

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

Establishment Record

For

HAGAN RESEARCH NATURAL AREA

Willamette National Forest

Lane County, Oregon



SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Hagan Research Natural Area

Willamette National Forest

Lane County, Oregon

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

Prepared by: Bruce Newhouse Date 4/15/97
Bruce Newhouse, AICP, Salix Associates

Recommended by: Lynn Burditt Date 3/28/97
Lynn Burditt, District Ranger, Blue River District

Recommended by: Darrel Kenops Date 3/24/97
Darrel Kenops, Forest Supervisor, Willamette National Forest

Concurrence of: Thomas J. Mills Date 5/1/97
Thomas J. Mills, Station Director, Pacific Northwest Research Station

TITLE PAGE

**Establishment Record
for
Hagan Research Natural Area
within
Willamette National Forest
Lane County, Oregon.**

INTRODUCTION

The proposed Hagan Research Natural Area (RNA), in the Willamette National Forest (WNF), comprises an entire watershed containing first to third order streams, and a variety of western hemlock (*Tsuga heterophylla*) and Douglas-fir (*Pseudotsuga menziesii*) plant associations. The area is characterized by deeply dissected topography, steep slopes, and vegetation typical of large areas of the western Cascades that are important for timber production, maintenance of biological diversity, and watershed values. The forest of the RNA is of two distinct age classes, having originated following fires in about 1855 and 1895 (Klopsch 1986). It is a uniform stand dominated almost entirely by Douglas-fir.

Pre-historic and historic use of the RNA and surrounding area has been light, probably because of the rugged terrain. In recent decades, timber harvest has occurred on private lands to the north and west (Berglund, pers. comm.). It is likely that Native Americans from the Willamette Valley passed through the area of the RNA on their way to huckleberry picking areas at Gold Hill to the north, although their use of the RNA itself was probably minor. A 1912 map shows a fire lookout on Mt. Hagan, approximately two miles south of the RNA. Also shown is a road along Gate Creek just to the north that was probably a route to the Gold Hill mining area.

Current use of the RNA includes an active program of research on permanent plots to investigate the dynamics of tree growth and mortality, understory vegetation, and riparian ecosystem processes. The only other known use of the RNA is occasional hunting near roads along the south and east boundaries.

The lands within the RNA are entirely in National Forest ownership. Lands northwest of the RNA are a mixture of National Forest and private ownership with the private lands bordering the RNA in four locations along the northwest boundary. All other surrounding lands are National Forest lands. No part of the RNA is within a wilderness area, wild and scenic river area, national recreation area, or any other Congressionally designated area.

Land Management Planning

The Hagan RNA is designated as an RNA in the WNF Land and Resource Management Plan (LRMP) (WNF 1990). The plan contains objectives and management guidelines applicable to all RNAs within the Forest (Appendix A).

OBJECTIVES

The objective of the establishment of the Hagan RNA is to preserve a forested watershed in the western hemlock zone containing first to third order streams. The area is typical of forested watersheds in the important timber-producing areas of the western Cascade Mountains of Oregon, and will provide baseline data for comparison with lands managed intensively for timber production. The adjacent watershed of the south fork of Hagan Creek provides an opportunity to compare the effects of timber harvest, road building and other management activities on upland

forest, riparian forest and aquatic ecosystems in a similar area to undisturbed ecosystems in the RNA. The RNA will serve as a reference area for the study of successional processes and the development of old growth characteristics in mature forests and riparian ecosystems.

Since the late 1970's, research has been conducted in the RNA by researchers and graduate students supported by the Long Term Ecological Research (LTER) program based at Oregon State University and the H. J. Andrews Experimental Forest. Studies in the RNA have investigated characteristics of old growth wildlife habitat, successional dynamics of upland forests and riparian vegetation, and tree growth and mortality. Studies of sediment routing in disturbed and undisturbed watersheds have been conducted using the RNA as the undisturbed watershed. Permanent research plots installed under the LTER program will provide information about long-term changes in ecosystems within the RNA. The RNA offers the opportunity to study mature forest stands in age classes not present in the nearby H. J. Andrews Experimental Forest.

The designation of the RNA will preserve the genetic diversity of an extensive Douglas-fir forest that regenerated naturally following forest fires.

JUSTIFICATION STATEMENT FOR ESTABLISHMENT OF AREA

The Hagan RNA fills stated needs in the Oregon Natural Heritage Plan (Appendix B) for a western hemlock/salal-Oregongrape community (Terrestrial Ecosystems - West Slope and Crest, Oregon Cascades) and for a first to third order stream system in the Western Hemlock Zone of the northern Cascades (Aquatic Ecosystems - West Slope and Crest, Oregon Cascades). An active program of long-term ecological research, proximity to the H. J. Andrews Experimental Forest and similarity to commercially important forest lands of the western Cascades add to its value for basic and applied ecological research.

PRINCIPAL DISTINGUISHING FEATURES

The principal distinguishing features of the Hagan RNA are:

1. Nearly pure, mature Douglas-fir forest of two age classes, representing a variety of plant associations in the Western Hemlock Zone;
2. A watershed containing first, second and third order streams;
3. A similar watershed adjacent to the RNA suitable for comparison of the effects of timber harvest and other management activities on ecosystem processes;
4. Ongoing research activities within the RNA, and proximity of a major forest research facility at the H. J. Andrews Experimental Forest.

LOCATION

The Hagan RNA is located in the Blue River Ranger District of the Willamette National Forest.

- The approximate center of the RNA is at latitude 44° 10' north and longitude 122° 25' west. It occupies portions of sections 11, 12, 13, 14, 15, 22, 23, and 24 within Township 16 South, Range 3 East, Willamette Meridian, Oregon.

Boundary

The boundaries of the Hagan RNA are shown on Map 3 (provided by WNF, Geometronics and Geographic Mapping Division 1997).

Area

The total area of the Hagan RNA is 1126 acres (456 ha).

Elevation

Elevations within the RNA range from approximately 1520 feet (463 m) where the north fork of Hagan Creek exits the southwest corner of the area, to 3510 feet (1070 m) on the ridge forming the boundary at the northeast corner. The total vertical difference between lowest and highest points is approximately 1990 feet (607 m).

Access

The Hagan RNA is located in the central Cascades of western Oregon approximately 35 air miles (56 km) east of Eugene, Oregon and 4 air miles (6 km) west of Blue River, Oregon. Access routes to the RNA are illustrated on Map 2. The RNA may be reached from the south by going west from Blue River approximately 8 miles (13 km) on State Highway 126 to Forest Service Road 2611 (West Hagan Mountain Road). Turn north on Road 2611 and drive approximately 7.5 miles (12 km) to where it splits into spurs 2611-080 and 2611-090. The RNA is bounded on the east by spur 2611-080 and on the south by spur 2611-090. A trail originates at the north end of spur 2611-080 providing access to the ridgeline that forms the eastern and northern boundaries of the RNA.

Access to the west and north sides of the RNA is by the Lower Gate Creek Road. This road is owned by the Giustina Land and Timber Company and has two locked gates. Permission to pass should be obtained from Giustina (1991 W. 2nd, Eugene; Tel: 541-345-2301). A gate key may be obtained from Giustina or from the H. J. Andrews Experimental Forest. From Blue River, drive west on State Highway 126 15 miles (24 km) to Vida. Turn north on the Gate Creek Road at Vida and drive 8.2 miles (13.2 km) to where there is a large bigleaf maple marked with flagging on the south side of the road. A trail originates at this point, crosses the south fork of Gate Creek and follows Hagan Creek about 1 mile (1.6 km) to the western boundary of the RNA at the confluence of the north and south forks of the creek. The trail continues up the north fork providing access to the lower elevations of the RNA.

To reach the northern boundary of the RNA continue 6.4 miles (10.3 km) on Upper Gate Creek Road around the head of the Gate Creek drainage and onto the north side of the ridge that forms the northern boundary of the RNA. At this point a short, steep trail leaves the south side of the road and gives access to the ridgeline trail and middle and upper elevations in the RNA.

Lower elevations are accessible year-round by gravel road and by trail. Gravel roads leading to upper elevations in the RNA are open during the snow-free months. Truck traffic may be heavy on any of the roads leading to the RNA, and appropriate caution should be exercised when travelling on them.

Maps

The Willamette National Forest Visitor Map (1990) illustrates the described access routes to the RNA. This map is available at the WNF Supervisor's Office in Eugene, Oregon and at all WNF ranger district offices.

The USGS 7.5 minute map of the Mt. Hagan, Ore. quadrangle covers the RNA. This map shows topographic features at a scale of 1:24,000 with contour intervals of 40 feet (12.2 m). It is available from the USGS and at many bookstores.

The Blue River Ranger District map is available at the Blue River Ranger District office in Blue River, Oregon. The McKenzie Resource Area map for the Eugene District of the Bureau of Land Management (BLM) is available from the Eugene District office in Eugene, Oregon. These maps have the most current road and trail information.

AREA BY COVER TYPE

The Hagan RNA comprises a single Society of American Foresters (SAF) forest cover type (Eyre 1980), and a single Kuchler vegetation cover type (Kuchler 1966). The SAF forest cover type is illustrated in Map 4. Two forest series (Hemstrom et al. 1987) occur within the RNA, although the areas occupied by the Douglas-fir series (portions of warmer south-facing slopes) are too small and scattered to quantify. Acreages of each Kuchler cover type, SAF forest cover type, and forest series are given in the following table:

<u>Kuchler Cover Types</u>		<u>Acres</u>	<u>Hectares</u>
2	Cedar-hemlock-Douglas-fir (<i>Thuja-Tsuga-Pseudotsuga</i>)	1126	456
Total		1126	456

<u>SAF Cover Types</u>	<u>Acres</u>	<u>Hectares</u>
229 Pacific Douglas-fir	1126	456
Total	1126	456

<u>Forest Series</u>	<u>Acres</u>	<u>Hectares</u>
Western hemlock	1126	456
Douglas-fir	Trace	Trace
Total	1126	456

PHYSICAL AND CLIMATIC CONDITIONS

The Hagan RNA consists of a deeply dissected west-facing drainage at low to middle elevations in the western Cascades. The terrain is generally quite steep, especially on north-facing slopes near stream bottoms. Landforms in the RNA are the result of mass wasting processes (landslides and soil creep) coupled with stream erosion (McKee et al. 1977). The area contains first to third order streams that form the headwaters of the north fork of Hagan Creek. These streams originate from two small valleys separated by an east-west running ridge in the upper reaches of the watershed. Valley bottoms are generally narrow and V-shaped, although wider valley bottoms occasionally occur along the lower third of Hagan Creek.

The climate of the western Cascades is maritime (Franklin and Dyrness 1973) with dry summers and cool, wet winters. According to Bierlmaier and McKee (1989) precipitation from cyclonic winter storms is directed at the region by the polar jet stream. In summer, the jet stream shifts to the north and high pressure dominates. Approximately 70 percent of the annual precipitation falls between November 1 and March 31. Precipitation may fall either as rain or snow with significant accumulations of snow common in the upper elevations of the RNA, and rare at lower elevations. Mountainous topography causes the amount of precipitation to vary greatly over short distances, thus nearby weather stations may not accurately represent the climatic conditions of the RNA.

The following tables present data from the nearest weather station at a similar elevation. The H. J. Andrews station (Bierlmaier and McKee 1989), with 14 years of weather data, is located 8 miles (12.9 km) east of the RNA at an elevation of 1398 feet (426 m). Precipitation and temperature data are incomplete for some months.

CLIMATE DATA FOR H. J. ANDREWS EXPERIMENTAL FOREST, OREGON

Elevation: 1398 feet (426 meters)

PRECIPITATION

Mean annual total = 89.67 inches (2278 millimeters)

Month	Mean		Maximum Total		Minimum Total		Record Length years
	in	mm	in	mm	in	mm	
January	11.65	296	19.21	488	3.19	81	12
February	12.17	309	18.54	471	4.13	105	12
March	10.20	259	16.46	418	3.27	83	12
April	5.94	151	9.09	231	3.32	59	12
May	4.09	104	7.95	202	0.79	20	12
June	2.91	74	7.36	187	0.83	21	13
July	0.71	18	2.48	63	0.00	0	13
August	1.69	43	3.82	97	0.04	1	13
September	2.99	76	6.81	173	0.00	0	13
October	6.57	167	13.43	341	0.94	24	13
November	14.02	356	27.32	694	2.76	70	13
December	16.73	425	29.53	750	2.91	74	14

TEMPERATURE

Month	Mean		Maximum Mean		Minimum Mean		Record Length years
	°F	°C	°F	°C	°F	°C	
January	42.4	5.8	45.3	7.4	39.7	4.3	12
February	45.0	7.2	50.7	10.4	39.7	4.3	12
March	49.5	9.7	56.5	13.6	46.4	8.0	12
April	54.5	12.5	63.0	17.2	48.2	9.0	12
May	58.1	14.5	63.0	17.2	51.8	11.0	12
June	60.3	15.7	67.8	19.9	54.0	12.2	13
July	66.2	19.0	72.1	22.3	55.9	13.3	13
August	66.0	18.9	75.2	24.0	56.8	13.8	13
September	63.7	17.6	73.9	23.3	54.3	12.4	13
October	55.6	13.1	68.2	20.1	44.8	7.1	13
November	43.9	6.6	48.9	9.4	38.7	3.7	13
December	39.9	4.4	43.2	6.2	32.4	0.2	14

DESCRIPTION OF VALUES

Flora

The Hagan RNA is located in the Western Hemlock Zone of the Western Cascades Province described by Franklin and Dyrness (1973). The area is densely forested by stands of mature Douglas-fir. Most of the plant associations in the RNA are in the western hemlock forest series (Hemstrom et al. 1987) with small areas of plant associations in the Douglas-fir series. The following plant associations occur within the RNA (Klopsch 1986). They are listed generally in order from the moistest associations to the driest:

- western hemlock/devil's club
- western hemlock/Oregon oxalis
- western hemlock/sword-fern
- western hemlock/dwarf Oregongrape/Oregon oxalis
- western hemlock/dwarf Oregongrape
- western hemlock/dwarf Oregongrape-salal
- western hemlock/salal
- Douglas-fir/oceanspray/grass

The most common plant associations are western hemlock/dwarf Oregongrape, western hemlock/dwarf Oregongrape-salal, and western hemlock/salal. These associations occur on sites with intermediate moisture regimes. Plant associations of moister sites are found in riparian zones and seepy areas, and the more xeric associations are located on dry south slopes and ridge tops.

The Douglas-fir forest of the Hagan RNA is made up of stands of two distinct age classes. These resulted from fires that burned through the area in about 1855 and 1895 (Klopsch 1986). Klopsch hypothesizes, based on old growth remnants in areas near the RNA, that the forest that burned in the RNA in 1855 was about 300 years old. Most of the northern two-thirds of the RNA is occupied by stands of the 1895 age class. This includes all south-facing slopes in the RNA. Stands of the older (1855) age class, and mixed age stands, occur in the southern third of the area, mostly on north-facing slopes. Klopsch found that Douglas-fir accounts for 90% of the trees in the younger stands and 77% in the older stands. The younger stands also contain more early successional hardwoods, such as bitter cherry (*Prunus emarginata*), and fewer later successional species, such as western hemlock and Pacific dogwood (*Cornus nuttallii*). Although western redcedar (*Thuja plicata*) trees are very rare in the RNA, cedar logs and snags are scattered through much of the area, indicating that the species was more common before the fires of the 1800's.

In addition to the tree species listed above, upland forests in the RNA contain giant chinkapin (*Castanopsis chrysophylla*), sugar pine (*Pinus lambertiana*), Pacific yew (*Taxus brevifolia*) and bigleaf maple (*Acer macrophyllum*). Common understory shrubs are salal (*Gaultheria shallon*), dwarf Oregongrape (*Berberis nervosa*), Pacific rhododendron (*Rhododendron macrophyllum*), vine maple (*Acer circinatum*) and red huckleberry (*Vaccinium parvifolium*).

Common herbs include sword-fern (*Polystichum munitum*), Oregon oxalis (*Oxalis oregana*), beargrass (*Xerophyllum tenax*) and bracken (*Pteridium aquilinum*).

Forests along the spur roads on the south and east edges of the RNA were selectively logged in the early 1970's or late 1960's (Geary, pers. comm.). As a result, the stands bordering these roads are open with dense understories of vine maple. Locations of selectively logged areas are shown in Appendix C.

Riparian zones, especially at lower elevations in the RNA, are dominated by red alder (*Alnus rubra*) and black cottonwood (*Populus trichocarpa*). This overstory is beginning to be overtopped in some areas by Douglas-fir, indicating the riparian zones are probably in transition from hardwood-dominated to conifer-dominated systems. The riparian shrub layer includes stink currant (*Ribes bracteosum*), salmonberry (*Rubus spectabilis*) and devil's club (*Oplopanax horridum*). The herb component is relatively rich and includes an abundance of fern species such as lady-fern (*Athyrium filix-femina*), maidenhair fern (*Adiantum pedatum*), deer-fern (*Blechnum spicant*), and mountain wood-fern (*Dryopteris austriaca*).

Two recent mapping projects have identified old growth forests on the Willamette National Forest. The "Old Growth Forests Within the Douglas-Fir Region" map (WNF no date) identifies the forests of the Hagan RNA and surrounding area as "other conifer, Douglas-fir-western hemlock," which does not meet the stated old growth definition. The "Ancient Forest Existing in 1990" map produced by The Wilderness Society (1991) shows portions of the RNA and surrounding areas as "Ancient Forest Below 3000 Feet" (914 m).

No federally listed or candidate threatened or endangered plant species have been found in the Hagan RNA (McMahon and Dimling, pers. comm.). Potential habitats for the following plants listed in the WNF Sensitive Plant Field Guide (Dimling 1992) are present within the RNA.

<u>Sensitive Species</u>	<u>Habitat</u>
fir clubmoss (<i>Lycopodium selago</i>)	streamside in dense moist woods to wet cliffs/talus
tall bugbane (<i>Cimicifuga elata</i>)	moist woods
loose-flowered bluegrass (<i>Poa laxiflora</i>)	moist woods to streamside

None of the above plants have been documented on the Blue River Ranger District, but they should be sought prior to any research or management activity that could affect them.

The following table lists plants documented within the RNA by research projects and field inventories conducted between the late 1970's and 1992.

Flora of Hagan RNA²

LATIN NAME	COMMON NAME
TREES	
<i>Abies procera</i>	noble fir
<i>Acer circinatum</i>	vine maple
<i>Acer glabrum</i>	Rocky Mountain maple
<i>Acer macrophyllum</i>	bigleaf maple
<i>Alnus rubra</i>	red alder
<i>Alnus sinuata</i>	Sitka alder
<i>Amelanchier alnifolia</i>	western serviceberry
<i>Arbutus menziesii</i>	Pacific madrone
<i>Castanopsis chrysophylla</i>	giant chinkapin
<i>Cornus nuttallii</i>	Pacific dogwood
<i>Corylus cornuta</i> var. <i>californica</i>	California hazel
<i>Pinus lambertiana</i>	sugar pine
<i>Populus trichocarpa</i>	black cottonwood
<i>Prunus emarginata</i>	bitter cherry
<i>Pseudotsuga menziesii</i>	Douglas-fir
<i>Rhamnus purshiana</i>	cascares buckthorn
<i>Rhododendron macrophyllum</i>	Pacific rhododendron
<i>Salix scoulerana</i>	Scouler willow
<i>Salix sitchensis</i>	Sitka willow
<i>Sambucus cerulea</i>	blue elder
<i>Sambucus callicarpa</i>	Pacific red elder
<i>Taxus brevifolia</i>	Pacific yew
<i>Thuja plicata</i>	western redcedar
<i>Tsuga heterophylla</i>	western hemlock
SHRUBS	
<i>Arctostaphylos columbiana</i>	bristly manzanita
<i>Berberis aquifolium</i>	tall Oregongrape
<i>Berberis nervosa</i>	dwarf Oregongrape
<i>Ceanothus velutinus</i>	snowbrush
<i>Chimaphila menziesii</i>	little pipsissewa
<i>Chimaphila umbellata</i> var. <i>occidentalis</i>	prince's-pine
<i>Cornus stolonifera</i>	creek dogwood

² Moss nomenclature follows Vitt, et al. (1988). Nomenclature for trees follows Little (1979). Other plant nomenclature follows Hitchcock and Cronquist (1973). List is a composite of unpublished lists compiled by LTER (1982), Fitz (1979), and Salix Associates (16 March and 15 September 1992).

