the South side of Satan Creek to;

Point 2
A point that intersects a line 100 feet (30.48 meters) south of and perpendicular to the centerline of County Road 46, said point having the coordinate value of N. 864270, E. 4591608.

Thence Northwesterly parallel with and perpendicular to and 100 feet (30.48 meters) from the center line said road 46, to;

Point 3
A point 100 feet (30.48 meters) from the trail along the South side of Devils Lake, said point being parallel with and perpendicular to and 100 feet (30.48 meters) from the center line said road 46, having the coordinate value of N. 865031, E. 4590824.

Thence Westerly parallel with and perpendicular to and 100 feet (30.48 meters) from the center line said trail along the Southern edge of Devils Lake, to;

Point 4
A point identified by the coordinates N. 865393, E. 4588658. Said point is 100 feet (30.48 meters) from and perpendicular to the trail, and is East of the most Northwesterly point of the large parking lot at the Devils Lake trailhead.

Thence southerly to;

Point 5
A point identified by the coordinates of N. 864614, E. 4588674. Said point is at the base of Talapus Butte and 100 feet (30.48 meters) from and perpendicular to the trail running south from the 4600-430 road into trailhead.

Thence Southerly, paralleling and 100 feet (30.48 meters) Easterly of said trail to;

Point 6
A point on the map where said trail intersects the line between Sections 9 and 16. Said point is further identified by the coordinates of N. 855908, E. 4586350, and is 100 feet (30.48 meters) East of and perpendicular to said trail.

Thence Easterly, along a line to the point of beginning.

Description written by Bill Ham,
Boundary Manager, Sept. 27, 2009.

ESTABLISHMENT RECORD FOR THE KATSUK BUTTE RESEARCH NATURAL AREA WITHIN DESCHUTES NATIONAL FOREST, DESCHUTES COUNTY, OREGON

A. INTRODUCTION

Katsuk Butte Research Natural Area (RNA) occupies approximately 1106 acres (448 hectares) in the High Cascades physiographic province (Franklin and Dyrness 1973) and the East Cascades Ecoregion of Oregon (Oregon Natural Heritage Program 2003), and lies within the Deschutes National Forest. The RNA is located on the High Cascades of Central Oregon, a volcanically active area with dormant stratovolcanoes, cinder cones and lava flows that have been covered by ash from the eruption of Mt. Mazama. The RNA is comprised of two forested cinder cones, Katsuk Butte in the southern portion and Talapus Butte in the northern portion of the RNA. The two buttes rise approximately 730 feet (223 meters) above the surrounding terrain and are situated adjacent to the west side of Sparks Lake and to the south side of Devils Lake. Both cinder cones contain summit craters up to 200 feet (61 meters) deep. A third crater lies in the saddle between the buttes.

The forest within the RNA has not been subject to harvest or other manipulation. Most of the RNA is forested with mountain hemlock (*Tsuga mertensiana*). Lodgepole pine (*Pinus contorta*) forest occupies the interiors of the craters, depressional areas, the south slope of Katsuk Butte and old burn areas. A small pond and wet meadow habitat is located between Talapus Butte and Satan Creek in the northeast corner of the RNA.

B. JUSTIFICATION

JUSTIFICATION STATEMENT

Katsuk Butte RNA fulfills a unique RNA network need for representation of an entire undisturbed cinder cone in the mountain hemlock zone (Oregon Natural Heritage Program 2003) and is the only RNA in which this cell is represented. In addition, the RNA provides regional cell representation of a lodgepole pine/grouse huckleberry (*Vaccinium scoparium*) community.

PRINCIPAL DISTINGUISHING FEATURES

Katsuk Butte RNA is comprised of two forested cinder cones and surrounding terrain in the High Cascades of Central Oregon. It is located in an area of recent volcanic activity that produced numerous lava flows, and deposits of pumice, ash, and cinders. Glaciation has left many shallow lakes in broad valleys in the surrounding area and the RNA is bounded on the north by Devils Lake and on the east by Sparks Lake. The two cinder

cones formed beneath an ice sheet that covered the area about 18,000 years ago. Both cones are over 6150 feet (1875 meters) in elevation at their summits. The buttes are steep sided and nearly symmetrical with central craters and slopes composed of cinders, pumice, and ash. A third crater is located in the saddle between the buttes and is thought to have formed when molten rock drained out from under a hardened crust, leaving a depression. Steep walls and a central dome of lava support this hypothesis. Also included within the RNA are lava flows, three small ponds and a wet meadow. The forest is dominated by mountain hemlock in most of the RNA. Lodgepole pine dominates in small areas on the rims and in the craters of the cones, and on the south side of Katsuk Butte. Subalpine fir (*Abies lasiocarpa*) is common in the understory throughout the RNA and other coniferous species are present in minor amounts. Natural regeneration of tree species is sparse and the herbaceous layer is simple to nearly lacking beneath closed forest canopy. Soils are shallow, pumiceous loamy sands. Slopes range from near zero in the craters to 80 percent on the sides of the cinder cones.

OBJECTIVE

The objective of the Katsuk Butte RNA is to protect the ecological processes represented by the biotic communities found within the RNA, to provide a reference area for determining long-term intrinsic ecological changes, and to serve as a benchmark for comparison with intensively used or managed sites supporting similar vegetation.

C. LAND MANAGEMENT PLANNING

Katsuk Butte RNA was included as a proposed RNA in the Land and Resource Management Plan (LRMP) of the Deschutes National Forest (USDA Forest Service 1990a) and the Final Environmental Impact Statement (FEIS) for the LRMP (USDA Forest Service 1990b).

The boundary of the RNA has been amended to include some small wetlands on the northeast edge of the RNA and an entire natural wildfire burn on the west side of Talapus Butte. The original acreage of the RNA as proposed in the 1990 LRMP was 883 acres (357 hectares). The amended acreage is 1106 acres (448 hectares).

D. MANAGEMENT PRESCRIPTION

The Katsuk Butte RNA is included, along with other established and proposed RNAs, in the Deschutes National Forest Plan in Management Area 2, Research Natural Areas (USDA Forest Service 1990a). Management of the RNA will be directed toward maintaining natural ecological processes and conditions. Activities such as logging, livestock grazing and mining will be prohibited. Recreational use will not be encouraged. No new roads or trails will be constructed. Management actions commensurate with RNA objectives may be taken to control or eradicate noxious weeds or exotic species, including

the use of herbicides or biological control organisms. Any pest management activities will be as specific as possible against target organisms and will be designed to induce minimal impact to ecosystem processes. The standards and guidelines for management of MA-2 are described in the Forest Plan pages 4-92 to 4-93.

E. APPENDICES

Documentation for natural diversity elements can be found in Appendix E page 23 of the FEIS for the Deschutes National Forest LRMP (USDA Forest Service 1990b). Cells represented by Katsuk Butte RNA are documented in the Oregon Natural Heritage Plan, Chapter 10, pages 98 and 99 (Oregon Natural Heritage Program 2003).

ECOLOGICAL EVALUATION

A. PHYSICAL SITE DESCRIPTION AND CLIMATIC CONDITIONS

LOCATION

Katsuk Butte RNA is located in the Deschutes National Forest on the Bend-Fort Rock Ranger District in Deschutes County, Oregon (Figure 1). The approximate center of the RNA is at latitude 44° 01' 24" North and longitude 121° 45' 29" West (Map datum: NAD 1983). The RNA is located in Sections 9, 10, 15 and 16 of Township 18 South, Range 8 East, Willamette Meridian, approximately 23 air miles (37 kilometers) west of Bend, Oregon and 5 miles (8 kilometers) south of South Sister.

AREA

Total area for Katsuk Butte RNA is approximately 1106 acres (448 hectares).

ELEVATION RANGE

Elevations within the RNA range from about 5430 feet (1655 meters) on the shore of Sparks Lake to 6165 feet (1879 meters) at the summit of Katsuk Butte.

ACCESS

Katsuk Butte RNA can be accessed from the Devils Lake Trailhead parking lot at the northwest corner of the RNA. From downtown Bend, Oregon take State Highway 372 and County Road 46 (Cascade Lakes Highway) 27.6 miles (44.4 kilometers) west to the Devils Lake Trailhead parking lot. The Devils Lake Trail (Deschutes National Forest Trail No. 6.1) provides access to the north edge of the RNA. The Katsuk Pond Trail (Deschutes National Forest Trail No. 13) also originates at the parking lot and provides access to the

western and southern parts of the RNA. There is a 100 foot (30.48 meter) buffer between these trails and the RNA boundary.

CLIMATIC DATA

The central Oregon climate is characterized by warm summers and cold winters. Most of the precipitation falls as snow during the winter with some rainfall occurring in the spring. Frost can occur in any month of the year. The frost-free season is very short with the average growing season approaching only 100 days. Summers are typically dry with high daytime temperatures and cool nighttime temperatures. Winds during the summer are typically light and from the northwest. During spring and fall, very strong easterly winds may occur, increasing fire hazards. Winter snowstorms generally come from the southwest with occasional frigid storms from the northwest.

The nearest National Oceanographic and Atmospheric Administration (NOAA) weather station with similar climate is Odell Lake East station, approximately 35 miles (56 kilometers) south of the RNA. The Odell Lake East station has a mean annual temperature of 41.5° F (5.3° C), receives average annual precipitation of 30.37 inches (28.1 cm) and average annual snowfall of 178.5 inches. Nearly half of the annual precipitation falls between November and February, much of it as snow, and . Summer high temperatures are moderate but can reach into the 80's F (27-31° C) and higher, while winter lows regularly drop below 20°F (-6.6° C). Monthly climatic data for Odell Lake East are illustrated in Figures 2 and 3.

Figure 2. Average monthly temperature and precipitation data for Odell Lake East, Oregon between 1971 and 2000 (National Oceanic Atmospheric Administration 2000).

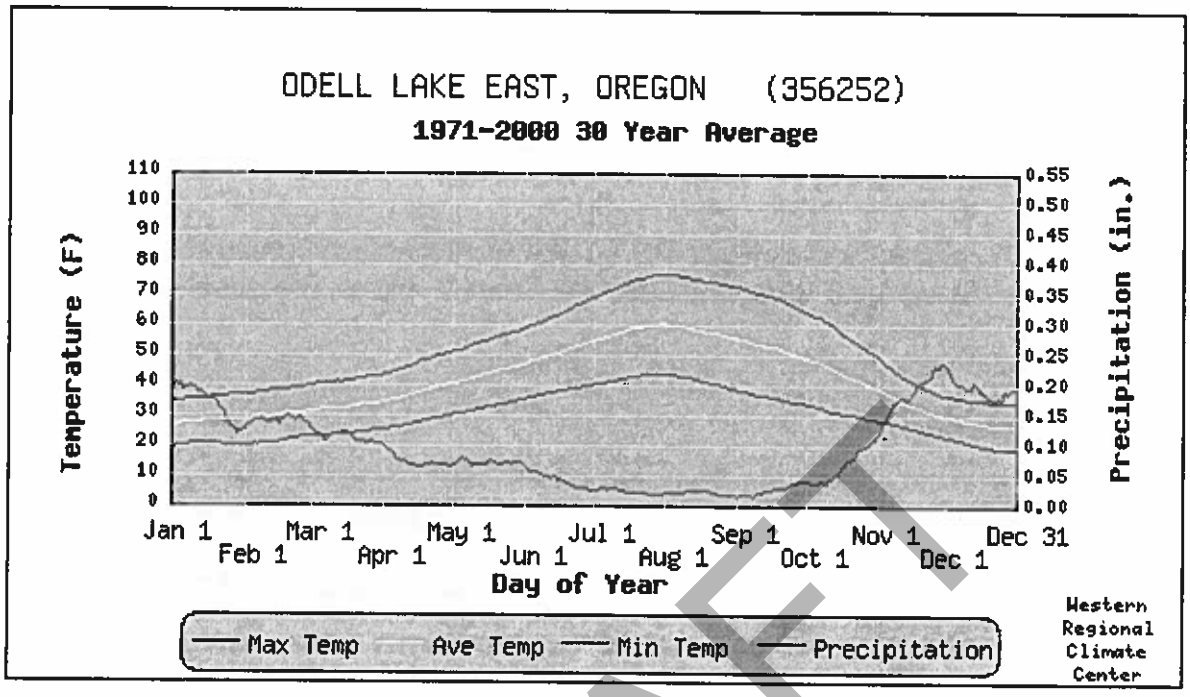
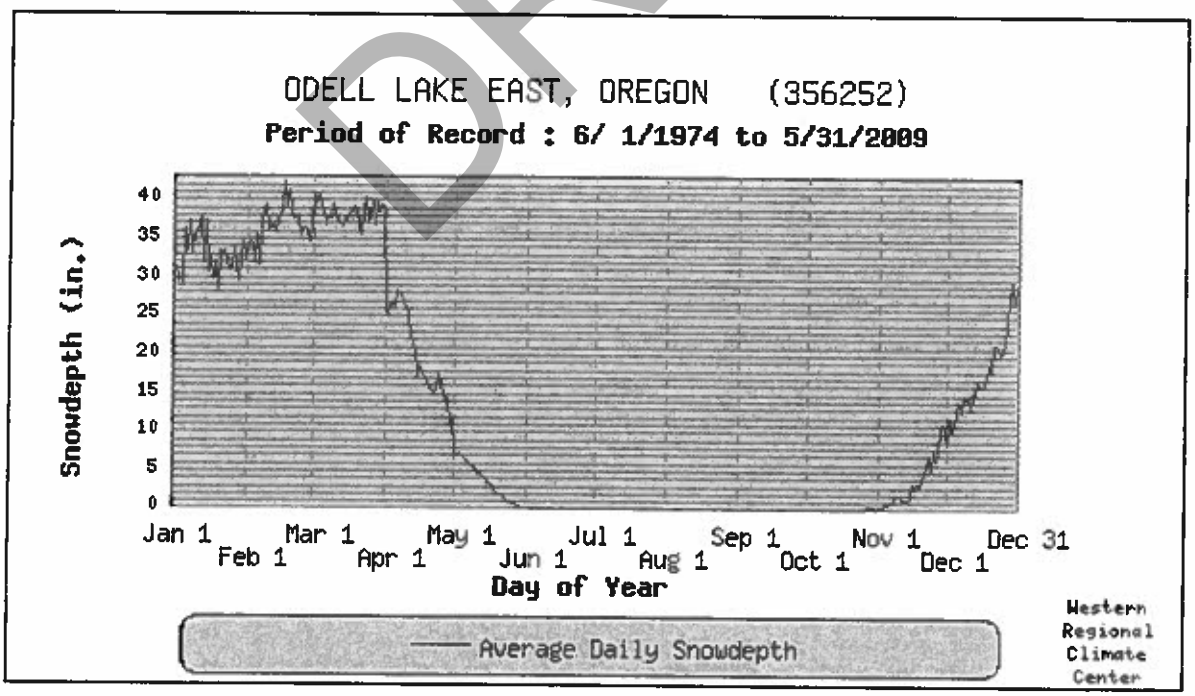


Figure 3. Average daily snow depth data for Odell Lake East, Oregon between 1968 and 1981 (National Oceanic Atmospheric Administration 2000).



B. ECOLOGICAL DESCRIPTION

ECOREGION

Katsuk Butte RNA is located in the Humid Temperate Domain, Marine Division/Marine Regime Mountains, Cascade Mixed Forest – Coniferous Forest Province, Eastern Cascades Section (Bailey 1994).

Thorson et al. (2003) placed Katsuk Butte RNA in the Northwestern Forested Mountains, Western Cordillera, Cascades Ecoregion, Cascade Crest Montane Forest subregion of Oregon.

VEGETATION TYPES

The vegetation of Katsuk Butte RNA has not been studied or mapped in detail. Three plant association groups are mapped by the Deschutes National Forest within the RNA: Mountain Hemlock (Tsuga mertensiana) Dry, Mixed Conifer Dry and Lodgepole Pine (*Pinus contorta)* Dry (Figure 4, Table 1).

Figure 4. Plant association groups of Katsuk Butte Research Natural Area.

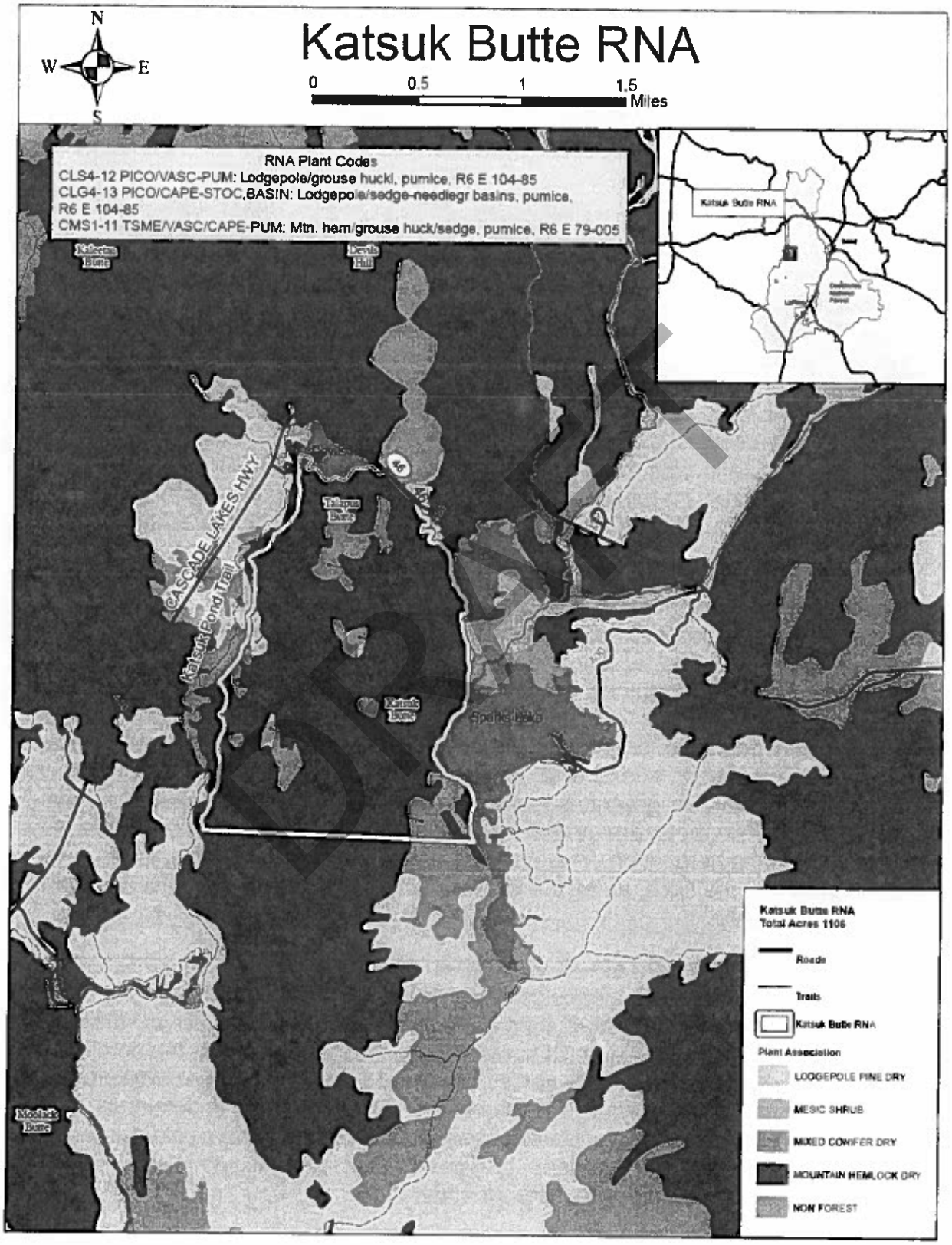


Table 1. Plant association groups and acreages within Katsuk Butte Research Natural Area.

Plant Association Group	Acres	Hectares
Mountain Hemlock Dry	970	392.6
Mixed Conifer Dry	65	26.3
Lodgepole Pine Dry	18	7.3
Non-forest	53	21.4

At Katsuk Butte RNA the Mountain Hemlock Dry plant association group is represented by the Mountain hemlock/grouse huckleberry (*Vaccinium scoparium*) plant association which covers approximately 88% of the RNA area. This plant association occurs on cold, well-drained sites and has low species diversity and sparse understory vegetation. Lodgepole pine is dominant in early seral stages following fire or logging, and silver fir (*Abies amabilis*) can be a co-climax species (Simpson 2007). Grouse huckleberry is the primary understory species. Pinemat manzanita (*Arctostaphylos nevadensis*) and long-rhizome sedge (*Carex inops* ssp. *inops*) also occur regularly. At Katsuk Butte RNA this plant association occurs throughout the RNA except in the craters of the buttes and a few other scattered locations.

The Mixed Conifer Dry plant association group is represented by the Mixed conifer/snowbrush (*Ceanothus velutinus*)/long-stolon sedge plant association which covers about 6% of the RNA area in widely scattered small patches. This plant association occurs on well drained soils on outwash plains, butte toeslopes and escarpments (Volland 1985). Overstory species may include ponderosa pine (*Pinus ponderosa*), lodgepole pine, sugar pine (*P. lambertiana*), white fir x grand white fir hybrid (*Abies concolor x grandis*), and Shasta red fir (*A. magnifica x procera*). Understory shrubs usually include snowbrush, greenleaf manzanita (*Arctostaphylos patula*) and pinemat manzanita. Long-rhizome sedge and western needlegrass (*Achnatherum occidentale*) occur regularly in the herb layer. This plant association occurs in small patches in the southwest corner of the RNA, along the western boundary, and on the west and north sides of Talapus Butte.

The Lodgepole Pine Dry plant association group is comprised of two plant associations that occur in small, scattered patches covering about 2% of the RNA area. The Lodgepole pine/long-rhizome sedge plant association occurs on excessively drained, pumice soils on flats and in basins (Simpson 2007). Lodgepole pine is the dominant tree species. When present, the shrub layer is dominated primarily by either bitterbrush (*Purshia tridentata*) or wax currant (*Ribes cereum*). The herb layer is dominated by long-rhizome sedge, and Ross' sedge (*Carex rossii*), squirreltail (*Elymus elymoides*) and western needlegrass are often present. This plant association occurs in small patches near the center and in the southwest corner of the RNA.

The Lodgepole pine/grouse huckleberry plant association occurs on cold, well-drained sites (Volland 1985). Lodgepole pine is the dominant tree species and the understory is sparse with low species diversity. Grouse huckleberry is dominant in the understory and wax currant and sticky currant (*Ribes viscosissimum*) occur regularly in the shrub layer. Herbaceous species include western needlegrass, squirreltail and yarrow (*Achillea millefolium*). There is a small area of this plant association along the western boundary of the RNA.

In addition to the plant association groups approximately 5% of the RNA area is mapped as non-forested. Included in this category are meadow, aquatic and rock habitats.

Four plant communities constitute the current vegetation of the RNA (Table 2): Mountain hemlock/grouse huckleberry, lodgepole pine/grouse huckleberry, black alpine sedge (*Carex nigricans*)-sphagnum (*Sphagnum* sp.) meadow, and bogbean (*Menyanthes trifoliata*)-yellow pond lily (*Nuphar polysepala*)-floating pondweed (*Potamogeton natans*).

Table 2. Existing plant communities and acreages within the Katsuk Butte Research Natural Area.

Plant Community	Acres	Hectares
Mountain hemlock/grouse huckleberry	972	393.4
Lodgepole pine/grouse huckleberry	84	34.0
Bogbean-yellow pondlily-floating pondweed	4	1.6
Black alpine sedge-sphagnum moss	0.1	<0.1
Rock (unvegetated lava, rock, cinders	46	18.6

The mountain hemlock/grouse huckleberry community occupies most of the RNA. There is considerable variety within this plant community. Nearly pure stands of mountain hemlock are seen on the north slope of Talapus Butte where soils are shallow and rocky, and slope averages 50 percent. Basal areas average 240 feet^2 per acre (56 meters^2 per hectare) for mountain hemlock and 20 feet^2 per acre (7 meters^2 per hectare) for both lodgepole pine and subalpine fir. The trees average 70 feet (21 meters) in height and 8 inches (20 centimeters) in diameter at breast height (dbh) for mountain hemlock, 80 feet (24 meters) and 10 inches (25 centimeters) dbh for lodgepole pine and 60 feet (18 meters) and 8 inches (20 centimeters) dbh for subalpine fir. The largest mountain hemlocks in the RNA reach heights of 120 feet (37 meters) and are up to 40 inches (102 centimeters) dbh and subalpine fir reach heights of 120 feet (37 meters) with diameters up to 27 inches (69 centimeters). Regeneration is dominated by mountin hemlock and subalpine fir. A few small white firs and western white pines are also present. Snow pressure has produced stems rather uniformly curved (pistol butt) at the bases. The snow depth in the RNA averages 15 feet as reflected by the lichens on the tree trunks. The understory in this community is depauperate, often dominated by grouse huckleberry. In some areas where the overstory is closed there is no understory vegetation. Where the crown cover is less dense both cover and diversity of understory vegetation increases.

