USDA United States Department of Agriculture
Forest Service
Pacific Southwest Research Station
P.O. Box 245
Berkeley, CA 94701-0245
(510) 559-6300
FAX (510) 559-6440
TTY (510) 559-6307

File Code: 4060-3
Route To:

Date: NOV - 3 1998

Subject: Establishment of Ruth Research Natural Area

To: Regional Forester, R5

I have reviewed the enclosed Establishment Record and I concur with the establishment of the Ruth Research Natural Area on the Six Rivers National Forest. The land allocation and NEPA decision for this Research Natural Area were included in the Record of Decision for the Six Rivers National Forest Land and Resource Management Plan.

It is my pleasure to support this establishment of a new RNA.

for HAL SALWASSER
Station Director

Enclosures

cc:
David Diaz, R5 RNA Coordinator, TM
Connie Millar, PSW RNA Coordinator
Forest Supervisor, Six Rivers NF

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

RUTH RESEARCH NATURAL AREA

SIX RIVERS NATIONAL FOREST

TRINITY COUNTY, CALIFORNIA

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 _____ Date 5/4/98
SHEAUCHI CHENG, Research Plant Ecologist,
Pacific Southwest Research Station

Recommended by _____ Date 10/7/98
MARCIA ANDRE, District Ranger,
Mad River Ranger District

Recommended by _____ Date 10/18/98
S.E. "LOU" WOLTERING, Forest Supervisor
Six Rivers National Forest

Concurrence of _____ Date 10/30/98
HAL SALWASSER, Station Director,
Pacific Southwest Research Station

Established by _____ Date 11/10/98
G. LYNN SPRAGUE, Regional Forester
Pacific Southwest Region

TITLE PAGE

Establishment Record

for

Ruth Research Natural Area

within Six Rivers National Forest

Trinity County, California

A. INTRODUCTION

Research Natural Areas (RNAs) of the Forest Service are part of the national network of public lands being protected permanently for the purposes of maintaining biological diversity, providing ecological baseline information, education, and research. Areas representing both wide-spread and unique ecosystems are selected for RNAs and only non-manipulative research and observation are allowed in the RNAs.

Selection of RNAs in California Forest Service land (Pacific Southwest Region [Region 5]) is based on the identification of "target elements", which are plant communities described in varies reference work, such as Kuchler (1966), Holland (1986), and Society of American Foresters (SAF, Eyre 1980), as well as unique ecosystems, such as geologically unusual or aquatic areas. It is intended to accurately reflect the natural diversity of vegetation types on Forest Service land in California and lead to the long term study of each.

Most RNAs contain a far greater diversity of vegetation types than just the designated target elements and their representation within the RNA is of equal importance. For an overview of the Forest Service's RNAs in California please refer to Todd Keeler-Wolf (1990), "Ecological Surveys of Forest Service Research Natural Area in California" (USDA Forest Service General Technical Report PSW-125).

The Ruth Research Natural Area (RRNA) is located on the Mad River Ranger District, Six Rivers National Forest. It is located on a west facing slope east of Ruth Reservoir in Trinity County, approximately 3 miles (5 km) southwest of Forest Glen. RRNA contains undisturbed ponderosa pine (Pinus ponderosa)[1], Douglas-fir (Pseudotsuga menziesii) and other conifers interspersed with glade and oak woodland.

RRNA was nominated by the Six Rivers National Forest in November 1977 to represent the Pacific Ponderosa Pine - Douglas-fir forest type (SAF type 244, Eyre 1980) in the North Coast Ranges physiographic province. A reconnaissance report was written in 1979 (Roy et al. 1979), and an Ecological Survey of the area was completed two years later (Thornburgh 1981). Keeler-Wolf in 1990 prepared a draft Establishment Record for the RRNA (Keeler-Wolf 1990a). However, proceeding to the RNA establishment stalled since then because of the unfinalized Forest Plan and boundaries. Efforts toward the establishment of RRNA resumed in 1996 after the Forest Land and Resource Management Plan (LRMP) was finalized in 1995 (Six Rivers National Forest 1995a-c).

The RRNA as described in this Establishment Record lies entirely on lands managed by the Six Rivers National Forest, the sole administrator of this RNA. However, lands neighboring the RRNA are not all Forest Service lands. Large tracks of private land are located to the south and southwest

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[1]Vegetation types follow Holland (1986). Tree names are in accordance with Little (1979), and all other plant names follow Munz (1968).

of the RNA (Appendix A). 1309 ft (399 m) of the borderline is shared with Ronald & Margo Acuna (who own a 80 ac [32 ha] parcel south of the RRNA) of Fortuna, California and 4049 ft (1234 m) of the borderline is shared with John and Christine B. Pavan (who own a 123.7 ac [50 ha] parcel southwest of the RRNA) of Boulder Creek, California.