Gaultheria shallon
Holodiscus discolor
Lonicera ciliosa
Oemleria cerasiformis
Oplopanax horridum
Pachistima myrsinites
Rhus diversiloba
Ribes bracteosum
Ribes lacustre
Ribes sanguineum
Ribes viscosissimum
Rosa gymnocarpa
Rubus lasiococcus
Rubus nivalis
Rubus parviflorus
Rubus spectabilis
Rubus ursinus
Symphoricarpos mollis
Vaccinium alaskaense
Vaccinium membranaceum
Vaccinium parvifolium
Whipplea modesta

salal
creambush ocean-spray
trumpet honeysuckle
Indian plum
devil's club
Oregon boxwood
poison oak
stink currant
swamp gooseberry
red currant
sticky currant
baldhip rose
dwarf bramble
snow bramble
thimbleberry
salmonberry
dewberry
creeping snowberry
Alaska blueberry
thin-leaved blueberry
red huckleberry
yerba de selva

FORBS

Achillea millefolium
Achlys triphylla
Actaea rubra
Adenocaulon bicolor
Agoseris sp.
Allotropa virgata
Anaphalis margaritacea
Anemone deltoidea
Anemone lyallii
Anemone oregana
Angelica argenta
Apocynum androsaemifolium
Aquilegia formosa
Aralia californica
Arenaria macrophylla
Artemisia cana
Aruncus sylvester
Asarum caudatum
Boykinia elata
Calypso bulbosa

yarrow
vanillaleaf
baneberry
pathfinder
agoseris
candystick
common pearly-everlasting
threeleaf anemone
Lyll's anemone
Oregon anemone
Lyll's angelica
spreading dogbane
red columbine
western aralia
bigleaf sandwort
silver sagebrush
sylvan goatsbeard
wild ginger
slender boykinia
fairy-slipper

Campanula scouleri	Scouler's harebell
Cardamine angulata	angled bittercress
Cardamine breweri	Brewer's bittercress
Cardamine pulcherrima	slender toothwort
Castilleja sp.	paintbrush
Circaea alpina	enchanter's nightshade
Claytonia lanceolata	lanceleaf springbeauty
Clintonia uniflora	queen's cup
Collomia heterophylla	varied-leaf collomia
Coptis laciniata	cutleaf goldthread
Corallorhiza maculata	Pacific coral-root
Corallorhiza mertensiana	western coral-root
Cornus canadensis	bunchberry
Corydalis scouleri	Scouler's corydalis
Crepis capillaris	smooth hawksbeard
Dicentra formosa	Pacific bleedingheart
Disporum hookeri var. oreganum	Hooker fairy-bell
Disporum smithii	fairy lantern
Eburophyton austinae	phantom-orchid
Epilobium angustifolium	fireweed
Epilobium minutum	small-flowered willow-herb
Epilobium paniculatum	autumn willow-herb
Epilobium watsonii	Watson's willow-herb
Fragaria vesca	woods strawberry
Fragaria virginiana var. platypetala	broadpetal strawberry
Galium aparine	cleavers
Galium oreganum	Oregon bedstraw
Galium triflorum	several-flowered bedstraw
Goodyera oblongifolia	western rattlesnake-plantain
Hemitomes congestum	gnome-plant
Heracleum lanatum	cow-parsnip
Heuchera micrantha	smallflowered alumroot
Hieracium albiflorum	white-flowered hawkweed
Hydrophyllum occidentale	western waterleaf
Hydrophyllum tenuipes	Pacific waterleaf
Hypopitys monotropa	pinemap
Iris chrysophylla	slender-tubed iris
Iris tenax	Oregon iris
Lactuca biennis	tall blue lettuce
Lactuca muralis	wall lettuce
Lathyrus nevadensis	peavine
Lilium columbianum	tiger lily
Linnaea borealis	twinflower
Linum micranthum	small-flowered white flax
Listera caurina	western twayblade

Listera cordata
Lithophragma parviflora
Lotus corniculatus
Lotus micranthus
Lotus nevadensis var. douglasii
Lupinus latifolius
Madia radioides
Microsteris gracilis var. gracilis
Mitella breweri
Mitella ovalis
Monotropa uniflora
Montia parvifolia
Montia perfoliata
Montia sibirica
Osmorhiza chilensis
Oxalis oregana
Oxalis suksdorfii
Oxalis trilliifolia
Penstemon serrulatus
Petasites frigidus

heart-leaf twayblade
smallflower prairie star
birdsfoot-trefoil
small-flowered deervetch
Nevada deervetch
broadleaf lupine
woodland tarweed
pink microsteris
Brewer's mitrewort
oval-leaved mitrewort
Indian-pipe
littleleaf montia
miner's lettuce
western springbeauty
mountain sweet-root
Oregon oxalis
western yellow oxalis
great oxalis
coast penstemon
sweet coltsfoot

Phacelia heterophylla
Phacelia hastata
Pleuricospora fimbriolata
Potentilla glandulosa
Pterospora andromedea
Pyrola aphylla
Pyrola asarifolia
Pyrola picta
Pyrola secunda var. secunda
Ranunculus uncinatus var. parviflorus
Rorippa nasturtium-aquaticum
Saxifraga sp.
Scoliopus hallii
Sedum oreganum
Senecio bolanderi
Senecio jacobaea
Senecio sylvaticus
Smilacina racemosa
Smilacina stellata
Stachys cooleyae
Stellaria crispa
Stellaria media
Streptopus amplexifolius
Streptopus roseus

varileaf phacelia
whiteleaf phacelia
Sierra-sap
sticky cinquefoil
woodland pinedrops
leafless pyrola
alpine pyrola
white vein pyrola
one-sided wintergreen
little buttercup
water-cress
saxifrage
Oregon fetid adder's-tongue
oregon stonecrop
Bolander's groundsel
tansy ragwort
wood groundsel
false Solomon's seal
star-flowered Solomon's seal
Cooley's hedge-nettle
crisped starwort
chickweed
clasping-leaved twisted-stalk
rosy twisted-stalk

Synthyris reniformis
Taraxacum officinale
Tellima grandiflora
Thalictrum occidentale
Thalictrum polycarpum
Tiarella trifoliata var. trifoliata
Tiarella trifoliata var. unifoliata
Tolmiea menziesii
Trientalis latifolia
Trifolium microcephalum
Trillium ovatum
Vancouveria hexandra
Vicia americana
Viola glabella
Viola sempervirens
Xerophyllum tenax

snow-queen
common dandelion
fringecup
western meadowrue
tall western meadowrue
trefoil foamflower
coolwort foamflower
youth-on-age
western starflower
woolly clover
white trillium
white inside-out-flower
American vetch
stream violet
redwoods violet
beargrass

SEDGES and RUSHES

Carex deweyana
Carex hendersonii
Carex mertensii
Carex rossii
Luzula campestris
Luzula divaricata
Luzula parviflora

Dewey's sedge
Henderson's sedge
Merten's sedge
Ross' sedge
field woodrush
spreading woodrush
smallflowered woodrush

GRASSES

Agrostis scabra
Bromus vulgaris
Calamagrostis inexpansa
Dactylis glomerata
Elymus glaucus
Festuca occidentalis
Festuca rubra
Festuca subulata
Festuca subuliflora
Glyceria elata
Hierochloa occidentalis
Lolium perenne
Melica harfordii
Melica subulata
Trisetum canescens

winter bentgrass
Columbia brome
narrow-spiked reedgrass
orchard-grass
blue wildrye
western fescue
red fescue
bearded fescue
crinkle awn fescue
tall mannagrass
California sweetgrass
perennial ryegrass
Harford's melic
Alaska oniongrass
tall trisetum

FERNS and ALLIES

Adiantum pedatum
Athyrium filix-femina
Blechnum spicant
Cheilanthes gracillima
Cryptogramma crista
Cystopteris fragilis
Dryopteris austriaca
Equisetum arvense
Equisetum telmateia var. *braunii*
Gymnocarpium dryopteris
Polypodium glycyrrhiza
Polypodium hesperium
Polystichum munitum
Polystichum lonchitis
Pteridium aquilinum

northern maidenhair fern
lady-fern
deer-fern
lace lip-fern
rock-brake
brittle bladder-fern
mountain wood-fern
common horsetail
giant horsetail
oak-fern
licorice-fern
common polypody
sword-fern
mountain holly-fern
bracken

MOSSES and LIVERWORTS

Dicranum sp.
Eurynchium oreganum
Hylocomium splendens
Leucolepis menziesii
Marchantia sp.
Plagiomnium insigne
Plagiothecium undulatum
Porella sp.
Rhizomnium glabrescens
Rhytidiadelphus loreus
Rhytidiadelphus triquetrus

Fauna

Wildlife species in the Hagan RNA have not been systematically inventoried or studied. The RNA contains potential foraging and dispersal habitat for the northern spotted owl (*Strix occidentalis caurina*) (Seitz, pers. comm.), which is federally listed as threatened. As the forest of the RNA develops old growth characteristics, it will provide nesting habitat and other late-successional habitat for this species. No northern spotted owl surveys have been conducted and no spotted owls have been documented inside the RNA, although individuals of the species have been verified in forests of surrounding lands (Seitz, pers. comm.). The entire RNA and the adjacent south fork of Hagan Creek are contained within a Late Successional Reserve (RO207) (USDA Forest Service 1994), under the system currently applied by the Forest Service. It is within Critical Habitat for the northern spotted owl as delineated by the U.S. Fish and Wildlife Service (Seitz, pers. comm.).

The Hagan RNA also contains habitat for marten (*Martes americana*), a WNF old growth indicator species that has been documented in the area (Seitz, pers. comm.). At present, forests in the RNA probably do not contain adequate snags and logs to provide optimum denning and foraging habitat for marten. These habitat features will become more common as stand age increases.

The following table lists the vertebrate species known to use the Hagan RNA for at least a portion of the year. The list is compiled from direct observation of the animals or obvious sign. Comprehensive sampling has not been conducted within the RNA and additional species are likely to be present.

Fauna of Hagan RNA³

<u>LATIN NAME</u>	<u>COMMON NAME</u>
FISH	
Onchorynchus clarki	cutthroat trout
Onchorynchus salar	rainbow trout
AMPHIBIANS and REPTILES	
Taricha granulosa	roughskin newt
BIRDS	
Dendragapus obscurus	blue grouse
Ceryle alcyon	belted kingfisher
Colaptes auratus	northern flicker
Picoides villosus	hairy woodpecker
Dryocopus pileatus	pileated woodpecker
Cyanocitta stelleri	Steller's jay
Corvus corax	common raven
Parus atricapillus	black-capped chickadee
Sitta canadensis	red-breasted nuthatch
Troglodytes troglodytes	winter wren
Regulus satrapa	golden-crowned kinglet
Ixoreus naevius	varied thrush
Junco hyemalis	dark-eyed junco
MAMMALS	
Aplodontia rufa	mountain beaver
Eutamias townsendi	Townsend chipmunk
Tamiasciurus douglasii	chickaree
Martes americana	North American marten
Euarctos americana	black bear
Cervus elaphus roosevelti	Roosevelt elk
Odocoileus hemionus columbianus	black-tailed deer

³Nomenclature follows Page and Burr (1991) for fish, Nussbaum et al. (1983) for reptiles and amphibians, Scott (1987) for birds and Maser et al. (1984) for mammals. Fish species were reported in McKee et al. (1977). Hairy woodpecker, pileated woodpecker, and marten sightings are from Blue River Ranger District records (Seitz, pers. comm.). All other species were documented by Salix Associates 16 March and 15 September 1992.

Geology

Geomorphic surfaces in the RNA appear to be post-Pleistocene in age, with landforms resulting from mass wasting processes (landslides and soil creep) coupled with stream erosion (McKee et al. 1977). Bedrock in the RNA is composed of tertiary volcanic rocks. Peck et al. (1964) maps the bedrock in the Little Butte Volcanic Series, which originated during the Oligocene and early Miocene. This formation is made up of beds of andesitic and dacitic tuff with small amounts of flows and breccias of olivine basalt and andesite. More recently, Walker and Duncan (1989) and Walker and MacLeod (1991) mapped the area as "undifferentiated tuffaceous sedimentary rocks, tuffs, and basalt," described as follows:

Heterogeneous assemblage of continental, largely volcanogenic deposits of basalt and basaltic andesite, including flows and breccia, complexly interstratified with epiclastic and volcaniclastic deposits of basaltic to rhyodacitic composition. Includes extensive rhyodacitic to andesitic ash-flow and air-fall tuffs, abundant lapilli tuff and tuff breccia, andesitic to dacitic mudflow (lahar) deposits, poorly bedded to well-bedded, fine- to coarse-grained tuffaceous sedimentary rocks and volcanic conglomerate. Originally included in Little Butte Volcanic Series (Peck et al. 1964)...Lower parts of unit exhibit low-grade metamorphism with primary constituents altered to clay minerals, calcite, zeolites (stilbite, laumontite, heulandite), and secondary silica minerals. In contact aureoles adjacent to stocks and larger dikes of granitic and dioritic composition or in areas of andesitic dike swarms, both wallrocks and intrusions are pervasively propylitized; locally rocks also have been subjected to potassic alteration...Most ages from basalt and basaltic andesite are in the range of 35 to 18 million years.

Soils

The Willamette National Forest Soil Resource Inventory (SRI) was completed in 1973 (Legard and Meyer) and updated in 1990. Three soil mapping units, representing three landtypes, occur within the Hagan RNA. One or two digit mapping units consist of at least 70% of a single landtype of the same number, and up to 30% of other landtypes. Mapping unit 212 is composed of 60% landtype 21 and 40% landtype 23. Land type 21 and mapping unit 212 have been identified as extremely unstable on slopes that exceed 60% (McSwain, pers. comm.). The following descriptions are from the SRI (Legard and Meyer 1973).

- Landtype 8 Steep dissected landforms from green and red breccias and tuffs. Soil materials consist of residuum and colluvium and may range from less than one foot deep along ridge tops to more than 20 feet deep along drainages. Soil drainage, texture, coarse fragment content, and depth are highly variable. Occasional dikes and sills of andesite and basalt may occur.

Landtype 21 Loamy-skeletal, mixed Dystric Cryochrept.
Shallow, nonplastic to slightly plastic soils derived from residuum and colluvium. Surface soils are thin gravelly loams. Subsoils are thin gravelly loams and clay loams. Bedrock is moderately hard, competent to moderately competent, reddish volcanic breccias and tuffs. Depth to bedrock is usually less than 3 feet. This landtype occurs on steep, smooth to moderately dissected upper sideslopes and ridges with slopes ranging from 60 to greater than 90%. Elevation ranges from 3000 feet (914 m) to 5000 feet (1524 m). Soils are well to excessively drained. Permeability is rapid in the surface soils and rapid to very rapid in the subsoils.

Landtype 23 Clayey, mixed mesic Typic Haplohumult.
Moderately deep to deep, slightly plastic to plastic soils derived from colluvium and residuum. Surface soils are generally thin shotty loams. Subsoils are generally clay loams, silty clay loams, and clays. Bedrock is composed of moderately competent, soft to moderately hard reddish breccias and tuffs. Depth to bedrock ranges from 3 to 8 feet. This landtype typically occurs on moderate, smooth to somewhat hummocky, lower sideslopes and benches with slopes ranging from 20 to 60%. Elevation ranges from 1000 feet (305 m) to 3500 feet (1067 m). Soils are well to moderately well drained. Permeability is rapid in the surface soils and moderate to slow in the subsoils.

Lands

All lands within the RNA boundary are reserved National Forest lands. There are no outstanding rights to any lands within the boundary (Pannell, pers. comm.).

Cultural

Pre-historic and historic use of the RNA and surrounding area have been light except for relatively recent timber harvest that has occurred on private lands to the north and west (Berglund, pers. comm.). Native Americans from the Willamette Valley probably passed through the area of the RNA on their way to huckleberry-picking areas at Gold Hill to the north, although pre-historic use of the RNA itself was probably minor. Historically, human activities in the Hagan Creek watershed were minimal, probably because of the rugged terrain (Berglund, pers. comm.). A 1912 map shows a fire lookout on Mt. Hagan, approximately two miles south of the RNA, and a road along Gate Creek just to the north of the RNA. This road was probably a route to the Gold Hill mining area.

Establishment of the RNA is not likely to have an impact on either pre-historic or historic cultural values, however, any proposed activities within the RNA should be coordinated with the Blue River Ranger District Archeologist. Known cultural site locations on the Blue River Ranger District are on file at the Ranger District office.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

There are no unpatented mining claims within the RNA on file with the U.S. Bureau of Land Management, and no known mineral resources are in or adjacent to the RNA (Peck, pers. comm.). A request will be made to withdraw the area from mineral entry if the RNA establishment is approved.

Grazing

No grazing occurs within or near the Hagan RNA. Establishment of an RNA will not conflict with grazing values (Seitz, pers. comm.).

Timber

Potential annual timber production from suited acres in the RNA is 126,112 cubic feet (3569 cu m) per year. Timber volume production was calculated using the WNF forest-wide average of 112 cubic feet/acre/year (7.8 cu m/ha/yr) (Mayo, pers. comm.). The RNA contains 1126 acres (456 ha) of forested land, all of which meets the productivity requirements of commercial forest land (Ragan, pers. comm.). The timber within the RNA was not included in the timber producing base specified in the LRMP (WNF 1990).

Watershed Values

The north fork of Hagan Creek originates within the RNA, joins the south fork of Hagan Creek, and subsequently empties into Gate Creek, a tributary of the McKenzie River. The Hagan RNA occupies a watershed that has been undisturbed by timber harvesting or road construction except along the southern and eastern boundaries. Roads in these areas cross soil types that have been identified as extremely unstable on slopes that exceed 60%, and pose a potential threat of mass slope failure if culverts become clogged during a heavy rainstorm (McSwain, pers. comm.). A failure such as this could adversely impact downslope areas within the RNA, particularly riparian and aquatic ecosystems. The WNF should consider restoring these roads to a natural condition (i.e. closing, ripping and revegetating them), or removing the culverts, outsloping the road surfaces and installing water bars (McSwain, pers. comm.).

Intact upper drainages, such as the north fork of Hagan Creek, are important for maintenance of water quality, and riparian and aquatic habitats (McSwain, pers. comm.) The designation of the area as an RNA will protect watershed values both within the RNA and downstream.

Recreation Values

Existing and potential recreation values of the Hagan RNA are low including hunting activities and the opportunity to visit an isolated, pristine area (Lee, pers. comm.). Recreational use of the RNA has been minimal in the past because of steep slopes and lack of public road access to the area. Public access has been improved since 1989, when the Forest Service obtained a permanent easement across private land for Road 2611 (Burditt, pers. comm.). Currently, the most common recreational use probably consists of occasional deer or elk hunting on the roads along the south and east sides of the RNA. Trails in the RNA are unmarked and are used only for access to research plots. There are no plans to build recreation trails or facilities in the RNA.

The establishment of the RNA will not have a significant impact on recreational values.

Wildlife and Plant Values

RNA designation will protect potential foraging and dispersal habitat for the northern spotted owl (Seitz, pers. comm.), which is federally listed as a threatened species. Over time, as the forest develops old growth characteristics, the area will also provide nesting habitat for this species.

No federally listed plant or animal species have been documented in the RNA. Because the RNA provides potential habitats for sensitive species, care should be taken to minimize disturbance of soils, streambeds, and vegetation. In particular, riparian areas probably provide important habitat for a variety of frogs and salamanders (McKee et al. 1977). The recent declines in amphibian populations in many parts of the world, including the Pacific Northwest, underscore the importance of maintaining suitable habitats (Nussbaum et al. 1983).

The steep slopes found in the Hagan RNA are particularly susceptible to erosion, especially in and near riparian areas. Trails and research activities should be located to minimize disturbance.

Special Management Area Values

The proposed RNA does not lie within any wilderness, wild and scenic river, national recreation area, or any other congressionally-designated area. Establishment of the RNA will not impact the purposes or management of any congressionally-designated area.

Transportation Plans

According to the Blue River Ranger District transportation planner, no road construction is planned in or adjacent to the RNA, and minimal maintenance is planned for roads within or adjacent to the area (Kellison, pers. comm.). Transportation plans will not adversely impact the RNA and designation of the Hagan RNA will have no effect on the forest transportation system.

MANAGEMENT PRESCRIPTION

The Hagan RNA will be managed according to the goals, desired future condition, and standards and guidelines set forth for RNAs in Management Area 4 of the LRMP for the WNF (1990) (Appendix A). According to the LRMP, RNAs "will be managed to provide for naturally occurring physical and biological processes without undo human intervention." Among the standards and guidelines listed in the LRMP are the following:

- an RNA management plan and implementation schedule for baseline data collection and periodic remeasurement shall be prepared;
- recreational activities within the RNA including camping, hunting and trapping will be discouraged;
- recreational off-road vehicle use will be prohibited;
- new trail or road construction will not occur unless it enhances RNA values;
- existing trails will be allowed to remain if they do not compromise RNA values;
- introduction of exotic plant and animal species will be prohibited;
- no programmed timber harvest will be scheduled;
- managed or naturally occurring fire may be used to perpetuate a sere provided prudent measures are taken to avoid catastrophe;
- no action will be taken against insects or diseases unless the outbreak threatens to drastically alter the natural ecological processes within the RNA or is an immediate threat to adjacent land;
- the RNA will be recommended for withdrawal from locatable mineral exploration.

Vegetation Management

The Hagan RNA will be managed with minimal human interference to preserve and maintain natural plant communities and ecological processes. Non-native plant species are rare in the RNA at this time, occurring mainly along roads and trails. These plants should be removed manually as soon as possible to prevent establishment and spread within the RNA, the area should be monitored periodically to identify threats from non-native weedy species.

Research Management

An active program of research occurs in the RNA in both upland forests and riparian areas, in conjunction with the research programs housed at the H. J. Andrews Experimental Forest. A

* map of permanent forest plot locations is included in Appendix C. Ninety-six permanent plots located on eight transects were installed in the RNA in 1981 and 1982 as part of the LTER program to monitor tree growth and mortality, and understory vegetation dynamics. Two reference stands also have been set up within the RNA by the LTER program to track tree growth and mortality, and measure coarse woody debris. A third reference stand is located outside the RNA on the south fork of Hagan Creek, upstream from its confluence with the north fork. Permanent riparian transects have been installed inside the RNA along the north fork, and outside the RNA on the south fork, for the study of riparian vegetation processes.

Future research activities and installations should be coordinated with ongoing research to avoid damage to existing plots or alteration of results.

Roads and Trails

Forest Service Road 2611-090 enters the RNA near the southern boundary and Road 2611-080 forms a portion of the east boundary. As noted in the Watershed Values section, it may be desirable to close and revegetate these roads because of unstable soils. If the roads were to be closed trails could provide foot access to research sites from the present junction of the two roads.

Trails have been built in the RNA to provide access to research plots and reference stands. The steep slopes, unstable soils, and active research in the Hagan RNA make well-designed, constructed, and maintained trails a necessity for protection of research plots and natural features. Additional trails may be required in areas that receive heavy or repeated use, such as along the LTER transects. If new trails are built they should be carefully placed so that they do not impact existing research installations or sensitive plant or animal habitats.

Adjacent Lands

Adjacent lands along portions of the northwest boundary of the RNA are owned by the Giustina Land and Timber Company. Giustina property extends into the north fork of Hagan Creek watershed in three locations. Timber harvest has not occurred in these locations because of the difficulty of yarding logs over the ridgetop, but helicopter or tractor logging would make such harvesting possible.