Common understory herbs include woodland beard-tongue (*Nothochelone nemorosa*), sidebells pyrola (*Orthilia secunda*), rattlesnake plantain (*Goodyera oblongifolia*) and smooth woodrush (*Luzula hitchcockii*).

In other areas of the RNA the pumice soils are coarser and the trees of the mountain hemlock community are smaller. Basal areas average about 130 feet^2 per acre (30 meters^2 per hectare) for hemlock, 40 feet^2 per acre (9 meters^2 per hectare) for lodgepole, and less than 20 feet^2 per acre (5 meters^2 per hectare) for subalpine fir. Common but sparse understory species include sticky currant (*Ribes viscosissimum*) and sidebells pyrola. On the east slopes of Talapus Butte Pacific silver fir (*Abies amabilis*) and white fir are common in the regeneration layer. Rocky outcrops within the hemlock community host additional shrubs. Under the tree canopy black twinberry (Lonicera involucrata), thinleaf huckleberry (Vaccinium membranaceum), and many lichens grow on the outcrops. On cindered slopes on the north side of Talapus Butte trees are few and stunted. Mountain hemlock dominates with scattered individual old whitebark and ponderosa pines. The dominant shrub in this area is pinemat manzanita and dominant herbs are Davidson's penstemon *(Penstemon davidsonii)* and creamy sedum *(Sedum oregonense)*.

Laminated root rot (*Phellinus weirii*) appears to be widespread in the mountain hemlock plant community. During a 2008 site visit numerous mountain hemlock trees on the southern slopes of Talapus Butte were observed that had fallen due to the combined effects of windthrow and laminated root rot.

The largest representation of the lodgepole pine/grouse huckleberry community is found on coarse soils on the dry south slope of Katsuk Butte on slopes averaging 40 percent. Lodgepole pine is the dominant tree species and is presently primarily as old growth. Periodic stand replacement fires with estimated return frequencies of 35 to 100 years (Waltz et al. 2009) have maintained this community in the RNA. Also present are subalpine fir and mountain hemlock of all ages. The shrub layer is composed of wax currant (*Ribes cereum*), sticky currant, and greenleaf manzanita (*Arctostaphylos patula*). Rabbitbrush goldenweed (*Ericameria bloomeri*), silvery lupine (*Lupinus argenteus*), American vetch (*Vicia americana*), pearly-everlasting (*Anaphalis margaritacea*), western needlegrass (*Achnatherum occidentale*), and squirreltail (*Elymus elymoides*) are common in the herbaceous layer.

Trees in the lodgepole pine community are pole-sized and total tree basal area averages 150 to 200 feet^2 per acre (35 to 47 meter^2 per hectare) with lodgepole pine averaging 100 feet^2 per acre (23 meters^2) per hectare. Regeneration is dominated by mountain hemlock and subalpine fir. A variation of this community is observed on the lava flow to the southwest of Katsuk Butte where vegetation is similar but patchy and comprised of fewer species. In these small patches lodgepole dominates the overstory. Both sticky currant and wax currant are found in the sparse shrub layer, and silvery lupine is the only herbaceous species. These areas may have been burned relatively recently, and are slow to recover. In other parts of the RNA lodgepole pine predominates on shallow, undeveloped soils, for example, on the rims of summit craters of both buttes and on

pumice and cinders deposits. Whitebark and ponderosa pines are also present on the rims. Sedges, grasses, pinemat manzanita (*Arctostaphylos nevadensis*) and dwarf oceanspray (*Holodiscus dumosus*) dominate the understory. Other common species on the butte summits include Parry's rush (*Juncus parryi*), rabbitbrush goldenweed, and greenleaf manzanita.

The three craters within the RNA produce a topoclimax of lodgepole pine as a result of the coarse, immature soils and extreme cold microclimates. The pit crater in the center of the RNA is about 100 feet (30 meters) deep. The floor of the crater is covered with coarse pumice and cinders. All ages of lodgepole are present, averaging 30 feet (9 meters) in height and 5 inches (13 centimeters) dbh. Mountain hemlock and subalpine fir occur rarely as regeneration and there is no shrub layer. Parry's rush and Brewer's sedge (*Carex breweri*) dominate the ground layer. The craters of Talapus and Katsuk Buttes are very similar in vegetation composition. Because of the depth of the craters and their steep sides, the southeast halves are shaded much of the time resulting in a more severe microclimate. This has caused a clear division in the distribution of plant species between the east and west portions of the craters. Brewer's sedge dominates the eastern half and Hall's sedge dominates the west half of each crater. Greenleaf fescue (*Festuca viridula*) and rosy pussy-toes (*Antennaria rosea*) individuals occur in greater numbers on the east side. Scattered, stunted lodgepole pine grows in the craters and few trees of other species are present. Trees are noticeably smaller and fewer in the eastern halves of the craters.

Black alpine sedge-sphagnum meadow community is a bog community that occurs in a small area adjacent to the ponds. Other common species include bog blueberry (Vaccinium uliginosum), western swamp laurel (*Kalmia occidentalis*), marsh cinquefoil (*Comarum palustre*), angelica (*Angelica* sp.), slimstem reedgrass (*Calamagrosris stricta* ssp. *stricta*), tufted hairgrass (*Deschampsia cespitosa*) and a diversity of sedge species (*Carex* spp.) Mountain hemlock and subalpine fir regeneration is encroaching from the surrounding forest along the upland edges of this community.

Two small ponds are located in the northeastern corner of the RNA and a third is located in the southwestern corner. The ponds have an emergent aquatic community dominated by bogbean, Indian pond lily and broad-leaved pondweed. Also present are grass-leaved pondweed (*Potamogeton gramineus*), small pondweed (*P. pusillus* ssp. *tenuissimus*) and bladderwort (*Utricularia* sp.). Several sedge species grow emergent at the pond margins including water sedge (*Carex aquatilis*) and southern beaked sedge (*C. utriculata*).

The vegetation of this RNA corresponds with the National Vegetation Classification System at the floristic classification level of alliance. (Federal Geographic Data Committee 2008)

DESCRIPTION OF VALUES

Katsuk Butte RNA was proposed to represent an entire, undisturbed, cinder cone in the mountain hemlock zone in the East Cascades Ecoregion. The RNA contains two pre-Mazama cinder cones that formed beneath a glacial ice sheet approximately 18,000 years ago. A third pit crater is located between the two cinder cones.

Vegetation in the RNA provides good representation of the following plant communities:

- Mountain hemlock/grouse huckleberry
- Lodgepole pine/grouse huckleberry

In addition, the RNA contains three small ponds, bog/wet meadow habitat, lava flows, and areas of cinders and pumice.

Approximately half of the Katsuk Butte RNA is mapped by the DNF as Nesting, Roosting, Foraging habitat for the Northern spotted owl (*Strix occidentalis caurina*) which is federally listed as Threatened. Northern spotted owls have not been documented within the RNA.

The flora and fauna of Katsuk Butte RNA have not been systematically inventoried; however, some plant species were documented during informal site visits (USDA Forest Service 1990a; Carex Working Group 2008) and a list of wildlife species that potentially use the area has been compiled (see below).

Flora List

The flora of Katsuk Butte RNA has not been systematically studied. Table 3 lists plant species that have been observed in the RNA (USDA Forest Service 1990a; Carex Working Group 2008).

Table 3. Plant species list for Katsuk Butte Research Natural Area. Nomenclature follows the PLANTS Database (USDA NRCS 2009), the Oregon Flora Project (2009), and Flora North America (1993+). Key: E = exotic, non-native species; * = special status taxa (Oregon Natural Heritage Information Center 2009).

Scientific name	Common name
Trees	
Abies amabilis	Pacific silver fir
Abies concolor x grandis	white fir x grand fir hybrid
Abies lasiocarpa	subalpine fir
Pinus albicaulis	whitebark pine
Pinus contorta var. *latifolia*	lodgepole pine
Pinus monticola	mountain hemlock
Pinus ponderosa var. *ponderosa*	ponderosa pine
Tsuga mertensiana	mountain hemlock

Shrubs

Arctostaphylos nevadensis	pinemat manzanita
Arctostaphylos patula	greenleaf manzanita
Holodiscus dumosus	dwarf oceanspray
Juniperus communis	dwarf juniper
Kalmia occidentalis	western swamp laurel
Lonicera involucrata	black twinberry
Paxistima myrsinites	Oregon boxwood
Ribes cereum var. *cereum*	wax currant
Ribes viscosissimum	sticky currant
Salix barclayi	Barclay's willow
Salix boothii	Booth's willow
Vaccinium membranaceum	thinleaf huckleberry
Vaccinium uliginosum	bog blueberry
Vaccinium scoparium	grouse huckleberry

Forbs

Achillea millefolium	common yarrow
Anaphalis margaritacea	pearly everlasting
Anemone drummondii ssp. *drummondii*	Drummond's anemone
Angelica sp.	angelica
Antennaria rosea	rosy pussytoes
Arabis sp.	rockcress
Arceuthobium tsugense ssp. *mertensianae*	mountain hemlock dwarf mistletoe
Cardamine bellidifolia var. *pachyphylla*	alpine bittercress
Castilleja sp.	paintbrush
Chimaphila menziesii	little prince's pine
Chimaphila umbellata	pipsissewa
Cirsium sp.	thistle
Cistanthe umbellata	pussypaws
Comarum palustre	marsh cinquefoil
Ericameria bloomeri	rabbitbrush goldenweed
Eriogonum sp.	buckwheat
Eucephalus ledophyllus	Cascade aster
Goodyera oblongifolia	rattlesnake plantain
Hieracium albiflorum	white flowered hawkweed
Hypericum anagalloides	bog St. John's wort
Kelloggia galioides	kelloggia
Lupinus argenteus	silvery lupine
Lupinus wyethii	Wyeth's lupine
Menyanthes trifoliata	bogbean
Mimulus primuloides	primrose monkeyflower
Monotropa hypopitys	pinesap
Nothochelone nemorosa	woodland beardtongue

Nuphar polysepala	yellow pondlily
Orthilia secunda	sidebells pyrola
Pedicularis groenlandica	elephant head
Penstemon davidsonii	Davidson's penstemon
Phoenocaulis cheiranthoides	daggerpod
Polygonum newberryi	Newberry's knotweed
Potamogeton gramineus	grass-leaved pondweed
Potamogeton natans	floating pondweed
Potamogeton pusillus ssp. *tenuissimus*	small pondweed
Pyrola picta	whitevein pyrola
Ranunculus flammula	creeping buttercup
Saxifraga tolmiei	Tolmie's saxafrage
Sedum oregonense	creamy stonecrop
Sparganium angustifolium	narrowleaf burreed
Symphyotrichum spathulatum	western mountain aster
Utricularia sp.	bladderwort
Vicia americana	American vetch

Graminoids

Achnatherum occidentale ssp. *pubescens*	hairy western needlegrass
Agrostis variabilis	mountain bentgrass
Calamagrostis canadensis	bluejoint
Calamagrostis stricta ssp. *inexpansa*	northern reedgrass
Calamagrostis stricta ssp. *stricta*	slimstem reedgrass
Calamagrostis rubescens	pinegrass
*Carex abrupta**	abrupt-beak sedge
Carex aquatilis	water sedge
Carex breweri	Brewer's sedge
Carex echinata ssp. *echinata*	star sedge
Carex halliana	Hall's sedge
Carex inops ssp. *inops*	long-rhizome sedge
Carex jonesii	Jones' sedge
Carex microptera	small-wing sedge
Carex nigricans	black alpine sedge
Carex rossii	Ross' sedge
Carex scopulorum var. *bracteosa*	mountain sedge
Carex simulata	short-beak sedge
Carex straminiformis	Shasta sedge
Carex utriculata	southern beaked sedge
Danthonia intermedia	timber oatgrass
Deschampsia cespitosa	tufted hairgrass
Eleocharis quiqueflora	beaked spikerush
Elymus cinereus	basin wildrye
Elymus elymoides	squirreltail
Eriophorum sp.	cottongrass

Festuca viridula	greenleaf fescue
Juncus parryi	Parry's rush
Juncus balticus	Baltic rush
Luzula hitchcockii	smooth woodrush
Muhlenbergia filiformis	slender muhly
Phleum alpinum	mountain timothy
Torreyochloa pallida var. *pauciflora*	weak mannagrass
Trisetum spicatum	spike trisetum

Ferns

Cheilanthes gracillima	lace fern
Cryptogramma acrostichoides	American rockbrake

Fauna List

The fauna of Katsuk Butte RNA has not been systematically studied or inventoried. Table 4 lists potentially occurring terrestrial vertebrates (Oregon State University 2009). No information on invertebrates is available for the RNA.

Table 4. Potential fauna list for Katsuk Butte RNA (Oregon State University 2009). Key: E = exotic (non-native) species; * = taxa with Oregon Natural Heritage Information Center status (Oregon Natural Heritage Information Center 2007, 2009).

Scientific name	**Common name**
Amphibians	
Ambystomatidae	
Ambystoma gracile	Northwestern salamander
Ambystoma macrodactylum	Long-toed salamander
Salamandridae	
Taricha granulosa	Roughskin newt
Plethodontidae	
*Aneides ferreus**	Clouded salamander
*Batrachoseps wrightorum**	Oregon slender salamander
Ensatina eschscholtzii	Ensatina
Plethodon dunni	Dunn's salamander
Ascaphidae	

*Ascaphus truei**	Coastal tailed frog
Bufonidae	
*Bufo boreas**	Western toad
Hylidae	
Pseudacris regilla	Pacific chorus frog
Ranidae	
*Rana cascadae**	Cascades frog
*Rana pretiosa**	Oregon spotted frog

Reptiles

Anguidae	
Elgaria coerulea	Northern alligator lizard
Phrynosomatidae	
*Sceloporus graciosus**	Sagebrush lizard
Sceloporus occidentalis	Western fence lizard
Scincidae	
Eumeces skiltonianus	Western skink
Colubridae	
Coluber constrictor	Racer
Thamnophis elegans	Western terrestrial garter snake
Thamnophis sirtalis	Common garter snake
Viperidae	
*Crotalus oreganus**	Western rattlesnake
Boidae	
Charina bottae	Rubber boa

Birds

Podicipedidae	
Podiceps nigricollis	Eared grebe
Podilymbus podiceps	Pied-billed grebe
Phalacrocoracidae	
Phalacrocorax auritus	Double-crested cormorant
Ardeidae	
Ardea herodias	Great blue heron

Botaurus lentiginosus	American bittern
Nycticorax nycticorax	Black-crowned night-heron
Anatidae	
Aix sponsa	Wood duck
Anas cyanoptera	Cinnamon teal
Anas discors	Blue-winged teal
Anas platyrhynchos	Mallard
Aythya affinis	Lesser scaup
Aythya americana	Redhead
Aythya collaris	Ring-necked duck
Aythya valisineria	Canvasback
Branta canadensis	Canada goose
*Bucephala albeola**	Bufflehead
*Bucephala islandica**	Barrow's goldeneye
Lophodytes cucullatus	Hooded merganser
Mergus merganser	Common merganser
Cathartidae	
Cathartes aura	Turkey vulture
Accipitridae	
Accipiter cooperii	Cooper's hawk
*Accipiter gentilis**	Northern goshawk
Accipiter striatus	Sharp-shinned hawk
*Aquila chrysa*etos	Golden eagle
Buteo jamaicensis	Red-tailed hawk
Circus cyaneus	Northern harrier
*Haliaeetus leucocephalus**	Bald eagle
Pandion haliaetus	Osprey
Falconidae	
*Falco peregrinus**	Peregrine falcon
Odontophoridae	
Callipepla californica	California quail
Phasianidae	
Bonasa umbellus	Ruffed grouse
Dendragapus obscurus	Blue grouse
Meleagris gallopavo (E)	Wild turkey
Rallidae	
Fulica americana	American coot
Porzana carolina	Sora

Rallus limicola	Virginia rail
Gruidae	
*Grus canadensis**	Sandhill crane
Charadriidae	
Charadrius vociferus	Killdeer
Scolopacidae	
Actitis macularius	Spotted sandpiper
Gallinago delicata	Wilson's snipe
Phalaropus tricolor	Wilson's phalarope
Columbidae	
Columba livia (E)	Rock pigeon
Zenaida macroura	Mourning dove
Strigidae	
Aegolius acadicus	Northern saw-whet owl
*Aegolius funereus**	Boreal owl
Asio otus	Long-eared owl
Bubo virginianus	Great horned owl
Glaucidium gnoma	Northern pygmy-owl
Megascops kennicottii	Western screech-owl
*Otus flammeolus**	Flammulated owl
*Strix nebulosa**	Great gray owl
*Strix occidentalis caurina**	Northern spotted owl
Strix varia	Barred owl
Caprimulgidae	
*Chordeiles minor**	Common nighthawk
Alcedinidae	
Ceryle alcyon	Belted kingfisher
Apodidae	
Chaetura vauxi	Vaux's swift
Trochilidae	
Calypte anna	Anna's hummingbird
Selasphorus rufus	Rufous hummingbird
Stellula calliope	Calliope hummingbird
Picidae	
Colaptes auratus	Northern flicker
*Dryocopus pileatus**	Pileated woodpecker

*Melanerpes lewis**	Lewis's woodpecker
*Picoides arcticus**	Black-backed woodpecker
*Picoides dorsalis**	American three-toed woodpecker
Picoides pubescens	Downy woodpecker
Picoides villosus	Hairy woodpecker
Sphyrapicus nuchalis	Red-naped sapsucker
Sphyrapicus ruber	Red-breasted sapsucker
Sphyrapicus thyroideus	Williamson's sapsucker
Tyrannidae	
*Contopus cooperi**	Olive-sided flycatcher
Contopus sordidulus	Western wood-pewee
Empidonax difficilis	Pacific slope flycatcher
Empidonax hammondii	Hammond's flycatcher
Empidonax oberholseri	Dusky flycatcher
*Empidonax traillii**	Willow flycatcher
Vireonidae	
Vireo cassinii	Cassin's vireo
Vireo gilvus	Warbling vireo
Corvidae	
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
Cyanocitta stelleri	Steller's jay
Nucifraga columbiana	Clark's nutcracker
Perisoreus canadensis	Gray jay
Alaudidae	
Eremophila alpestris	Horned lark
Hirundinidae	
Hirundo rustica	Barn swallow
Petrochelidon pyrrhonota	Cliff swallow
Stelgidopteryx serripennis	Northern rough-winged swallow
Tachycineta bicolor	Tree swallow
Tachycineta thalassina	Violet-green swallow
Paridae	
Poecile atricapillus	Black-capped chickadee
Poecile gambeli	Mountain chickadee
Aegithalidae	
Psaltriparus minimus	Bushtit

Sittidae	
Sitta canadensis	Red-breasted nuthatch
Sitta carolinensis	White-breasted nuthatch
Certhiidae	
Certhia americana	Brown creeper
Troglodytidae	
Cistothorus palustris	Marsh wren
Salpinctes obsoletus	Rock wren
Troglodytes aedon	House wren
Troglodytes troglodytes	Winter wren
Cinclidae	
Cinclus mexicanus	American dipper
Regulidae	
Regulus calendula	Ruby-crowned kinglet
Regulus satrapa	Golden-crowned kinglet
Turdidae	
Catharus guttatus	Hermit thrush
Catharus ustulatus	Swainson's thrush
Ixoreus naevius	Varied thrush
Myadestes townsendi	Townsend's solitaire
Sialia currucoides	Mountain bluebird
*Sialia mexicana**	Western bluebird
Turdus migratorius	American robin
Motacillidae	
Anthus rubescens	American pipit
Bombycillidae	
Bombycilla cedrorum	Cedar waxwing
Sturnidae	
Sturnus vulgaris (E)	European starling
Parulidae	
Dendroica coronata	Yellow-rumped warbler
Dendroica nigrescens	Black-throated gray warbler
Dendroica occidentalis	Hermit warbler
Dendroica petechia	Yellow warbler
Dendroica townsendi	Townsend's warbler
Geothlypis trichas	Common yellowthroat
*Icteria virens**	Yellow-breasted chat

Oporornis tolmiei	Macgillivray's warbler
Vermivora celata	Orange-crowned warbler
Vermivora ruficapilla	Nashville warbler
Wilsonia pusilla	Wilson's warbler
Thraupidae	
Piranga ludoviciana	Western tanager
Cardinalidae	
Passerina amoena	Lazuli bunting
Pheucticus melanocephalus	Black-headed grosbeak
Emberizidae	
Junco hyemalis	Dark-eyed junco
Melospiza lincolnii	Lincoln's sparrow
Melospiza melodia	Song sparrow
Passerculus sandwichensis	Savannah sparrow
Passerella iliaca	Fox sparrow
Pipilo chlorurus	Green-tailed towhee
Pipilo maculatus	Spotted towhee
Pooecetes gramineus	Vesper sparrow
Spizella breweri	Brewer's sparrow
Spizella passerina	Chipping sparrow
Zonotrichia leucophrys	White-crowned sparrow
Icteridae	
Agelaius phoeniceus	Red-winged blackbird
Euphagus cyanocephalus	Brewer's blackbird
Icterus bullockii	Bullock's oriole
Molothrus ater	Brown-headed cowbird
Xanthocephalus xanthocephalus	Yellow-headed blackbird
Fringillidae	
Carduelis pinus	Pine siskin
Carduelis psaltria	Lesser goldfinch
Carduelis tristis	American goldfinch
Carpodacus cassinii	Cassin's finch
Carpodacus mexicanus	House finch
Carpodacus purpureus	Purple finch
Coccothraustes vespertinus	Evening grosbeak
Leucosticte tephrocotis	Gray-crowned rosy-finch
Loxia curvirostra	Red crossbill
Loxia leucoptera	White-winged crossbill
Passeridae	
Passer domesticus (E)	House sparrow

Mammals

Soricidae	
Sorex bairdi	Baird's shrew
Sorex bendirii	Pacific water shrew
Sorex palustris	Water shrew
Sorex sonomae	Fog shrew
Sorex trowbridgii	Trowbridge's shrew
Sorex vagrans	Vagrant shrew
Talpidae	
Neurotrichus gibbsii	Shrew-mole
Scapanus orarius	Coast mole
Vespertilionidae	
*Antrozous pallidus**	Pallid bat
Eptesicus fuscus	Big brown bat
*Lasionycteris noctivagans**	Silver-haired bat
*Lasiurus cinereus**	Hoary bat
*Myotis californicus**	California myotis
*Myotis ciliolabrum**	Western small-footed myotis
*Myotis evotis**	Long-eared myotis
Myotis lucifugus	Little brown myotis
*Myotis volans**	Long-legged myotis
*Myotis yumanensis**	Yuma myotis
Ochotonidae	
Ochotona princeps	American pika
Leporidae	
Lepus americanus	Snowshoe hare
Sciuridae	
Glaucomys sabrinus	Northern flying squirrel
Marmota flaviventris	Yellow-bellied marmot
Neotamias amoenus	Yellow-pine chipmunk
Neotamias minimus	Least chipmunk
Neotamias senex	Allen's chipmunk
Neotamias siskiyou	Siskiyou chipmunk
Spermophilus beecheyi	California ground squirrel
Spermophilus beldingi	Belding's ground squirrel
Spermophilus lateralis	Golden-mantled ground squirrel
Tamiasciurus douglasii	Douglas' squirrel
Geomyidae	

Thomomys mazama	Western pocket gopher
Castoridae	
Castor canadensis	American beaver
Cricetidae	
Microtus longicaudus	Long-tailed vole
Microtus montanus	Montane vole
Microtus oregoni	Water vole
Myodes californicus	Western red-backed vole
Neotoma cinerea	Bushy-tailed woodrat
Ondatra zibethicus	Muskrat
Peromyscus maniculatus	Deer mouse
Peromyscus truei	Pinon mouse
Phenacomys intermedius	Heather vole
Muridae	
Mus musculus (E)	House mouse
Dipodidae	
Zapus princeps	Western jumping mouse
Zapus trinotatus	Pacific jumping mouse
Erethizontidae	
Erethizon dorsatum	Common porcupine
Canidae	
Canis latrans	Coyote
Urocyon cinereoargenteus	Common gray fox
Vulpes vulpes	Red fox
Ursidae	
Ursus americanus	Black bear
Procyonidae	
Procyon lotor	Common raccoon
Mustelidae	
*Gulo gulo**	Wolverine
Lontra canadensis	Northern river otter
*Martes americana**	American marten
*Martes pennanti**	Fisher
Mustela erminea	Ermine
Mustela frenata	Long-tailed weasel
Neovison vison	Mink

Mephitidae	
Mephitis mephitis	Striped skunk
Spilogale gracilis	Western spotted skunk
Felidae	
Lynx rufus	Bobcat
Puma concolor	Mountain lion
Cervidae	
Cervus canadensis	Elk
Odocoileus hemionus	Black-tailed deer

Geology

Katsuk Butte Research Natural Area lies within the Cascade Range geologic physiographic province. The modern High Cascade Range is a constructional feature of north-south trending volcanic eruptive centers that extends from northern California to southern British Columbia and has been very active for the past four million years to the present (Orr and Orr 1999). The eruptive centers that comprise the Cascade Range in Central Oregon are numerous stratovolcanoes, shield volcanoes, cinder cones, silicic domes, tuyas, and maars (MacLeod and Sherrod 1992; Sherrod et al. 2004). Over the past 1.8 million years, the Cascade Range has experienced a dozen major periods of glaciation the last of which was the Suttle Lake advance of Cabot Creek glaciation which culminated about 22,000 to 18,000 years ago (Scott 1988).