(1) Land Management Planning

The establishment of Ruth RNA is recommended and evaluated in the Six Rivers National Forest LRMP and accompanying Environmental Impact Statement (Six Rivers National Forest 1995a-c, Appendix B, C). The land allocation for the Ruth RNA was decided by the signing of the Record of Decision (ROD) for the LRMP by the Regional Forester (1995). The establishment of the RNA will be completed by the signing of this Establishment Record with concurrence of the Station Director.

The Ruth RNA is part of Management Area 5 - Research Natural Area, which emphasizes the preservation of natural conditions and the protection of features for which the RNA was established (Appendix B).

B. OBJECTIVES

The RRNA is established to represent the Pacific Ponderosa Pine - Douglas-fir type (SAF type 244, Eyre 1980) and its associated vegetation types for the North Coast Range physiographic province of the Pacific Southwest Region (Region 5). This is the only such area currently considered as a candidate for representation of SAF type 244 in the North Coast Range Province.

Two other RNAs in the North Coast Range physiographic province, Doll Basin and Hale Ridge, contain comparable areas of forest similar to SAF 244 (neither have SAF 244 as the target element). However, this type in the RRNA is well represented by ponderosa pine both in the canopy and in reproduction layers, while the other two sites are strongly dominated by Douglas-fir. The RRNA also includes a greater diversity of slope exposures and successional states than either of the other two areas (Keeler-Wolf 1986a, 1987, 1988).

Establishment of RRNA will also serve the objective of maintaining biodiversity of the area. RRNA contains the headwaters of 2 creeks, Hobart and Choptoy. Several seeps and springs occur in the RNA. These wet land habitats support a number of plants and animals not typical to the general area.

C. JUSTIFICATION STATEMENT

The targeted forest type is one of four principal vegetation types occurring at the RRNA (Thornburgh 1981). According to the description of SAF type 244 (McDonald 1980) the two principal species, ponderosa pine and Douglas-fir, may alternate in dominance over short distances. Stands are rarely even-aged and are often two-storied. Ponderosa pine is usually represented by the largest and oldest individuals. McDonald (1980) states

that most of the old growth of this type in the western United States has been cut and the forest today is typically less than 120 years old.

At the RRNA, stands of SAF type 244 occur at the lower elevations (approximately 4000-4800 ft, or 1219.2-1463.0 m) and occupy principally southerly-facing exposures (ranging from west-to southwest-facing). Within this zone dominance is typically traded between the two principal conifers with Douglas-fir dominating and reproducing best in the relatively mesic areas and ponderosa pine doing the same on more xeric sites. In general, the description of the type by McDonald (1980) corresponds well to the local conditions (see Thornburgh 1981).

The relatively small area of remaining old growth SAF 244 in the California Region is a result of its high value as a timber type and its accessibility throughout its range. The stands remaining at RRNA are minimally disturbed by humans and representative of the type and should serve well as a example of this productive and heavily managed forest. Reproduction is well represented by 60-90 year old, often dense, stands of both dominants with a relatively open scattered canopy of mature ponderosa pine and lesser numbers of Douglas-fir, incense cedar (Libocedrus decurrens), and sugar pine (Pinus lambertiana). The dominant ponderosa pines are up to 5.5 ft (1.7 m) dbh (diameter at breast height) and 180 ft (54.9 m) tall.

At the RRNA, as well as at other typical points of occurrence, the Pacific ponderosa pine - Douglas-fir forest is a transitional type. Locally, adjacent lower elevation forests are usually dominated by Douglas-fir with a significant mixture of hardwoods such as canyon live oak (Quercus chrysolepis) and Pacific madrone (Arbutus menziesii) (similar to SAF type 234, Eyre 1980), while upper elevation forests are typically of the Sierran mixed coniferous type (SAF 243, Eyre 1980), co-dominated by ponderosa pine, Douglas-fir, white fir (Abies concolor), sugar pine, and incense-cedar.

The Pacific Ponderosa Pine - Douglas-fir forest is essentially a mesic analog of the Pacific ponderosa pine type (SAF 245) which occurs in the Klamath Mountains, the North Coast Ranges, Southern Cascades, and Northern Sierra provinces of California. Compared to the Pacific ponderosa pine type, the Pacific Ponderosa Pine - Douglas-fir forest occupies slightly higher elevation or more mesic sites.