Logging within the watershed and immediately adjacent to the RNA could negatively impact the research value of the area. To protect the integrity of the watershed containing the RNA, the WNF has initiated a process to acquire the private lands within the watershed from Giustina. Should the transaction take place, the boundary of the RNA should be adjusted to include all the lands within the watershed.

The remainder of the RNA is adjacent to a designated Late Successional Reserve. Late Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth ecosystems. Though thinning in young stands is permitted to promote late successional conditions, these objectives are not seen as a threat to the integrity of the RNA.

ADMINISTRATION RECORDS AND PROTECTION

The following principal contacts are responsible for the administration and protection of the Hagan RNA.

1. For administration and protection of the physical area:

District Ranger
Blue River Ranger District
Blue River, Oregon 97413

2. For approval and coordination of research within the RNA, maintenance of the RNA databases and lists of plant and animal species documented and/or collected from the RNA:

Director Pacific Northwest Research Station 333 S.W. First Avenue P.O. Box 3890 Portland, Oregon 97208	RNA Database Coordinator Department of Forest Science Peavy Hall 154 Oregon State University Corvallis, Oregon 97331
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Records for the Blue River RNA will be maintained in the following offices:

Regional Forester
Pacific Northwest Region
333 S.W. First Avenue
P.O. Box 3623
Portland, Oregon 97208

Director
Pacific Northwest Research Station
333 S.W. First Avenue
P.O. Box 3890
Portland, Oregon 97208

Forest Supervisor
Willamette National Forest
211 East 7th Avenue
P.O. Box 10607
Eugene, Oregon 97440

District Ranger
Blue River Ranger District
Blue River, Oregon 97413

RNA Database Coordinator
Department of Forest Science
Peavy Hall 154
Oregon State University
Corvallis, Oregon 97331

ARCHIVING

The Pacific Northwest Research Station Director will establish and maintain a system for archiving data and reports from the RNA that will facilitate the exchange of information among research stations and scientists. Data from the RNA will be archived in the Forest Science Data Bank (FSDB) at the Forest Science Department, Oregon State University, Corvallis, Oregon under cooperative agreement between the FSDB and the Forest Service.

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PERSONAL COMMUNICATIONS

Blue River Ranger District

Eric Berglund, Cultural Resources

Lynn Burditt, District Ranger

Karen Geary, Planning

Bob Kellison, Transportation

Rick Lee, Recreation

Kim McMahon, Botany

Michele McSwain, Watershed

Ruby Seitz, Wildlife

WNF Supervisor's Office

Jim Mayo, Timber

JeriLynn Peck, Ecology

Mike Ragan, Timber

Doris Pannell, Lands

- Campbell, Alsie G. and Jerry F. Franklin. 1979. Riparian vegetation in Oregon's western Cascade Mountains: composition, biomass, and autumn phenology. *Coniferous Forest Biome Bulletin* 14. University of Washington, Seattle.
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⁴Reference list compiled during the summer of 1992 by JeriLynn Peck of the WNF Supervisor's Office.

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APPENDICES

- A - Excerpt from Land and Resource Management Plan (Willamette National Forest 1990).
- B - Excerpt from Oregon Natural Heritage Plan (Natural Heritage Advisory Council to the State Land Board 1988).
- C - Locations of permanent research plots and partial harvest area.

MANAGEMENT AREA 4

Emphasis: Research Natural Areas

Management Goals

The goals of this management area are to preserve naturally occurring physical and biological units where natural conditions are maintained insofar as possible for the purposes of:

- Comparison with those lands influenced by man.
- Provision of educational and research areas for ecological and environmental studies.
- Preservation of gene pools for typical as well as rare and endangered plants and animals.

Desired Future Condition

Research Natural Areas (RNAs) will be managed to provide for naturally occurring physical and biological processes without undue human intervention. Plant and animal communities native to an area will be allowed to evolve unaltered, serving as a gene pool source and as a baseline for measuring long-term ecological change. RNAs will provide for nonmanipulative environmental research, observation and study. They will serve as control areas for comparing results from manipulative research, and for monitoring effects of resource management techniques and practices. Areas will preserve a wide spectrum of pristine values or natural settings that have unique educational and scientific interest. No programmed timber harvest will occur. Access will be limited to trails and roads that do not compromise the objectives of the RNA.

Description

This prescription applies to existing RNAs and areas recommended for inclusion during the life of this Plan. The sites designated as Research Natural Areas include:

Area Name	Acres	District	Date Established
Ollalie Ridge	720	McKenzie	1963
Gold Lake Bog	463	Oakridge	1965
Wildcat Mountain	1,000	Sweet Home	1968
Middle Santiam	1,145	Sweet Home	1979
Hagan Block	1,280	Blue River	1990
McKenzie Pass	1,195	McKenzie	1990
Rigdon Point	300	Rigdon	1990
Three Creeks	661	Sweet Home	1990
Torrey-Chariton	2,154	Oakridge	1990
Wildcat Mtn Addition	384	Sweet Home	1990

Site-specific resource values and management activities will be prescribed in individual Establishment Records. The Regional Forester and Pacific Northwest Station Director will prepare an Establishment Report for each recommended area; this document will describe features, objectives for establishment, and specific management direction.

Standards and Guidelines

PLANNING

- MA-4-01 A management plan shall be prepared for each RNA to fulfill objectives of the Establishment Report.
- MA-4-02 An implementation schedule for baseline data collection and periodic remeasurement shall be prepared for each RNA. The baseline data will serve as a benchmark for research needs as well as for long-term assessments of changes in the forest ecosystem.
- MA-4-03 Ecological responses to management activities or natural disturbances on or adjacent to RNAs should be measured when appropriate. Studies may be prioritized based on the significance of the potential impact.

RECREATION MANAGEMENT

- MA-4-04 Area management practices should result in a physical setting that meets or exceeds the ROS class of Roaded Natural.
- MA-4-05 Recreation activities and uses within RNAs shall be discouraged. This includes overnight camping; recreation use within 200 feet of lakes, ponds and streams; and pack and saddle stock use.
- MA-4-06 All recreation ORV use shall be prohibited.
- MA-4-07 Hunting and trapping shall be discouraged.
- MA-4-08 If other recreation use threatens research or education values, closures or permits should be instituted.
- MA-4-09 Educational use of an RNA should generally be directed toward the graduate level, but may be approved for any educational level.
- MA-4-10 On-site interpretive or demonstrative facilities shall be prohibited.
- MA-4-11 Publicity that would attract the general public to the RNA shall be avoided.

FOREST TRAIL SYSTEM

- MA-4-12 New trails shall not be constructed unless they are needed for research purposes. Existing trails may be allowed to remain as long as the RNA objectives are not compromised.

MANAGEMENT AREA 4

WILDERNESS

- MA-4-13** If an RNA is established within wilderness, wilderness management direction shall take precedence.

SCENIC RESOURCES

- MA-4-14** All design and implementation practices should be modified as necessary to meet the VQO of Preservation.

WILDLIFE MANAGEMENT

- MA-4-15** Introduction of exotic plant and animal species shall not be permitted. Reintroduction of former native species, including fish stocking, may be permitted if the objectives of the RNA are met.
- MA-4-16** Control of excessive animal populations should be evaluated and control activities may be implemented where such populations threaten the RNA objectives.

Habitat improvement projects may be approved if they meet the objectives of the RNA.

TIMBER MANAGEMENT

- MA-4-17** No programmed harvest shall be scheduled.
- MA-4-18** Cutting and removal of all vegetation, including firewood, shall be prohibited, except as part of approved scientific investigation.
- MA-4-19** Felled trees shall remain in place, unless lying across trail or road. Trees shall not be removed. Hazard tree felling may be permitted along boundary trails or roads for safety.

FIRE MANAGEMENT

- MA-4-20** If fire is used to perpetuate a sere, it should mimic a natural fire, but with prudent measures to avoid catastrophe. Managed or naturally occurring fire may be used to perpetuate the sere and thus the cell that the RNA is meant to represent.
- MA-4-21** Suppression strategies, practices and activities shall be limited to those which have minimal impacts to RNA values.
- MA-4-22** Chemical fire retardants shall be avoided.
- MA-4-23** Fuels normally should be allowed to accumulate at natural rates unless they threaten the objectives of the RNA.

INTEGRATED PEST MANAGEMENT

- MA-4-24** No action shall be taken against insects or diseases unless the outbreak threatens to drastically alter the natural ecological processes within the RNA or is an immediate threat to adjacent lands.

LANDS

- MA-4-25** Rights-of-way easements, including utility corridors, existing before RNA establishment shall be honored. Upgrading that would compromise the objectives of the RNA should be discouraged.
- MA-4-26** FERC licenses or permits that compromise the objectives of the RNA shall not be recommended.
- MA-4-27** All lands shall be retained and private inholdings acquired.

MINERALS AND ENERGY

- MA-4-28** RNAs shall be recommended for withdrawal from locatable mineral exploration.
- MA-4-29** RNAs may be recommended for lease issuance with a no surface occupancy stipulation.

FACILITIES

- MA-4-30** New trail or road construction should not occur, except to enhance RNA values.
- MA-4-31** Construction of new facilities shall be prohibited. Existing facilities may be allowed to deteriorate without replacement. Temporary research facilities and installations may be approved under permit.

TERRESTRIAL ECOSYSTEMS - West Slopes and Crest, Oregon Cascades

Agency	Priority	Element Name	Present Representation
Western Hemlock Zone			
FS, BLM	M	1. Western hemlock/oceanspray community.	
	+	2. Western hemlock/salal-Oregon grape community.	Hagan PRNA
	*	3. Western hemlock/rhododendron-salal community.	Bagby RNA
	*	4. Western hemlock/rhododendron-Alaska huckleberry community.	Middle Santiam RNA
	*	5. Western hemlock/oxalis forest with Alaska huckleberry or dwarf Oregon grape.	Middle Santiam RNA
FS	M	6. Western hemlock/vanillaleaf community.	Bagby RNA**
FS, BLM	H	7. Western hemlock-western red cedar/dwarf Oregon grape/twinflower community.	
	*	8. Western hemlock/swordfern-oxalis community.	Middle Santiam RNA
	*	9. Western hemlock/devil's club community.	Carolyn's Crown RNA
FS, BLM ST	H	10. Moist temperate river terrace forest with Douglas fir, western hemlock, western red cedar, and associated hardwoods.	Middle Santiam River Terrace ACEC**
FS	H	11. Western hemlock-western white pine forest.	
FS	H	12. Western hemlock with western red cedar, dogwood, rhododendron and oxalis in southern Cascades.	
	*	13. Old growth western red cedar in the western Cascades.	Carolyn's Crown RNA
FS	H	14. Western red cedar with hemlock, rhododendron and rose in southern Cascades.	

PVT = Private Land ST = State Land FS = U.S. Forest Service NPS = National Park Service
 ACE = Army Corps of Engineers FWS = US Fish & Wildlife Service BLM = Bureau of Land Management

P. = Proposed.. RNA = Research Natural Area ACEC = Area of Critical Environmental Concern SIA = Special Interest Area
 TNC = Nature Conservancy Preserve NHCA = Natural Heritage Conservation Area RSNA = Registered State Natural Area

H = High Priority M = Medium Priority L = Low Priority + = Adequately represented on proposed but not established area
 * = Adequately represented in the area named ** = Partially protected due to designation, size, or quality at this site

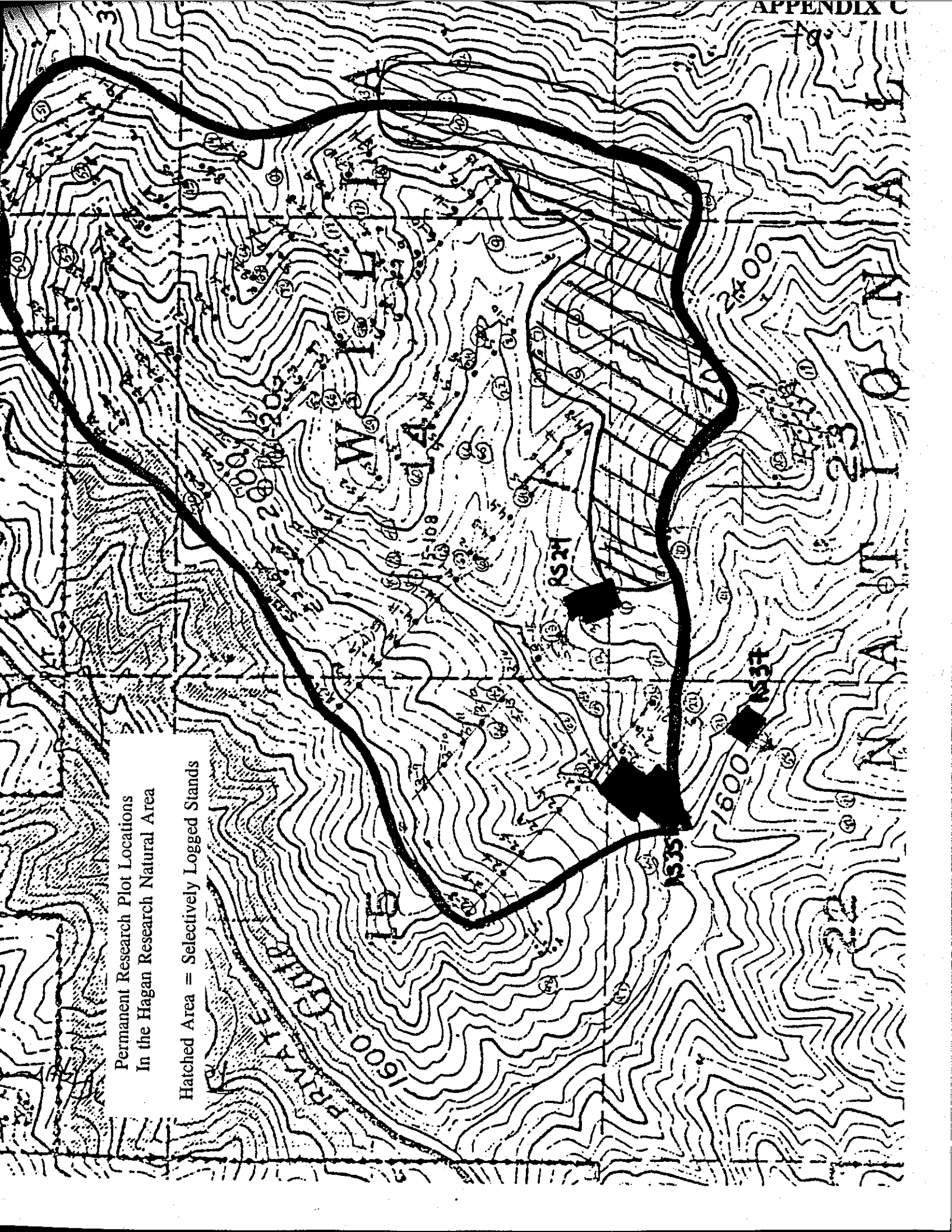
AQUATIC ECOSYSTEMS - West Slope and Crest, Oregon Cascades

Agency	Priority	Element Name	Present Representation
Riverine			
	*	1. First to third order stream system in north Cascades in Western Hemlock zone.	Big Bend Mtn. PRNA Hagan RNA Middle Santiam RNA
FS	M	2. First to third order stream system in south Cascades in Western Hemlock zone.	
	*	3. First to third order stream system in Pacific Silver Fir zone.	Bull Run RNA Wildcat RNA Big Bend Mtn. PRNA
FS	L	4. Glacier fed first to third order alpine stream system.	Three Sisters Wilderness**
	*	5. First to third order stream system in Mixed Conifer zone.	Abbott Creek RNA
FS	L	6. First to third order stream system in southern Cascades subalpine.	Sky Lakes Wilderness**
	*	7. Fourth order stream segment in Douglas fir-western hemlock forest north of the McKenzie River.	Middle Santiam Terrace ACEC
FS	H	8. Fourth order stream segment in mixed conifer forest south of the McKenzie River.	
Lacustrine			
FS, BLM	H	9. Low elevation lake in northern Cascades, surrounded by Douglas fir-western hemlock forest.	
	+	10. Low elevation lake in southern Cascades, surrounded by mixed conifer forest.	Lost Lake PRNA
FS	L	11. Montane lake in northern Cascades.	Mount Hood Wilderness** Mount Jefferson Wilderness**
FS	L	12. Montane lake in southern Cascades.	Sky Lakes Wilderness**

PVT = Private Land ST = State Land FS = U.S. Forest Service NPS = National Park Service
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P. = Proposed. RNA = Research Natural Area ACEC = Area of Critical Environmental Concern SIA = Special Interest Area
 TNC = Nature Conservancy Preserve NHCA = Natural Heritage Conservation Area RSNA = Registered State Natural Area

H = High Priority M = Medium Priority L = Low Priority + = Adequately represented on proposed but not established area
 * = Adequately represented in the area named ** = Partially protected due to designation, size, or quality at this site



Permanent Research Plot Locations
In the Hagan Research Natural Area

Hatched Area = Selectively Logged Stands

I certify the enclosed boundary description of the Hagan Reserch Natural Area.

REGISTERED
PROFESSIONAL
LAND SURVEYOR
Seal

Donn Rowe
Donn Rowe, Land Surveyor

OREGON
JULY 25, 1991
DONN ROWE
2519

HAGAN RESEARCH NATURAL AREA

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
Mt. Hagan				Commencing at the 1/4 corner between section 11 and section 12 T. 16 S. R. 3 E. W.M., thence south to the top of a ridge which is the True Point of Beginning. The
	POB			True Point of Beginning being on the top of the ridge.
		N86/18/18E	68.1	
2		S62/42/56E	77.8	
3		S65/25/20E	76.2	
4		S49/23/32E	155.0	
5		S55/12/04E	239.7	Ascend easterly along of the ridge.
6		S61/19/25E	209.3	
7		S70/28/06E	128.4	
8		S83/32/22E	90.3	
9		S78/24/56E	101.6	
10		S71/01/34E	86.0	
11		S53/15/56E	76.0	
12				A point at the junction of 2 ridges which define the east and north boundary of the Hagan Creek watershed.
		S16/31/19W	267.3	
13		S15/43/28W	80.5	Descend along the top of a ridge.
14		S27/39/25W	203.0	
15		S24/58/24W	244.4	

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	16			
	17	S22/05/17W	141.1	
	18	S25/21/17W	240.8	
	19	S19/46/36W	215.0	
	20	S30/49/18W	105.6	
	21	S32/23/30W	240.4	
	22	S30/12/04W	111.9	
	23	S23/18/11W	133.7	
	24	S19/37/06W	229.5	
	25	S10/58/41W	215.0	
	26	S19/38/28E	184.3	Descend along the top of a ridge.
	27	S27/41/55E	123.6	
	28	S23/36/35E	128.0	
	29	S19/56/44E	126.7	
	30	S27/27/15E	91.3	
	31	S18/49/13E	104.4	
	32	S07/34/10E	103.3	
	33	S01/38/20E	192.3	
	34	S04/15/21E	205.0	
	35	S02/42/20W	168.0	
	36	S11/42/28W	166.7	
	37	S04/59/47E	72.5	
		S17/22/35E	124.6	
	38			A point on the ridge which is 50 feet westerly from and perpendicular to the centerline of (the end of) USFS road 080 or its prolongation.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	39	S88/53/19W	46.0	
	40	S44/19/49W	120.2	
	41	S29/44/08W	84.1	
	42	S10/18/48W	115.4	
	43	S03/25/11E	168.6	
	44	S25/40/31E	110.0	
	45	S30/31/56E	106.0	
	46	S28/47/02E	143.4	
	47	S06/42/43W	235.0	
	48	S07/53/52W	175.1	
	49	S16/27/52W	76.6	50 feet westerly of and parallel with the centerline of USFS road 080.
	50	S27/33/54W	149.3	
	51	S22/52/54W	81.7	
	52	S45/04/43W	63.6	
	53	S36/53/03W	154.8	
	54	S29/20/23W	178.9	
	55	S29/01/28W	137.7	
	56	S18/39/09W	161.3	
	57	S15/44/23W	152.8	
	58	S11/30/21W	294.6	
		S13/56/25W	174.2	
	59			A point 50 feet westerly of and perpendicular to the centerline of USFS road 080 and 50 feet northerly and perpendicular to the centerline of USFS road 090.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	60	S28/24/52W	101.0	
	61	S43/54/45W	133.0	
	62	S55/00/32W	131.5	
	63	S62/50/19W	104.7	
	64	S58/39/32W	192.4	
	65	S70/30/42W	134.8	
	66	S76/06/53W	114.0	
	67	N82/46/00W	156.8	
	68	N45/20/29W	189.6	
	69	N52/04/33W	144.4	
	70	N24/51/23W	144.9	
	71	N30/07/08W	114.9	
	72	N46/01/05W	68.0	
	73	N75/46/25W	116.9	50 feet northerly of and parallel with the centerline of USFS road 090.
	74	S56/31/57W	112.0	
	75	S55/49/09W	103.2	
	76	S32/18/21W	93.3	
	77	S60/14/10W	123.8	
	78	S60/15/04W	135.4	
	79	S48/22/19W	120.2	
	80	S44/40/49W	145.7	
	81	S13/40/39W	65.5	
	82	S10/48/04W	97.3	
	83	S14/08/37W	90.2	
	84	S34/31/16W	62.1	
	85	S78/55/52W	139.2	
		N76/40/40W	106.3	