Katsuk Butte RNA contains both Talapus and Katsuk Buttes with a peak elevation of 6165 feet (1879 meters). Talapus and Katsuk Buttes are tuyas, or subglacial volcanoes, that began erupting approximately 18,000 years ago during the receding of the Suttle Lake glaciation when an ice sheet covered the High Cascades (Scott 1988). Initially, the heat from the 1.6 mile (2.5 kilomter)-long fissure melted a lake into the glacier. Later explosive basaltic eruptions in the water formed a hydrated tuff-like breccia rich in black volcanic glass called hyaloclastite which was partially secondarily altered by water to palagonite. The glassy breccia either filled the lake, or the water drained by channels opened through the ice, then allowing subaerial strombolian eruptions to continue forming Talapus and Katsuk cinder cones (Scott 1988). Later the degassed basaltic lava flows filled the space that remained between the cinder cones and was buttressed by the glacier giving the buttes a steep-sided flat-topped appearance. Landslides have occurred in places along the southeast and southwest sides of Katsuk Butte since deglaciation (Sherrod 2004) because the buttressing lavas were steep, relatively thin, and unstable. These buttes were later blanketed by several different tephra and ash falls, including ash from the Mount Mazama eruption 7,700 years ago (Bacon 1983).

Soils

Surface soils are comprised primarily of a moderately thick layer of pumice and volcanic ash from the Devil's Hill and South Sister tephras mixed with a small amount of ash from Mt. Mazama. Localized areas of coarse-textured cinders or pumice are exposed in the area. Surface soils typically have a pumiceous sandy loam texture and subsurface soils typically have loamy sand or sandy loam texture.

Topography

Katsuk Butte RNA is dominated by two, steep-sided cinder cones, Katsuk Butte and Talapus Butte, each with a deep summit crater. The two buttes are generally aligned on a north south axis with a low saddle between them in the center of the RNA. Summits of the buttes are just over 6150 feet (1875 meters) in elevation. Slopes drop steeply from the buttes to the shores of Sparks Lake on the east and Devil's Lake on the north. Gentler slopes occur between the butttes and in on the west side of the RNA. Slopes range from flat in the craters and along the northeastern edge to 80 percent on the sides of the craters of Katsuk and Talapus Buttes.

The crater of Talapus Butte has several rock cliffs and is approximately 200 feet (61 meters) deep. The crater of Katsuk Butte is smooth sided and has a depth of about 150 feet (46 meters).

Aquatic/Riparian

Three small ponds, each less than 2 acres, are located within the RNA, two in the northeast corner and one in the southwest corner. The ponds host emergent plant communities dominated by bogbean, yellow pondlily and floating pondweed, and grade at their edges into sedge-sphagnum bog communities and wet meadow habitats. The shorelines of Devils Lake, Satan Creek, and Sparks Lake form the northern and eastern boundaries of the RNA, and while these water bodies are not within the RNA they provide adjacent habitat for a variety of species that use aquatic environments.

Rare, Threatened, Endangered, or Sensitive Species

One Forest Service Regional Sensitive plant species, abrupt-beak sedge (*Carex abrupta*), occurs in Katsuk Butte RNA. Abrupt-beak sedge is also on the Oregon Natural Heritage List 4 (Oregon Natural Heritage Information Center 2009). A small population of this sedge was found during a field visit in 2008, growing in the open, cindery habitat at the summit of Talapus Butte. Additional potential habitat for this species exists on Talapus and Katsuk Buttes but there have been no systematic searches for this species.

No listed threatened or endangered plant or animal species have been documented within Katsuk Butte RNA. Approximately half of the Katsuk Butte RNA is mapped by the DNF as Nesting, Roosting, Foraging habitat for the Northern spotted owl which is federally listed as Threatened. Northern spotted owls have not been documented within the RNA. Several other special status wildlife species potentially inhabit or use the RNA for breeding or foraging (Table 5). The establishment of the RNA should have no adverse effects on populations of any of these species if they are present.

Table 5. Rare, threatened, endangered or sensitive species potentially occurring in Katsuk Butte RNA (Oregon Natural Heritage Information Center 2007, 2009; USDA Forest Service 2009). Key: C=Proposed federal candidate; SOC=Federal species of concern; SC=State of Oregon Sensitive-Critical; SV=State of Oregon Sensitive-Vulnerable; SU=State of Oregon Status Unknown; 2=ORNHIC List 2; 3=ORNHIC List 3; 4=ORNHIC List 4.

Species	Federal	FS	Oregon	ORNHIC
Amphibians				
Aneides ferreus			SV	4
Batrachoseps wrightorum	SOC	Sensitive	SV	1
Ascaphus truei	SOC		SV	4
Bufo boreas				4
Rana cascadae	SOC		SV	4
Rana pretiosa	C	Sensitive	SC	1
Reptiles				
Sceloporus graciosus	SOC		SV	4
Crotalus oreganus				4
Birds				
Bucephala albeola		Sensitive		2
Bucephala islandica				4
Accipiter gentilis	SOC		SV	4
Haliaeetus leucocephalus		Sensitive	LT	4
Falco peregrinus		Sensitive	SV	2
Grus canadensis			SV	4
Aegolius funereus				3
Otus flammeolus			SV	4
Strix nebulosa			SV	4
Strix occidentalis caurina	LT		LT	1
Chordeiles minor			SC	4
Dryocopus pileatus			SV	4
Melanerpes lewis	SOC	Sensitive	SC	2
Picoides arcticus			SV	4

Species	Federal	FS	Oregon	ORNHIC
Picoides dorsalis			SV	4
Contopus cooperi	SOC		SV	4
Empidonax traillii	SOC		SV	4
Lanius ludovicianus			SV	4
Sialia mexicana			SV	4
Icteria virens	SOC		SC	4
Sturnella neglecta			SC	4
Mammals				
Sorex preblei	SOC			3
Antrozous pallidus	SOC		SV	2
Lasionycteris noctivagans	SOC		SV	4
Lasiurus cinereus			SV	4
Myotis californicus			SV	4
Myotis ciliolabrum	SOC			4
Myotis evotis	SOC			4
Myotis volans	SOC		SV	4
Myotis yumanensis	SOC			4
Brachylagus idahoensis	SOC	Sensitive	SV	2
Lepus californicus				4
Gulo gulo	SOC	Sensitive	SC	2
Martes americana				4
Martes pennanti	C	Sensitive	SC	2

List of Rare Elements and Rare Plant Communities

No globally rare elements have been documented at Katsuk Butte RNA. Two elements have been identified as rare in Oregon (Oregon Natural Heritage Information Center (2007 & 2009; Kagan et al. 2004).

- Abrupt-beak sedge (Heritage Program Rank: G5S3 - rare, threatened or uncommon in Oregon.)
- Lodgepole pine/grouse huckleberry community (Heritage Program Rank: G4S3 - rare, threatened or uncommon in Oregon.)

C. RESOURCE INFORMATION

MINERALS

There were no active locatable mining claims within or adjacent to the Katsuk Butte RNA as of November 25, 2009, based on a search of the BLM LR2000 public website (USDI Bureau of Land Management 2009). There were three previous mining claims along the western border of the RNA that are now closed (Table 6). Previous mining likely non-

invasive surface prospecting because the mining claims were never formally assessed by the BLM. There are no known locatable minerals in the area of the RNA. There are also no Forest Service mineral material pits or quarries located in the area. Katsuk and Talapus Buttes could be mined for cinder but due to the steep, unstable sides of basalt, the cinder is considered uneconomical compared to numerous other cinder sources available in the broader region.

Table 6. Closed mining claims in the Katsuk Butte RNA (USDI Bureau of Land Management 2009).

Serial Number	Town	Range	Sec	Quad	Claim Name/Number	Case Type	Status
ORMC1487	18 S	8 E	9	SE	INDEPENDENCE #22	384201	CLOSED
ORMC1484	18 S	8 E	16	NE	INDEPENDENCE #16	384201	CLOSED
ORMC1485	18 S	8 E	16	SE	INDEPENDENCE #17	384201	CLOSED

There are no known significant mineral resources within the area. The Deschutes National Forest may pursue an application to the Bureau of Land Management to formally withdraw the area within the RNA from mineral entry. While the RNA is within land open to leasing for oil and gas and for geothermal energy, there are no active leases or applications for leases.

GRAZING

There are no active grazing allotments within or adjacent to Katsuk Butte RNA. Grazing within the RNA will not be allowed.

PLANTS

Timber harvesting, timber salvage and firewood cutting are not permitted within RNAs on the DNF (USFS 1990a). Timber resources within the RNA are not included in the DNF timber base. Harvest of special forest products from within the RNA is not permitted, although activities associated with light recreational use, such as berry picking, are permitted as long as they do not impair research or educational values of the RNA.

WATERSHED VALUES

There are no significant watershed values present in Katsuk Butte RNA. Small ponds and associated wetlands are present in the northeastern and southwestern parts of the RNA. The RNA abuts Devils Lake, Sparks Lake and Satan Creek.

RECREATION USE

There are no developed recreation facilities or trails within Katsuk Butte RNA and none will be constructed. Some light dispersed use such as day hiking, nordic skiing, and snowmobiling likely occurs. Occasional dispersed camping occurs on the shore of Sparks Lake on the east side of the RNA. The RNA is a "discovery" area that is frequented by visitors to Devils Lake and Sparks Lake. Motor vehicle use, including use of all-terrain vehicles, is prohibited within the RNA. The Katsuk Pond Trail parallels the western boundary of the RNA at a distance of 100 feet (31 meters). This trail is open to both hikers and horses. No impacts of recreation use are evident in the RNA. Recreation use should not be encouraged, but will be permitted as long as it does not conflict with the purpose for establishing the RNA.

WILDLIFE

Establishment of the Katsuk Butte RNA would have no detrimental effects on wildlife habitats or wildlife species, including any special status species that may use the area.

TRANSPORTATION/ROAD SYSTEM

There are no roads within Katsuk Butte RNA and none are planned to be built. The RNA will be closed to motor vehicles. The RNA is in the West and South Bachelor Inventoried Roadless Area (RARE No. 06195; USDA Forest Service 1990b). There are no conflicts with the DNF Transportation Plan. Designation of the RNA will not preclude the treatment of danger trees along County Road 46, in accordance with established procedures for the identification and treatment of danger trees along roads. Treatment methods would be limited to falling the danger trees and leaving them on the ground.

D. HISTORICAL INFORMATION

RESEARCH/EDUCATIONAL USE AND INTEREST: HISTORY OF ESTABLISHMENT

No research or educational activities have been undertaken within Katsuk Butte RNA.

Katsuk Butte was identified as a potential RNA in the 1970s by Area Ecologist William Hopkins (USDA Forest Service 1990b). In the 1978 DNF Land Management Plan (USDA Forest Service 1978) Katsuk Butte was listed as one of 16 areas selected as possible

candidates to meet identified RNA needs, and one of 11 selected to be protected until more detailed studies could be made. As part of the planning effort for the 1990 LRMP the 16 areas were reviewed. Seven areas, including Katsuk Butte, were selected as potential RNAs in the 1990 LRMP (USDA Forest Service 1990a, 1990b). William Hopkins field checked Katsuk Butte prior to inclusion in the 1990 LRMP (USDA Forest Service 1990b).

CULTURAL/HERITAGE

There are no known cultural resources located within Katsuk Butte RNA. A complete cultural inventory of the site has not been conducted to date.

DISTURBANCE HISTORY

Wildfires occur infrequently in high elevation forests dominated by mountain hemlock or lodgepole pine due to moist conditions (Eckert et al. 2008). Because there is a long time between fires, heavy fuel loads accumulate and severe, stand-replacing fires result when conditions permit.

The mountain hemlock forest of Katsuk Butte RNA has been classified as Fire Regime 5 with stand-replacing fires with a return interval of greater than 200 years (Waltz et al. 2009). This fire regime occurs at the environmental extremes where natural ignitions are very rare or virtually non-existent or environmental conditions rarely result in large fires. Sites tend to be very cold, very hot, very wet, very dry or some combination of these conditions. Dry lodgepole pine forest is classified as Fire Regime 4 with stand-replacing fires with a return interval of 35 to 100+ years. Seral communities that arise from or are maintained by stand-replacement fires, such as lodgepole pine are often important components of this fire regime. Natural ignitions within this regime that result in large fires may be relatively rare.

A lightning-caused wildfire burned 42 acres in the western part of the RNA in 1992. The fire was severe enough to kill most overstory trees. Laminated root rot is extensive in the mountain hemlock forest. During a field visit in 2008, substantial windthrow was observed on the south slope of Talapus Butte. Most of the fallen trees had evidence of laminated root rot and likely were predisposed to being blown down by the disease.

OCCURRENCE OF EXOTIC SPECIES

No exotic plant or animal species have been documented within Katsuk Butte RNA.

E. OTHER INFORMATION

PERMANENT RESEARCH PLOTS AND/OR PHOTO POINTS

There are no permanent research plots or photo points established within Katsuk Butte RNA.

BIBLIOGRAPHY

Bacon, C.R. 1983. Eruptive history of Mount Mazama and Crater Lake caldera, Cascade Range, U.S.A. Journal of Vulcanology and Geothermal Research, v. 18.

Bailey, R.G., P.E. Avers, T. King, W.H. McNab, eds. 1994. Ecoregions and subregions of the United States (map). Washington, DC: USDA Forest Service. 1:7,500,000. With supplementary table of map unit descriptions, compiled and edited by W. H. McNab and R. G. Bailey.

Carex Working Group. 2008. Unpublished list of plant species observed at Katsuk Butte Research Natural Area during site visit in October 2008. On file at the Deschutes National Forest Supervisor's Office, Bend, Oregon.

Eckert, B.E., J.D. Walstad and J.C. Tappeiner II. 2008. An illustrated guide to fire in central Oregon forests. Contributions in Education and Outreach No. 1, Forest Research Laboratory, Oregon State University, Corvallis, Oregon.

Federal Geographic Data Committee. 2008. National Vegetation Classification Standard, Version 2. Federal Geographic Data Committee, Vegetation Subcommittee. http://www.fgdc.gov/standards/projects/FGDC-standards-projects/vegetation

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 12+ vols. Oxford University Press. New York and Oxford.

Franklin, J.F. and C.T. Dyrness. 1973. Natural Vegetation of Oregon and Washington. USDA Forest Service. Pacific Northwest Forest and Range Experiment Station, Portland, OR. General Technical Report PNW-8.

Kagan, J.S., J.A. Christy, M.P. Murray and J.A. Titus. 2004. Classification of Native Vegetation of Oregon. Oregon Natural Heritage Information Center. Oregon State University, Portland, Oregon. http://oregonstate.edu/ornhic/documents/pclist_2004.pdf.

MacLeod, N.S. and D.R. Sherrod. 1992. Reconnaissance geologic map of the west half of the Crescent 1° by 2° Quadrangle, Central Oregon. U.S. Department of Interior, U.S. Geological Survey. Miscellaneous Investigations Series Map I-2215.

National Oceanic and Atmospheric Administration. 2009. Climatological data annual summary. Western Regional Climate Center. http://www.wrcc.dri.edu/summary.

Oregon Flora Project. 2009. Oregon State University Department of Botany and Plant Pathology. http://www.oregonflora.org.

Oregon Natural Heritage Information Center. 2007. Rare, threatened and endangered species of Oregon. Oregon Natural Heritage Information Center, Oregon State University, Portland, Oregon. 100 pp.

Oregon Natural Heritage Information Center. 2009. Rare, threatened and endangered species of Oregon, update to the March 2007 edition. Oregon Natural Heritage Information Center, Oregon State University, Portland, Oregon. http://oregonstate.edu/ornhic/publications.html.

Oregon Natural Heritage Program. 2003. Oregon Natural Heritage Plan. Department of State Lands, Salem, OR. 167 pp.

Oregon State University. 2009. Oregon wildlife explorer natural resources digital library. Oregon State University and Oregon Department of Fish and Wildlife. Corvallis, OR. http://www.oregonexplorer.info/wildlife.

Orr, E.L. and W.N. Orr. 1999. Geology of Oregon. Kendall Hunt Publishing Co., Dubuque, IA. 268 pp.

Scott, W. 1988. Guidebook – 1988 field trip to the Central Oregon High Cascades. Friends of the Pleistocene, Pacific Cell.

Sherrod, D.R., E.M. Taylor, M.L. Ferns, W.E. Scott, R.M. Conrey and G.A. Smith. 2004, Geologic map of the Bend 30- x 60-Minute Quadrangle, Central Oregon. U.S. Department of Interior U.S. Geological Survey, Geologic Investigations Series Map I-2683.

Simpson, M. 2007. Forested Plant Associations of the Oregon East Cascades. USDA Forest Service, Pacific Northwest Region, Technical Paper R6-NR-ECOL-TP-03-2007.

Thorson, T.D., S.A. Bryce, D.A. Lammers, A.J. Woods, J.M. Omernik, J.S. Kagan, D. E. Pater and J.A. Comstock. 2003. Ecoregions of Oregon (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey. http://www.epa.gov/wed/pages/ecoregions/or_eco.htm.

Volland, L.A. 1985. Plant associations of the central Oregon pumice zone. USDA Forest Service, Pacific Northwest Region. R6 Ecol 104-1985. 138 p.

Waltz, A., J. Campbell, M. Simpson, D. Owens, J. O'Reilly, G. Ardt, G. Riegel, C. Zanger. 2009. Upper Deschutes Basin Forest Condition Class Analysis Deschutes National Forest. USDA Forest Service, Deschutes National Forest, Bend, Oregon.

USDA Forest Service. 1978. Land Management Plan. Deschutes National Forest. Bend, Oregon.

USDA Forest Service. 1990a. Land and Resource Management Plan. Deschutes National Forest. Bend, Oregon.

USDA Forest Service. 1990b. Final Environmental Impact Statement, Land and Resource Management Plan. Deschutes National Forest. and Crooked River National Grassland. Bend, Oregon.

USDA Forest Service 2009. Regional forester's special status species list. Interagency special status/sensitive species program. USDI Bureau of Land Management/USDA Forest Service. http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy.

USDA Natural Resource Conservation Service (NRCS). 2009. The PLANTS Database. National Plant Data Center. Baton Rouge, LA. http://plants.usda.gov.

USDI Bureau of Land Management. 2009. Land and mineral legacy rehost 2000 system – LR2000. USDI Bureau of Land Management. http://www.blm.gov/lr2000.

CONTRIBUTING FOREST SERVICE PERSONNEL

Robin Vora, Assistant Natural Resource Staff Officer; Establishment Record Project Leader
Bart Wills, Forest Geologist; geology, minerals
Bill Ham, Land Surveyor, Deschutes/Ochoco National Forests; boundary description
Caleb Hennekey, Heritage Stewardship Group; cultural resources
Charmane Powers, District Botanist/Ecologist; Bend-Fort Rock Ranger District; plants, noxious weeds, fire history, recreation
Dana Simon, Data Services Specialist, Ochoco National Forest; Northern Spotted Owl mapping
Deb Mafera, IDT Leader for the Invasive Plant Project; noxious weeds
Geoff Babb, Fire Ecologist; fire history and fire regime
Gery Ferguson, Planner; NEPA and scoping
Jim Lowrie, Wildlife Biologist, Bend-Fort Rock Ranger District; wildlife
Katie Grenier, Forest Botanist; plants
Lauri Turner, Forest Wildlife Biologist; wildlife
Leslie Moscoso, Recreation Operations Supervisor; recreation
Marvin Lang, Recreation Forester; fire history, recreation
Mike Simpson, Ecologist; plant associations, vegetation cover types
Mose Harris IV, FOIA Coordinator; NEPA and scoping
Paul Claeyssens, Supervisory Archaeologist; cultural resources
Peter Sussman, Forest Soil Scientist; soils
Rachel Armstrong, Customer Service Area 3; GIS mapping

Scott E. McBride, Special Uses, Lands and Minerals Administrator; minerals
Susan Skakel, Planning and Environmental Coordination; forest planning and NEPA

POTENTIAL RESEARCH PROJECTS

Katsuk Butte RNA provides opportunities to study the relatively recent volcanic processes of the Central Oregon High Cascades. The variety of surface soils and substrates including cinders, pumice, sandy loam, and exposed lava could be used to examine relationships between substrates and plant communities, and successional processes on recently formed rock surfaces in the lava flows. The craters and rims present opportunities for research on extreme soils and severe microhabitats. The presence of laminated root rot and extensive windthrow in the moutain hemlock forest provide the potential to investigate processes of disease, tree mortality and plant succession. The RNA provides an opportunity to investigate the interaction of global warming with ecosystem processes such as succession, fire, insect infestation, and forest disease.

F. EVALUATION OF SPECIFIC MANAGEMENT RECOMMENDATIONS ON THE RESEARCH NATURAL AREA

POTENTIAL OR EXISTING CONFLICTS

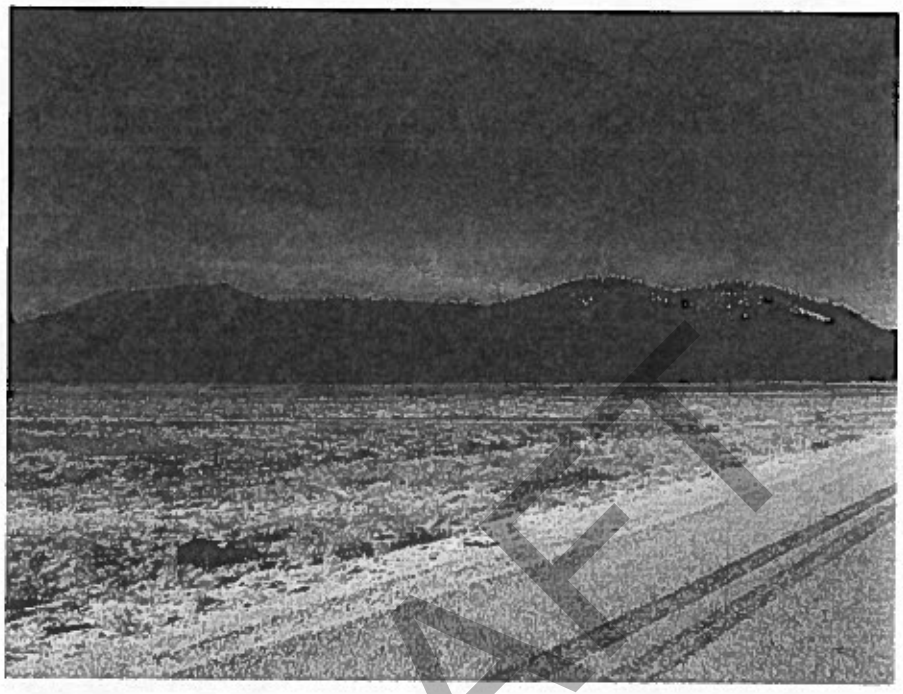
No existing conflicts have been identified for the Katsuk Butte RNA. Current recreational use is very light and limited to hiking, nordic skiing and dispersed camping along the Sparks Lake shoreline. Motor vehicle use, including use of all-terrain vehicles, is prohibited within the RNA. Recreation use should not be encouraged, but will be permitted as long as it does not conflict with the purpose for establishing the RNA.

SPECIAL MANAGEMENT AREA

Establishment of Katsuk Butte RNA does not impact any congressionally designated areas. Lands surrounding the RNA are designated Management Area 11 – Intensive Recreation and Management Area 13 – Winter Recreation (USDA Forest Service 1990a). Expansion of the RNA from the acreage that was proposed in the LRMP included lands from both these management areas within the RNA boundary.

G. PHOTOGRAPHS

Figure 5a. Katsuk Butte RNA viewing west across Sparks Lake. Katsuk Butte is on the left, Talapus Butte is on the right with twin summits



Firure 5b. View into the crater of Talapus Butte from the west rim.

Figure 5c. Laminated root rot zone on south slope of Talapus Butte, showing heavy dead and down mountain hemlock.

Figure 5d. East side of Talapus Butte; uprooted mountain hemlock showing stubby rotted roots typical of laminated root rot.