The mixed conifer forest at RRNA covers more acreage than the target element (43% versus 26% of the area). It is best developed on the gradually sloping central portion of the RNA and contains numerous old growth specimens of all five dominants. Members of each dominant species attain dbh of approximately 6 ft (1.8 m). The understory conifer reproduction varies from open with few saplings and pole sized trees to dense reproduction dating back to fire or fires at about 1900-1910. This forest type is well-represented in the North Coast Range province at Doll Basin RNA (Keeler-Wolf 1986a, 1988). However, typical slope aspect at RRNA (south or southwest) is different than at Doll Basin (east or northeast). The more xeric exposures and the relatively recent extensive fire at RRNA is largely responsible for ponderosa pine being the dominant canopy tree and a significant member of young age classes throughout much of the RRNA mixed

coniferous forest. At Doll Basin, white fir and incense-cedar are the most important trees. Thus, the two RNAs combined will provide essential study sites for this important forest type.

Several seeps and springs occur in the RRNA. There are a number of riparian and hydrophilic plants associated with these wet areas. These range from herbaceous species typical of woodland springs to riparian trees such as white alder (Alnus rhombifolia) and semi-riparian or mesophilic species not typical of southerly exposures such as giant chinquapin (Chrysolepis chrysophylla), Pacific yew (Taxus brevifolia), and big-leaf maple (Acer macrophyllum). These seeps provide water and essential forage for a variety of wildlife species. Evidence of black bear, deer, porcupine, coyote, and gray fox, among numerous bird species was noted at and around these seeps.

Oregon white oak (Quercus garryana) dominates in patches in the successional mixed montane chaparral and young white fir stands at the upper elevations. This species is represented locally by a small spindly ecotype (aff. Quercus garryana var. breweri, or Brewer oak [Munz 1968]). It has recolonized much of the upper slopes following fires 70-90 years ago. Oregon white oak is widespread in the North Coast Range physiographic province but, it is not well-represented on any established RNAs. It occurs at the Soldier candidate RNA approximately 7 miles (11.3 km) southwest of the RRNA. However, it is represented there by extensive woodlands and mixed coniferous-oak forests. It is not represented by the shrubby successional form at Soldier (Malloch-Leitner 1987).

D. PRINCIPAL DISTINGUISHING FEATURES

The RRNA occupies a portion of the southwest-facing slope of South Fork Mountain in Southwestern Trinity County. This long ridge has a remarkably even summit (Irwin 1966) and has been touted as one of the longest continuous ridges known in the world (Shasta-Trinity National Forests 1995a,b). At the RRNA the slope of South Fork Mountain is dissected by several small intermittent streams, the two principal ones being Hobart and Choptoy creeks. Both of these creeks originate at several permanent springs within the RNA.

Topography is gradual to moderately steep and is largely determined by the underlying parent material. The lowest elevations are underlain by Mesozoic Franciscan metasediments (Thornburgh 1981, Page 1966, Blake and Jones 1981). This portion of the RNA is relatively steeply sloping (70-100%) and contains the majority of the target element Pacific ponderosa pine - Douglas-fir forest (SAF 244).

The South Fork Mountain Fault separates the steep lower elevations from the moderately and gently sloping upper portion, which covers the majority of the area. The largest portion of the RNA is underlain by South Fork Mountain Schist (Irwin 1966, Blake and Jones 1981). This schist is prone to slumping (Scott et al. 1980) and several flats and benches occur in the central portion of the RNA. These benches house the heaviest forest, principally mixed conifer and white fir types.

The highest elevation areas are underlain by South Fork Mountain Schist and occasional associated resistant outcrops of metabasalt (Irwin 1966). Soil is generally shallow and rocky at the high elevations and is vegetated with mixed montane chaparral with some young patches of white fir.

E. LOCATION (reference maps 1 and 2)

(1) National Forest involved

The RRNA is located entirely on the Six Rivers National Forest and is adjacent to its boundary with the Shasta-Trinity National Forests.

(2) Latitude/Longitude

The approximate mean latitude and longitude at the center of the area is 40°20'N., 123°21'W.

(3) Boundary description

The RRNA is on land managed by the Six Rivers National Forest in Sections 26, 34, and 35 T1S, R7E Humboldt Base and Meridian (HBM) south of the Shasta-Trinity and Six Rivers National Forests boundary and southeast of the spur ridge descending from the summit of Pickett Peak from the SW 1/4 Sect. 26 to the SE 1/4 Sect. 34 T1S., R7E HBM (Forest Glen quad.).