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	86	S88/06/16W	70.1	
	87	N84/25/04W	136.3	
	88	S81/14/49W	113.7	
	89	N88/37/27W	80.0	
	90	N39/51/47W	258.0	
	91	N45/38/03W	202.4	50 feet northerly of and parallel with the centerline of USFS road 090.
	92	N26/51/45W	93.1	
	93	N41/27/33W	111.8	
	94	N62/03/32W	152.1	
	95	N79/38/57W	153.9	
	96	N82/26/22W	241.4	
	97	N87/41/03W	122.0	
	98	S84/51/14W	140.9	
	99	N86/46/33W	124.0	
	100	S80/21/16W	230.2	
	101			A point which is 50 feet northerly of and perpendicular to the 50 foot prolongation of the centerline of USFS road 090.
		S05/07/03E	106.7	Along sidehill.
	102			A point 50 feet westerly from the end of USFS road 090 and on the top of the ridge.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	103	S56/21/49W	73.2	
	104	S77/30/30W	158.6	
	105	S74/05/10W	188.4	
	106	S70/16/22W	150.0	
	107	S82/33/34W	261.0	
	108	S77/32/27W	133.8	
	109	N78/45/21W	186.7	
	110	N66/49/19W	75.4	
	111	N72/40/34W	87.4	
	112	N63/36/22W	132.4	
	113	N62/45/26W	220.1	
	114	S79/44/17W	69.4	Descend along top of a ridge to the West.
	115	S84/01/13W	62.5	
	116	S69/57/54W	158.9	
	117	S71/47/31W	95.5	
	118	S66/37/40W	195.9	
	119	S76/44/53W	237.6	
	120	S85/01/59W	217.3	
	121	S87/30/32W	148.3	
	122	S71/27/40W	123.3	
	123	N86/19/56W	150.1	
		N42/27/54W	138.7	
	124			The confluence of Wet Gulch and Hagan Creek.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	125	N13/00/15W	266.4	
	126	N17/05/13W	189.8	
	127	N22/43/28W	103.0	
	128	N13/43/24W	107.7	
	129	N07/32/20W	259.2	
	130	N12/27/17W	117.4	
	131	N23/27/27W	233.6	
	132	N10/14/58W	79.6	Ascend along a minor ridge to the Northwest.
	133	N24/43/20W	104.7	
	134	N29/25/39W	218.9	
	135	N08/57/45W	89.5	
	136	N22/08/52W	100.4	
	137	N17/54/41W	175.9	
	138	N11/39/05W	160.1	
	139	N29/04/09W	146.2	
	140	N13/05/60W	136.3	
	141	N13/26/16W	149.0	
	141	N03/46/41W	134.6	
	142	N13/56/37E	155.7	
	143	N24/32/07E	91.4	
	144	N38/04/01E	157.1	Ascend along the top of the ridge.
	145	N42/09/35E	116.2	
	146	N60/33/26E	121.0	
	147	N65/29/47E	73.3	
	148	N76/54/02E	192.0	

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	149			A point on the top of the ridge and on the E-W centerline of said Section 15.
		N87/16/28E	503.1	Along the E-W centerline of said Section 15.
	150			The CE 1/16 corner of Section 15, T. 16 S. R. 3 E. W.M.
		N02/48/21E	78.0	Along the N-S centerline of the NE 1/4 of Section 15, T. 16 S. R. 3 E W.M.
	151			A point on the top of the ridge and on the N-S centerline of the NE 1/4 of Section 15, T. 16 S. R. 3 E.
	152	N72/46/22E	225.7	
	153	N59/29/30E	87.1	
	154	N69/14/23E	196.4	
	155	N69/33/53E	96.9	Descend along the top of the ridge.
	156	N59/51/21E	72.7	
	157	N59/45/04E	91.5	
	158	N64/47/55E	71.5	
		N62/21/52E	189.7	
	159			A low point in a saddle on the top of the ridge.
	160	N58/04/59E	76.5	
	161	N53/39/39E	222.3	Ascend along the top of the ridge.
	162	N47/49/09E	110.3	
	163	N51/23/45E	96.5	
		N45/53/54E	179.5	

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	164			A high point on the ridge.
		N42/58/51E	72.2	
	165			
		N46/21/01E	99.0	Descend along the top of the ridge.
	166			
		N42/24/07E	164.4	
	167			
		N48/05/13E	93.3	
	168			A point on the top of the ridge and on the E-W centerline of the NW 1/4 of said Section 14.
		S89/31/09E	893.9	Along the E-W centerline of the NW 1/4 of said Section 14.
	169			The NW 1/16 corner of said Section 14.
		N02/40/58E	682.2	Along the N-S centerline of the NW 1/4 of said Section 14.
	170			A point on the top of the ridge and on the N-S centerline of the NW 1/4 of Section 14, T. 16 S. R. 3 E. W.M.
		N47/00/10E	248.8	
	171			
		N55/59/46E	152.0	
	172			
		N55/57/48E	93.2	
	173			Ascend along the top of the ridge.
		N59/36/03E	98.8	
	174			
		N59/54/16E	199.2	
	175			
		N61/11/22E	99.4	
	176			
		N61/32/34E	188.9	
	177			A point on the top of the ridge and on the Section line.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
		N85/45/18E	387.8	Along the South line of said Section 11.
	178			The South 1/4 corner of Section 11, T. 16 S. R. 3 E. W.M.
		N02/03/21E	480.1	Along the N-S centerline of Section 11, T. 16 S. R. 3 E. W.M.
	179			A point on the top of the ridge and on the N-S centerline of Section 11, T. 16 S. R. 3 E. W.M.
	180	N36/48/06E	162.0	
	181	N43/03/40E	123.2	
	182	N38/13/02E	120.0	
	183	N39/24/50E	210.8	
	184	N54/49/48E	67.2	Ascend along the top of the ridge.
	185	N51/42/46E	90.9	
	186	N53/01/27E	109.6	
	187	N56/51/07E	116.5	
	188	N61/37/08E	161.2	
		N59/21/28E	94.3	
	189			A point on the top of the ridge and on the E-W centerline of the SE 1/4 of said Section 11.
		S87/44/20E	390.0	Along the E-W centerline of the SE 1/4 of said Section 11.
	190			The SE 1/16 of section 11 T. 16 S. R. 3 E. W.M.
		N05/16/12E	262.6	Along the N-S centerline of the SE 1/4 of said Section 11.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	191			A point on the top of the ridge and on the N-S centerline of the SE 1/4 of Section 11 T. 16 S. R. 3 E. W.M.
	192	N71/21/09E	274.5	
	193	N74/40/25E	125.2	
	194	N74/16/14E	244.7	
	195	N86/44/32E	74.2	
	196	N79/16/52E	200.4	Ascend along the top of a ridge to the True Point of Beginning.
	197	N87/22/29E	200.4	
	198	N87/56/45E	200.3	
	199	S83/40/47E	162.6	
	200	N83/09/03E	167.7	
	201	N80/39/52E	75.3	
	202	S89/59/05E	84.0	
		S89/31/48E	124.1	

**DECISION NOTICE / DESIGNATION ORDER
and
FINDING OF NO SIGNIFICANT IMPACT**

ESTABLISHMENT OF ELEVEN RESEARCH NATURAL AREAS

**USDA Forest Service
Pacific Northwest Region
Oregon and Washington**

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

Table 1: Research Natural Area Locations

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

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

SELECTED ALTERNATIVE

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

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

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

OTHER ALTERNATIVE CONSIDERED

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

FINDING OF NO SIGNIFICANT IMPACT

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

CONTEXT

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

INTENSITY

1. There are no known effects on public health and safety.
2. No significant direct, indirect or cumulative impacts to the natural resources or other components of the human environment are anticipated.
3. Effects on the human environment are not uncertain, do not involve unique or unknown risks,

and are not likely to be highly controversial.

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

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

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

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

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

NOTIFICATION and IMPLEMENTATION

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

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

APPEAL RIGHTS

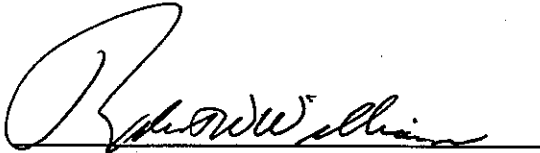
This decision is subject to appeal pursuant to 36 CFR Part 217. A copy of the Notice of Appeal must be in writing and must be submitted to:

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

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

CONTACT PERSON

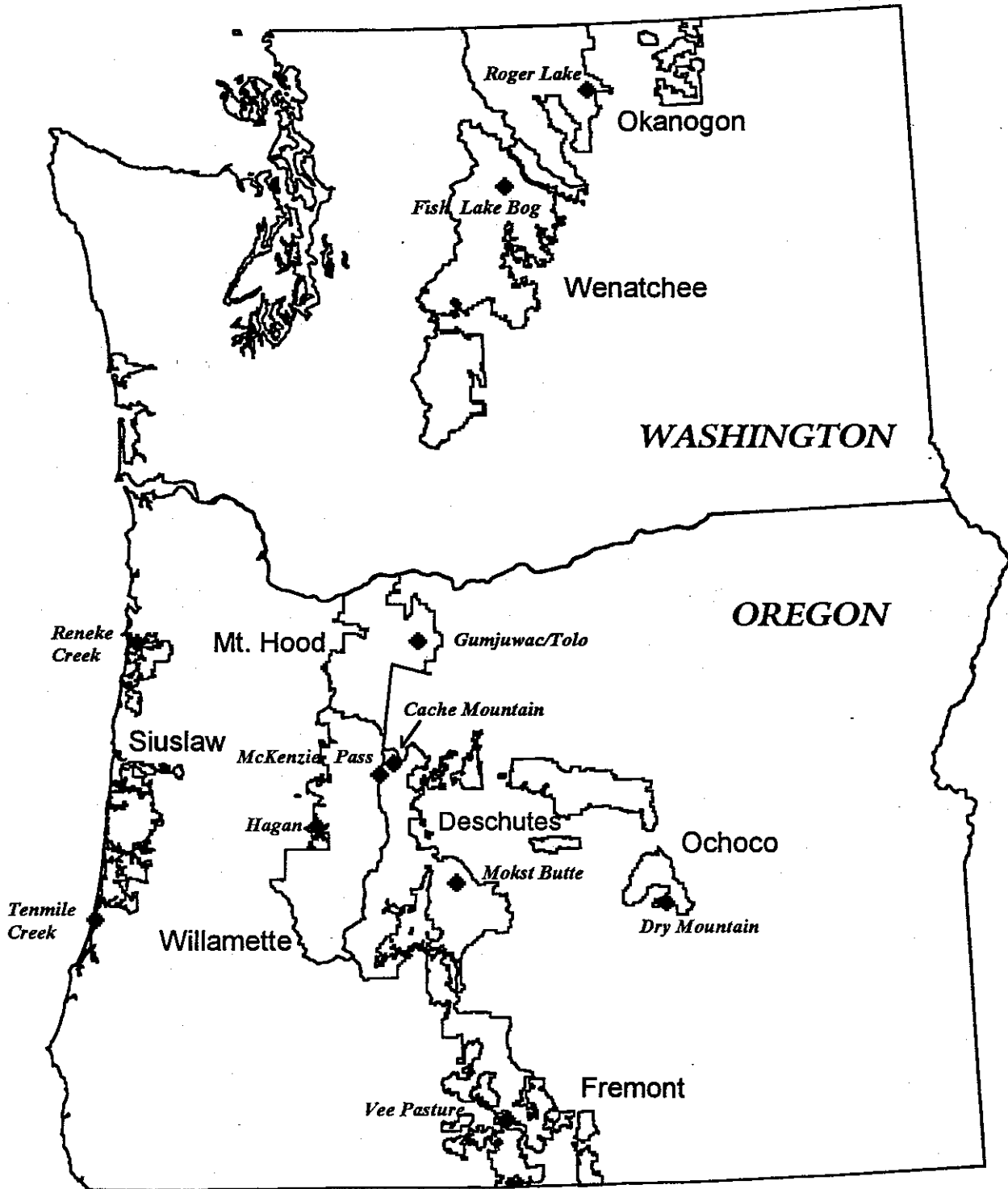
For further information regarding this decision contact Sarah Greene,
RNA Coordinator, Pacific Northwest Research Station, 3200 S.W. Jefferson
Way, Corvallis, Oregon 97331, Phone 541-750-7360.



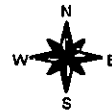
ROBERT W. WILLIAMS
Regional Forester

6/9/97
Date

Research Natural Area Locations



50 0 50 Miles



ESTABLISHMENT OF ELEVEN RESEARCH NATURAL AREAS

ENVIRONMENTAL ASSESSMENT

**Pacific Northwest Region
USDA Forest Service
Oregon and Washington**

Lead Agency: USDA Forest Service
P.O. Box 3623
Portland, OR 97208

Responsible Official: ROBERT W. WILLIAMS, Regional Forester
Pacific Northwest Region
P.O. Box 3623
Portland, OR 97208

Prepared by: Donna Short
Sweet Home Ranger District
Willamette National Forest
3225 Highway 20
Sweet Home, OR 97386
541-367-5158

Abstract:

This Environmental Assessment identifies the need for the proposed action, describes the analysis process and the alternatives formulated during that process. It discusses the environmental effects of each of the proposed alternatives. Two alternatives were evaluated and compared and are as follows: Alternative 1 - No Action and Alternative 2 - Finalize Establishment.

ESTABLISHMENT OF ELEVEN RESEARCH NATURAL AREAS

USDA FOREST SERVICE PACIFIC NORTHWEST REGION OREGON AND WASHINGTON

ENVIRONMENTAL ASSESSMENT

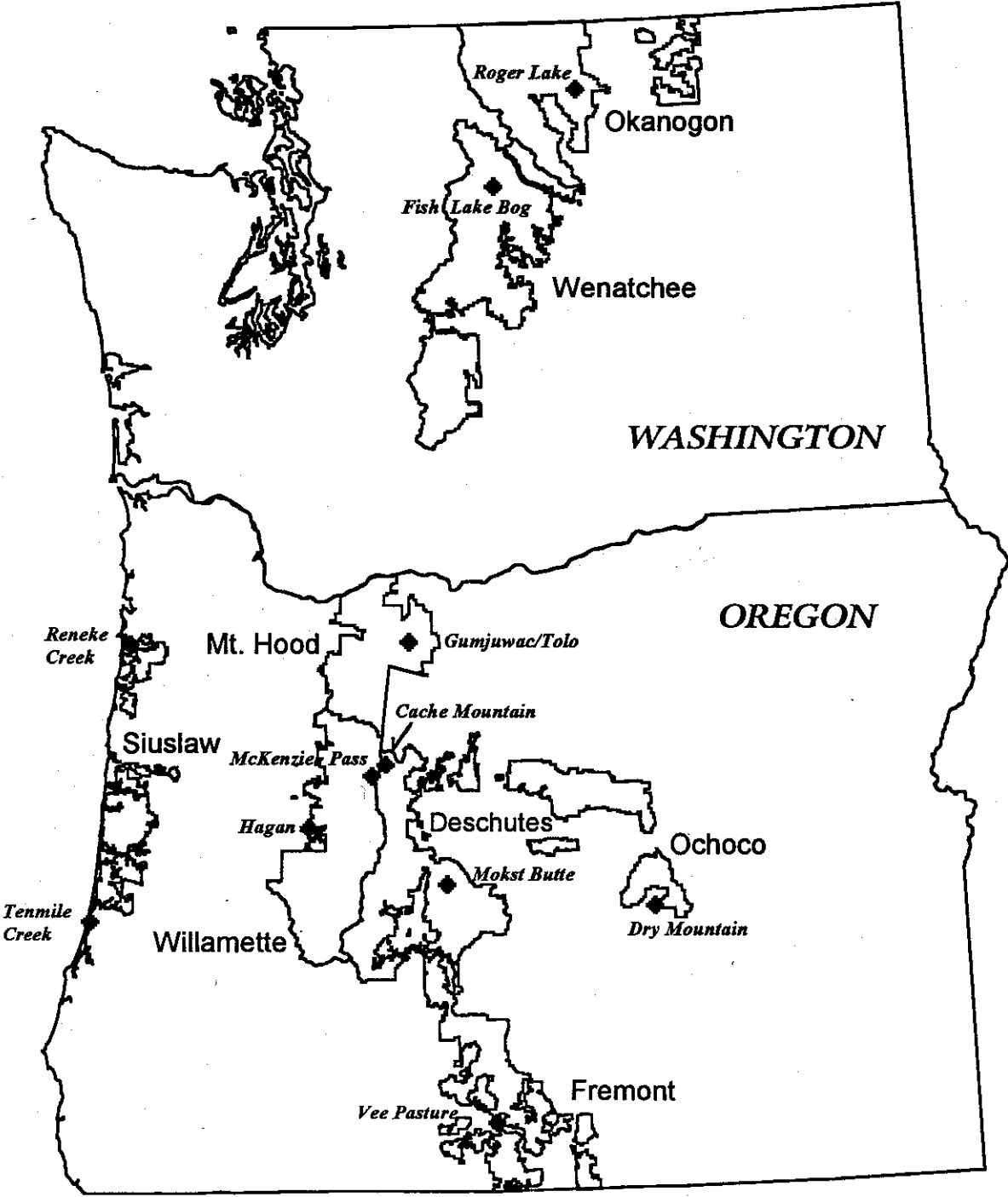
Proposed Action

The proposed action is to establish eleven Research Natural Areas (RNAs) as proposed in the Land and Resource Management Plans (Forest Plan) of each respective National Forest and the Oregon Dunes Management Plan (Tenmile Creek). These RNAs will be managed according to the direction provided in the management plans. This proposed action, formal designation of the RNAs by the Regional Forester, will amend each National Forest's Forest Plan. Table 1 lists the RNAs that are included in this environmental assessment and Figure 1 shows their locations.

Table 1: Research Natural Area Locations

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

Figure 1: Vicinity Map



50 0 50 Miles



Purpose and Need for Action

The purpose of establishing these RNAs 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). An evaluation by the Regional RNA Committee, pursuant to direction in Forest Service Manual 4063.04b, identified the vegetation types represented by these RNAs as suitable and desirable for inclusion in the national network. Establishment of these RNAs will provide long-term protection and recognition of these representative vegetation types (see Table 2).

Table 2: Representative Vegetative Types

RNA	Physiographic Province	Major Vegetation Types		
Cache Mountain	East Slope Oregon Cascades	Mid-elevation lakes with marshy shores	Lodgepole pine/ beargrass and /grouse huckleberry	White fir - Pacific silver fir/snowberry
Dry Mountain	Blue Mountains	Western juniper/big sagebrush	Ponderosa pine/ mountain mahogany	Mountain mahogany/ bunchgrass
Fish Lake Bog	East slope Wash. Cascades	Low elevation wetland & sphagnum bog	Grand fir/vine maple	Western hemlock/ Oregongrape-twinflower
Gumjuwac/Tolo	East Slope Oregon Cascades	Grand fir/ Engelmann spruce/starry solomonseal	Grand fir/ skunkleaf polemonium	
Hagan	West slope Oregon Cascades	Western hemlock/salal-Oregongrape	Douglas-fir/ oceanspray/grass	
McKenzie Pass	High Cascades	Lavaflows with mountain hemlock associations		
Mokst Butte	East Slope Oregon Cascades	Cinder cones with mixed conifer/snowbrush	Ponderosa pine/ bitterbrush	Lava communities
Reneke Creek	Oregon Coast Range	Sitka spruce/ salmonberry	Red alder dominated riparian communities	
Roger Lake	East slope Wash. Cascades	Subalpine fir/ Engelmann spruce	Sedge dominated wetlands	
Tenmile Creek	Oregon Coast Range	Coastal dune mosaic with tree islands	Native stabilized dune grassland	Deflation plain marsh
Vee Pasture	East Slope Oregon Cascades	Western juniper/ low sage	Low sage/ bluegrass/fescue	Low sage/one-spike oatgrass/ junegrass

A more detailed description of the vegetation, wildlife, and physical and climatic conditions can be found in the Establishment Record for each RNA. Site conditions have been reviewed since these RNAs were proposed during the land management planning process and no significant changes have occurred.

Public Involvement

Each National Forest included this project in their quarterly publication "Schedule of Proposed Actions" (FSH 1909.15, sec. 17) or sent a letter to interested parties. No comments were received from the public on continuing with the establishment process for ten of the RNAs. The proposed RNAs were also subjected to public review and comment during the land management planning process that resulted in the Forest Plans and the Oregon Dunes Management Plan (Tenmile Creek).

Several comments were received on Cache Mountain RNA on the Deschutes National Forest. Eunice Brandt and Donald Fontin expressed support for establishment of the RNA. Comments from the Blue Ribbon Coalition addressed the area proposed to be added to the original RNA boundary, road closures, and access for off-road vehicles. Northwest Antenna Site Services had concerns about use of the communications site on Cache Mountain. Sisters Sno-Go-Fers and William Rice expressed their opposition to placing restrictions on more public lands.

Alternatives and Environmental Consequences

Alternative 1, No Action: This alternative continues management according to the direction in the each National Forest's Forest Plan for "proposed RNAs". This management generally limits recreation use to non-motorized use of existing trails and prohibits timber harvest and/or other vegetation management. There are no cumulative effects generated by this alternative. Other environmental consequences are described in the Final Environmental Impact Statement for each Forest Plan. For those RNAs with boundary changes (Cache Mountain, Dry Mountain, and Gumjuwac/Tolo) there is a possible loss of research potential in the areas that were not included in these RNAs originally.

Alternative 2, Proposed Action: This alternative will formally establish each RNA in the location described in their respective Establishment Record. The standards and guidelines listed in each respective Forest Plan will be applied to the management of these RNAs (see Table 3). Environmental consequences of this alternative have been discussed in the Final Environmental Impact Statements for each Forest Plan (Final EIS) and the Record of Decision and Final Environmental Impact Statement for the Oregon Dunes National Recreation Area (Tenmile Creek) (see Table 3). These consequences include the short-term loss of opportunities to change vegetation conditions through management. There are no significant cumulative effects from establishment of these RNAs beyond those already discussed in the Final EIS's.

The direction in the National Forest management plans for established RNAs also includes reasonably foreseeable actions such as withdrawal of the area from mineral entry. The general consequences of withdrawal are discussed in the Final EIS's. Site-specific consequences will be disclosed in more detail when the mineral entry withdrawal recommendation is implemented.

A map of each RNA follows in Figures 2 - 12. A summary of the consequences associated with a particular RNA are listed below the map for that RNA. Those with proposed boundary changes (Cache Mountain, Dry Mountain, Gumjuwac/Tolo) also discuss any additional environmental consequences not covered by the Forest Plan Final EIS for that RNA.