DECISION NOTICE / DESIGNATION ORDER

DECISION NOTICE/ FOREST PLAN AMENDMENT
And Finding of No Significant Impact

Katsuk Butte Research Natural Area
Deschutes National Forest, Bend/Ft. Rock Ranger District
Deschutes County, Oregon
T18S, R8E, Sections 9, 10, 15, 16, Willamette Meridian

BACKGROUND

An environmental assessment (EA) that discusses the designation of the Katsuk Butte Research Natural Area (RNA) on the Bend/Ft. Rock Ranger District is available for public review at the Forest Supervisor's Office, Deschutes National Forest in Bend, Oregon.

The Katsuk Butte area was identified in the Deschutes National Forest Land and Resource Management Plan (LRMP) (USDA Forest Service 1990), as a "proposed" RNA based on the unique nature of the area, and recognition that designation of this area as an RNA would make an important contribution by filling a need for natural heritage elements.

The newly established RNA will consist of approximately 1,109 acres on the west side of the Bend/Ft. Rock Ranger District. The area is about 23 miles west of Bend and five miles south of the South Sister mountain. The RNA features two pre-Mazama cinder cones in the mountain hemlock forest zone (see map, Appendix A). The Katsuk Butte area was proposed for designation as an RNA in the Deschutes National Forest Land and Resource Management Plan (Forest Plan, 1990) in order to fill an element in the State of Oregon Natural Heritage Program. The proposed RNA has been managed as a regular RNA since 1990. This project to "establish" the RNA is to formalize the designation and protect this area permanently.

The system of RNAs was established with the goal of allowing natural processes to dominate. RNAs preserve natural features and plant communities for research and educational purposes. The objectives of RNAs are (Franklin et al. 1972):

- to provide baseline areas against which the effects of human activities in similar environments can be measured;
- to provide sites for study of natural processes in undisturbed ecosystems;
- to provide gene pool preserves for plant and animal species.

The purpose of establishing the RNA in the Katsuk Butte area is to contribute to a series of RNAs designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance" (36 CFR 251.23). The area provides representation of:

- An entire undisturbed forested cinder cone in the mountain hemlock *(Tsuga mertensiana)* zone.

In addition, the RNA provides regional cell representation of a lodgepole pine (*Pinus contorta*)/grouse huckleberry (*Vaccininium scoparium*) plant community.

An establishment record is being completed for the proposed Katsuk Butte RNA and is currently on file at the Bend/Ft. Rock Ranger District. The establishment record is to be completed with the final Decision Notice.

DECISION and DECISION RATIONALE

Our decision is to select the Proposed Action as described in the *Designation of the Katsuk Butte Research Natural Area Environmental Assessment* (Deschutes National Forest 2015). Specifically, we are deciding to amend the Forest Plan to officially designate the 1,109 acres located at T18S, R8E, Sections 9, 10, 15, and 16 on the west side of the Bend/Ft. Rock Ranger District as a Research Natural Area.

The purpose of establishing the Katsuk Butte RNA is to contribute to a series of RNAs designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance" (36 CFR 251.23).

Deschutes National Forest staff has re-examined the rationale to ensure that the environmental effects of establishing the area as an RNA have not changed since 1990 when the Forest Plan was established. A complete Ecological Evaluation is included in the Establishment Record. We selected the Proposed Action because it provides long-term protection and recognition of an undisturbed mountain hemlock forest and lodgepole pine/grouse huckleberry plan community, and provides opportunities for long-term observation of the development of this fores type.

The selected alternative will allow ecological processes to proceed without active management intervention in the area as described in the EA pp. 8-10. This decision includes a modification to the boundary of the RNA as shown on the map in Appendix A of this Decision Notice. The modified boundary will increase the size of the RNA from 883 to 1,109. The increase will be realized from a decrease in the Intensive Recreation (MA-11) and Winter Recreation (MA-13) allocations on the Deschutes LRMP (EA p. 12). The modified boundary will be easier to describe and manage as it follows an established sectin line, an established trail, and the shorelines of Deveils and Sparks Lakes.

This decision is a non-significant amendment to the Deschutes Land and Resource Management Plan. Formal designation of the RNA by the Regional Forester would amend the Forest Plan under the provisions of the 1982 planning regulations in accordance with 36 CFR 219.17(b)(3).

The regulations for forest planning under the 1982 National Forest Management Act (36 CFR Part 219) provide procedures for the Responsible Officials to amend a Forest Plan. The regulations state: "If the change resulting from the amendment is determined not to be significant for the purposes of the planning process, the Forest Supervisor may implement the amendment following appropriate public notification and satisfactory completion of NEPA procedures" (36 CFR 219.10(f)). The proposal to amend the Forest Plan was described in a scoping letter mailed to the public in 2005 and again in 2013.

Additional guidance on amending Forest Plans is provided in the Forest Service Manual 1900- Planning. Section 1926.51 of the manual describes non-significant amendments as:

- Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management;

- Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management;
- Minor changes in standards and guidelines; and/or
- Opportunities for additional management practices that would contribute to achievement of the management prescriptions.

The RNA in the Katsuk Butte area would be designated Management Area 2 (MA-2) in the Forest Plan. Proposed and designated RNAs in the Forest Plan are listed as Management Area 2. Standards and guidelines for this management area are noted in the Forest Plan and listed in the EA pages 8-10. These standards and guidelines apply to proposed RNAs that are actively being evaluated for RNA status through the Forest Planning process. Presently the area is being managed in accordance with this management area so designation would not impact other programs or activities; therefore, officially designating the area would not be a significant amendment to the Forest Plan.

The Katsuk Butte RNA will be managed in compliance with all relevant laws, regulations, and Forest Service Manual direction regarding RNA, and in accordance with the management direction identified in the Forest Plan as amended by the Northwest Forest Plan, including Riparian Reserves established under the Snow Lakes Watershed Assessment (2006).

OTHER ALTERNATIVES CONSIDERED

One other alternative was considered. The No Action alternative would continue the management of the proposed RNA as a proposed RNA in the short-term. Long-term management would be determined during the next Forest Plan revision.

No Action was not selected because it would not address the purpose and need to contribute to a series of RNAs and in particular to designate an area that fills a need for representation of natural heritage elements identified in the 2003 Natural Heritage Plan. No Action would only provide short-term protection of the area. The team evaluating the establishment strongly felt that this area was still deserving of the designation and research attention that the Forest Plan proposed.

PUBLIC INVOLVEMENT

The proposal of this RNA establishement was first initiated in 2009. Scoping letters were sent out to the Forest's mailing list including Federal and State agencies, the Confederated Tribes of the Warm Springs, environmental groups, and interested citizens. The project was also listed in the *Schedule of Projects* and posted to the Forest Service NEPA project web page. Two public scoping comments were received in response, both supportive of the designation.

A draft Environmental Assessment was made available for a 30-day public comment period, beginning October 17, 2014. Three comment letters were received based on the draft EA. The comments received were supportive of RNA establishment. Specific comments are addressed in Appendix A of the final EA.

FINDING OF NO SIGNIFICANT IMPACT

We find that this action is consistent with the Forest Plan, as amended by 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).

We have determined through the EA 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 RNA, we find that both short-term and long-term physical and biological effects are limited to the local area. This decision officially designates 1,109 acres as an RNA on a 1.6 million acre forest.

Intensity:

1. Adverse and beneficial impacts have been assessed and found to be not significant. The analysis considered not only the direct and indirect effects of the projects but also their contribution to cumulative effects (EA pages 12-33). My finding of no significant environmental effects is not biased by the beneficial effects of the action. No significant cumulative or secondary effects were identified.

2. We find there will be no significant effects to public health and safety. No public health and safety issues were raised during scoping or the comment period (EA, page 6 and Appendix A, Response to Comments). Public access and use of the RNA is not encouraged and officially designating the RNA will not change recreational use.

3. We find there will be no significant effects on unique characteristics or ecologically critical areas, including historic or cultural resources, park lands, prime farmlands, rangelands, wetlands, or Wild and Scenic Rivers. No heritage resource properties which meet the criteria for inclusion in the National Register of Historic Places were documented in the RNA (EA, page 33; Heritage Resource Report). There are no other unique characteristics or ecologically critical areas in the area. Because these features do not exist within the RNA boundaries, there would be no effect to park lands, farmlands, or rangelands, wetlands or Wild and Scenic Rivers (EA, pages 33-34).

4. The effects on the quality of the human environment are not likely to be highly controversial. No comments were received from the public concerning the scientific controversy over the impacts of the project (EA, Appendix A, Response to Comments pages 46-48).

5. The Forest Service has experience designating lands as RNAs and we find that the effects are not uncertain, and do not involve unique or unknown risk.

6. We find this action is one of several similar actions undertaken on National Forest System lands and is not likely to establish a precedent for future actions with significant effects, or represent a decision in principle. The decision implements the Deschutes Forest Plan, as amended (EA, page 4, 8-10).

7. We find the cumulative impacts are not significant. Cumulative impacts are addressed in Chapter 3 of the EA (EA pages 13-39).

OTHER LAWS AND REGULATIONS

We find this action does not violate other Federal, State, or local laws designed for the protection of the environment. Laws that were considered include the Clean Water Act, the Endangered Species Act, National Historic Preservation Act, and the National Forest Management Act.

ADMINISTRATIVE REVIEW/ OBJECTION PROCESS

The final Environmental Assessment (EA) has been made available for review at the Deschutes National Forest website: http://www.fs.usda.gov/project/?project=28899. Additional information regarding this plan amendment can be obtained from Beth Peer, Environmental Coordinator, at 541-383-4769, or email bpeer@fs.fed.us.

A draft Decision Notice was provided to the public for administrative review under 36 CFR 219, Subpart B. The objection process included in Subpart B of 36 CFR 219 gives an individual or entity an opportunity for an independent Forest Service review and resolution of issues before the approval of the plan amendment. The opportunity to file an objection ran from February 27, 2015 until April 13, 2015.

No objections were filed. Therefore, implementation of this decision may occur when it is signed.

CONTACT

For additional information concerning this decision, contact Beth Peer, Bend/Ft. Rock Ranger District Environmental Coordinator, during normal office hours (weekdays, 8:00 a.m. to 4:30 p.m.) at the Bend/Ft. Rock Ranger District office, Phone: (541) 383-4769; e-mail: bpeer@fs.fed.us. For more information on the RNA program, contact Robin Vora, RNA Program Manager, Phone: (541)383-5766; e-mail: rvora@fs.fed.us

Robert Mangold

ROBERT MANGOLD
Station Director
Pacific Northwest Research Station

5/6/15
Date

James M Peña

JAMES PEÑA
Regional Forester
Pacific Northwest Region

5/8/15
Date

8. We find the action will have no significant adverse effect on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. No heritage resource properties which meet the criteria for inclusion in the National Register of Historic Places were documented in the RNA (EA, page 33; Heritage Resource Report).

9. We have considered the degree to which the actions will adversely affect endangered or threatened species or their habitat that have been determined to be critical under the Endangered Species Act of 1973. There are no threatened, endangered or proposed plant or fish species located in the area affected by the designation; therefore there would be no effect to any federally-listed plant or fish species (EA, pages 16-17). The Candidate species Whitebark pine is present; the effect of designation would be beneficial. The only federally-listed wildlife species or habitat potentially present in the area are the northern spotted owl and gray wolf. Designating the Katsuk Butte area as an RNA under this alternative would have no effect on spotted owls or their critical habitat and no effect on gray wolf because there is no change from the existing condition.

10. We find the actions will not violate Federal, State, and local laws or requirements for the protection of the environment. Applicable laws and regulations were considered in the EA. The action is consistent with the Deschutes National Forest Land and Resource Management Plan as amended.

NATIONAL FOREST MANAGEMENT ACT/ FOREST PLAN CONSISTENCY

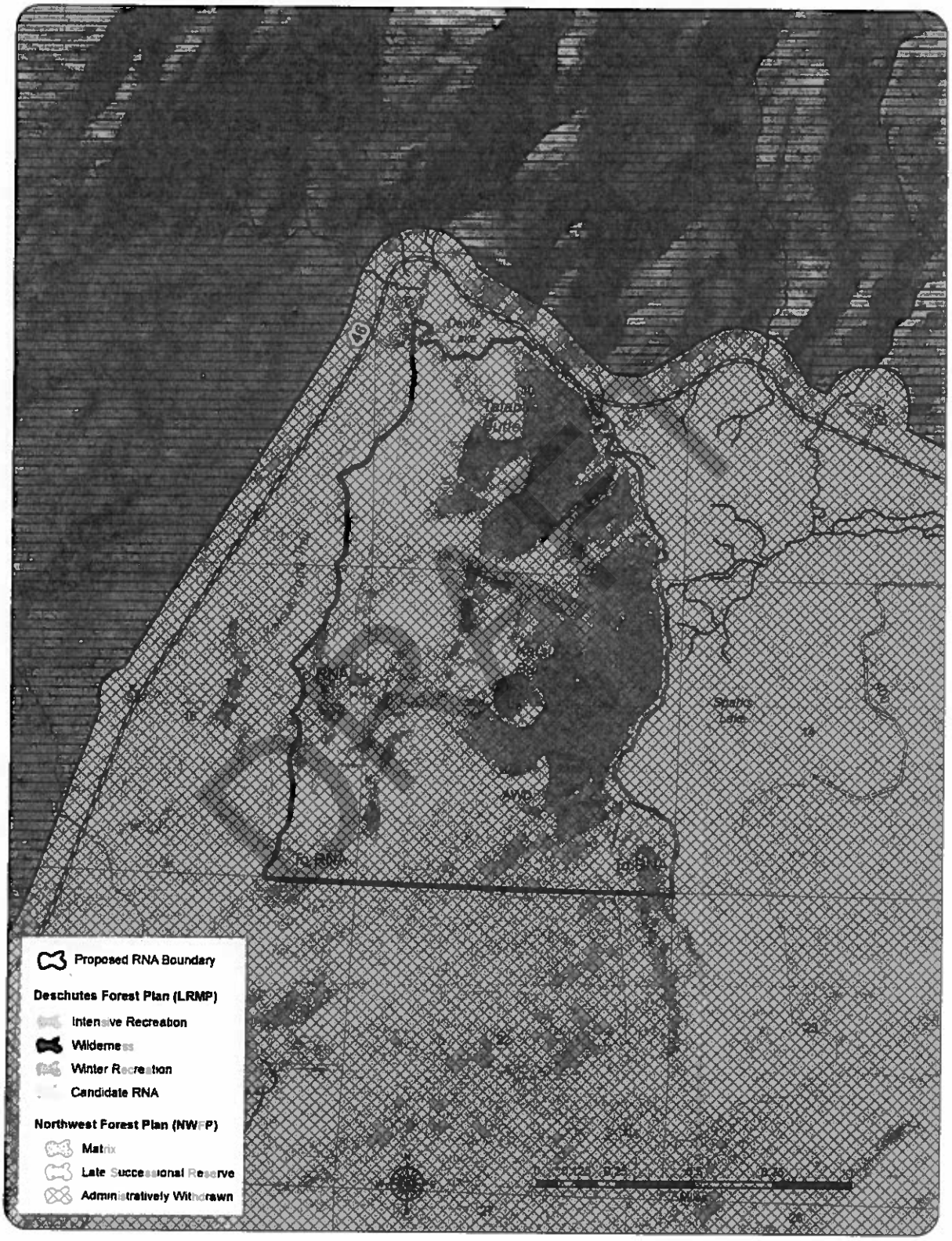
As required by the National Forest Management Act, this decision is tiered to the Final Environmental Impact Statement that was completed to inform the *Deschutes National Forest Land and Resource Management Plan* (1990) as amended by the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (1994).

There will be no impacts to Forest Service, Region 6 Sensitive Species (EA, pages 21-30).

We have considered the effects to management indicator species (MIS) as disclosed in the EA (EA, pp. 30-32). MIS on the Deschutes National Forest include goshawk, Cooper's hawk, sharp-shinned hawk, great gray owl, great blue heron, golden eagle, waterfowl, woodpeckers, red-tailed hawk, osprey, American marten, deer, and elk. There will be no impact to any of the management indicator species and therefore no contribution to negative trends in viability on the Deschutes National Forest.

We find that the designation "meets" or "does not prevent attainment" of the Aquatic Conservation Strategy objectives because there are no proposed activities in the RNA or riparian reserves that would have any impact on the ACS objectives, the management direction of the NWFP will continue to apply, and the area is protected under this designation.

Appendix A – Boundary map of the Katsuk Butte RNA



USDA

United States
Department of
Agriculture

Forest
Service

February 2015

Environmental Assessment

Designation of the Katsuk Butte Research Natural Area

Deschutes National Forest Service
Bend/Ft. Rock Ranger District
Deschutes County, Oregon

Township 18 South, Range 8 East, Sections 9, 10, 15, 16

Responsible Official: James M. Peña
Regional Forester
Pacific Northwest Region

For more Information: Robin Vora, RNA Program Manager
rvora@fs.fed.us
Phone: (541)383-5766

Table of Contents

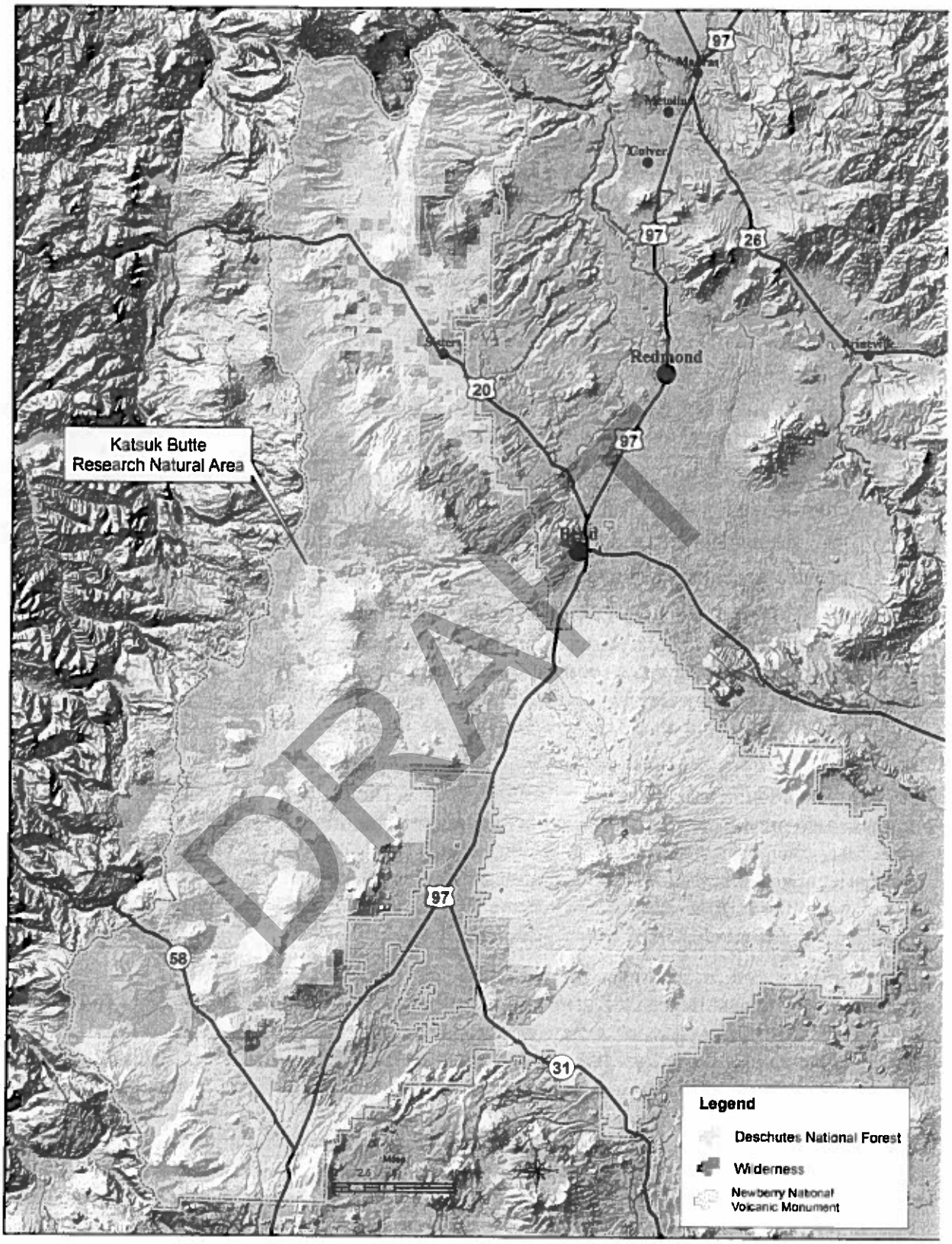


Figure 1: Vicinity of the Planning Area

Chapter 1: Purpose of and Need for Action

Introduction and Planning Area Description

This environmental assessment evaluates the proposal to formally establish the Katsuk Butte Research Natural Area (RNA). The proposed Katsuk Butte RNA is identified in the 1990 Deschutes National Forest Land and Resource Management Plan (LRMP) (USDA Forest Service 1990a) and is described in Appendix E of the 1990 Final Environmental Impact Statement (FEIS) for the LRMP (USDA Forest Service 1990b). The proposed RNA is within and completely surrounded by National Forest System lands. Establishment and designation involves: 1) completion of an environmental assessment to approve the candidate RNA with final boundaries and 2) amendment or adoption of existing LRMP Standards and Guidelines to guide management.

A national system of RNAs was established with the goal of preserving natural features and plant communities for research and educational purposes. The objectives of RNAs are to:

- provide baseline areas against which the effects of human activities in similar environments can be measured;
- provide sites for study of natural processes in undisturbed ecosystems;
- provide gene pool preserves for plant and animal species (Franklin et al. 1972).

The Katsuk Butte RNA is located in the Deschutes National Forest on the Bend-Fort Rock Ranger District approximately 23 miles west of Bend and 5 miles south of South Sister. It is bounded on the north by Devils Lake and the Cascade Lakes Highway (Hwy 46), and on the east by Sparks Lake (Figure 2

Figure 2). The RNA is located in the East Cascades Ecoregion of Oregon (Oregon Natural Heritage Program 2003). The RNA contains two pre-Mazama cinder cones in the mountain hemlock zone that, when protected, can serve as benchmarks for comparison with areas of similar vegetation that are intensively used. A full description of the Katsuk Butte RNA is in the Establishment Record (USDA Forest Service 2010).

Research Natural Areas are part of a national network of ecological areas designated for research, monitoring, education, and to maintain biological diversity (USDA Forest Service manual 4063). For more information on the research arm of the Forest Service, visit www.fs.fed.us/research.

RNA needs in the Pacific Northwest were originally identified by Pacific Northwest Research Station scientists in the 1960s and early 1970s following national agency direction (Dyrness et al. 1975). Extensive surveys for RNAs were conducted in Central Oregon by Deschutes National Forest Ecologist Dr. Bill Hopkins and other staff in the 1970s and 1980s and recommendations were further evaluated by Sarah Greene of the PNW Research Station. Public involvement in the selection of the candidate RNAs occurred during the preparation and approval of the Deschutes LRMP in the late 1980s (USDA Forest Service 1990a). The Katsuk Butte RNA was identified in the 1990 Deschutes LRMP as a "proposed" RNA based on the unique nature of the area, and recognition that designation of this area as a research natural area would make an important contribution to the Natural Heritage network. A draft Establishment Record (ER) has been prepared providing specific background, justification, objectives, and management prescriptions per USDA Forest Service manual 4063.41 (USDA Forest Service 2010). The ER will be

finalized concurrent with the NEPA process. The conversion from candidate to established RNA is accomplished by amending the Deschutes National Forest LRMP through a Decision Notice and Designation Order.

Purpose of and Need for Action

The purpose of establishing the RNA in the Katsuk Butte area is to contribute to a series of RNAs designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance." 36 CFR 251.23

The Katsuk Butte RNA would fill a need for representation of the following natural heritage elements identified in the 2003 Oregon Natural Heritage Plan (Oregon Natural Heritage Program 2003):

- An entire undisturbed forested cinder cone in the mountain hemlock (*Tsuga mertensiana*) zone.

The RNA also provides regional cell representation of a lodgepole pine (Pinus contorta)/grouse huckleberry (*Vacciniium scoparium*) community.

There is a need to modify the boundaries of the proposed RNA to provide a boundary that can be better described and recognized, and to provide for the ability to conduct roadside management activities such as hazard tree removal.

Proposed Action

The proposed action is to formally establish the Katsuk Butte RNA, to revise the boundary of the RNA, and to manage it according to the direction provided in the Deschutes LRMP (LRMP 4-92 to 4-93). Formal designation of the RNA by the Regional Forester would amend the Deschutes LRMP pursuant to 36 CFR 219.4 (1982 planning regulations).

The proposed RNA would be designated Management Area 2 (MA-2). The proposed RNA is presently being managed in accordance with this allocation's direction so designation would not impact other programs or activities. Specifics are given in Chapter 2.

Decision Framework

The Regional Forester for the Pacific Northwest Region of the USDA Forest Service is the responsible official for this project. The responsible official will review the environmental assessment and the entire project record and will decide whether or not to select the proposed action. In making the decision, the responsible official will take into consideration the specific objective of providing for research and educational opportunities, as well as preserving the unique ecological characteristics that are representative of the area. The Decision Notice would be accompanied by a Designation Order.

The final decision will be to either:

- Amend the Deschutes LRMP to establish the RNA in the Katsuk Butte area (Proposed Action), or
- Decline to establish the area as an RNA, resulting in removal of Katsuk Butte as a proposed RNA from the Forest Plan during the next Forest Plan revision, or

- Conclude that significant impacts would result from the proposed action which would warrant the preparation of an environmental impact statement.

Public Involvement

Public participation in this project began when a scoping letter and map were mailed to members of the public and to Tribal governments on March 12, 2009. The project also appeared in the Deschutes National Forest Schedule of Projects starting in March 2009 and has appeared quarterly since this initiation. An article "Forest Service Proposes Four Areas of Study" was also published in *The Bulletin* (Bend, Oregon) newspaper on March 22, 2009. The project appears on the Deschutes National Forest's project web page as well: http://data.ecosystem-management.org/nepaweb/project_list.php?forest=110601.

Two telephone calls were received. Both commenters were supportive of the proposed action. The Proposed Action is not highly controversial as evidenced by the number and tone of the responses received from the public during the scoping phase of the process.

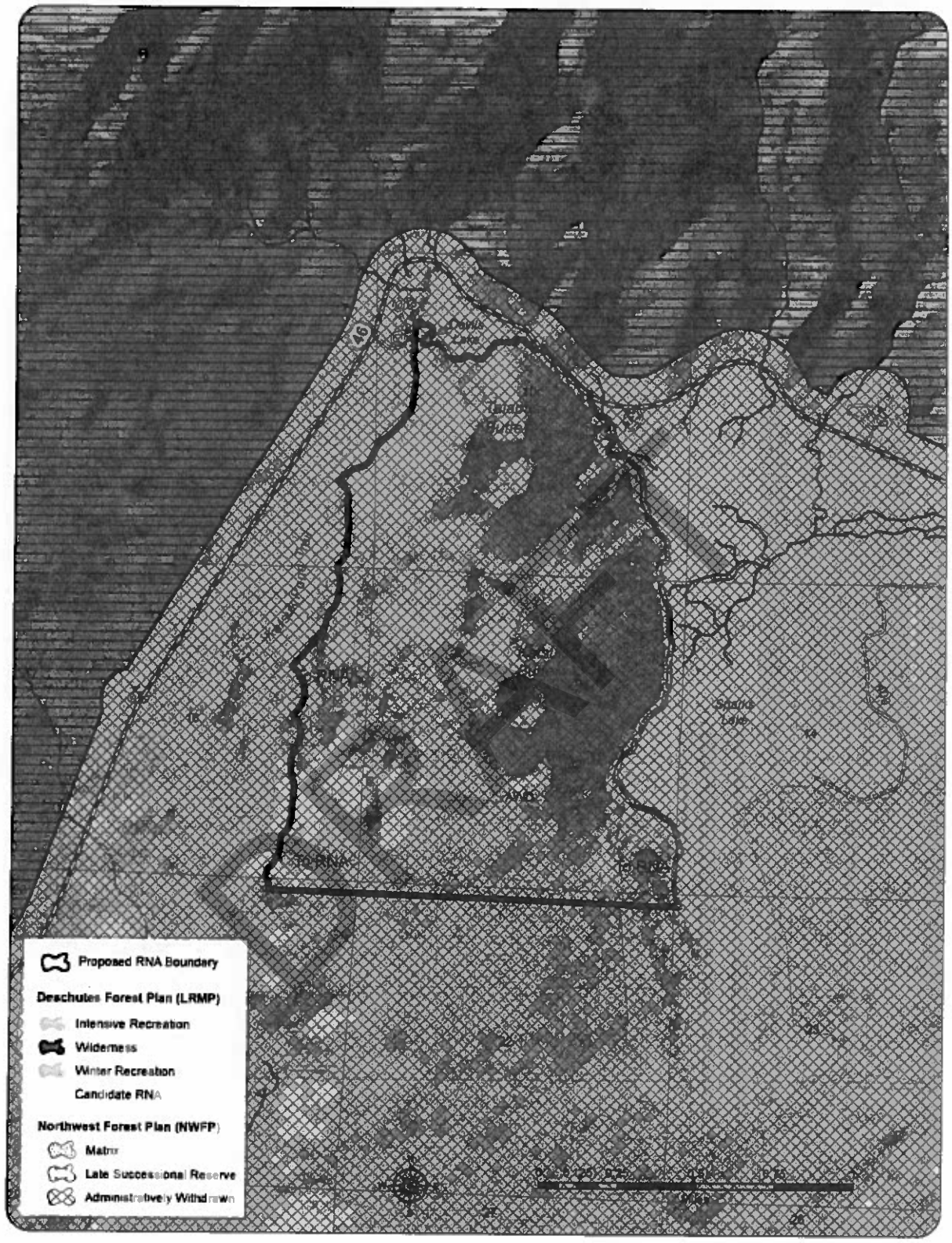


Figure 2: Map displays Deschutes LRMP allocations, including candidate RNA boundary and the proposed boundary for the Katsuk Butte Research Natural Area.

Chapter 2: Alternatives

No unresolved conflicts concerning alternative uses of available resources were identified during the scoping process. Therefore, no additional alternatives were developed beyond the No Action and Proposed Action.

No Action

Under the No Action alternative, the proposed RNA area would continue to be managed as a proposed RNA as directed in the Deschutes National Forest LRMP. The boundary of the proposed RNA, which encompasses approximately 883 acres, would not be modified. All current management direction of the Deschutes LRMP Management Area 2 as well as the Northwest Forest Plan would continue to apply until the LRMP is revised.

Proposed Action

The Proposed Action would establish approximately 1,109 acres on the Deschutes National Forest as the Katsuk Butte RNA.

Boundary

The Proposed Action would modify the RNA boundary from what is shown in the 1990 LRMP to one that can be better described and identified.

The boundary would follow the shorelines of Devils and Sparks Lakes; the section line that runs along the southern edge of the RNA; and parallel to the Katsuk Pond Trail along the western edge. The actual boundary will be at least 100 feet from the trail (Figure 2). This would incorporate some small wetlands and an area burned by a wildfire. Mean high water would be used to define lakeshore boundaries.

The expanded boundary increases the size of the RNA to 1,109 acres. To expand the MA-2 allocation, the following changes would occur: Intensive Recreation would be reduced by 157 acres and Winter Recreation would be reduced by 69 acres.

Management Direction

The RNA would be managed as MA-2 in the 1990 Deschutes LRMP (LRMP 4-92 to 4-93). There would be no change from the existing standards and guidelines as listed here:

Standards and Guidelines in Deschutes LRMP adopted for Katsuk Butte RNA:

Recreation

M2-1: No physical improvements for recreation purposes such as campgrounds or buildings will be permitted.

M2-1: Picnicking, camping, collecting plants, gathering cones and herbs, picking berries, and other public uses will be allowed, though not encouraged, as long as they do not modify the area to the extent that such uses threaten impairment of research or educational values.

M2-3: The area will be closed to all off-highway motorized vehicle use if use of these vehicles

threatens natural conditions.[1]

Timber

M2-4: Timber harvest is not allowed in an RNA. No control of insect or disease should be instituted (see M2-22).

M2-5: Firewood cutting is not permitted.

M2-6: Timber harvesting will not be allowed in catastrophic situations.

Range

M2-7: Grazing is only allowed when authorized to preserve some representation of the vegetation for which the RNA was created.

M2-8: Where RNAs are located adjacent to or within grazing allotments, the boundaries will be marked and physical barriers constructed around the area to prohibit livestock entry if needed. [Note: there are no grazing allotments within or near the proposed RNA].

M2-9: Vegetation manipulation will not be allowed in catastrophic situations.

Wildlife

M2-10: Management practices may be authorized to control excessive non-game animal populations and only in cases where these populations threaten the preservation of some representation of vegetation for which the RNA was originally created.

Minerals

M2-11: Areas are to be withdrawn for mineral entry for mining claims.

M2-12: Geothermal leases will be issued with No Surface occupancy Stipulations. Leases must be approved by the Experiment Station Director.

M2-13: Pits and quarries will require approval of the Research Station Director and the Forest Supervisor.

Visual

M2-14: Management activities and research facilities should meet the visual quality level on the Visual Quality Objective Map. [Note: the Visual Quality Objective Map shows a visual quality level of Partial Retention].

Transportation

M2-15: No new roads or trails will be permitted within these areas, except those considered essential to research, protection, or educational uses.

M2-16: Any transportation facilities such as roads and trails provided for in this MA will have minimum impacts on the area ecosystems and must be located and managed to best fulfill the area's management objectives. Management of the transportation facilities could include closing facilities to all but the designated research personnel. Helispots and special uses such as telephone lines are not allowed.

---

[1] Travel management regulations have since prohibited off-highway motorized vehicle use except on designated routes or areas. No such routes or areas exist in the RNA.

Wildfire

M2-17: Unless plans approved by the Station Director provide for letting natural fires burn, aggressive containment using low impact methods should be used. High impact methods will be used only to prevent a total loss of the RNA. Mop up should be minimized with natural burnout being the preferred method.

Prescribed Fire

M2-18: Prescribed fire will be used only as specified in approved RNA management goals.

Fuel Loading

M2-19: Fuels will be allowed to accumulate at natural rates.

Special Uses

M2-20: Special uses will be allowed if they support the management objectives of the area and are approved by the Research Station Director and the Forest Supervisor.

Forest Health

M2-21: Monitor the area to detect pest problems which could destroy the RNA or cause damage to adjacent lands. Reintroduction of fire should be considered to reduce possible insect epidemic conditions.

M2-22: Action should be taken when the damage has the potential to modify ecological processes to the point that the area has little value for observation and research.

M2-23: Follow Forest-wide standards/guidelines for forest health.

Northwest Forest Plan

The proposed RNA area is considered Administratively Withdrawn under the NWFP, which means that underlying existing Forest Plan direction continues to apply. Additionally, Riparian Reserves are present along lake edges and around any wetlands. Riparian Reserve direction would apply to any management actions in those areas. Specific standards and guides that apply to research activities are: RS-1 and RS-2 (research activities must not cause significant risk to watershed values and ongoing research activities were to be reviewed by the Regional Ecosystem Office; C-38).

Inventoried Roadless Area

The proposed RNA area is located within the West-South Bachelor Inventoried Roadless Area. The regulation at 36 CFR 294 "Roadless Area Conservation Rule" prohibits road construction or reconstruction and timber harvest to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management.

Comparison of the Alternatives

Table 1: Comparison of the Alternatives

	(No Action Alternative) 1990 LRMP Proposed RNA	Proposed Action (Establish RNA)
Acres of Proposed RNA at Katsuk Butte	883	0
Acres of Established RNA at Katsuk Butte	0	1,109
Short-term Management (< 10 years)	Continue Management Direction of proposed RNA under LRMP MA-2 S&Gs until Forest Plan revision.	Continue Management Direction of established RNA with existing LRMP S&Gs for MA-2.
Long-term Management (> 10 years)	To be determined during forest plan revision.	

Chapter 3: Environmental Consequences

This chapter discusses the potential effects on the human environment resulting from the implementation of the no action or proposed action alternatives. This analysis tiers to the Deschutes National Forest Land and Resource Management Plan Final Environmental Impact Statement and Record of Decision (USDA Forest Service 1990b).

Management Allocations

The proposed RNA boundary modifications will not have a measurable effect on Forest Plan goals, objectives, or outputs when considered in context of the Deschutes National Forest. The RNA would total 1,109 acres which is less than one of half of one percent of the Forest.

The proposed boundary modification would result in a net reduction in Management Area 11 Intensive Recreation of 157 acres; a net reduction in Management Area 13 Winter Recreation of 69 acres, and a net increase of 226 acres in Management Area 2 Research Natural Areas (

Figure 2). This modification would change the potential management actions that could be undertaken in these areas including timber harvest, fire management and suppression, and recreation. The impact of such actions in an area of this size would be minimal when considered on a landscape level. The boundary modification is in response to the need for a boundary that can be better described.

The Katsuk Butte RNA is considered Administratively Withdrawn under the NWFP. The modified boundary would not change any Northwest Forest Plan allocations, as all other underlying LRMP allocations are also considered Administratively Withdrawn under the NWFP.

Forest Plan Amendment – Assessment of Significance

Forest Service Manual (FSM) 1926.51, the following items describe non-significant amendments:

- Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management;
- Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management;
- Minor changes in standards and guidelines; and/or
- Opportunities for additional projects or activities that will contribute to achievement of the management prescriptions.

The conversion from a proposed RNA to an established RNA would not alter the currently described goals for the area, the boundary modifications are minor, no standards and guidelines will change, and the area will permanently be subject to the management prescriptions for RNAs.

Threatened, Endangered, and Sensitive Fish Species

A Biological Evaluation (BE) was prepared in compliance with the requirements of Forest Service Manual 2630.3, FSM 2670-2671, FSM W.O. Amendments 2600-95-7, and the

Endangered Species Act of 1973.

For aquatics there are no threatened or endangered species or designated critical habitat within the proposed RNA therefore the action will have no effect on any aquatic threatened or endangered species.

Species classified as sensitive by the Forest Service are to be considered by conducting biological evaluations (BE) to determine potential effects of all programs and activities on these species (FSM 2670.32). The BE is a documented review of Forest Service activities in sufficient detail to determine how a proposed action may impact sensitive aquatic species, and to comply with the requirements of the Endangered Species Act.

The Forest Service Region 6 Sensitive Species List (USDA 2011) was reviewed for species that may be present on the Deschutes National Forest. There are no listed sensitive aquatic species located within the proposed RNA, however, within Tyee Creek there is A.Caddis Fly that has been found within this stream. The nearest section of Tyee Creek to the proposed RNA is 0.1 miles.

Summary of Conclusions for Sensitive Species

1. The No Action Alternative serves as a baseline for all sensitive species.
2. Implementation of the Proposed Action will have **no impact** on A.Caddis fly and its habitat on the Deschutes National Forest.

Environmental Consequences

Direct and Indirect Effects

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA and there are no Sensitive aquatic species within the proposed RNA. Therefore, there will be no direct or indirect effects to any Sensitive aquatic species including A.Caddis fly within Tyee Creek.

Cumulative Effects

Implementation of proposed action for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for any Sensitive aquatic species including A.Caddis fly within Tyee Creek.

Determination

The proposed action is programmatic in nature and there will be no change from the existing condition. Therefore, implementation of the proposed action will have a **"No Impact"** to any Sensitive aquatic species.

Consistency

Implementation of the Designation of the Headwaters of the Katsuk Butte RNA is consistent with the Deschutes Land and Resource Management Plan and the Northwest Forest Plan. There are no ground disturbing activities associated with this designation therefore it is consistent with the Aquatic Conservation Strategy Objectives and maintains the existing conditions for aquatic habitats.

Threatened, Endangered, and Sensitive Plants

A Biological Evaluation has been prepared to evaluate Threatened, Endangered, and Sensitive (TES) plants to determine potential effects from a proposed action on these species. This Biological Evaluation evaluates effects to TES plants related to the establishment of Katsuk Butte Research Natural Area (RNA). It is prepared in compliance with direction in Forest Service Manual 2672.4. Species considered are those TES plant species on the current Regional Forester's Sensitive Species List (USDA Forest Service 2011) that are documented or suspected to occur on the Deschutes National Forest (see Appendix A of Botany BE).

Summary

Whitebark pine (*Pinus albicaulis*) is a Candidate species for Federal listing as Threatened or Endangered. The Proposed Action to officially designate Katsuk Butte as a Research Natural Area would have a beneficial effect on this species. There are no adverse effects to whitebark pine from the proposed action.

No Sensitive plants are known to occur in Katsuk Butte RNA. If Sensitive plants are found in the future, the establishment of Katsuk Butte RNA would be a beneficial effect to those species and their habitat.

Existing Condition

Three small ponds, each less than 2 acres, are located within the RNA, two in the northeast corner and one in the southwest corner. The ponds host emergent plant communities dominated by bogbean (*Menyanthes trifoliata*), yellow pondlily (*Nuphar polysepala*) and floating pondweed (*Potamogeton natans*), and grade at their edges into sedge-sphagnum bog communities and wet meadow habitats. The shorelines of Devils Lake, Satan Creek, and Sparks Lake form the northern and eastern boundaries of the RNA, and while these water bodies are not within the RNA, they provide adjacent habitat for a variety of species that use aquatic environments.

Whitebark pine (*Pinus albicaulis*), a candidate for Federal listing as Threatened or Endangered, occurs within the proposed Katsuk Butte RNA.

The U.S. Forest Service Regional Forester lists 69 Sensitive plant species as suspected or documented to occur on the Deschutes National Forest Sensitive (Appendix A): 36 vascular plants (18 documented to occur), 26 bryophytes (11 documented), 2 lichens (1 documented) and 5 fungi (4 documented).

A pre-field review was completed to determine if any of the 69 Sensitive plant species occur within the RNA. The following sources were used in this review:

1. U.S. Forest Service NRIS-TESP-Invasives Database which is where U.S. Forest Service Sensitive plant locations are entered and tracked;
2. Katsuk Butte Plant Species List (USDA Forest Service 2010).
3. Vascular plant list provided by the Carex Working Group (2008).

Katsuk Butte has been surveyed by Forest Service Ecologists and a preliminary species list was developed for the 1990 Deschutes National Forest Land Management Plan (USDA Forest

Service 1990). In 2008, the area was again surveyed, adding to the RNA plant species list (USDA Forest Service 2010).

A former Sensitive plant species, *Carex abrupta*, was located with the RNA. However, this species is no longer listed as Sensitive. There are currently no known populations of Sensitive plant within the RNA. However, surveys focused on vascular plant species and did not survey for bryophytes (mosses and liverworts), lichens, and fungi; the presence of these species is unknown.

Environmental Consequences

Under both the No Action and Proposed Action, the Katsuk Butte RNA would continue to be managed as a Research Natural Area. Research Natural Areas are part of a national network of ecological areas designated for research, monitoring, education, and to maintain biological diversity (USDA Forest Service Manual 4063). RNAs are managed to allow natural processes to occur and to minimize human disturbance (USDA Forest Service Manual 4063.3).

The Proposed Action would guarantee that the RNA would be managed to maintain biological diversity into perpetuity. Management of RNAs is beneficial to plants and their habitats.

Direct and Indirect Effects

There would be no direct or indirect negative effects to whitebark pine. Establishment of Katsuk Butte RNA would have a beneficial effect to this species because the RNA would be managed to maintain biodiversity with limited human disturbance, thus protecting these species and its habitat within the RNA.

Cumulative Effects

Implementation of the proposed action for the Designation of Katsuk Butte RNA will not result in any direct or indirect adverse effects to whitebark pine and, therefore, will not result in any cumulative effects to sensitive plants.

Threatened, Endangered, and Sensitive Wildlife

A Biological Evaluation has been prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3., FSM 2670-2671, FSM W.O. Amendments 2600-95-7, and the Endangered Species Act (ESA) of 1973. A Biological Assessment (BA) will be prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3, FSM 2672.4 and the Endangered Species Act of 1973 (Subpart B: 402.12, Section 7 Consultation, as amended) on actions and programs authorized, funded, or carried out by the Forest Service to assess their potential for effect on threatened and endangered species and species proposed for federal listing (FSM 2670.1).

Those species thought to occur presently or historically on the Deschutes National Forest and analyzed in this document include the northern spotted owl (*Strix occidentalis*), Oregon spotted frog, and gray wolf (*Canis lupis*).

Table 2: Threatened and Endangered Species Summary

Species	Status	Habitat	Presence
Northern Spotted Owl	Federal Threatened, MIS	Old Growth Mixed Conifer Forests	Yes
Gray Wolf	Federal Endangered	Generalist	Yes
Oregon Spotted Frog	Federal Proposed Threatened, Regional Forester Sensitive	Stream, Marsh	No
Northern Spotted Owl Critical Habitat			No
Oregon Spotted Frog Proposed Critical Habitat			No

Table 3: Summary of Conclusion of Effects, Threatened and Endangered Species.

Species/Habitat	Action Alternatives
Northern Spotted Owl	"No Effect"
Gray Wolf	"No Effect"
Oregon Spotted Frog	NA
Northern Spotted Owl Critical Habitat	NA
Oregon Spotted Frog Proposed Critical Habitat	NA

Summary of Conclusions for T&E Species

1. The Proposed Action will have "**No Effect**" on the northern spotted owl or gray wolf and their habitats. Consultation is not required.

2. The Proposed Action does not occur within designated critical habitat for the northern spotted owl or proposed critical habitat for the Oregon spotted frog. Consultation is not required.

After a review of records, habitat requirements, and existing habitat components, it was determined that Oregon spotted frog do not occur and have no habitat in the project area and will not be included in any further analysis. Supporting information is included in the BE.

Northern Spotted Owl, Federal Threatened, MIS

The BE includes a thorough description of the habitat and prey needs for the northern spotted owl and its critical habitat on the Deschutes National Forest. The Katsuk Butte RNA includes approximately 239 acres of nesting, roosting and foraging (NRF) habitat. The majority of the NRF occurs on the western edge of the proposed RNA.

Environmental Consequences

Proposed Action

Direct and Indirect Effects

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to suitable spotted owl habitat, dispersal habitat, known home ranges, or designated Critical Habitat.

Cumulative Effects

Implementation of proposed action for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the spotted owl and its habitat.

Determination

The proposed action is programmatic in nature and there will be no change from the existing condition. Therefore, implementation of the proposed action will have a "No Effect" to spotted owls and their habitat.

Critical Habitat Units

The proposed action is programmatic in nature and there will be no change from the existing condition. Therefore, implementation of the proposed action will have a "No Effect" to spotted owls critical habitat.

Communication with U.S. Fish and Wildlife Service

This project is not covered under the current FY2014 Programmatic Biological Assessment. Further communication with U.S. Fish and Wildlife Service is not recommended.

Consistency

Implementation of the Designation of the Katsuk Butte RNA is consistent with the Deschutes Land and Resource Management Plan, the Deschutes National Forest Late-Successional Reserve Assessments, and the 2011 Critical Habitat Rule.

Gray Wolf, Federally Endangered

The BE includes a thorough description of the habitat needs and existing habitat on the Deschutes National Forest.

Environmental Consequences

Proposed Action

Direct and Indirect Effects

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to gray wolf habitat.

Cumulative Effects

Implementation of proposed action for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for

the gray wolf and its habitat.

Determination

The proposed action is programmatic in nature and there will be no change from the existing condition. Therefore, implementation of the proposed action will have a "No Effect" to gray wolves and their habitat.

Communication with U.S. Fish and Wildlife Service

This project is not covered under the current FY2014 Programmatic Biological Assessment. Further communication with U.S. Fish and Wildlife Service is not recommended.

Consistency

Implementation of the Designation of the Katsuk Butte RNA is consistent with the Deschutes Land and Resource Management Plan and the Deschutes National Forest Late-Successional Reserve Assessments.

Region 6 Sensitive Species

Species classified as sensitive by the Forest Service are to be considered by conducting biological evaluations (BE) to determine potential effects of all programs and activities on these species (FSM 2670.32). The BE is a documented review of Forest Service activities in sufficient detail to determine how a proposed action may impact sensitive wildlife species, and to comply with the requirements of the Endangered Species Act.

The Forest Service Region 6 Sensitive Species List (USDA 2011) was reviewed for species that may be present on the Deschutes National Forest. After a review of records, habitat requirements, and existing habitat components, it was determined the following sensitive animal species have habitat or are known to occur in the project area and will be included in this analysis:

Table 4: Sensitive Species Summary for the Deschutes National Forest.