Table 3: Land Management Plan References

RNA	Administrative Unit	Standards and Guidelines in Land and Resource Management Plan	Environmental Consequences in Final EIS
Cache Mountain	Deschutes NF	Chapter 4 - pages 92-93	Chapter IV - pages 69-70
Dry Mountain	Ochoco NF	Pages 125-264*	Chapter IV - 9,10, 41, 51, 108
Fish Lake Bog	Wenatchee NF	Chapter IV - pages 189-197	Chapter IV - pages 83-85
Gumjuwac/Tolo	Mt. Hood NF	Chapter IV - pages 136-150	Chapter IV - pages 145-150
Hagan	Willamette NF	Chapter IV - pages 134-137	Chapter IV - pages 166-169
McKenzie Pass	Willamette NF	Chapter IV - pages 134-137	Chapter IV - pages 166-169
Mokst Butte	Deschutes NF	Chapter 4 - pages 92-93	Chapter IV - pages 69-70
Reneke Creek	Siuslaw NF	Chapter IV - pages 104-107	Chapter IV - pages 77-80
Roger Lake	Okanogan NF	Chapter 4 - pages 73-75	Chapter IV - pages 71-72
Tenmile Creek	Oregon Dunes NRA	Chapter III - pages 49-51	Chapter IV - pages 60-62
Vee Pasture	Fremont NF	Pages 126, 165-166	Chapter IV - pages 171-172

*Specific pages that refer to RNA management include 125-127, 132, 136-138, 142-143, 147, 152, 155, 160, 163-168, 172-175, 178-179, 182, 190, 192, 198, 210, 228-234, 238-239, 250 and 262-264.

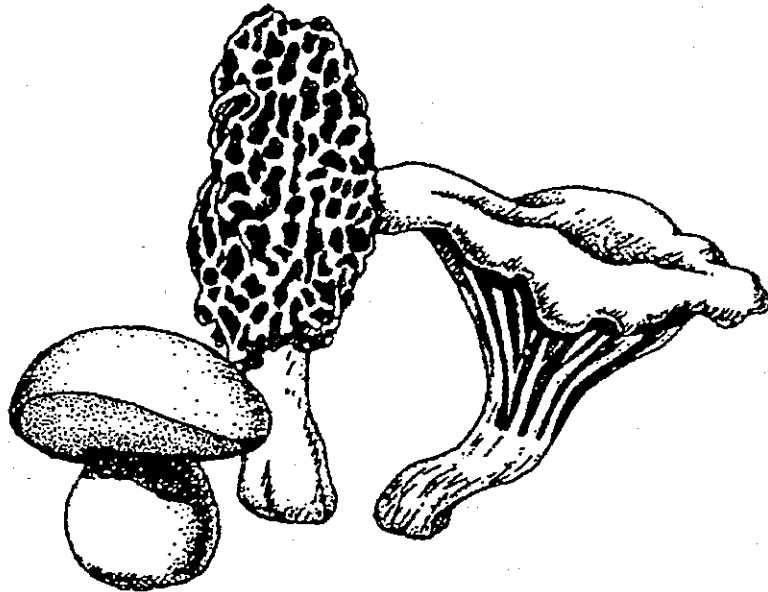
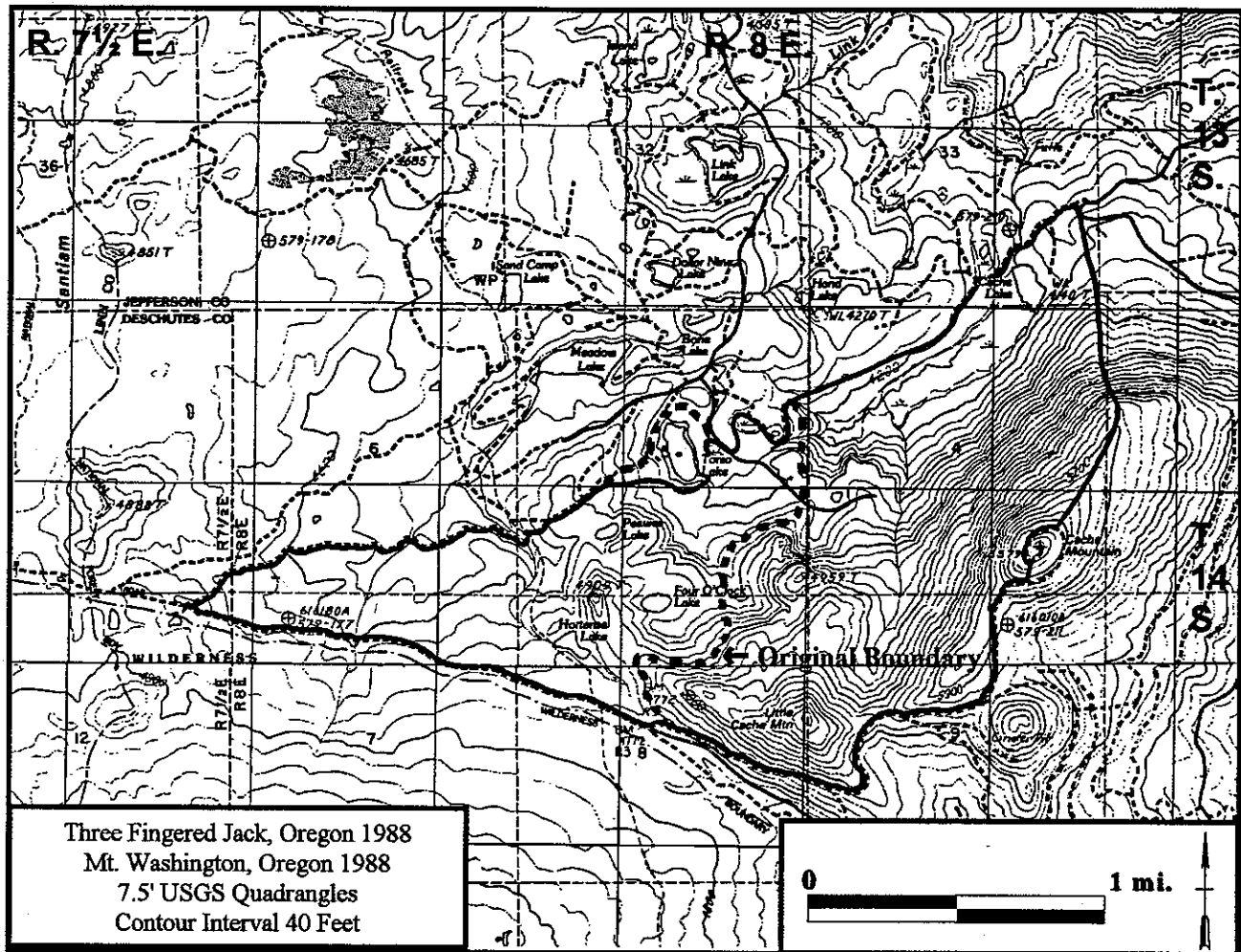


Figure 2: Cache Mountain RNA



Boundary Change: This RNA was originally proposed to include 600 acres in the Deschutes Forest Plan. Review of the area during the establishment process found that the uplands make a significant hydrologic contribution to the lakes and marshy areas that were the main objective for this RNA. To adequately maintain the hydrologic integrity of the system 800 acres were added to the RNA. Torso Lake was found to be significantly altered by previous recreational use and was therefore excluded from the final RNA boundary.

Mineral Resources: There are no known locatable or leasable mineral resources in the RNA and there is a low probability of finding them. Salable mineral resources include cinders and a potential hard rock resource. There has been no exploratory work done on the potential hard rock source.

Grazing: One quarter of an existing but inactive sheep grazing allotment will no longer be available for grazing.

Timber: Of the 1400 total acres in the RNA, 1300 are within a Late-Successional Reserve and are unavailable for timber management purposes. The other 100 acres include Riparian Reserves and Forest

Matrix allocations. The Matrix lands are all within the proposed addition to the RNA and will no longer be available for timber harvest. The effect on the probable sale quantity will be negligible.

Recreation: Most recreation use is associated with the lakes. Due to limited road and trail access, use has been low in the proposed RNA. It is not anticipated that establishment of the RNA will affect this type of dispersed use. Off-highway vehicle (OHV) use in the area surrounding the RNA is high particularly along roads and the summit of Cache Mountain on the eastern boundary of the RNA. Much of the area added to the RNA is unroaded and is already off limits to this use because of wetlands standards and guidelines. Abundant down wood and steep topography in other areas has and will continue to limit OHV use in the remainder of the area that has been added. The summit area of Cache Mountain is outside the RNA. For these reasons it is anticipated that the effect of establishment on OHV use in the area will be minimal. About one half mile of Rd. 2076-800 lies within the RNA. If closure of this road to protect RNA values becomes desirable, a separate NEPA analysis will be completed.

Communications Site: The communications site on Cache Mountain is not included in the proposed addition to the RNA and the road to the site will remain open. There should be no conflict between use of the site and establishment of the RNA.

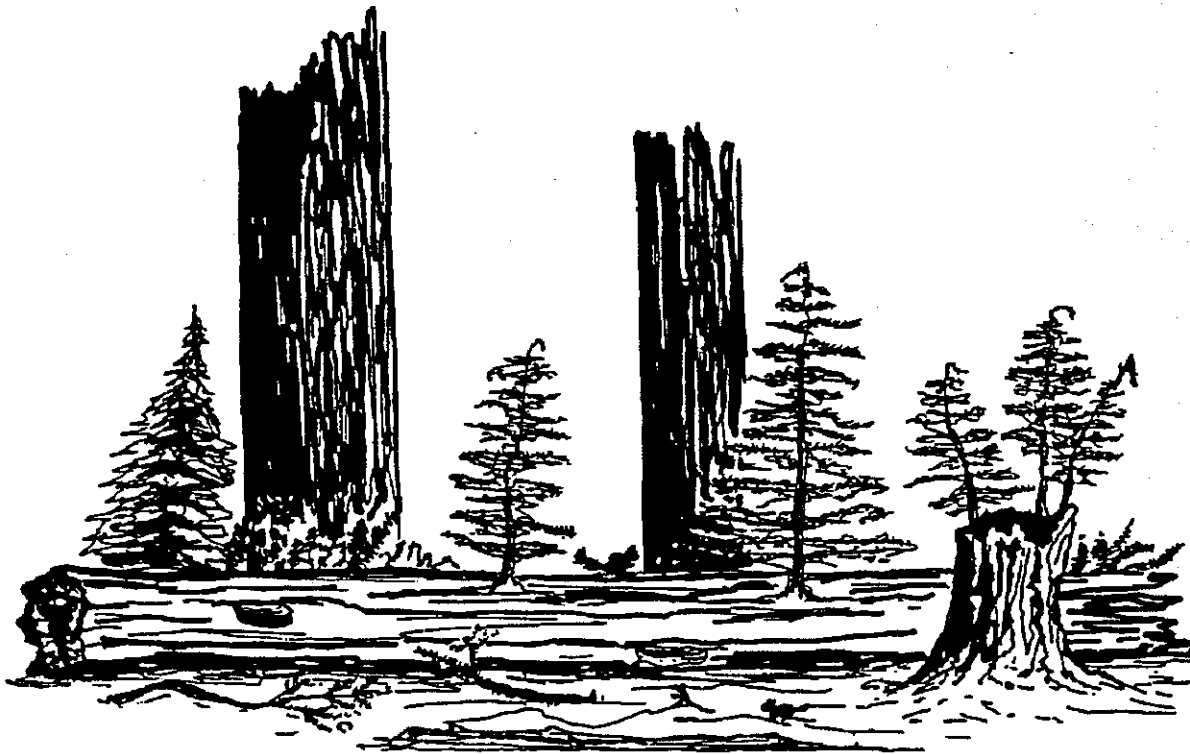
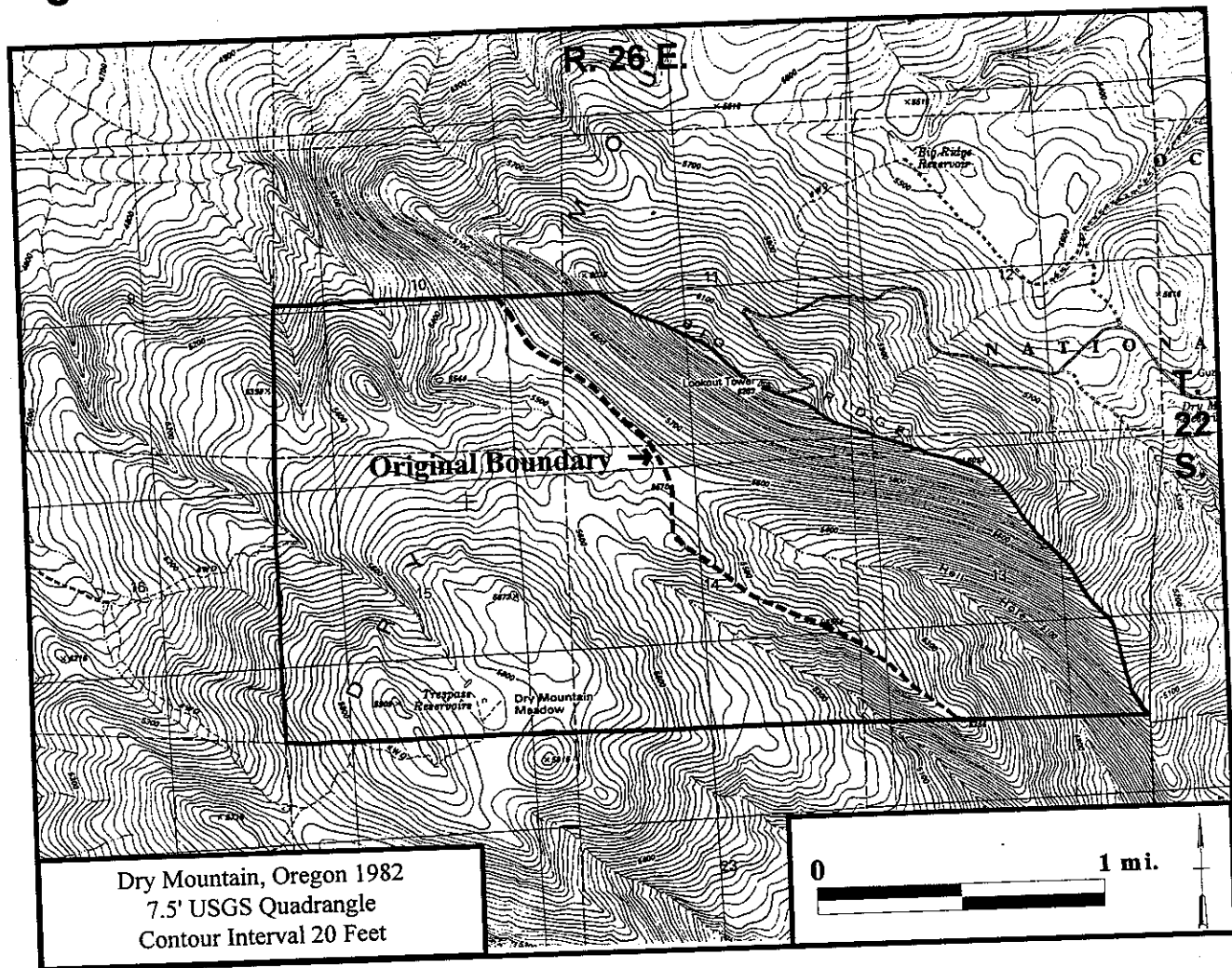


Figure 3: Dry Mountain RNA



Boundary Change: The proposed change incorporates natural watershed boundaries and is more consistent with the topography of the area. The additional acres are currently managed as big game winter range. This change will not have any measurable effect on Forest plan outputs.

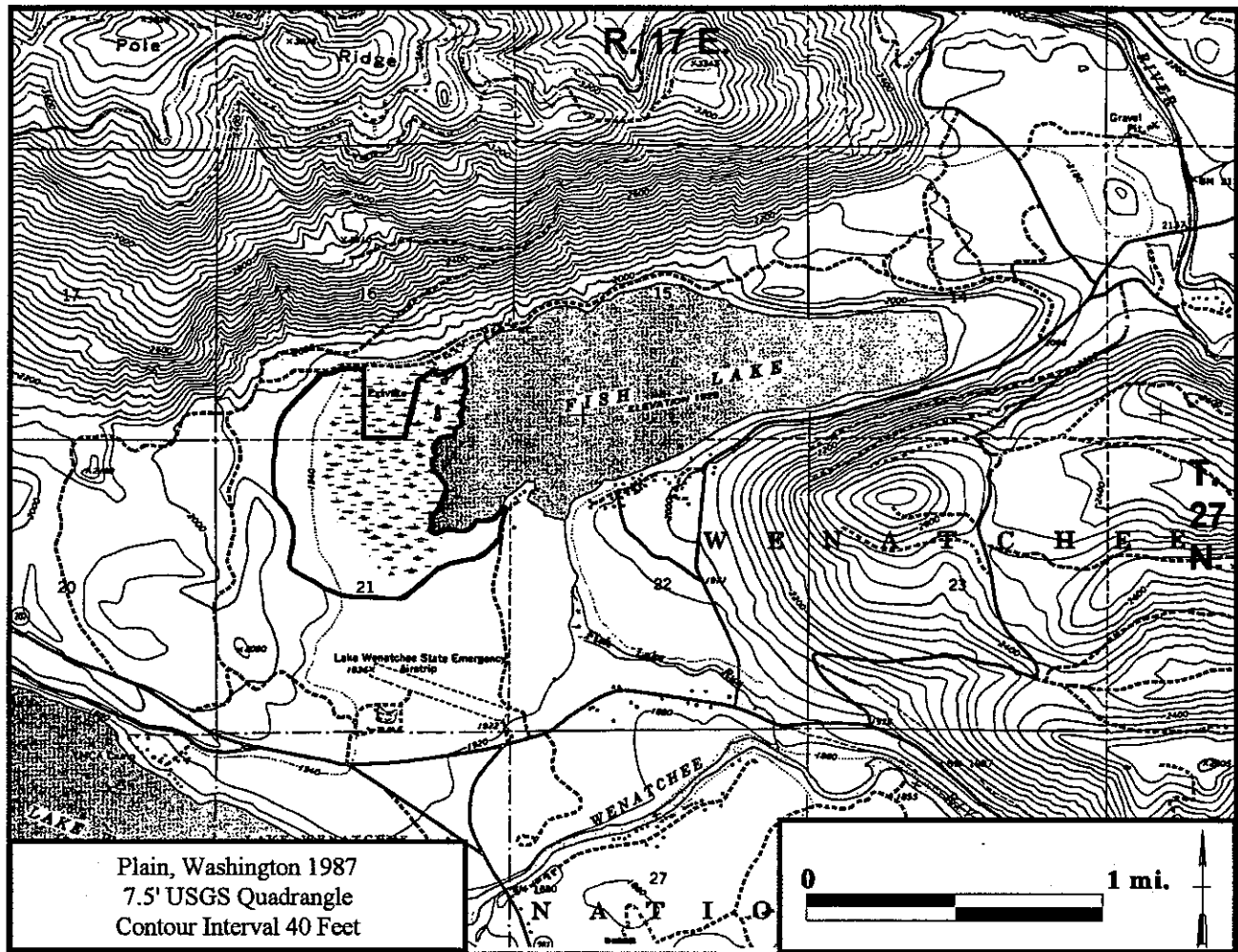
Mineral Resources: There are no reported hardrock mining claims in the RNA. The geology of the area does not lend itself to valuable mineral claims. Salable minerals, such as gravel, are potentially available on the RNA but recovery of these resources would be difficult due to the limited access to the area.

Grazing: Dry Mountain RNA is within the Green Butte grazing allotment but, because of the isolated nature of the site, there has been no recent cattle grazing on this part of the allotment.

Timber: The RNA has not been cruised to determine the volume of timber present but approximately half of the site contains 150-200 year old ponderosa pine in low to moderate densities.

Recreation: Dry Mountain RNA receives almost no recreation use therefore, establishment will have no effect on recreation.

Figure 4: Fish Lake Bog RNA



Mineral Resources: There are no known mineral resources within the RNA.

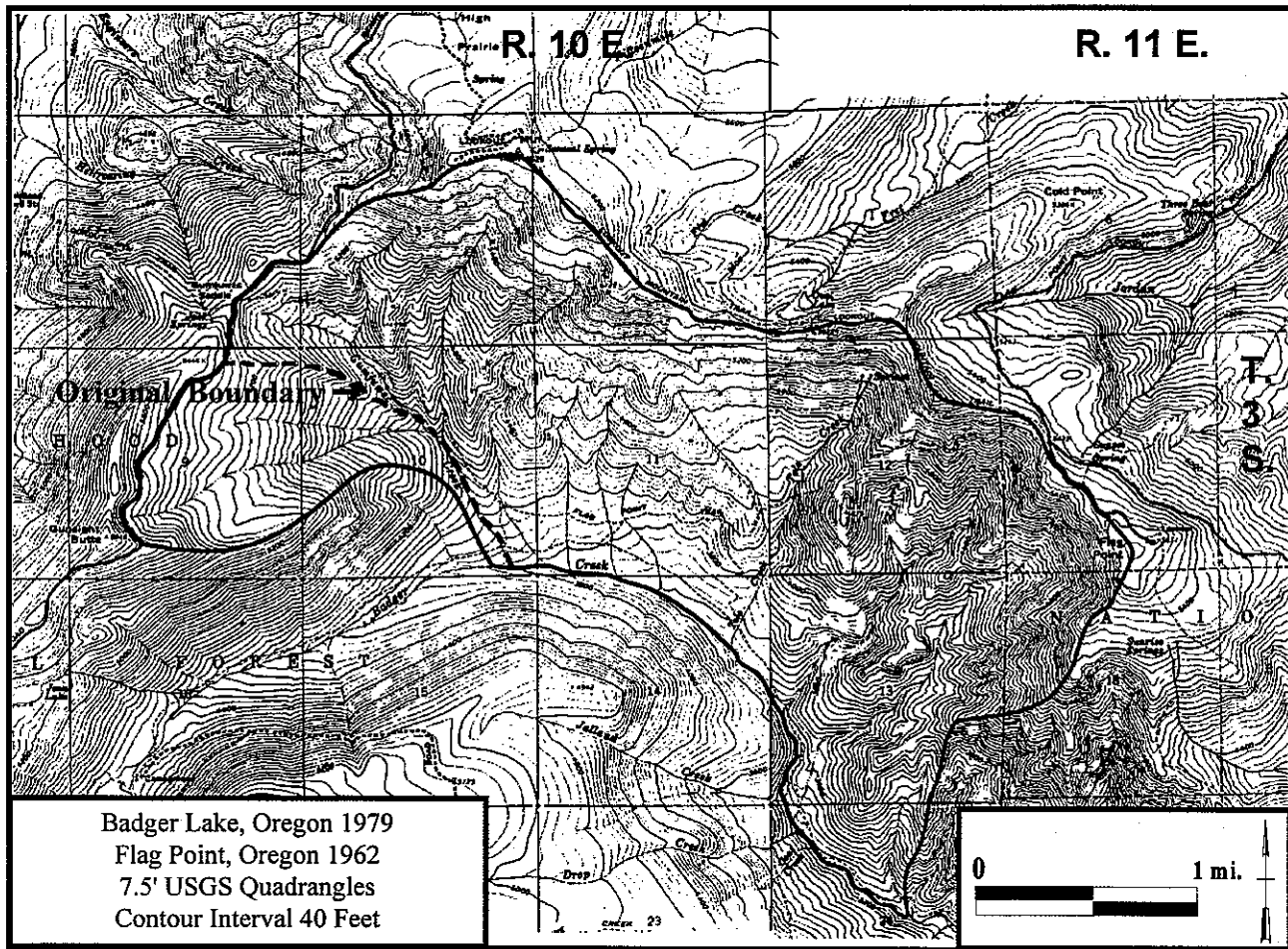
Grazing: There is no grazing allotment or potential for grazing associated with this RNA.