Species	Status	Habitat	Habitat/Species Present
Northern Bald Eagle (*Haliaeetus leucocephalus*)	Regional Forester Sensitive, MIS	Lakeside with Large Trees	Yes
Bufflehead (*Bucephala albeola*)	Regional Forester Sensitive	Lakes, Snags	No
Harlequin Duck (*Histrionicus histrionicus*)	Regional Forester Sensitive	Rapid Streams, Large Trees	No
Tricolored Blackbird (*Agelaius tricolor*)	Regional Forester Sensitive	Lakeside, Bullrush	No
Yellow Rail (*Coturnicops noveboracensis*)	Regional Forester Sensitive	Marsh	No
Greater (Western) Sage	Federal Candidate,		No

Species	Status	Habitat	Habitat/Species Present
Grouse (*Centrocercus urophasianus phaeios*)	Regional Forester Sensitive	Sagebrush Flats	
American Peregrine Falcon (*Falco peregrinus anatum*)	Regional Forester Sensitive, MIS	Riparian, Cliffs	No
Lewis' Woodpecker (*Melanerpes lewis*)	Regional Forester Sensitive, MIS	Large, open ponderosa pine and burned forests	No
White-headed Woodpecker (*Picoides albolarvatus*)	Regional Forester Sensitive, MIS	Large, open ponderosa pine	No
Northern Waterthrush (*Seiurus noveboracensis*)	Regional Forester Sensitive	Riparian vegetation including willows and alder	No
Horned Grebe (*Podiceps auritus*)	Regional Forester Sensitive, MIS	Lakes	No
Tule White-fronted Goose (*Anser albifrons elgasi*)	Regional Forester Sensitive, MIS	Large rivers, marsh/lakeshore habitat with emergent vegetation	No
Pacific Fisher (*Martes pennanti*)	Federal Candidate, Regional Forester Sensitive	Mixed, Complex	No
North American Wolverine (*Gulo gulo luscus*)	Regional Forester Sensitive, MIS	Mix, High Elevation	No
Townsend's Big-eared Bat (*Corynorhinus townsendii*)	Regional Forester Sensitive, MIS	Caves	No
Pallid Bat (*Antrozous pallidus*)	Regional Forester Sensitive	Canyons, cliffs, caves, and buildings	No
Spotted Bat (*Euderma maculatum*)	Regional Forester Sensitive	Canyons, cliffs, caves, and buildings	No
Fringed Myotis (*Myotis thysanodes*)	Regional Forester Sensitive	Canyons, cliffs, caves, buildings, and large snags	No
Columbia Spotted Frog (*Rana luteiventris*)	Federal Candidate, Regional Forester Sensitive	Stream, Marsh	No
Crater Lake Tightcoil (*Pristiloma arcticum crateris*)	Regional Forester Sensitive	Riparian, Perennially Wet	Yes
Evening Field Slug (*Deroceras hesperium*)	Regional Forester Sensitive	Perennially wet meadows	Yes
Silver-bordered Fritillary (*Boloria selene*	Regional Forester Sensitive	Open riparian bogs and marshes	Yes

Species	Status	Habitat	Habitat/Species Present
atrocostalis)			
Johnson's Hairstreak (*Mitoura johnsonii*) (*Callophrys johnsonii*)	Regional Forester Sensitive	Coniferous forests with mistletoe	No
Western Bumblebee (*Bombus occidentalis*)	Regional Forester Sensitive	Meadows with floral resources	Yes

Summary of Conclusions for Sensitive Species

1. The No Action Alternative serves as a baseline for all sensitive species.
2. Implementation of Proposed Action will have **"No Impact"** to the bald eagle, Crater Lake tightcoil, evening field slug, silver-bordered fritillary, and western bumble bee and their habitats for the Deschutes National Forest.
3. There is no habitat in the Proposed RNA for the bufflehead, harlequin duck, tri-colored blackbird, yellow rail, greater sage grouse, American peregrine falcon, Lewis' woodpecker, white-headed woodpecker, northern waterthrush, horned grebe, Tule white-fronted goose, Pacific fisher, North American wolverine, Townsend's big-eared bat, pallid bat, spotted bat, fringed myotis, Columbia spotted frog, and Johnson's hairstreak and their habitats for the Deschutes National Forest.

After a review of records, habitat requirements, and existing habitat components, it was determined the remaining sensitive species do not occur and have no habitat in the project area and will not be included in any further analysis: bufflehead, harlequin duck, tricolored blackbird, yellow rail, greater sage grouse, peregrine falcon, Lewis' woodpecker, white-headed woodpecker, northern waterthrush, horned grebe, Tule white-fronted goose, Pacific fisher, North American wolverine, Townsend's big-eared bat, pallid bat, spotted bat, fringed myotis, Columbia spotted frog, and Johnson's hairstreak. The rationale for that determination is found in the BE.

The following table displays those Region 6 Sensitive Species that are known to occur or have habitat within the Katsuk Butte RNA.

Table 5: Summary of Conclusion of Impacts, Region 6 Sensitive Species for the Designation of the Katsuk Butte RNA.

Species	Action Alternative
Northern Bald Eagle	NI
Crater Lake Tightcoil	NI
Evening Field Slug	NI
Silver-bordered Fritillary	NI
Western Bumblebee	NI

NI = No Impact
MIIH = May impact individuals or habitat, but will not likely contribute a trend toward federal listing or loss of viability to the population or species
BI = Beneficial Impact

Existing Condition/No Action

The bald eagle, formerly a threatened species in the lower 48 states under the Endangered Species Act, has been delisted (August 8, 2007) because it has recovered from being at risk of extinction (Fed Reg 2007). It will continue to be protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The bald eagle is now designated a Regional Forester Sensitive Species. The FWS has issued National Bald Eagle Management Guidelines (USFWS 2007b) intended to minimize activities that could interfere with the eagle's ability to forage, nest, roost, breed, or raise young. Such impacts to bald eagles, where they may constitute "disturbance", are prohibited by the Eagle Act. The guidelines identify management practices that can be used for added benefit to bald eagles.

On the Deschutes and Ochoco National Forests, ponderosa pine and Douglas-fir trees averaging 32 inch+ dbh with live large, open limb structure are preferred for nesting. Nests consist of bulky stick platforms built in the super-canopy of such trees, or less frequently on cliffs. They are typically constructed within one mile of appropriate foraging habitat, which includes rivers and large lakes and reservoirs. Bald eagles are sit-and-wait predators, which predominantly capture prey from perches over water; ideal perches are large trees and snags within 330 ft. (100 m) of water (Anthony et al. 1995). Prey items include fish, waterfowl and other birds, small mammals, and carrion (Stalmaster 1987).

There are 178 acres of potential bald eagle habitat within the proposed Katsuk Butte RNA. However, there are no known bald eagle territories found in this proposed RNA.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to bald eagle.

Cumulative Effects

Implementation of action alternative for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the bald eagle and its habitat.

Determination

Implementation of the Designation of the Katsuk Butte RNA will result in no change to suitable bald eagle habitat. Therefore, the Action Alternative will have "No Impact" to bald eagles or their habitat.

Crater Lake Tightcoil, Region 6 Sensitive

Existing Condition/No Action

"The Crater Lake Tightcoil may be found in perennially wet situations in mature conifer forests, among rushes, mosses and other surface vegetation or under rocks and woody debris within 10 m. of open water in wetlands, springs, seeps and riparian areas, generally in areas which remain under snow for long periods during the winter. Riparian habitats in the Eastern Oregon Cascades may be limited to the extent of permanent surface moisture, which is often less than 10 m. from open water" (Duncan et al. 2003).

Threats to the species include activities that compact soils, reduce litter and/or vegetative cover, or impact potential food sources (i.e. livestock grazing, heavy equipment use, ORV's, and camping on occupied habitats). Fluctuations from removal of ground vegetation on ground temperature and humidity may be less extreme at higher elevations and on wetter sites, but no studies have been conducted to evaluate such a theory. These snails appear to occur on wetter sites than general forest conditions, so activities that would lower the water table or reduce soil moisture would degrade habitat (Burke et al. 1999).

Intense fire that burns through the litter and duff layers is devastating to most gastropods, and even light burns during seasons when these animals are active can be expected to have more serious impacts than burns during their dormant periods. Snowmobiling or skiing would impact these snails if snow, over their occupied habitats, is compacted losing its insulative properties and allowing the litter or ground to freeze (Burke et al. 1999).

Habitat for the Crater Lake tightcoil includes Class 1, 2, 3, and 4 streams and lake and wetland buffers. Suitable habitat specific to the Crater Lake tightcoil has not been mapped at this time as assessments are generally conducted at a project level.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to Crater Lake tightcoil habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the Crater Lake tightcoil and its habitat.

Determination

Implementation of the Designation of the Katsuk Butte RNA will result in no change to suitable Crater Lake tightcoil habitat. Therefore, the Action Alternative will have "No Impact" to the Crater Lake tightcoil or their habitat.

Evening Field Slug, Region 6 Sensitive

Existing Condition/No Action

Scattered sites have been documented for the Evening field slug in several provinces in Oregon, including both sides of the Oregon Cascades from Hood River to the Klamath River basin in Jackson County; and from the Elliot State Forest north in the northern Coast Range. The majority of currently documented sites occur on the eastern slopes of the Oregon Cascades. The type locality was in Oswego, OR, the paratype locality in Hood River. The range extends through western Washington and on to Vancouver Island, B.C.

The Evening Fieldslug is associated with perennially wet meadows in forested habitats; microsites include a variety of low vegetation, litter and debris; rocks may also be used as refugia. Little detail is known about exact habitat requirements for the species, due to the limited number of verified sites. However, this species appears to have high moisture requirements and is almost always found in or near herbaceous vegetation at the interface between soil and water, or under litter and other cover in wet situations where the soil and vegetation remain constantly saturated. Because of the apparent need for stable environments that remain wet throughout the year, suitable habitat may be considered to be limited to moist surface vegetation and cover objects within 30 m. (98 ft.) of perennial wetlands, springs, seeps and riparian areas. Areas with coastal fog may allow the species to occupy habitats farther from open water. Down wood may provide refugia sites for the species that remain more stable during drier periods of the year than the general habitat.

Primary threats to this species are habitat loss from draining and conversion of wet meadows for agricultural, urbanization, grazing, forest management and other uses; and from fire. Natural threats may include ingrowth of conifer or hardwood tree and shrub species in historically herbaceous habitats, changes in hydrology that reduce the availability of water in wetlands, and exposure to vertebrate and invertebrate predators (i.e., predatory snails and beetles), especially in locally restricted areas.

A study conducted by Guralnick and Roth (2013) on the Fremont Winema NF found that *Deroceras hesperium* is likely an anatomical variant of *Deroceras laeve*, a more common and widespread species.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to evening field slug habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the evening field slug and its habitat.

Determination

Implementation of the Designation of the Katsuk Butte RNA will result in no change to suitable evening field slug habitat. Therefore, the Action Alternative will have "No Impact" to the evening field slug or their habitat.

Silver-bordered Fritillary, Region 6 Sensitive

Existing Condition/No Action

The silver-bordered fritillary is a holarctic species ranging from the Appalachians, Midwest, Rockies, and the Cascades. This species is known from three locations in Oregon – Big Summit Prairie (Crook Co.), the Strawberry Mountains (Grant Co.), and the southern Wallowa range north of Halfway (Baker Co.) (Pyle 2002, Warren 2005). They are associated with open riparian areas, bogs, and marshes dominated by *Salix* and larval foodplants (marsh violet, bog violet). The adults nectar on various composites, mints, and *Verbena*. Populations from Crook and Grant counties fly from early June to mid-August, in what is apparently a single annual brood. Threats include small populations that are stressed by habitat succession and drying (Pyle 2002).

Habitat for the silver-bordered fritillary includes wetlands. Wetlands include both the wetland and the associated buffer. Suitable habitat specific to the silver-bordered fritillary has not been mapped at this time as assessments are generally conducted at a project level.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to silver-bordered fritillary habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the silver-bordered fritillary and its habitat.

Determination

Implementation of the Designation of the Katsuk Butte RNA will result in no change to suitable silver-bordered fritillary habitat. Therefore, the Action Alternative will have "No Impact" to the silver-bordered fritillary or their habitat.

Western Bumble Bee, Region 6 Sensitive

Existing Condition/No Action

The western bumblebee was once widespread and common throughout the western United States and western Canada before 1998. Since 1998 populations of this bumblebee species have declined drastically throughout parts of its former range. Populations in central California, Oregon, Washington and southern British Columbia have mostly disappeared. NatureServe (2013) reported this species has declined about 70-100% since the late 1990s in many places,

especially from British Columbia to California. For Oregon, NatureServe (2014) lists them as S1, Critically Imperiled and S2N, Imperiled. It is difficult to accurately assess the magnitude of these declines since most of this species' historic range has not been sampled systematically (Xerces Society 2012, Andrews 2010). Western bumble bees have been documented on the Deschutes National Forest near Sparks Lake and in the Sunriver vicinity.

The Xerces Society website (Xerces Society 2012) stated there are a number of threats facing bumblebees, any of which may be leading to the decline of *Bombus occidentalis*. The major threats to bumble bees include: spread of pests and diseases by the commercial bumble bee industry, other pests and diseases, habitat destruction or alteration, pesticides, invasive species, natural pest or predator population cycles, and climate change. Commercial bumblebee rearing is thought to be the greatest threat to the western bumblebee. Bumblebee expert, Dr. Robbin Thorp (Univ. of California, Davis) has hypothesized western bumblebee queens shipped to Europe to produce new colonies and then shipped back to the United States may have acquired a disease (mircosporidium *Nosema bombi*) from a European bumblebee at the same rearing facility. The western bumblebee would have had no prior resistance to this pathogen. While this hypothesis needs validation, the timing, speed, and severity of the population crashes strongly supports the idea that an introduced disease caused the decline of bees (Xerces Society 2012).

An unpublished document prepared by the Xerces Society (Xerces Society 2013) stated the primary threats to the western bumblebee at the sites where it currently exists in Oregon and Washington include: pathogens from commercial bumble bees and other sources, impacts from reduced genetic diversity, and habitat alterations including conifer encroachment (resulting from fire suppression), grazing, and logging. Other threats include pesticide use, fire, agricultural intensification, urban development and climate change. Indirect effects of logging (such as increased siltation in runoff) and recreation (such as off-road vehicle use) also have the potential to alter meadow ecosystems and disrupt habitat. Additional habitat alterations, such as conifer encroachment resulting from fire suppression, fire, agricultural intensification, urban, and climate may threaten the western bumblebee. (Xerces Society 2013).

Management consideration for the western bumblebee mentioned by the Xerces Society in protecting all known and potential sites from practices, such as livestock grazing, and threats such as conifer encroachment, that can interfere with the habitat requirements of this species (availability of nectar and pollen throughout the colony season and availability of underground nest sites and hibernacula).

Most common management activities should not directly affect underground nests; however, bumble bees above ground in grasses would be vulnerable to fire and to mowing if the blade is low enough to destroy them. Hibernating queens and workers could be very vulnerable to prescribed burns if they are above ground in dry microhabitats. Thinning and prescribed burning may have positive or negative effects: direct mortality to the pollinators and change in vegetation composition and structure (NatureServe 2013). Long term, these treatments would benefit bumblebees by reducing encroaching conifers and maintain an open meadow/brush habitat. Maintaining a diverse assemblage of primarily native flora such that flowers would be constantly available throughout the active season of April to September would benefit bumble bees (NatureServe 2013).

Native bees including bumblebees are adapted to local weather conditions and can forage during

cold, rainy periods. Bumble bees are generalist foragers, meaning they gather pollen and nectar from a wide variety of flowering plants and need a constant supply of flowers in bloom from spring to autumn (Evans et al. 2008). The western bumblebee visits a wide variety of wildflowers including Aster spp., Gaultheria shallon (salal), Pedicularis (Elephant's Head), Penstemon, Phacelia, Prunus spp. (cherry), Rhododendron spp., Solidago spp. (Goldenrod), Symphoricarpos spp. (snowberry), Trifolium spp. (clovers), Salix (willow) plus many others. Commercially reared colonies of western bumblebees have been used extensively for pollination of greenhouse tomatoes and field berry crops in the western United States (Evans et al. 2008). Wild colonies of western bumblebees have also been significant pollinators of cranberry farms. The species is also used to pollinate alfalfa, apples, cherries, blackberries and blueberries.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to western bumble bee habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the western bumble bee and its habitat.

Implementation of the Designation of the Katsuk Butte RNA will result in no change to suitable western bumble bee habitat. Therefore, the Action Alternative will have "No Impact" to the western bumble bee or their habitat.

Wildlife other than Federally Listed or Sensitive

The Wildlife Report documents the review of activities and projects to meet the requirements of the Forest Service Manual (2634.03-.2), the National Forest Management Act, the Land and Resource Management Plan (LRMP) for the Deschutes National Forest, the Northwest Forest Plan (NWFP), and the Decision Notice for the Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (i.e. "Eastside Screens"), and the Landbird Strategies. The Wildlife Report is summarized in this EA; the full report is located in the project file.

Species and Habitats

The following wildlife/habitats have been reviewed to determine if the project/activity will have any negative effects on them including LRMP Management Indicator Species (MIS), NWFP Survey and Manage (S&M) species, and landbirds.

The Deschutes National Forest Land and Resource Management Plan (LRMP) (USDA 1990a) identified a group of wildlife species as management indicator species (MIS). These species were selected because they represent other species with similar habitat requirements.

Management indicator species can be used to assess the impacts of management activities for a wide range of wildlife species with similar habitat needs (FSM 2620.5).

In addition to the above mentioned MIS species there have been a number of wildlife species deemed "species of concern" either through the Northwest Forest Plan (e.g. bats; pg C-43) or through other directives (e.g., landbirds).

Management Indicator Species

Table 6: Deschutes NF Management Indicator Species Summary

Species	Habitat	Habitat in Project Area
Northern Goshawk (*Accipiter gentiles*)	Mature and old-growth forests; especially high canopy closure and large trees	Yes
Cooper's Hawk (*Accipiter cooperi*)	Similar to goshawk, can also use mature forests with high canopy closure/tree density	Yes
Sharp-shinned Hawk (*Accipiter striatus*)	Similar to goshawk in addition to young, dense, even-aged stands	Yes
Great Gray Owl (*Strix nebulosa*)	Mature and old growth forests associated with openings and meadows	Yes
Great Blue Heron (*Ardea herodias*)	Riparian edge habitats including lakes, streams, marshes and estuaries	Yes
Golden Eagle (*Aquila chrysaetos*)	Large open areas with cliffs and rock outcrops	No
Waterfowl	Lakes, ponds, streams	Yes
Woodpeckers (Cavity Nesters)	Snags, Mature Conifers, Hardwoods, etc.	Yes
Red-tailed Hawk (*Buteo jamaicensis*)	Large snags, open country interspersed with forests	Yes
Osprey (*Pandion haliaetus*)	Large snags associated with fish bearing water bodies	Yes
Townsend's Big-eared Bat	Caves and dwellings	No
American Marten (*Martes americana*)	Mixed Conifer or High Elevation late successional forests with abundant down woody material	Yes
Elk (*Cervus elephas*)	Mixed habitats	No
Mule Deer (*Odocoileus hemionus*)	Mixed habitats	Yes
Snags and Down Wood Associated Species and Habitat	Snags and down woody material	Yes

The following table displays the acres of potential habitat mapped within the proposed Katsuk Butte RNA.

Table 7: Acres of potential habitat for species within the proposed Katsuk Butte RNA.

Species	Acres of Potential Habitat	Percent of Proposed RNA
Northern Goshawk	117 acres	37%
Coopers Hawk	89 acres	28%
Sharp-shinned Hawk	94 acres	30%
Great Gray Owl	526 acres	62%
Great Blue Heron	161 acres	51%
Golden Eagle	0	
Waterfowl	83 acres	26%
Black-backed Woodpecker	11 acres	3%
Hairy Woodpecker	50 acres	11%
Northern Flicker	9 acres	2%
Pileated Woodpecker	21 acres	7%
Three-toed Woodpecker	11 acres	3%
Williamson's Sapsucker	21 acres	7%
Red-tailed Hawk	21 acres	7%
Osprey	311 acres	99%
Townsend's Big-eared Bat	0	
American Marten	21 acres	7%
Elk Hiding Cover	0	
Elk Thermal Cover	0	
Mule Deer Hiding Cover	203 acres	65%
Mule Deer Thermal Cover	0	

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to the above management indicator species.

Cumulative Effects

Implementation of action alternative for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the above mentioned management indicator species and their habitats.

Determination

This project will not affect the above mentioned management indicator species in the project area. Therefore, the designation of the Katsuk Butte RNA project will not contribute to a negative trend in viability on the Deschutes National Forest for the above mentioned management indicator species.

Conservation Strategy for Eastslope of the Cascade Mountains

Landbird Strategic Plan

The Forest Service has prepared a Landbird Strategic Plan (January 2000) to maintain, restore, and protect habitats necessary to sustain healthy migratory and resident bird populations to achieve biological objectives. The primary purpose of the strategic plan is to provide guidance for the Landbird Conservation Program and to focus efforts in a common direction. On a more local level, individuals from multiple agencies and organizations with the Oregon-Washington Chapter of Partners in Flight participated in developing a publication for conserving landbirds in this region. A Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washington was published in June 2000 (Altman 2000). This document outlines conservation measures, goals and objectives for specific habitat types found on the east-slope of the Cascades and the focal species associated with each habitat type. See Table 8 for specific habitat types highlighted in that document, the habitat features needing conservation focus and the focal bird species for each.

Table 8: East-slope Cascade Mountain landbirds.

Habitat	Habitat Feature	Focal Species for Central Oregon
Ponderosa Pine	Large patches of old forest with large snags	White-headed woodpecker
	Large trees	Pygmy nuthatch
	Open understory with regenerating pines	Chipping sparrow
	Patches of burned old forest	Lewis' woodpecker
Mixed Conifer (Late-Successional)	Large trees	Brown creeper
	Large snags	Williamson's sapsucker
	Interspersion grassy openings and dense thickets	Flammulated owl
	Multi-layered/dense canopy	Hermit thrush
	Edges and openings created by wildfire	Olive-sided flycatcher
Lodgepole Pine	Old growth	Black-backed woodpecker
Whitebark Pine	Old-growth	Clark's nutcracker
Meadows	Wet/dry	Sandhill Crane
Aspen	Large trees with regeneration	Red-naped sapsucker
Subalpine fir	Patchy presence	Blue Grouse

Birds of Conservation Concern

In January 2001, President Clinton issued an executive order on migratory birds directing federal agencies to avoid or minimize the negative impact of their actions on migratory birds, and to take active steps to protect birds and their habitats. Federal agencies were required within two years to develop a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service to conserve migratory birds including taking steps to restore and enhance planning processes

whenever possible. To meet this goal in part the U.S. Fish and Wildlife Service developed the Birds of Conservation Concern released in December 2002 (USFWS 2002) and an update to the original list was released in 2008 (USFWS 2008).

The "Birds of Conservation Concern 2008" (BCC) identifies species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973. Bird species considered for inclusion on lists in this report include non-game birds, gamebirds without hunting seasons, subsistence-hunted non-game species in Alaska, landbirds, shorebirds, waterbirds, and Endangered Species Act candidate, proposed endangered or threatened, and recently delisted species. While all of the bird species included in BCC are priorities for conservation action, the list makes no finding with regard to whether they warrant consideration for ESA listing. The goal is to conserve avian diversity in North America and includes preventing or removing the need for additional ESA bird listings by implementing proactive management and conservations actions (USFWS 2008). The 2008 lists were derived from three major bird conservation plans: the Partners in Flight North American Landbird Conservation Plan, the United States Shorebird Conservation Plan, and the North American Waterbird Conservation Plan. Conservation concerns stem from population declines, naturally or human-caused small ranges or population sizes, threats to habitat, or other factors.

Bird Conservation Regions (BCRs) were developed based on similar geographic parameters and are the basic units within which all bird conservation efforts should be planned and evaluated (USFWS 2008). One BCR encompasses the Designation of the Katsuk Butte RNA Project Area – BCR 9, Great Basin. See Table 4 for a list of the bird species of concern for the area, the preferred habitat for each species, and whether there is potential habitat for each species within the Katsuk Butte project area.

Table 9: BCR 9 (Great Basin) BCC 2008 list.

Bird Species	Preferred Habitat	Habitat within the Project Area (Y or N)
Greater Sage Grouse (Columbia Basin DPS)	Sagebrush dominated Rangelands	N
Eared Grebe (non-breeding)	Open water intermixed with emergent vegetation	N
Bald Eagle	Lakeside with large trees	Y
Ferruginous Hawk	Elevated Nest Sites in Open Country	N
Golden Eagle	Elevated Nest Sites in Open Country	N
Peregrine Falcon	Cliffs	N
Yellow Rail	Dense Marsh Habitat	N
Snowy Plover	Dry Sandy Beaches	N
Long-billed Curlew	Meadow/Marsh	N
Marbled Godwit	Marsh/Wet Meadows	N
Yellow-billed Cuckoo	Dense riparian/cottonwoods	N
Flammulated Owl	Ponderosa pine forests	N
Black Swift	Cliffs associated with waterfalls	N

Bird Species	Preferred Habitat	Habitat within the Project Area (Y or N)
Calliope Hummingbird	Open mountain meadows, open forests, meadow edges, and riparian areas	N
Lewis's Woodpecker	Ponderosa pine forests	N
Williamson's Sapsucker	Ponderosa pine forests	Y
White-headed Woodpecker	Ponderosa pine forests	N
Loggerhead Shrike	Open country with scattered trees or shrubs	N
Pinyon Jay	Juniper, juniper-ponderosa pine transition, and ponderosa pine edges	N
Sage Thrasher	Sagebrush	N
Virginia's Warbler	Scrubby vegetation within arid montane woodlands	N
Green-tailed Towhee	Open ponderosa pine with dense brush	N
Brewer's Sparrow	Sagebrush clearings in coniferous forests/bitterbrush	N
Black-chinned Sparrow	Ceanothus and oak covered hillsides	N
Sage Sparrow	Unfragmented patches of sagebrush	N
Tricolored Blackbird	Cattails or Tules	N
Black Rosy Finch	Rock outcroppings and snowfields	N

Environmental Consequences

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to the above landbirds or Birds of Conservation Concern.

Cumulative Effects

Implementation of action alternative for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the above mentioned landbirds or birds of conservation concern and their habitats.

Survey and Manage

Terrestrial species thought to occur on the Deschutes National Forest included the Crater Lake Tightcoil (*Pristiloma arcticum crateris*) and the Great Gray Owl (*Strix nebulosa*). The Crater Lake tightcoil was included in a group of eight mollusk species where equivalent-effort pre-

disturbance surveys were required even though it was considered a Category B species (species are considered rare, where pre-disturbance surveys are not practical) based on direction in the 2001 Record of Decision. In the subsequent 2002 Annual Species Review Memorandum (USDA and USDI 2003), the Crater Lake Tightcoil was changed from a Category B to a Category A species, where species are considered rare and pre-disturbance surveys are considered practical. The great gray owl was a Category C species which were species considered uncommon and where pre-disturbance surveys are practical. The status of the great gray owl has not changed during subsequent reviews. The Crater Lake tightcoil is included in the Sensitive Species update in the biological evaluation while the great gray owl is analyzed under the management indicator species section in the wildlife report.

On December 2009, the District Court for the Western District of Washington issued an order on partial summary judgment in favor of the Plaintiffs finding inadequacies in the NEPA analysis supporting the *Record of Decision to Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Bureau of Land Management Resource Management Plans Within the Range of the Northern Spotted Owl* (FS et al. 2007)(2007 ROD). The District Court did not issue a remedy or injunction at that time.

Plaintiffs and Defendants entered into settlement negotiations that resulted in the 2011 Survey and Manage Consent Decree, adopted by the District Court on July 6, 2011.

The Defendant-Intervenor subsequently appealed the 2011 Consent Decree to the Ninth Circuit Court of Appeals. The April 25, 2013 ruling in favor of Defendant-Intervener remanded the case back to the District Court.

On February 18, 2014, the District Court vacated the 2007 RODs. Vacatur of the 2007 RODs has the result of returning the Forest Service to the status quo in existence prior to the 2007 RODs.

The District Court and all parties agreed that projects begun in reliance on the Settlement Agreement should not be halted. The District Court order allowed for the Forest Service and BLM to continue developing and implementing projects that met the 2011 Settlement Agreement exemptions or species list, for three categories of projects. These categories include:

1) Projects in which any Survey and Manage pre-disturbance survey(s) has been initiated (defined as at least one occurrence of actual in-the-field surveying undertaken according to applicable protocol) in reliance upon the Settlement Agreement on or before April 25, 2013;
2) Projects, at any stage of project planning, in which any known site(s) (as defined by the 2001 Record of Decision) has been identified and has had known site-management recommendations for that particular species applied to the project in reliance upon the Settlement Agreement on or before April 25, 2013; and
3) Projects, at any stage of project planning, that the Agencies designed to be consistent with one or more of the new exemptions contained in the Settlement Agreement on or before April 25, 2013.

Environmental Consequences

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to the Crater Lake tightcoil or the great gray owl.

Cumulative Effects

Implementation of action alternative for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the Crater Lake tightcoil or the great gray owl and their habitats.

Cultural Resources

No cultural resource sites or historic sites have been documented within the RNA (USDA Forest Service 2011). Establishing the RNA will have no impact to cultural resources and will not alter or limit existing Native American treaty rights. As per Section 106 of the National Historic Preservation Act, no ground disturbing activities will occur within the RNA without a cultural resources inventory.

Recreation

There is light recreation use within the RNA along the shores of Sparks Lake and Devils Lake, and there is light use of other portions of the RNA by day hikers and Nordic skiers. Recreational use level sand resulting impacts on the RNA are expected to remain unchanged following establishment. Recreation use impacts on the RNA are expected to remain minimal. Designation of the RNA will not impact existing opportunities for light recreation as long as use does not threaten the research value of the area. Management direction does not allow for any recreation improvements to be added.

Transportation

There are no roads within Katsuk Butte RNA and none are planned to be built. The RNA will be closed to motor vehicles. The RNA is in the West and South Bachelor Inventoried Roadless Area (RARE No. 06195; USDA Forest Service 1990b). There are no conflicts with the DNF Transportation Plan. Designation of the RNA will not preclude the treatment of danger trees along County Road 46, in accordance with established procedures for the identification and treatment of danger trees along roads. Treatment methods would be limited to falling the danger trees and leaving them on the ground.

Invasive Plants

Treatment of invasive plants was addressed in the Deschutes-Ochoco Invasive Plant Treatment Final EIS and Record of Decision (USDA Forest Service 2012).

Establishment of the RNA does not preclude continuation of treatment of existing invasive plant occurrences, nor would it prevent the practice of Early Detection Rapid Response (EDRR) to other invasive species, if detected within the RNA in the future. For these reasons, establishment of the RNA is not anticipated to cause an increase in establishment or spread of invasive species.

Other Required Disclosures

Effects on Prime Farmland, Rangeland, and Forestland

There is no prime farmland, rangeland, or forestland in the proposed Katsuk Butte RNA area.

Floodplains and Wetlands

Executive Order 11988 sets the direction of federal actions to avoid adverse impacts associated with the occupancy and modification of floodplains. Executive Order 11990 sets the direction of federal actions to avoid adverse impacts associated with destruction or modification of wetlands. The designation of the area as RNA is not expected to have any adverse impacts to floodplains or wetlands.

Potential or Unusual Expenditures of Energy

There would be no unusual expenditures of energy with this designation. The project does not involve any forms of energy expenditure.

Conflicts with Plans, Policies, or other Jurisdictions

There would be no conflicts with plans, policies, or other jurisdictions with either alternative. All overlapping plans and policies have been evaluated for consistency. The proposal to establish an RNA in this location was developed under consultation with regulatory agencies including the U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife, and the State Historic Preservation Officer.

Environmental Justice

The proposed designation does not appear to have a disproportionately high or adverse effect on minority or low-income populations, or Native American tribes. No mitigation measures to offset or ameliorate adverse effects to these populations have been identified. All interested and affected parties would continue to be involved with the comment and decision-making process.

Consumers, Civil Rights, Minority Groups, and Women

The proposed designation does not appear to have a disproportionately high or adverse effect on consumers, minorities, or women. The project would not have any effect on civil rights of any human being.

Consistency with Deschutes LRMP, as Amended

Formally designating the RNA would require amending the Deschutes LRMP. The designation is consistent with all other Forest Plan standards and guidelines. The management direction listed in Chapter 2 lists the management area categories for the Forest Plan and Northwest Forest Plan.

Chapter 4: Agencies and Persons Consulted

U.S. Fish and Wildlife Service

It was determined that there would be no effect to any Federally-listed wildlife species, therefore consultation with the U.S. Fish and Wildlife Service was not required.

State Historic Preservation Officer

Designating Katsuk Butte as an RNA would not affect any historic or pre-historic artifacts; therefore no consultation with the Oregon State Historic Preservation Officer is required.

On March 12, 2009 a scoping letter was sent to a mailing list of interested parties maintained in the project file at the Deschutes National Forest Supervisor's Office. The following list of individuals, organizations, and agencies are receiving notice of the availability of this environmental assessment for comment:

Individuals, Agencies, and Organizations

Luann Danforth
Dave Lynn
Chuck Tolboe
Matt Mahoney
Vera Riser
Steven J. McNulty, Gas Transmission NW Corp.
Ken Roadman
Wally Buckman
Lee Fischer
Gary Pankey
Larry McGlocklin
Flip Houston, Scott Logging Inc.
Scott Odgers, Central Oregon Flyfishers
Pat Schatz, Mickey Finn Guide Service
Craig Vaage, Bigfoot Guide Service
David Nissen, Wanderlust Tours
Larry Ulrich
Ed Duffy, Deschutes County 4-Wheelers
David H. Tjomsland
Robert Speik
Susan Jane Brown
Brad Chalfant, Deschutes Basin Land Trust
Jim King
Michael Krochta
Josh Laughlin, Cascadia Wildlands Project
Karen Coulter, Blue Mountains Biodiversity Project
Doug Heiken, Oregon Wild
Glen Ardt
Marilyn Miller
Stuart Garrett, MD
Scott Silver, Wild Wilderness
Matt Kern
Mike Morris
Libby Johnson, Bonneville Power Administration
Keenen Howard
Senator Ron Wyden
Sunriver Owners Association
Dick Artley
John Pindar
Dennis Krakow, Woodside Ranch Owners Association
Arlie Holm
Fred Tanis
Chuck Burley, Interfor
Gerald Keck, D.R. Johnson Lumber Co.
John Morgan, Ochoco Lumber
Shawn Gerdes, Arnold Irrigation District
Bend Metro Parks & Recreation
Dylan Darling, The Bulletin
Billy Toman
Rick Bozarth, Bozarth's Offroad Service Specialties
Gordon Baker
Bodie Dowding, Interfor
Peggy Spieger, Oregon State Snowmobile Association
Corey Heath, Oregon Department of Fish and Wildlife
Stuart Otto, Oregon Department of Forestry

John McKenzie, Sunriver Owners Association
Mark Dunaway, Pine Mountain Observatory, Univ. of Oregon
Dyarle Sharkey
Patti Gentiluomo
Wade N. Foss
Bruce Cunningham
Moon Country Snowmobilers
Scott O'Neill
June Ramey
Mark Davis
Scott McCaulou, Deschutes River Conservancy
Ryan Houston, Upper Deschutes Watershed Council
Lynne Breese, Eastern Oregon Forest Protection Association
Greg McClarren
Rick Williams, ODOT Region 4
Kate Lighthall, Project Wildfire
SROA
Northwest Environmental Defense Center
Vicki McConnell, Department of Geology and Mineral Industries
Andy Ingram
Dean Richardson
Vic Russell
Ed Keith, Deschutes County Forester
Patricia Moore
Jim Lowrie
Jim Wilson. JTS Animal Bedding
Pieter & Diane Van Gelderen
L. Ulven
Steve Johnson, Central Oregon Irrigation District
Jim Anderson
Loren Smith
Jim Larson, Upper Deschutes River Coalition
Gail Carbiener
Margie Gregory
David Pitts
Central Oregon Climate Alliance
Kreg Lindberg
Peter Geiser
Senator Jeff Merkley
Larry Pennington, Oregon Chapter, Sierra Club
Judy Meredith, East Cascades Audubon Society
Paul Bannick, Conservation Northwest
Don Franks
Lowell Franks
Matt Bales, Mule Deer Foundation
Rod Adams, Oregon Hunter's Association
Jeff Trant
Kenna Hoyser, Central Oregon Chapter, Oregon Equestrian Trails
John Zachem
Scott Walley
Lisa Clark, Central Oregon Fire Management Service
Congressman Greg Walden
George Wuerthner
Steve Bigby
Sarah Peters, Wildlands CPR
Meriel Darzen, Oregon Ch., Sierra Club, Juniper Group
Paul Dewey, Central Oregon Landwatch
Confederated Tribes of the Warm Springs
Burns Paiute Tribe
The Klamath Tribes
USDI Fish & Wildlife Service

References

Altman, B. 2000. Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washington. Version 1.0. Oregon-Washington Partners in Flight. 81 pp.

Altman, B. and A. Holmes. 2000. Conservation strategy for landbirds in the Columbia Plateau of eastern Oregon and Washington. Version 1.0. Oregon-Washington Partners in Flight. 97 pp.

Andrews, Heather. 2010. Species Fact Sheet, Western Bumblebee *(Bombus occidentalis*). Prepared for the Bureau of Land Management/Forest Service Interagency Special Status Species Program. Portland, Oregon.

Anthony, R.G., R.L. Knight, G.T. Allen, B.R. McClelland, J.I. Hodges. 1982. Habitat Use by Nesting and Roosting bald eagles in the Pacific Northwest. Pp. 332-342 in: Transactions of the 47th North American Wildlife and Natural Resources Conference. Wildlife Management Institute, Washington, D.C.

Anthony, R.G., R.J. Steidl, and K. McGarigal. 1995. Recreation and bald eagles in the Pacific Northwest. In: R.L. Knight and K.J. Gutzwiller, eds. Wildlife and recreationists: coexistence through management and research. Island Press, Washington D.C. 372 pp.

Aubry, K.B., M.J. Crites, and S.D. West. 1991. Regional patterns of small mammal abundance and community composition in Oregon and Washington. Pages 284-294 in PNW-GTR-285, Pacific Northwest Research Station, USDA Forest Service, Olympia, WA.

Aubry, K.G., K.S. McKelvey, and J.P. Copeland. 2007. Distribution and Broadscale Habitat Relations of the Wolverine in the Contiguous United States. Journal of Wildlife Management 71(7):2147.

Bart, J. 1995. Amount of suitable habitat and viability of northern spotted owls. Conservation Biology 9(4):943-946.

Bauer, R.D. 1979. Historical and status report of the Tule White-fronted Goose. Pp. 44-45 in Management and biology of Pacific Flyway geese (R.L. Javis and J. C. Bartonek, eds.). Oregon State University, Corvallis as cited ***In:*** Marshall, D.B., M.G. Hunter, and A.L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, Oregon. 768 pp.

Beedy, E.C., and W.J. Hamilton III. 1999. Tricolored Blackbird (Agelaius tricolor). *In*: The Birds of North America, No. 423 (A. Poole and F. Gill, eds). The Birds of N. Am., Philadelphia, PA. p. 580 *In*: Marhsall, D.B., M.G. Hunter, and A. L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, OR. 768 pp.

Bingham, B. and B.R. Noon. 1997. Mitigation of Habitat Take: Application to Habitat Conservation Planning. Conservation Biology 9(4):943-946.

Boucher, Karin. 2008. Wildlife Technician, Crescent Ranger District. Personal communication regarding northern waterthrush surveys on the Crescent Ranger District.

Buchanan, J.B. 2005. Barred Owl. Pages 218–219 in Birds of Washington: status and distribution. T. R. Wahl, B. Tweit, and S. G. Mlodinow (editors), Oregon State University Press, Corvallis.

Burke, T.A., Applegarth, J.S. and T.R. Weasma, N. Duncan ed. 1999. Management Recommendations for Survey and Manage Terrestrial Mollusks. Version 2.0.

Carex Working Group. 2008. Vascular Plants of Headwaters of the Katsuk RNA. On File at the Deschutes National Forest, Bend, Oregon.

Carey, A.B. 1995. Sciurids in Pacific Northwest managed and old-growth forests. Ecological Applications 5(3):648-661.

Carey, A.B. 2000. Effects of new forest management strategies on squirrel populations. Ecological Applications 10(1):248-257.

Carey, A.B., T.M. Wilson, C.C. Maguire, and B.L. Biswell. 1997. Dens of northern flying squirrels in the Pacific Northwest. J. Wildl. Manage. 61(3):684-699.

Carey, A.B., J. Kershner, B. Biswell, and L. Dominguez de Toledo. 1999. Ecological scale and forest development: squirrels, dietary fungi, and vascular plants in managed and unmanaged forests. Wildlife Monographs 142:1-71.

Carey, A.B., W. Colgan III, J.M. Trappe, and R. Molina. 2002. Effects of forest management on truffle abundance and squirrel diets. Northwest Science, 76(2):148-157.

Christy, Robin E., and Stephen D. West. 1993. Biology of bats in Douglas-fir forests. Gen. Tech. Report PNW-GTR-308. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 28 pp. (Huff, Mark.: Holthausen, Richard M.: Aubrey, Keith B., Tech. Cords. Biology and management of old-growth forests).

Contreras, A. 1988. Northern Waterthrush summer range in Oregon. West. Birds 19: 41-42.

Cook, F.R. 1984. Introduction to Canadian amphibians and reptiles. National Museum of Natural Science, National Museum of Canada.

Copeland, J.P. 1996. Biology of the wolverine in Idaho. M.Sc. Thesis. University of Idaho. 138 pp.

Copeland, Jeffrey P., J.M. Peek, C.R. Groves, W.E. Melquist, K.S. McKelvey, G.W. McDaniel, C.D. Long, and C.E. Harris. 2007. Seasonal Habitat Associations of the Wolverine in Central Idaho. Journal of Wildlife Management 71(7):2201-2212.

Copeland, J.P., McKelvey, K.S., Abry, K.B., Landa, A., Persson, J., Inman, R.M., Krebs, J., Lofroth, E., Golden, H., Squires, J.R., Magoun, A., Schwartz, M.K., Wilmot, J., Copeland, C.L., Yates, R.E., Kojola, I., and R. May. 2010. The bioclimatic envelope of the wolverine (Gulo gulo): do climatic constraints limit its geographic distribution? Canadian Journal Zoology 88:233-246.

Coulter, M.W. 1966. Ecology and management of fishers in Maine. Syracuse, NY: Syracuse University, University College of Forestry. Ph.D. thesis.

Courtney, S.P., J.A. Blakesley, R.E. Bigley, M.L. Cody, J.P. Dumbacher, R.C. Fleischer, A.B. Franklin, R.J. Gutierrez, J.M. Marzluff, and L. Sztukowski. 2004. Scientific evaluation of the status of the northern spotted owl. Sustainable Ecosystems Institute, Portland, OR.

Csuti, B., A.J. Kimerling, T.A. O'Neill, M.M. Shaughnessy, E.P. Gaines, and M.M.P. Huso. 1997. Atlas of Oregon: Distribution, Habitat, and Natural History. Oregon State University Press, Corvallis, Oregon. 492 pp.

Dixon, R.D. 1995. Ecology of white-headed woodpeckers in the central Oregon Cascades. Masters Thesis. Univ. Idaho. 148 pp.

Dyrness, C.T., J.F. Franklin, C. Maser, S.A. Cook, J.D. Hall, and G. Faxon. 1975. *Research Natural Area needs in the Pacific Northwest, contribution to land-use planning.* USDA Forest Service, PNW Forest and Range Experiment Station, Portland, OR. General Technical Report PNW-38. 231 pp.

Dugger, K.M., F. Wagner, R.G. Anthony, and G.S. Olson. 2005. The relationship between habitat characteristics and demographic performance of northern spotted owls in southern Oregon. The Condor 107:863-878.

Duncan, Nancy, Tom Burke, Steve Dowlan, and Paul Hohenlohe. 2003. Survey Protocol For Survey and Manage Terrestrial Mollusk Species From the Northwest Forest Plan. Version 3.0.

Dunlap, D.G. 1955. Inter- and intraspecific variation in Oregon frogs of the genus Rana. American Midland Naturalist 54:314–331.

Earle, R.D. 1978. The fisher-porcupine relationship in Upper Michigan. Houghton, MI: Michigan Technical University. M.S. Thesis. 184 pp.

Ely, C.R. 1992. Time allocation by Greater White-fronted Geese: influence if diet, energy reserves and predation. Condor 94:857-870 *In*: Marshall, D.B., M.G. Hunter, and A.L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, Oregon. 768 pp.

Engler, J., and D.C. Friesz. 1998. Draft 1998 Oregon spotted frog breeding surveys, Conboy Lake National Wildlife Refuge, Klickitat County, Washington. Unpublished Report. 5 pp.

Evans, Elaine, (The Xerces Society), Dr. Robbin Thorp (Univ. of California Davis), Sarina Jepsen (The Xerces Society), and Scott Hoffman Black (The Xerces Society). 2008. Status Review of Three Formerly Common Species of Bumble Bee in the Subgenus *Bombus*. The Xerces Society. 63 pp. Accessed at http:/www.xerces.org/wp content/uploads/2008/12/xerces_2008_bombus_status_review.pdf.

Federal Register Vol. 77, No. 46/Thursday, March 8, 2012. Announcement of a proposed rule to revise designation of critical habitat for the Northern Spotted Owl under the Endangered Species Act (ESA) of 1973, as amended.

Federal Register. 2013a. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the Oregon Spotted Frog; Proposed Rule. 50 CFR Part 17.

Federal Register. 2013b. Endangered and Threatened Wildlife and Plants: Threatened Status for Oregon Spotted Frog; Proposed Rule. 50 CFR Part 17.

Franklin, J. F., C. Frederick, C. Hall, c. T. Dyrness, and C. Maser. 1972. Federal *Research Natural Areas in Oregon and Washington: A Guidebook for Scientists and Educators.* Pacific Northwest Forest and Range Experiment Station.

Frenzel, R.W. 2000. Nest-sites, nesting success, and turn-over rates of white-headed woodpeckers on the Winema and Deschutes National Forests, Oregon in 2000. Unpubl. Report submitted to the Oregon Natural Heritage Program, The Nature Conservancy of Oregon. 51 pp.

Frenzel, R.W. 2002. Nest-sites, nesting success, and turn-over rates of white-headed woodpeckers on the Winema and Deschutes National Forests, Oregon in 2002. Unpubl. Report submitted to the Oregon Natural Heritage Program, The Nature Conservancy of Oregon. 56 pp.

Frenzel, R.W. 2003. Nest-site occupancy, nesting success, and turn-over rates of white-headed woodpeckers on the Winema and Deschutes National Forests, Oregon in 2003. Unpubl. Report submitted to the Oregon Natural Heritage Program, The Nature Conservancy of Oregon. 49 pp.

Gilligan, J., M. Smith, D. Rogers, and A. Contreras. 1994. Birds of Oregon: status and distribution. *In* Marshall, M. G. Hunter, and A. L. Contreras. Eds. 2003. Birds of Oregon: A General Reference, Oregon State University Press, Corvallis, OR. 768 pp.

Guralnick, R. and B. Roth. 2013. Determination of Species Status of Terrestrial Slugs, *Deroceras*. USDA, Region 6, Portland, OR. 16 pp.

Hallock, L., and S. Pearson. 2001. Telemetry study of fall and winter Oregon spotted frog (Rana pretiosa) movement and habitat use at Trout Lake, Klickitat County, Washington. Unpublished report to Washington State Department of Transportation and Washington Department of Natural Resources Natural Areas Program. 20 pp.

Harvey, Michael J., Altenbach, J. Scott, and Best, Troy L. 1999. Bats of the United States. Published by the Arkansas game and Fish Commission in cooperation with the Asheville field Office, U. S. Fish and Wildlife Service.

Hayes, M.P. 1997. Final Report: Status of the Oregon spotted frog (*Rana pretiosa sensu stricto*) in the Deschutes Basin and selected other systems in Oregon and northeastern California with a range-wide synopsis of the species' status. Oregon Department of Fish and Wildlife. Unpublished report.

Hayes, M.P., J.D. Engler, R.D. Haycock, D.H. Knopp, W.P. Leonard, K.R. McAllister, and L.L. Todd. 1997. Status of the Oregon spotted frog (Rana pretiosa) across its geographic range. Oregon Chapter of the Wildlife Society, Corvallis, Oregon.

Hayes, M.P. and M.R. Jennings. 1986. Decline of ranid frog species in western North America: are bullfrogs (Rana catesbeiana) responsible? Journal of Herpetology 20:490–509.

Hayes, M.P., J.D. Engler, S.Van Leuven, D.C. Friesz, T. Quinn, and D.J. Pierce. 2001 Overwintering of the Oregon spotted frog (Rana pretiosa) at Conboy Lake National

Wildlife Refuge, Klickitat County, Washington, 2000-2001. Final Report to Washington Department of Transportation. June 2001. 86 pp.

Hornocker, M.G. and H.S. Hash. 1981. Ecology of the wolverine in northwestern Montana. Can. J. Zool. 59:1286-1301.

Inman, R.M., K. H. Inman, A.J. McCue, M.L. Packila, G.C. White, and B.C. Aber. 2007. Wolverine space use in Greater Yellowstone. Chapter 1 in Greater Yellowstone Wolverine Study, Cumulative Report, May 2007. Wildlife Conservation Society, North America Program, Gen. Technical Report, Bozeman, Montana, USA.

Kelly, G.M. 1977. Fisher (*Martes pennanti*) biology in the White Mountain National Forest and adjacent areas. Amherst, MA: University of Massachusetts. Ph.D. thesis. 178 p.

Leonard, W.P., H.A. Brown, L.L.C. Jones, K.R. McAllister, and R.M. Strom. 1993. Amphibians of Washington and Oregon. Seattle Audubon Society, Seattle, Washington.