Timber: There about 64 acres of forest land within the RNA. This land was not included in the timber base for the Forest Plan therefore precluding timber harvest on these acres will have no effect on the probable sale quantity.

Recreation: Fish Lake which is adjacent to the RNA is a major fishing, boating, and snowmobiling area. There is a snowmobile trail along the western and northern boundaries of the RNA. This use is not expected to conflict with protection of RNA values. Because of the bog type of vegetation along the lake's boundary with the RNA there will be no impact on the water-based recreational uses of the lake.

Private Land: It is desirable to obtain the 44 acres of private land adjacent to the RNA in Section 16 in order to fully utilize the research potential of this RNA.

Figure 5: Gumjuwac/Tolo RNA



Boundary Change: The boundary was slightly modified during the establishment process to include all of Gumjuwac Creek. Since the whole RNA is within the Badger Creek Wilderness, this change is not expected to change the environmental consequences documented in the Final EIS.

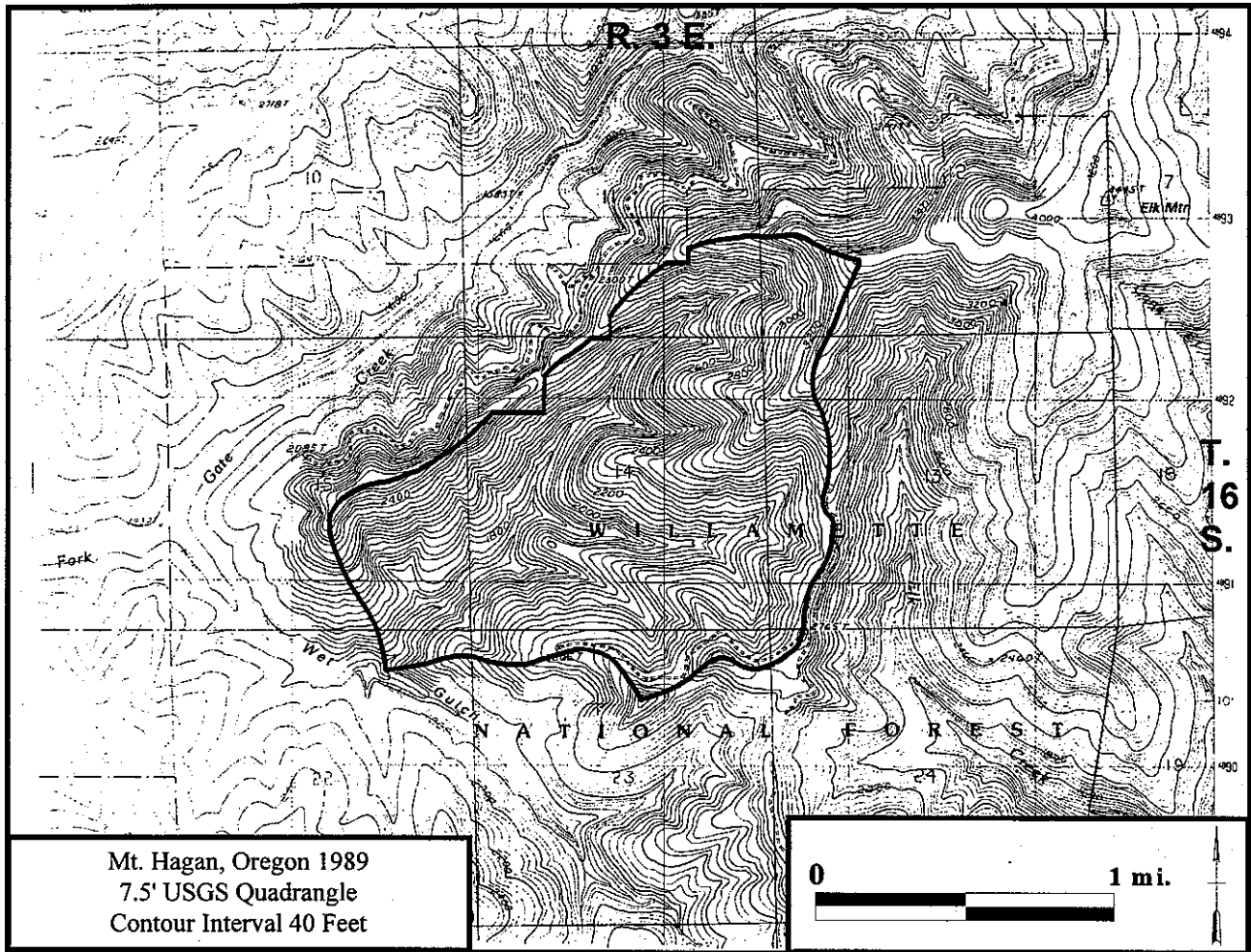
Mineral Resources: This area is considered to have low to very low potential for economic deposits of all minerals except construction rock. The RNA has already been withdrawn from future locatable mineral entry in conjunction with designation of the wilderness.

Grazing: No grazing allotments currently exist within the area.

Timber: There will be no change in the probable sale quantity by establishment of this RNA since the RNA lies entirely within the Badger Creek Wilderness, in which timber harvest is not permitted.

Recreation: Parts of several wilderness trails lie within the proposed RNA and roughly demarcate its perimeter. These trails receive relatively light use and do not appear to detract from the natural values of this area. Therefore, recreation use should not be effected by establishment of this RNA.

Figure 6: Hagan RNA



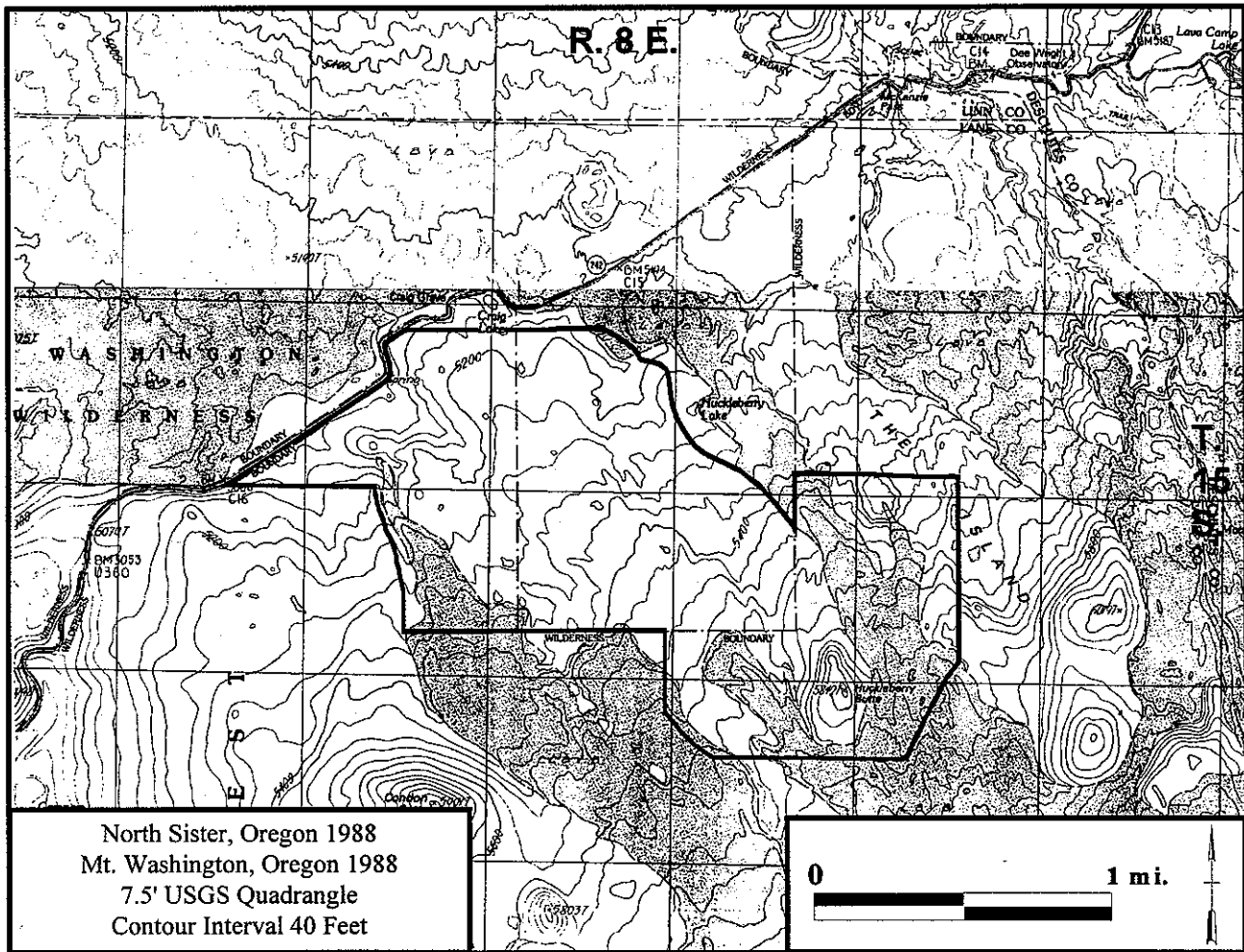
Mineral Resources: There are no known mineral resources in or adjacent to the RNA.

Grazing: There are no grazing allotments in or adjacent to the RNA.

Timber: The RNA includes 1126 acres of forested lands that meet the productivity requirements for commercial timber harvest. This land was not included in the timber base for the Forest Plan and is now within a Late-Successional Reserve. Therefore establishment will have no effect on probable sale quantity.

Recreation: Steep slopes and lack of public road access have limited recreational use of the RNA to some hunting use. Establishment is not expected to have any impact on this use.

Figure 7: McKenzie Pass RNA



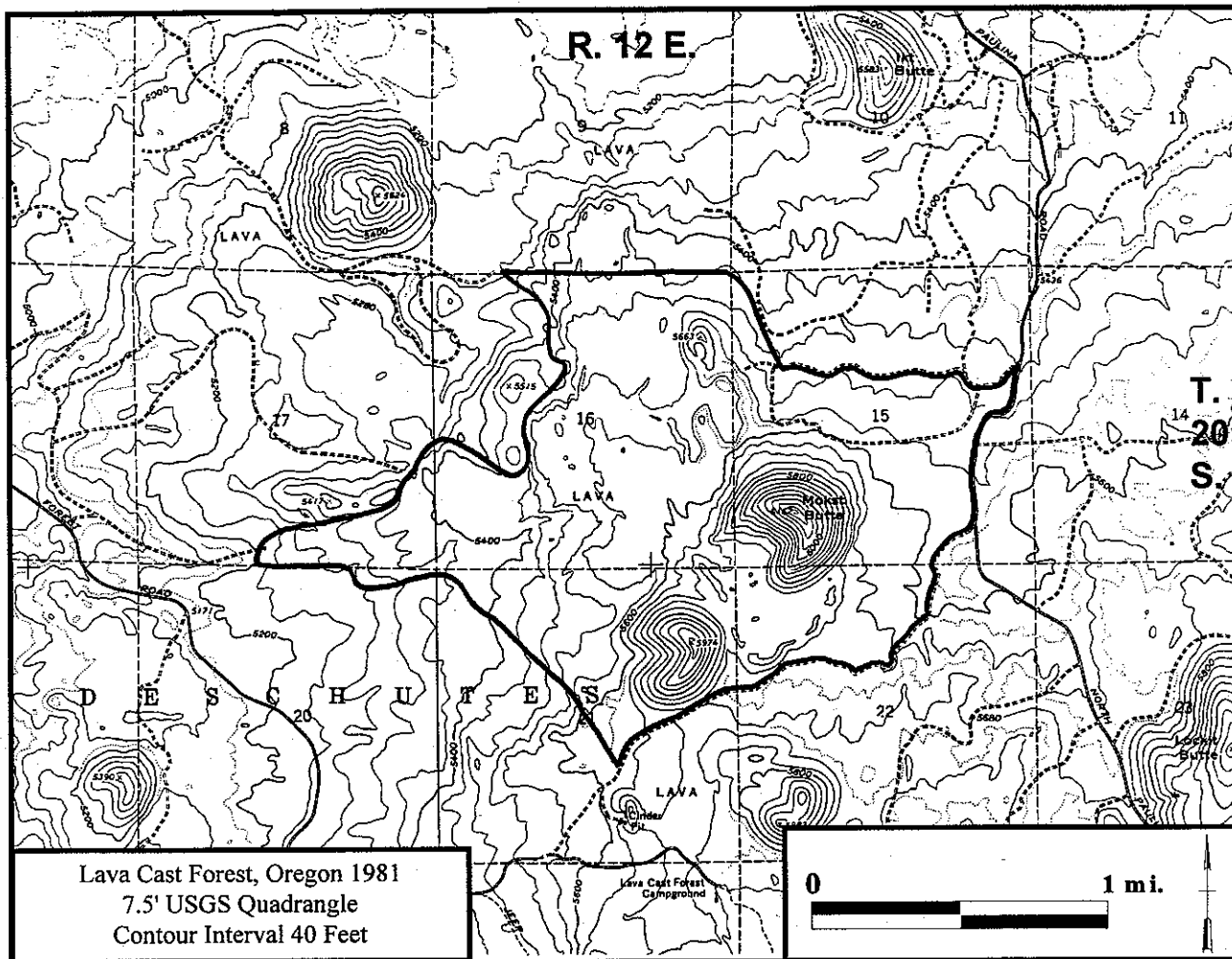
Mineral Resources: There are no known mineral resources in or adjacent to the RNA.

Grazing: There are no grazing allotments in or adjacent to the RNA because of lack of forage and inaccessibility of the area.

Timber: The RNA contains 926 acres (out of 1187 acres) of forested lands that meet the productivity requirements for commercial timber harvest. About half of these acres (471 acres) are in the Three Sisters Wilderness and are not available for harvest. The remainder were not included in the timber base for the Forest Plan. Therefore, establishment will have no effect on probable sale quantity.

Recreation: There is light to moderate use of the area by day hikers, mountain bikers, and hunters. Most of the use is concentrated around Craig Lake and Huckleberry Lake, both of which are outside the RNA boundary. The RNA includes 723 acres of the Three Sisters Wilderness. A trail in the eastern portion of the RNA that runs to Huckleberry Butte will continue to be used. No conflicts are anticipated with protection of RNA values therefore recreation use of the area will not be effected by establishment.

Figure 8: Mokst Butte RNA



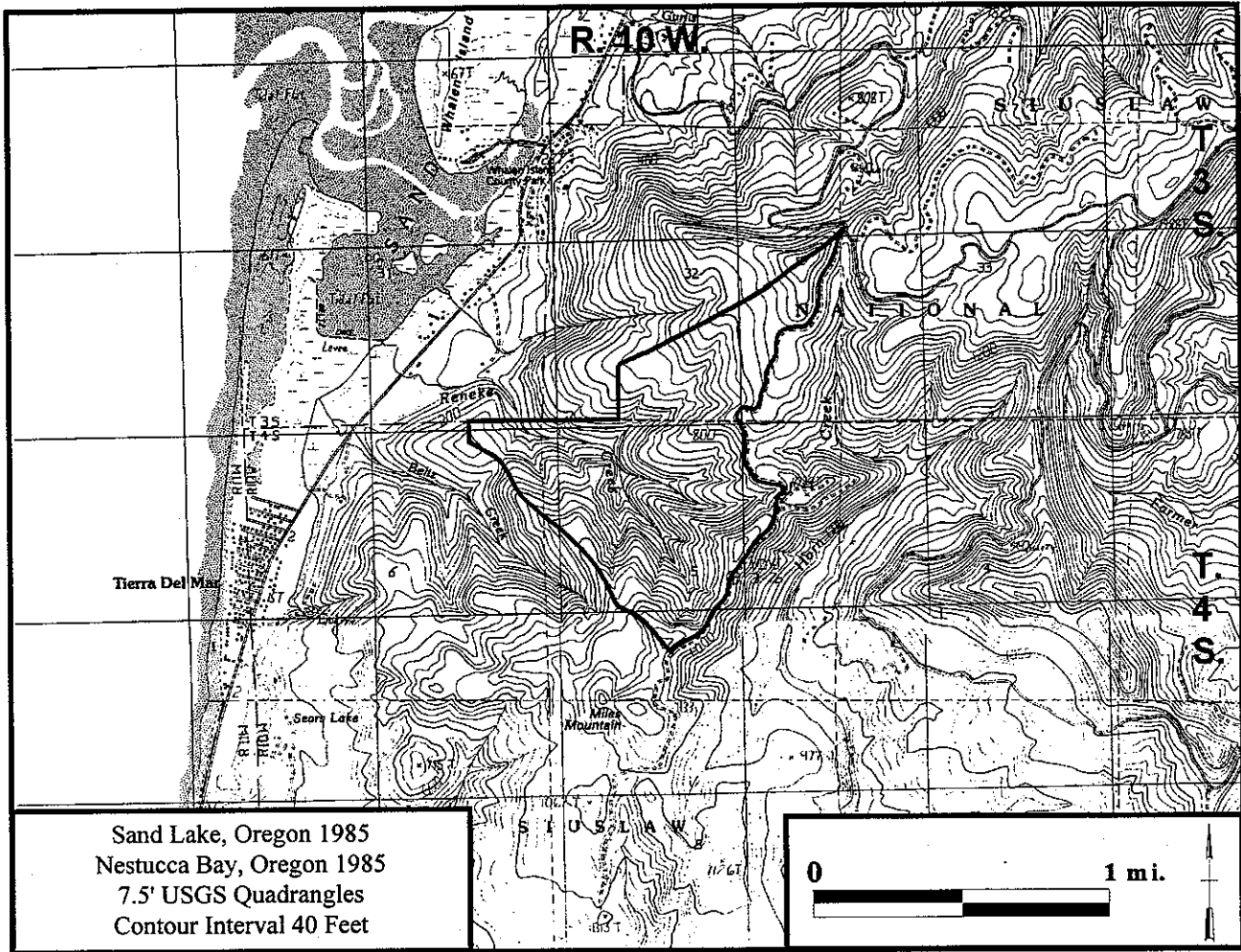
Mineral Resources: The State of Oregon has a mineral reservation covering 480 acres in section 16 of the RNA. The area is also withdrawn from mineral entry under the Newberry Crater National Volcanic Monument enabling legislation.

Grazing: There are two allotments adjacent to the RNA. Both are currently vacant and requirements for the Volcanic Monument already preclude grazing so establishment will have no effect on grazing.

Timber: The RNA contains approximately 500 acres (out of 1250 acres) of forested lands that meet the productivity requirements for commercial timber harvest. This land was not included in the timber base for the Forest Plan. Therefore, establishment will have no effect on probable sale quantity.

Recreation: The RNA receives limited recreation use, mostly hiking and dispersed camping. This use is not expected to conflict with protection of RNA values. Therefore, recreation use of the area will not be effected by establishment.