Lehmkuhl, J.F., L.E. Gould, E. Cazares, and D.R. Hosford. 2004. Truffle abundance and mycophagy by northern flying squirrels in eastern Washington forests. Forest Ecol. and Mgmt 200:49-65.

Lehmkuhl, J.F., K.D. Kistler, and J.S. Begley. 2006. Bushy-tailed woodrat abundance in dry forests of eastern Washington. Journal of Mammal 87(2):371-379.

Licht, L.E. 1974. Survival of embryos, tadpoles, and adults of the frogs *Rana aurora aurora* and *Rana pretiosa pretiosa* sympatric in southwestern British Columbia. Can. J. Zool. 52:613-627.

Licht, L.E. 1986. Food and feeding behavior of sympatric red-legged frogs, Rana aurora, and spotted frogs, Rana pretiosa, in Southwestern British Columbia. Canadian Field Naturalist 100:22-31.

Magoun, A. J. and J.P. Copeland. 1998. Characteristics of wolverine reproductive dens sites. Journal of Wildlife Management 62(4):1313-1320.

Maser, Z., C. Maser, and J.M. Trappe. 1985. Food habits of the northern flying squirrel (*Glaucomys sabrinus*) in Oregon. Can. J. Zool. 63:1084-1088.

Marshall, D. B., M. G. Hunter, and A. L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, OR. 768 pp.

McAllister, Kelly. Washington Department of Transportation. February 6, 2008 email

communications with Deanna Lynch, USFWS Western Washington Fish and Wildlife Office, Regarding Annual update of Oregon spotted frog species assessment.

McAllister, K.R. and H.Q. White. 2001. Oviposition ecology of the Oregon spotted frog at Beaver Creek, Washington. Unpublished report. Washington Department of Fish and Wildlife, Olympia. 24 pp.

McCallister, K.R., and W.P. Leonard. 1997. Status of the Oregon spotted frog in Washington. Draft unpublished report, Washington Department of Fish and Wildlife.

Meyer, J.S., L.L. Irwin, and M.S. Boyce. 1998. Influence of habitat abundance and fragmentation on northern spotted owls in western Oregon. Wildlife Monog. No. 139.

Mills, L.S. 1995. Edge effects and isolation: red-backed voles on forest remnants. Conservation Biology 9(2):395-403.

NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer.

Nussbaum, R.A., E.D. Brodie, and R.M. Storm. 1983. Amphibians and reptiles of the Pacific Northwest. University of Idaho Press, Moscow.

Oregon Department of Fish and Wildlife 2013. Wildlife Division. Wolf Program Website accessed August 12, 2014. http://www.dfw.state.or.us/wolves .

Oertley, Jill. U.S. Forest Service, September 28, 2005, email communications with Deanna

Lynch. USFWS Western Washington Fish and Wildlife Office, Regarding Oregon spotted frog – update on activities.

Oregon Natural Heritage Program. 2003. Oregon Natural Heritage Plan. Department of State Lands, Salem, OR. 167 pp.

Pacific Flyway Council. 1991. Pacific Flyway plan for the Tule greater White-fronted Goose. Pacific Flyway Study Subcomm. On the Pacific Flyway population of White-fronted Geese. Unpubl. Rep., U.S. Fish and Wildlife Service. Portland, Oregon as cited ***In:*** Marshall, D.B., M.G. Hunter, and A.L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, Oregon. 768 pp.

Pearl, C.A., and M.P. Hayes. 2002. Predation by Oregon spotted frogs (Rana pretiosa) on western toads (Bufo boreas) in Oregon. American Midland Naturalist 147:145-152.

Pearl, C. A., and M.P. Hayes. 2004. Habitat associations of the Oregon spotted frog (*Rana pretiosa*): a literature review. Final Report. Washington Department of Fish and Wildlife, Olympia, Washington In: Cushman, Kathleen A. and Christopher A. Pearl 2008. A Conservation Assessment for the Oregon Spotted Frog (*Rana pretiosa*).

Pearl, Christopher and J. Bowerman. October 5, 2005, email communications with Deanna

Lynch, USFWS Western Washington Fish and Wildlife Office, Regarding Oregon spotted frog assessment, additional remarks.

Pearl, C.A., J. Bowerman, and D. Knight. 2005. Feeding behavior and aquatic habitat use by Oregon spotted frogs (Rana pretiosa) in central Oregon. Northwestern Naturalist 86:36-38.

Pearl, C.A., M.J. Adams, and N. Leuthold. 2009. Breeding habitat and local population size of the Oregon spotted frog (Rana pretiosa) in Oregon, USA. Northwest Naturalist 90:136-147.

Pearl, C.A., and M.P. Hayes. 2004. Habitat associations of the Oregon spotted frog (*Rana pretiosa)*: a literature review. Final Report. Washington Department of Fish and Wildlife, Olympia, Washington.

Popper, Kenneth J. 2001. Abundance and distribution of Yellow Rails in the Deschutes and Northern Great Basins of Southcentral Oregon, 2000.

Powell, R.A., and W.J. Zielinski. 1994. Fisher. Pages 38-73 in L.F. Lyon, and W.J. Zielinski, editors. American marten, fisher, lynx, and wolverine in the western United States. U.S. Forest Service Tech. Report. RM-254.

Pyle, R.M. 2002. The Butterflies of Cascadia. A Field Guide to all the Species of Washington, Oregon, and Surrounding Territories. Seattle Audubon Society. 420 pp.

Risenhoover, K.L., T.C. McBride, K. McAllister and M. Golliet. 2001. Overwintering behavior of the Oregon Spotted Frog (Rana pretiosa) along Dempsey Creek, Thurston County, Washington. Unpublished report submitted to Washington Department of Transportation, Olympia. 26 pp. + appendices.

Rombough, C.R., M.P. Hayes, and J.D. Engler. 2006. Rana pretiosa (Oregon Spotted Frog). Maximum Size. Herpetological Review 37(2):210.

Ransome, D.B. and T.P. Sullivan. 2003. Population dynamics of *Glaucomys sabrinus* and *Tamiasciurus hudsonicus* in old-growth and second-growth stands of coastal coniferous forests. Can. J. For. Res. 33:587-596.

Rosterolla, Carina. 2012. Wildlife Biologist, Crescent Ranger District. Personal communication regarding northern waterthrush survey results on the Crescent Ranger District.

Rosenberg, D.K. and R.G. Anthony. 1992. Characteristics of northern flying squirrel populations in young second- and old-growth forests in western Oregon. Can. J. Zool. 70:161-166.

Rosenberg, D.K. and K.S. McKelvey. 1999. Estimation of habitat selection for central-place foraging animals. J. Wildlife Management 63(3):1028-1038.

Rosenberg, D.K., K.A. Swindle, and R.G. Anthony. 1994. Habitat associations of California red-backed voles in young and old-growth in western Oregon. Northwest Science 68(4):266-272.

Rosentreter, R., G.D. Hayward, and M. Wicklow-Howard. 1997. Northern flying squirrel seasonal food habits in the interior conifer forests of central Idaho, USA. Northwest Science, 71(2):97-102.

Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, L. J. Lyon, W. J. Zielinski, tech eds. 1994. The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx and Wolverine in the Western United States. Gen. Tech. Rep. RM-254. Ft. Collins, CO: USDA, FS, Rocky Mountain Forest and Range Experiment Station. 184p.

Saab, V.A. and J.G. Dudley. 1998. Responses of cavity-nesting birds to stand-replacement fire and salvage logging in ponderosa pine/Douglas-fir forests of southwestern Idaho. Res. Pap. RMRS-RP-11. Ogden, UT: USDA Forest Service, Rocky Mountain Research Station. 17 p.

Saab, V.A., R. Brannon, J. Dudley, L. Donohoo, D. Vanderzanden, V. Johnson, and H. Lachowski. 2002. Selection of fire-created snags at two spatial scales by cavity-nesting birds. Gen. Tech. Rep. PSW-GTR-181. Pacific Southwest Research Station, USDA Forest Service. 14 pp.

Smith, F.A. 1997. Neotoma cinerea. Mammalian Species 564:1-8.

Stalmaster, M. 1987. The Bald Eagle. Universe Books, New York, NY. 227 pp.

Tallmon, D. and L.S. Mills. 1994. Use of logs within home ranges of California red-backed voles on a remnant of forest. Journal of Mammalogy 75(1):97-101.

Tattersall, G.J. and G.R. Ultsch. 2008. Physiological ecology of aquatic overwintering in ranid frogs. Biological Reviews 83:119-140.

Thomas, J.W., E.D. Forsman, J.B. Lint, E.C. Meslow, B.R. Noon, and J. Verner. 1990. A conservation strategy for the northern spotted owl. Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl. U.S. Forest Service, U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, and U.S. National Park Service, Portland, Oregon.

Thysell, D.R., L.J. Villa, and A.B. Carey. 1997. Observations of northern flying squirrel feeding behavior: use of non-truffle food items. Northwestern Naturalist 78:87-92.

USDA (Forest Service). 1996. Deschutes National Forest Memo on Northern Spotted Owl Dispersal Habitat. File Code 2670.

USDA. 2008. Johnson's Hairstreak Butterfly and Dwarf Mistletoe Backgrounder. USDA Forest Service, LaGrande, OR. 8 pp.

USDA Forest Service. 2011. Update of the Regional Forester's Sensitive Species Lists and Transmittal of Strategic Species List. Region 6, Portland, OR.

USDI (U.S. Fish and Wildlife Service). 1992. Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). U.S. Fish and Wildlife Service. Portland, Oregon.

USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDA Forest Service. 2008. Methodology for estimating the number of northern spotted owls affected by proposed federal actions. Version 2.0. Oregon Fish and Wildlife Office, Fish and Wildlife Service, Portland, OR.

USDA (U.S. Fish and Wildlife Service). 2008. Birds of conservation concern 2008. Division of Migratory Bird Management, Arlington, Virginia. 99pp. [Online version available at http://migratorybirds.fws.gov/reports/bcc2008.pdf.

USDI (U.S. Fish and Wildlife Service). 2009. Rocky Mountain Wolf Recovery 2009 Interagency Annual Report. C.A. Sime and E. E. Bangs, eds. USFWS, Ecological Services, Helena, Montana. http://westemgraywolf.fws.gov

USDI (U.S. Fish and Wildlife Service). 2011. Revised Recovery Plan for the Northern Spotted Owl, (*Strix occidentalis caurina*). U.S. Fish and Wildlife Service, Portland, Oregon. Xvi+258 pp.

USDA Forest Service. 1990a. Land and Resource Management Plan. Deschutes National Forest. Bend, Oregon.

USDA Forest Service. 1990b. Final Environmental Impact Statement, Land and Resource Management Plan. Deschutes National Forest. Bend, Oregon.

USDA Forest Service. 2010. Establishment Record for the Katsuk Butte Research Natural Area within the Deschutes National Forest, Deschutes County, Oregon. Deschutes National Forest. Bend, Oregon.

USDA Forest Service. 2011. A Cultural Resource Overview of the Deschutes/Ochoco RNA Projects. Heritage Stewardship Group. Bend, Oregon.

USDA Forest Service. 2011. Update of the Regional Forester's Sensitive Species Lists and Transmittal of Strategic Species List. Region 6, Portland, OR.

USDA Forest Service. 2012. Invasive Plant Treatments, Deschutes and Ochoco National Forests and Crooked River National Grassland, Final Environmental Impact Statement and Record of Decision,. Bend, Oregon.

Warren, A.D. 2005. Butterflies of Oregon: Their Taxonomy, Distribution, and Biology. Lepidoptera of North America 6. Contributions of the C.P. Gillette Museum of Arthropod Diversity. Colorado State University, Fort Collins, CO. 408 pp.

Waters, J.R. and C.J. Zabel. 1995. Northern flying squirrel densities in fir forests of northeastern California. Journal of Wildlife Management 59(4):858-866.

Waters, J.R., K.S. McKelvey, C.J. Zabel, and D. Luoma. 2000. Northern flying squirrel mycophagy and truffle production in fir forests in northeastern California. Gen. Tech. Rep. PSW-GTR-178. Arcata, CA. USDA Forest Service, Pacific Southwest Research Station.

Watson, J.W., K.R. McAllister. D.J. Pierce, and A. Alvarado. 2000. Ecology of a remnant population of Oregon spotted frogs (*Rana pretiosa*) in Thurston County, Washington. Final Report. Washington Department of Fish and Wildlife, Olympia, Washington.

Watson, J.W., K.R. McAllister, D.J. Pierce. 2003. Home ranges, movements, and habitat selection of Oregon spotted frogs (*Rana pretiosa*). Journal of Herpetology 37(2):292-300.

Wisdom, M.J.; S. Richard; B.C. Wales; et al. 2000. Source habitats for terrestrial vertebrates of focus in the interior Columbia basin: broad-scale trends and management implications. Volume 2-Group Results. Gen. Tech. Report PNW-GTR-485.

Xerces Society. 2012. Accessed at www.xerces.org (accessed 2/24/12)

Zabel, C.J., J.R. Dunk, H.B. Stauffer, L.M. Roberts, B.S. Mulder, and A. Wright. 2003. Northern spotted owl habitat models for research and management application in California. Ecological Applications 13(4):1027-1040.

Appendix A – Consideration of Public Comments

During the public comment period (October 17, 2014 – November 17, 2014), three responses were received from the following individuals or organizations: George Wuerthner, Doug Heiken (Oregon Wild), Karen Coulter (Blue Mountains Biodiversity Project). Some comments are specific to just one of the RNAs, but some comments apply to all of them. This appendix incorporates all of the comments and responses regardless of whether or not they applied to just one of the RNAs.

All comments have been considered during the decision-making process for the RNA Establishment Project. Although not a requirement for environmental assessments, the responses provided here are intended to briefly discuss all major points of view and to document if comments resulted in any changes to the environmental assessment. Statements may have been summarized or paraphrased to reduce paperwork. Full text of the comment letters are on file at the Bend/Ft. Rock Ranger District.

Comment: I strongly approve of creation of these RNAs. My only comment has to do with the Many Lakes proposed NRA. It is not clear to me why the northern boundary does not extend past Deer Lake to the Three Sisters Wilderness boundary. It would seem to me to make a more logical boundary and expansion of the NRA to include Deer Lake and the surrounding area would provide more protection to the NRA and its purposes....trying to make it as large as possible because I like to have "buffers" around these areas, and it seemed somewhat logical to just go north to the Wilderness boundary. (G. Wuerthner)

Response: Boundary modifications that are included in the EAs are for the purpose of making the boundaries more easily recognized and described. The changes result in a net increase of 157 acres in the Many Lakes RNA. The Forest did not see a need to expand the Many Lakes RNA boundary further as the existing area incorporates the ecological area to be represented (Many Lakes EA pp 4-5); the purpose and need does not include making the RNAs as large as possible. Additionally, the area between the proposed boundary and the Wilderness is within the Dispersed Recreation management allocation in the Forest Plan (Many Lakes EA Figure 2, p. 7). Existing recreation sites and uses in that area may not be consistent with the direction for RNAs.

Comment: I'm very supportive of the designation. The EAs should have discussed the long-term benefits for focal species due to the preservation of habitat. (K. Coulter)

Response: The EAs describe which species may be present or have habitat within each RNA. Because there is no expected change to any existing habitat from officially designating the RNAs, the effects analysis concludes that there will be no effect to species or their habitat. The long-term objectives of the RNAs are to provide sites for study of natural processes in undisturbed ecosystems that can be compared to similar environments where human activities occur and to provide gene pool preserves for plant and animal species.

Comment: Oregon Wild supports conservation of these four RNAs. We encourage the Forest Service to go further and protect more of the landscape within which these special natural areas are embedded.

The proposed Cultus River RNA could be expanded to include sections 16 and 17 between roads 46 and 4623. This would help maintain more intact forest and protect more of the watershed of the Cultus River headwaters. (D. Heiken)

Response: The Forest did not see a need to expand the Headwaters Cultus River RNA boundary further as the existing area incorporates the ecological area to be represented (HW Cultus EA pp 4-5). This RNA falls within the Cultus Late Successional Reserve (LSR). The LSR is intended to provide habitat for species that rely on late-successional habitat and any activities must be consistent with the direction in the LSR Assessment and Northwest Forest Plan. Much of the areas outside the RNA in Sections 16 and 17 are roaded and have been managed in the past, including timber harvest.

Comment: The proposed Katsuk Butte RNA could be expanded to include the similar and connected biophysical setting including all of Section 22 and most of section 27 (south of Katsuk Butte and west of Sparks Lake and extending west to the amazing spring complex at Quinn Meadows in the southeast portion of section 21. The proposed Many Lanes RNA could be expanded northward to include sections 26 and 21 thereby encompassing Deer Lake and the small lake west of Deer Lake. (D. Heiken)

Response: The original RNA boundaries were the result of extensive surveys to identify areas that met the needs of the Research Station to represent specific forest type or plant community. The Forest did not identify a need to enlarge the proposed RNA, only to modify the boundary to make it easier to identify and describe. The result is a net increase of 226 acres over the proposed Katsuk Butte RNA. The entire Katsuk Butte RNA and most of the surrounding area fall within an Inventoried Roadless Area where timber harvest and road building are not allowed.

Comment: The proposed Wechee Butte RNA is in a heavily managed part of the forest and should be expanded to include all contiguous native forest, such as in the extreme NW corner of section 28. The FS might even consider adding the adjacent butte in section 28 and doing appropriate restoration and recovery efforts to that contributes to RNA values. (D. Heiken)

Response: The Oregon Natural Heritage Plan identified a need for representation in an "undisturbed forested cinder cone at mid-elevation with ponderosa pine-lodgepole pine climax." The focus area proposed for designation is almost entirely free of disturbance, which fits the purpose of providing a site where the study of natural processes can occur and be compared against areas where human activities are occurring. The establishment of the Wechee Butte RNA does not affect the potential to conduct restoration in areas surrounding the RNA.

Comment: There appears to be a small OHV play area on the border between section 28 and 29 that needs to be closed so that OHVs do not intrude any further into the Wechee Butte RNA. (D. Heiken)

Response: This information has been provided to Central Oregon's Combined off Highway Vehicle Operations (COHVOPS), which manages OHV use on the Deschutes National Forest. There is no designated trail or play area in this area, so the use is not in compliance with the Travel Management Rule.

Comment: The cover of the Wechee Butte RNA EA says it's located in section 27, but it's in section 29. (D. Heiken)

Response: This is corrected in the Final EA.

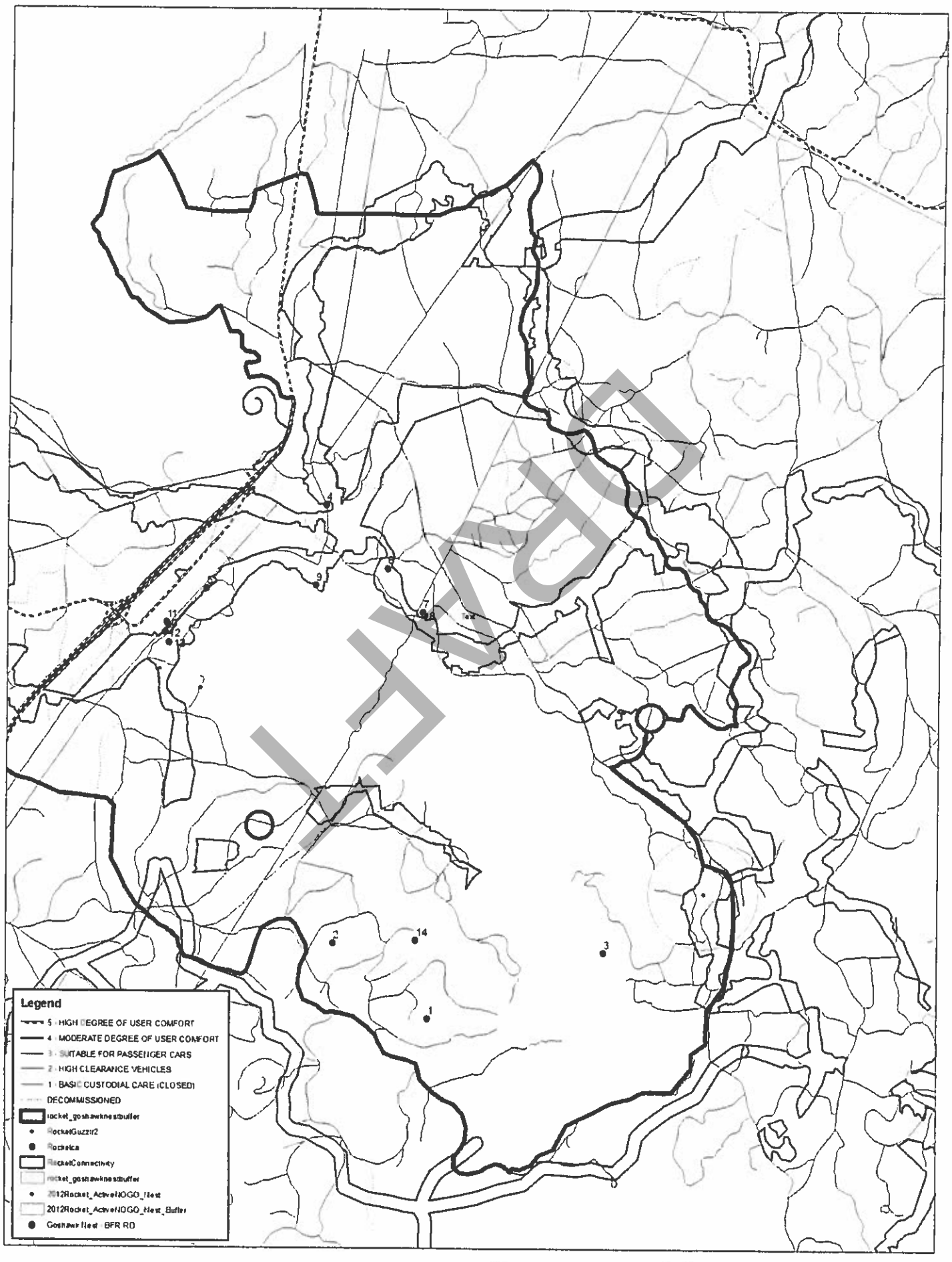
Comment: We strongly support standards for all RNAs that allow natural processes to function without significant intervention. As such, road building and logging must be prohibited. Native insects and disease and other natural disturbance processes are a natural and integral part of the ecosystem and should be allowed to play out. Forest health logging and salvage logging should not be practiced. Fire should be reintroduced in appropriate forest types to maintain stands.

Some of the proposed standards & guidelines include following the Deschutes LRMP standards for "forest health." This would be inappropriate because these standards are outdated. They label native insects "pests" and they focus too much on tree "vigor" when (from an ecological standpoint) mortality processes are just as important. (LRMP p 4-36). We recommend dropping this proposed standard "M2-23: Follow Forest-wide standards/guidelines for forest health." (D. Heiken)

Response: The system of RNAs was established with the goal of preserving natural features and plant communities for research and education purposes (Cultus Headwaters EA p. 4). Therefore timber harvest, including salvage harvest is not allowed (S&Gs M2-4, M2-5, M2-6). The S&Gs do allow for the use of fire where appropriate and prescribed fire has been used in established RNAs such as the Pringle Falls RNA (see http://www.fsl.orst.edu/rna/sites/Pringle_Falls.html for a photo of burning in the Pringle Falls RNA). This web site also provides information on all RNAs in the system across the country, including the research that has been conducted.

Comment: The designation of these RNAs should not trump the protective standards that may already be in place, such as for riparian reserves, Late Successional Reserves and inventoried roadless areas. (D. Heiken)

Response: Three of the new RNAs fall within the Northwest Forest Plan, and overlapping layers of protective management direction are in place. Headwaters Cultus River and Many Lakes RNAs fall within an LSR (see Headwaters Cultus EA p. 10), and Katsuk Butte and Many Lakes RNAs fall within Inventoried Roadless Areas (also page 10 of each of those EAs). Standards and guidelines that are consistent with those for RNAs (e.g. timber harvest is not allowed in the RNAs, regardless of direction for silviculture in LSRs under the Northwest Forest Plan) are applicable, including Riparian Reserve standards and guidelines. This has been clarified within Chapter 2 of the EAs and the map of management allocations has been updated to display NWFP allocations.


Legend
5 - HIGH DEGREE OF USER COMFORT
4 - MODERATE DEGREE OF USER COMFORT
3 - SUITABLE FOR PASSENGER CARS
2 - HIGH CLEARANCE VEHICLES
1 - BASIC CUSTODIAL CARE (CLOSED)
DECOMMISSIONED
rocket_goshawknestbuffer
RocketGuzzi2
Rockelca
RocketConnectivity
rocket_goshawknestbuffer
2012Rocket_ActiveNOGO_Nest
2012Rocket_ActiveNOGO_Nest_Buffer
Goshawk Nest - BFR RD
0
0.5
1
2 Miles