Figure 9: Reneke Creek RNA



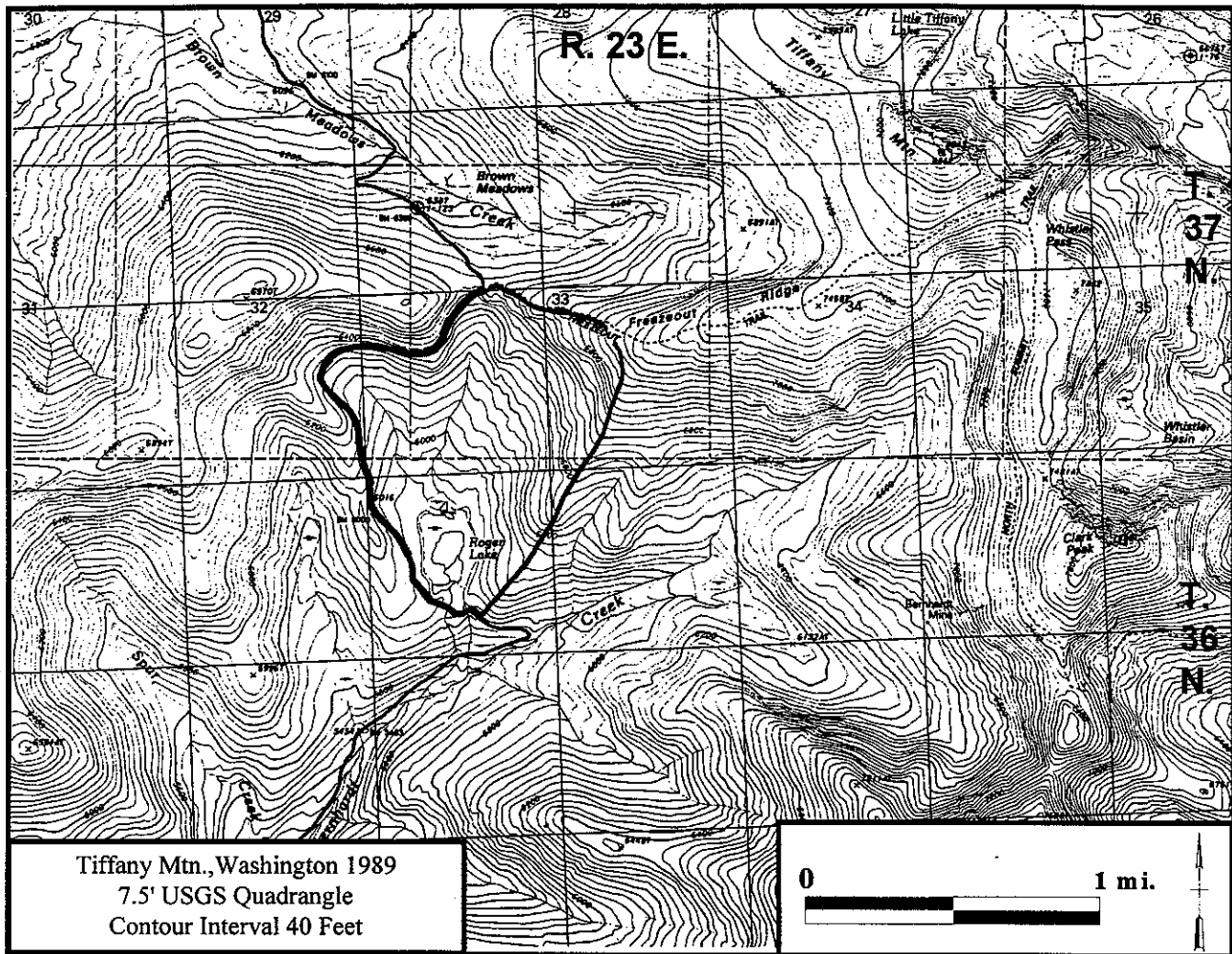
Mineral Resources: There are no known mineral resources in the RNA.

Grazing: There are no grazing allotments in or adjacent to the RNA.

Timber: The RNA is covered by forested lands that meet the productivity requirements for commercial timber harvest. This land was not included in the timber base for the Forest Plan and is within a Late-Successional Reserve. Therefore, establishment will have no effect on probable sale quantity.

Recreation: The RNA receives almost no recreation use. The site is not particularly inviting to hikers because it is densely forested and secluded by private lands. There is some use during hunting season. This use is not expected to conflict with protection of RNA values. Therefore, recreation use of the area will not be effected by establishment.

Figure 10: Roger Lake RNA



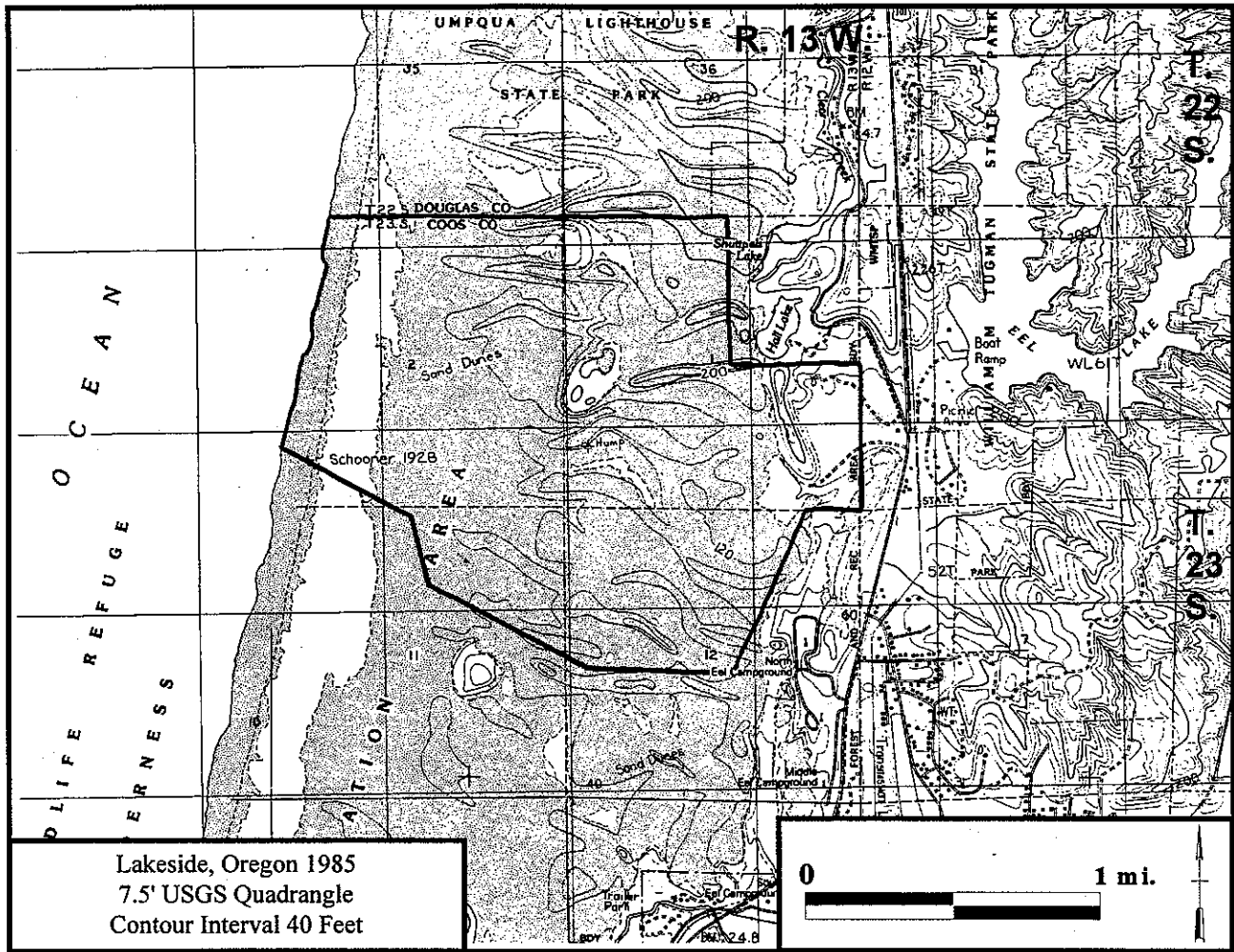
Mineral Resources: There are no known mineral resources in the RNA.

Grazing: The RNA is located within a grazing allotment that has not been grazed since 1987. If this allotment becomes active, the 436 acres in the RNA will be excluded from grazing.

Timber: Approximately 380 acres of the RNA are covered by forested lands that meet the productivity requirements for commercial timber harvest. This land was not included in the timber base for the Forest Plan. Therefore, establishment will have no effect on probable sale quantity.

Recreation: The RNA receives most of its recreation use in the area around Roger Lake where there is a parking area and two campsites. These facilities will be closed as required by the Forest Plan standards and guidelines. Dispersed recreation such as hunting and hiking will continue unless it reduces the research or educational values of the RNA.

Figure 11: Tenmile Creek RNA



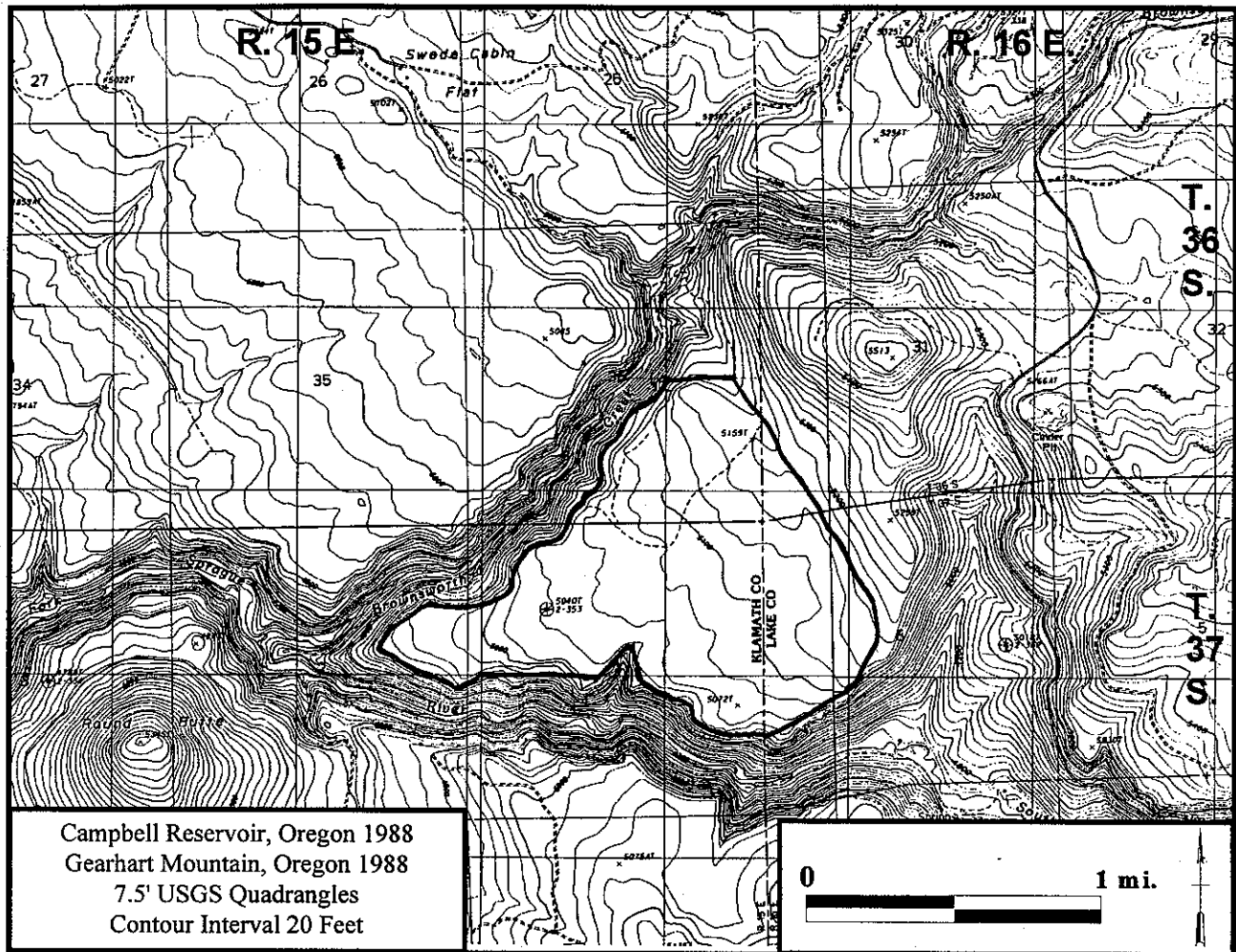
Mineral Resources: This area has been withdrawn from mineral entry as part of the Oregon Dunes National Recreation Area.

Grazing: There are no grazing allotments in or near the RNA.

Timber: A small portion of the RNA consists of timbered lands. These lands were considered unavailable for harvest during analysis for the Oregon Dunes Management Plan and EIS.

Recreation: The RNA receives some recreation use, mostly in the form of day hiking. Recreation in the RNA is a concern if use increases as expected in the Oregon Dunes National Recreation Area. It is anticipated that education of users will be used to minimize conflicts between continued recreational use of the RNA and protection of the research values of the RNA.

Figure 12: Vee Pasture RNA



Mineral Resources: There are no known mineral resources in this RNA.

Grazing: Livestock have used this area to only a limited extent due to natural barriers, rocky soil surface, and distance from water. It is not part of any grazing allotment.

Timber: This RNA is covered with grasslands therefore, establishment will have no effect on timber outputs.

Recreation: There is very limited recreational use within the RNA due to its inaccessibility. The most likely use is some hunting. This use is not expected to conflict with the research or educational values of the RNA.

Revision of Boundaries for
Hagan Research Natural Area

Willamette National Forest
Lane County, Oregon

The Willamette National Forest is revising the boundaries of the Hagan Research National Area. In September 1998 the Forest Supervisor, Darrel Kenops, signed the Guistina Land Exchange Environmental Assessment. The EA assigned 74.96 acres of acquired land to the Hagan RNA.

The revised RNA boundary included acres at T16S R3E S11, 14, 15. The additional acres moved the boundary of the RNA to the ridgetop. With the new acres Hagan RNA is now a full 6th field watershed. The acres are divided into three areas that run along the above Township/Range section lines.

The addition does not change the access to the area and no additional flora, fauna, or soil types added.

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified.

Recommended by: Mary Allison Date: 3-26-07
Mary Allison, District Ranger
McKenzie Ranger Station

Recommended by: Dallas Emch Date: 4/6/07
Dallas Emch, Forest Supervisor
Willamette National Forest

Recommended by: Paul Eav Date: 19 Apr 07
Bov Eav, Station Director
Pacific Northwest Research Station

By virtue of the authority vested in me by 7 CFR 2.60(a) and 36 CFR 251.23 of the Regulations of the Secretary of Agriculture, I hereby order that the lands described in the preceding establishment record by Michael J. Schwartz, dated March 22, 2007, be designated as a part of the Hagan Research Natural Area.

Linda Goodman
Linda Goodman
Regional Forester

4/21/07
Date

HAGAN RESEARCH NATURAL AREA

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

1922

State Reg. No.



MICHAEL J. SCHWARTZ
Land Surveyor

3-22-2007

Date

HAGAN RESEARCH NATURAL AREA

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
Mt. Hagan				Commencing at the 1/4 corner between section 11 and section 12 T. 16 S. R. 3 E. W.M., thence south to the top of a ridge which is the True Point of Beginning. The
	POB			True Point of Beginning being on the top of the ridge.
		N86/18/18E	68.1	
2		S62/42/56E	77.8	
3		S65/25/20E	76.2	
4		S49/23/32E	155.0	
5		S55/12/04E	239.7	Ascend easterly along of the ridge.
6		S61/19/25E	209.3	
7		S70/28/06E	128.4	
8		S83/32/22E	90.3	
9		S78/24/56E	101.6	
10		S71/01/34E	86.0	
11		S53/15/56E	76.0	
12				A point at the junction of 2 ridges which define the east and north boundary of the Hagan Creek watershed.
		S16/31/19W	267.3	
13		S15/43/28W	80.5	Descend along the top of a ridge.
14		S27/39/25W	203.0	
15		S24/58/24W	244.4	

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	16	S22/05/17W	141.1	
	17	S25/21/17W	240.8	
	18	S19/46/36W	215.0	
	19	S30/49/18W	105.6	
	20	S32/23/30W	240.4	
	21	S30/12/04W	111.9	
	22	S23/18/11W	133.7	
	23	S19/37/06W	229.5	
	24	S10/58/41W	215.0	
	25	S19/38/28E	184.3	Descend along the top of a ridge.
	26	S27/41/55E	123.6	
	27	S23/36/35E	128.0	
	28	S19/56/44E	126.7	
	29	S27/27/15E	91.3	
	30	S18/49/13E	104.4	
	31	S07/34/10E	103.3	
	32	S01/38/20E	192.3	
	33	S04/15/21E	205.0	
	34	S02/42/20W	168.0	
	35	S11/42/28W	166.7	
	36	S04/59/47E	72.5	
	37	S17/22/35E	124.6	
	38			A point on the ridge which is 50 feet westerly from and perpendicular to the centerline of (the end of) USFS road 080 or its prolongation.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	39	S88/53/19W	46.0	
	40	S44/19/49W	120.2	
	41	S29/44/08W	84.1	
	42	S10/18/48W	115.4	
	43	S03/25/11E	168.6	
	44	S25/40/31E	110.0	
	45	S30/31/56E	106.0	
	46	S28/47/02E	143.4	
	47	S06/42/43W	235.0	
	48	S07/53/52W	175.1	
	49	S16/27/52W	76.6	50 feet westerly of and parallel with the centerline of USFS road 080.
	50	S27/33/54W	149.3	
	51	S22/52/54W	81.7	
	52	S45/04/43W	63.6	
	53	S36/53/03W	154.8	
	54	S29/20/23W	178.9	
	55	S29/01/28W	137.7	
	56	S18/39/09W	161.3	
	57	S15/44/23W	152.8	
	58	S11/30/21W	294.6	
		S13/56/25W	174.2	
	59			A point 50 feet westerly of and perpendicular to the centerline of USFS road 080 and 50 feet northerly and perpendicular to the centerline of USFS road 090.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	60	S28/24/52W	101.0	
	61	S43/54/45W	133.0	
	62	S55/00/32W	131.5	
	63	S62/50/19W	104.7	
	64	S58/39/32W	192.4	
	65	S70/30/42W	134.8	
	66	S76/06/53W	114.0	
	67	N82/46/00W	156.8	
	68	N45/20/29W	189.6	
	69	N52/04/33W	144.4	
	70	N24/51/23W	144.9	
	71	N30/07/08W	114.9	
	72	N46/01/05W	68.0	
	73	N75/46/25W	116.9	50 feet northerly of and parallel with the centerline of USFS road 090.
	74	S56/31/57W	112.0	
	75	S55/49/09W	103.2	
	76	S32/18/21W	93.3	
	77	S60/14/10W	123.8	
	78	S60/15/04W	135.4	
	79	S48/22/19W	120.2	
	80	S44/40/49W	145.7	
	81	S13/40/39W	65.5	
	82	S10/48/04W	97.3	
	83	S14/08/37W	90.2	
	84	S34/31/16W	62.1	
	85	S78/55/52W	139.2	
		N76/40/40W	106.3	

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	86			
	87	S88/06/16W	70.1	
	88	N84/25/04W	136.3	
	89	S81/14/49W	113.7	
	90	N88/37/27W	80.0	
	91	N39/51/47W	258.0	
	92	N45/38/03W	202.4	50 feet northerly of and parallel with the centerline of USFS road 090.
	93	N26/51/45W	93.1	
	94	N41/27/33W	111.8	
	95	N62/03/32W	152.1	
	96	N79/38/57W	153.9	
	97	N82/26/22W	241.4	
	98	N87/41/03W	122.0	
	99	S84/51/14W	140.9	
	100	N86/46/33W	124.0	
		S80/21/16W	230.2	
	101			A point which is 50 feet northerly of and perpendicular to the 50 foot prolongation of the centerline of USFS road 090.
		S05/07/03E	106.7	Along sidehill.
	102			A point 50 feet westerly from the end of USFS road 090 and on the top of the ridge.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	103	S56/21/49W	73.2	
	104	S77/30/30W	158.6	
	105	S74/05/10W	188.4	
	106	S70/16/22W	150.0	
	107	S82/33/34W	261.0	
	108	S77/32/27W	133.8	
	109	N78/45/21W	186.7	
	110	N66/49/19W	75.4	
	111	N72/40/34W	87.4	
	112	N63/36/22W	132.4	
	113	N62/45/26W	220.1	
	114	S79/44/17W	69.4	Descend along top of a ridge to the West.
	115	S84/01/13W	62.5	
	116	S69/57/54W	158.9	
	117	S71/47/31W	95.5	
	118	S66/37/40W	195.9	
	119	S76/44/53W	237.6	
	120	S85/01/59W	217.3	
	121	S87/30/32W	148.3	
	122	S71/27/40W	123.3	
	123	N86/19/56W	150.1	
		N42/27/54W	138.7	
	124			The confluence of Wet Gulch and Hagan Creek.

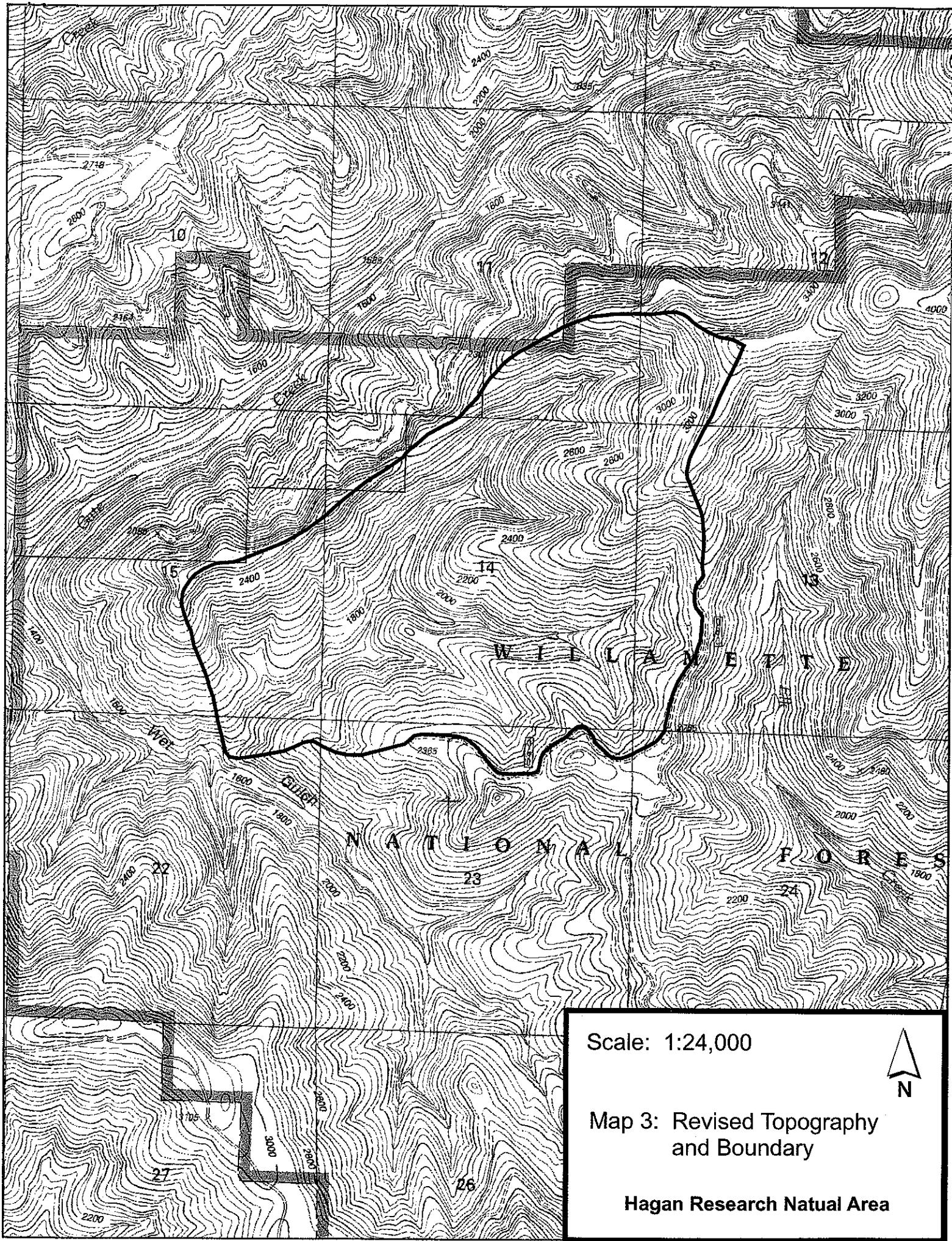
QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	125	N13/00/15W	266.4	
	126	N17/05/13W	189.8	
	127	N22/43/28W	103.0	
	128	N13/43/24W	107.7	
	129	N07/32/20W	259.2	
	130	N12/27/17W	117.4	
	131	N23/27/27W	233.6	
	132	N10/14/58W	79.6	Ascend along a minor ridge to the Northwest.
	133	N24/43/20W	104.7	
	134	N29/25/39W	218.9	
	135	N08/57/45W	89.5	
	136	N22/08/52W	100.4	
	137	N17/54/41W	175.9	
	138	N11/39/05W	160.1	
	139	N29/04/09W	146.2	
	140	N13/05/60W	136.3	
	141	N13/26/16W	149.0	
		N03/46/41W	134.6	
	142			
	143	N13/56/37E	155.7	
	144	N24/32/07E	91.4	
	145	N38/04/01E	157.1	Ascend along the top of the ridge.
	146	N42/09/35E	116.2	
	147	N60/33/26E	121.0	
	148	N65/29/47E	73.3	
		N76/54/02E	192.0	

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	149			A point on the top of the ridge in Section 15.
		N78/30/00E	300.0	Along the ridge top
	150			
		N77/00/00E	220.0	
	151			
		N72/46/22E	225.7	
	152			
		N59/29/30E	87.1	
	153			
		N69/14/23E	196.4	
	154			Descend along the top of the ridge
		N69/33/53E	96.9	
	155			
		N59/51/21E	72.7	
	156			
		N59/45/04E	91.5	
	157			
		N64/47/55E	71.5	
	158			
		N62/21/52E	189.7	
	159			A low point in a saddle on the top of the ridge.
		N58/04/59E	76.5	
	160			
		N53/39/39E	222.3	Ascend along the top of the ridge
	161			
		N47/49/09E	110.3	
	162			
		N51/23/45E	96.5	
	163			
		N45/53/54E	179.5	

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	164			A high point on the ridge
	165	N42/58/51E	72.2	
	166	N46/21/01E	99.0	Descend along the top of the ridge
	167	N42/24/07E	164.4	
		N48/05/13E	93.3	
	168			A point on the top of the ridge
	169	N53/00/00E	500.0	Along the ridge top
		N50/00/00E	645.0	
	170			A point on the top of the ridge
	171	N47/00/10E	248.8	
	172	N55/59/46E	152.0	
	173	N55/57/48E	93.2	
	174	N59/36/03E	98.8	Ascend along the top of the ridge
	175	N59/54/16E	199.2	
	176	N61/11/22E	99.4	
		N61/32/34E	188.9	
	177			A point on the top of the ridge

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	178	N38/00/00E	325.0	Along the ridge
		N37/00/00E	325.0	
	179			A point on the top of the ridge
	180	N36/48/06E	162.0	
	181	N43/03/40E	123.2	
	182	N38/13/02E	120.0	
	183	N39/24/50E	210.8	
	184	N54/49/48E	67.2	Ascend along the top of the ridge.
	185	N51/42/46E	90.9	
	186	N53/01/27E	109.6	
	187	N56/51/07E	116.5	
	188	N61/37/08E	161.2	
		N59/21/28E	94.3	
	189			A point on the top of the ridge and on the E-W centerline of the SE 1/4 of said Section 11.
		S87/44/20E	390.0	Along the E-W centerline of the SE 1/4 of said Section 11.
	190			The SE 1/16 of section 11 T. 16 S. R. 3 E. W.M.
		N05/16/12E	262.6	Along the N-S centerline of the SE 1/4 of said Section 11.

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET	DESCRIPTION
	191			A point on the top of the ridge and on the N-S centerline of the SE 1/4 of Section 11 T.16 S. R.3 E. W.M.
	192	N71/21/09E	274.5	
	193	N74/40/25E	125.2	
	194	N74/16/14E	244.7	
	195	N86/44/32E	74.2	
	196	N79/16/52E	200.4	Ascend along the top of a ridge to the True Point of Beginning.
	197	N87/22/29E	200.4	
	198	N87/56/45E	200.3	
	199	S83/40/47E	162.6	
	200	N83/09/03E	167.7	
	201	N80/39/52E	75.3	
	202	S89/59/05E	84.0	
		S89/31/48E	124.1	



Scale: 1:24,000

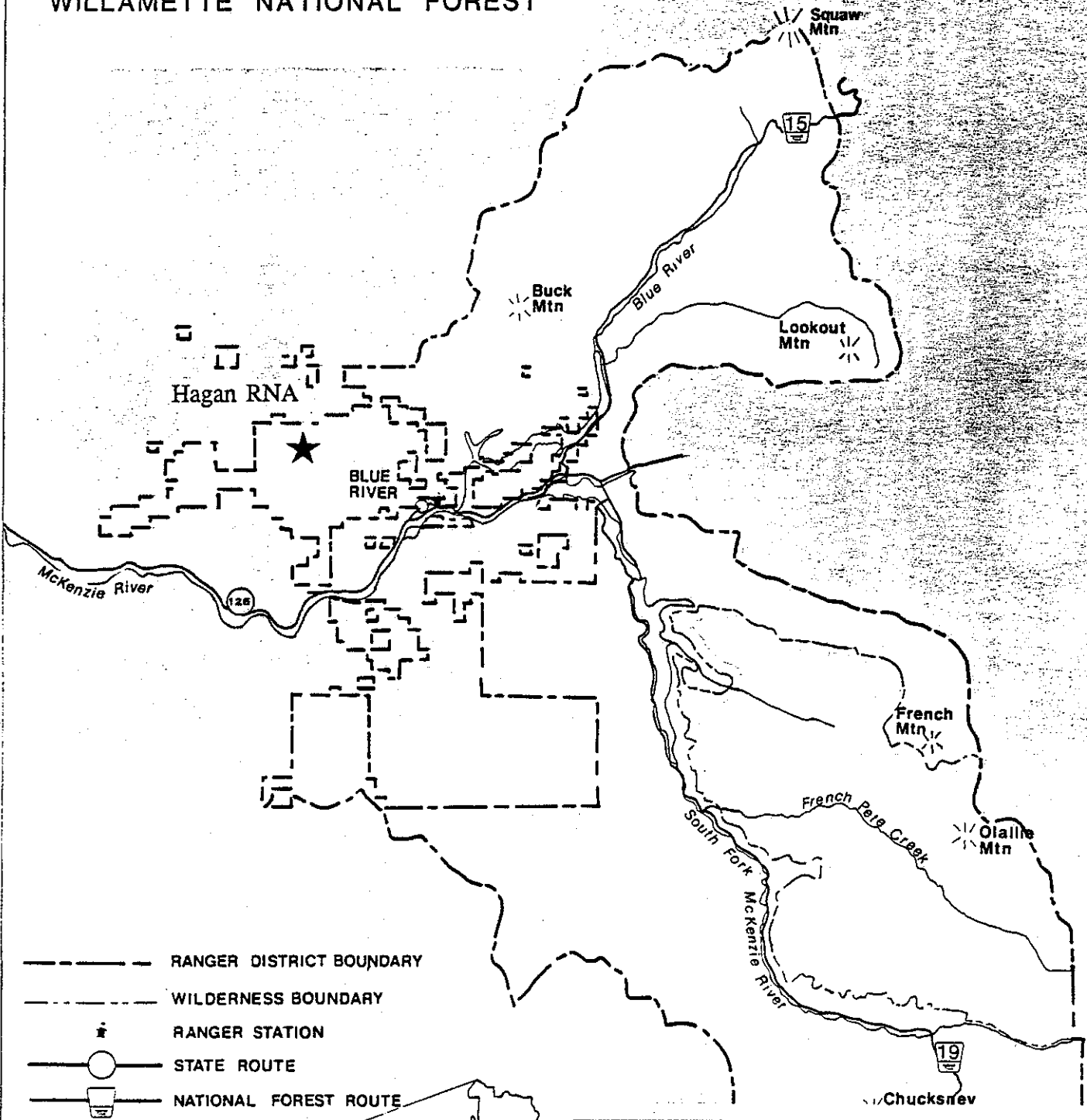


Map 3: Revised Topography
and Boundary

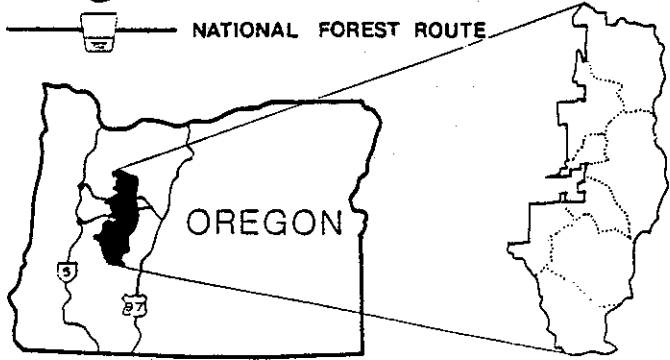
Hagan Research Natual Area

BLUE RIVER RANGER DISTRICT

WILLAMETTE NATIONAL FOREST



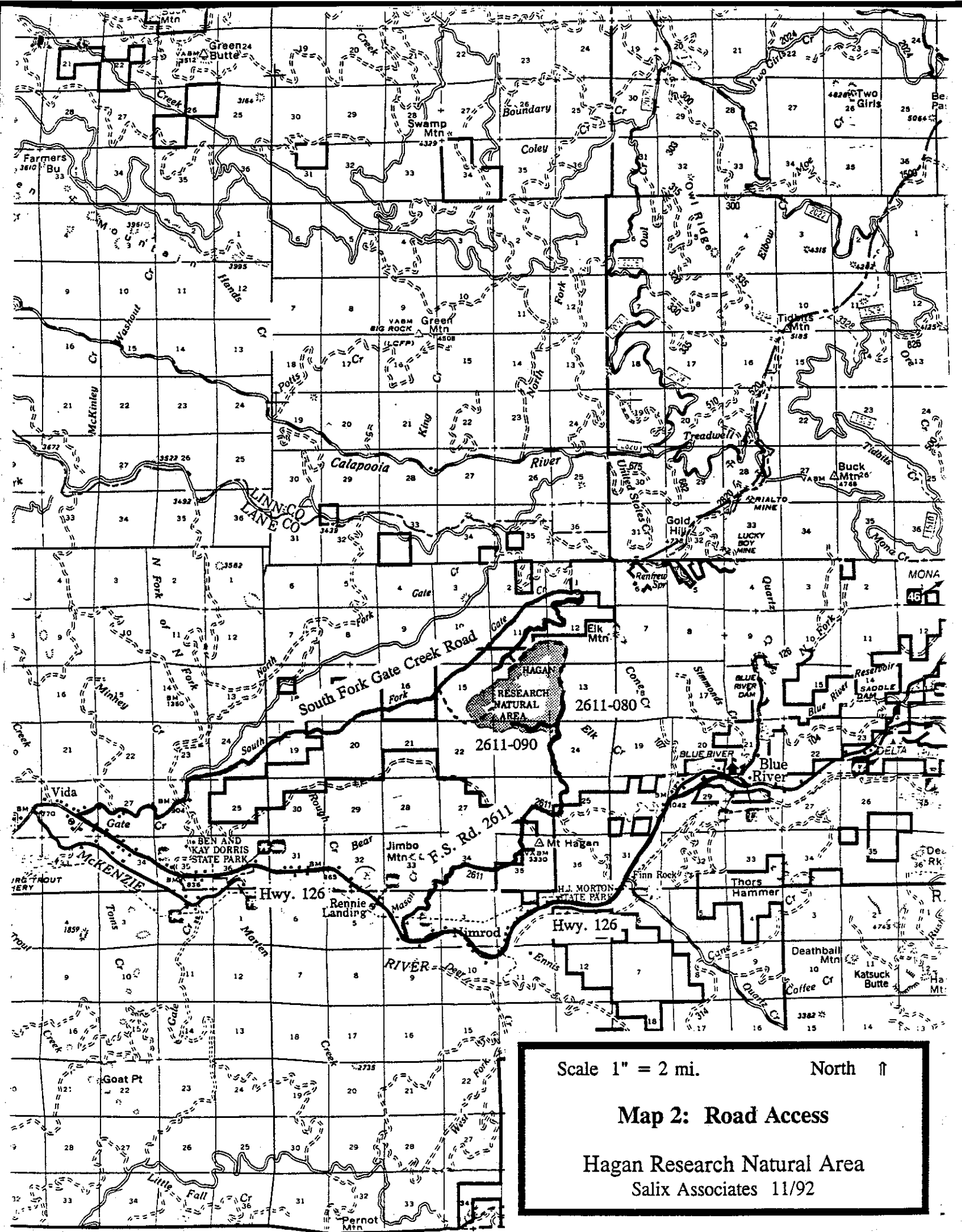
- RANGER DISTRICT BOUNDARY
- WILDERNESS BOUNDARY
- ★ RANGER STATION
- STATE ROUTE
- ☐ NATIONAL FOREST ROUTE



Scale 1" = 4 mi. North ↑

Map 1: Location

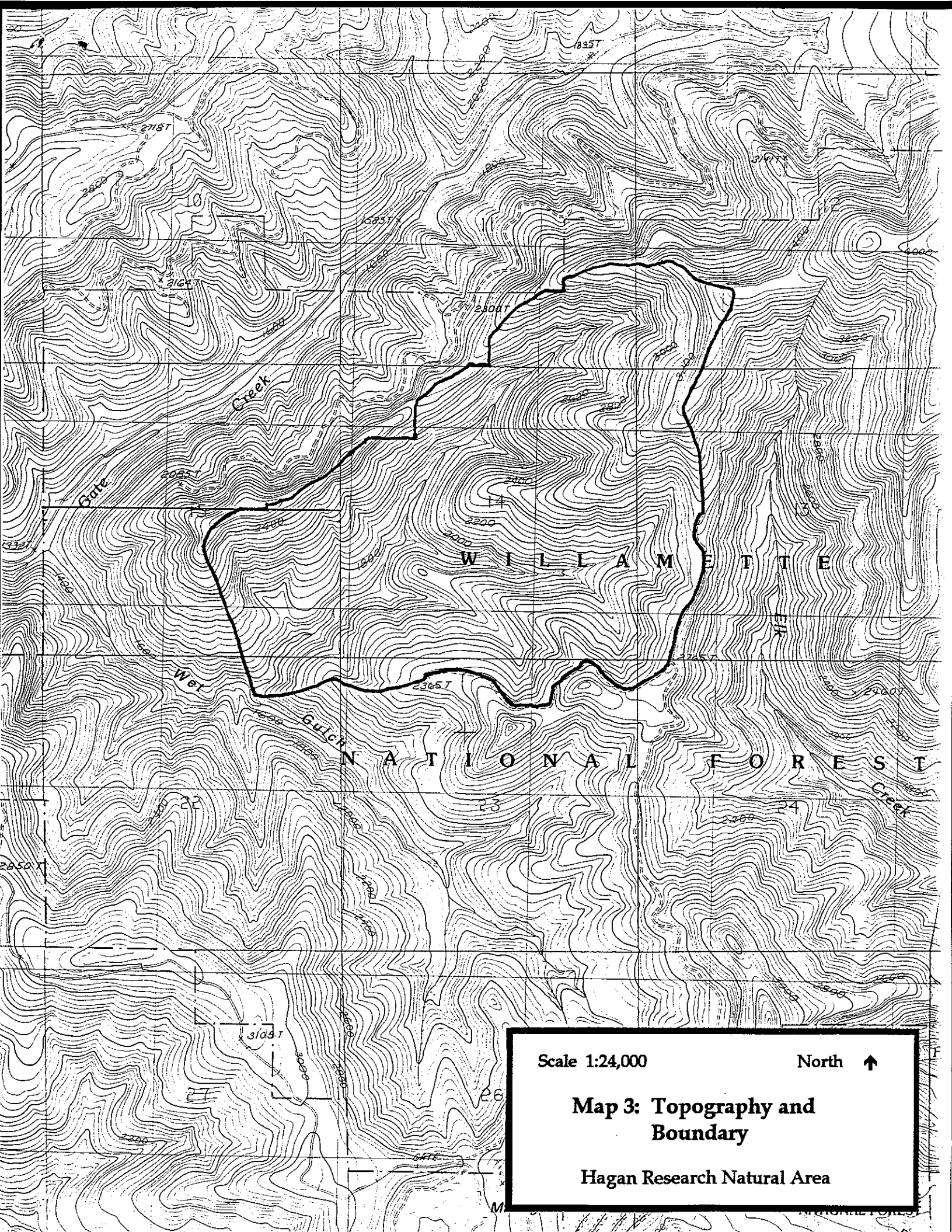
Hagan Research Natural Area
Salix Associates 11/92



Scale 1" = 2 mi. North ↑

Map 2: Road Access

Hagan Research Natural Area
Salix Associates 11/92

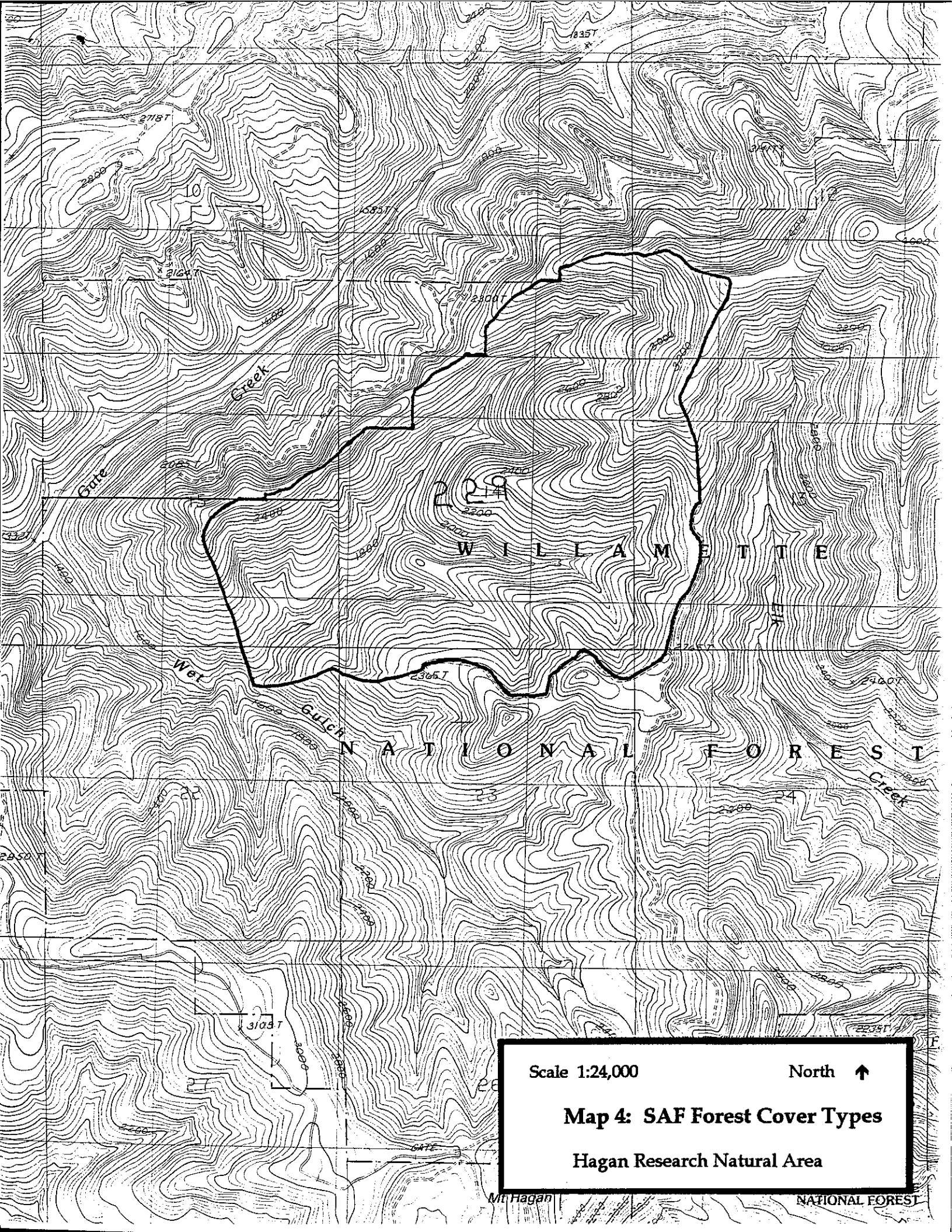


Scale 1:24,000

North ↑

**Map 3: Topography and
Boundary**

Hagan Research Natural Area



Scale 1:24,000 North ↑

Map 4: SAF Forest Cover Types

Hagan Research Natural Area

Mt Hagan

NATIONAL FOREST