More particularly, the boundaries are described as follows:

(a) Beginning at the southeast corner of said section 35 (point a) and running thence west approximately one mile (1.609 km) to the SW corner of sect. 35 (point b);

(b) thence northerly approximately 1320 ft (411.5 m) to a point marking the northeast corner of private land in the SE 1/4 of section 34 T 1S, R7E HBM (point c);

(c) thence westward approximately 1320 ft (411.5 m) following the demarcation of private land to the northwest corner of SE1/4 SE1/4 Section 34 (point d);

(d) thence northward approximately 1320 ft (411.5 m) following the boundary of private property in the SE 1/4 of said sect 34 to the point the corner of private land intersects with said ridge crest running from the SE 1/4 of section 34 to the summit of Pickett Peak in the SW 1/4 of said sect. 26 (point e);

(e) thence following said ridge line to the approximate summit of Pickett Peak (about 550 ft or 167.6 m southeast of the Pickett Peak Lookout as shown on U.S.G.S. Forest Glen 7.5 minute quadrangle 1979 edition) (point f);

(f) at this point the boundary skirts the radio transmitting towers at a distance of 100 ft (30.5 m) and joins with the boundary between the said two National Forests; hence running southeast, corresponding with the forest boundary for approximately 1170 ft (356.6 m) until 100 ft (30.5 m) NW of the roadbed of Forest Road 1S05. The RNA boundary skirts the roadbed to the south and eastward, maintaining its 100 ft (30.5 m) distance until the Forest boundary is again met at a point in the NW 1/4 Sect 35 (point g);

(g) hence following the Forest boundary and running southeastwardly from said point along the summit of South Fork Mountain for a distance of approximately 0.6 miles (0.97 km) to the intersection of the summit ridge with the section line dividing sects. 35 and 36 T1S, R7E HBM (point h);

(h) hence running southward along said section line for approximately 0.7 miles (1.13 km) to the southeast corner of Section 35 (point a), point of beginning.

(4) Acreage

The total acreage of the RRNA as described above is 630 ac (255 ha).

(5) Elevations

Elevations in the RRNA range from approximately 3920 ft (1194.8 m) at the southwestern corner to approximately 5760 ft (1755.6 m) atop Pickett Peak. This represents an elevation range of approximately 1840 ft (560.8 m).

(6) Access

Access to the RRNA is possible from both the upper elevations via Forest Roads 1S02 and 1S05 and the lower elevations via the Forest Route 501 and 504 (see maps 1 and 2).

For the lower elevation access, starting from the Mad River Ranger Station, drive about 3.5 miles (5.6 km) east along State Highway 36 to the junction with Forest Route 501. Turn south and drive on Route 501 toward Ruth Reservoir. Continue on Route 501, which becomes Route 504 after Ruth Dam, to the Ruth Lake Campground. Continue past the campground approximately 1.2 miles (1.9 km) to the junction with County Road 530. Turn left on this poorly maintained dirt road and continue uphill approximately 1.6 miles (2.6 km). Park below a locked gate on Forest Service Land, and walk uphill approximately 0.2 miles (0.3 km) to the southwestern corner of the RNA.

To access the upper elevations drive east from the Mad River Ranger Station along Highway 36 for approximately 12.5 miles (20.1 km) to the junction of Forest Road 1S02. Drive southeast on 1S02 for approximately 6 miles (9.7 km) to the Pickett Peak Campground at which point 1S02 becomes

1S04. Continue on 1S04 approximately 1.3 miles (2.1 km) to the junction with the Pickett Peak Lookout Road (1S05). At this point one may drive up the Pickett Peak Lookout road (parking at several possible points) or stop at this junction and descend to the southwest directly into the RNA.

Ease of travel within the RNA is variable. Steeper slopes at the lower elevations make the walk up hill from the Ruth Reservoir area somewhat strenuous. However, the understory is generally open enough to afford easy penetration. Access from the upper elevations is made initially difficult by the dense stands of spindly oaks and dense shrub cover. However, once within the central portion of the area slopes are gradual and the forest understory is open affording easy access to the majority of the RNA.

F. AREA BY COVER TYPES

SAF TYPES (Eyre 1980)	percent	acres	hectares
Pacific Ponderosa Pine-Douglas-fir (244)	26.4	166	67.1
Sierra Nevada Mixed Conifer (243)	43.3	273	110.5
White Fir (211)	10.0	63	25.6
unclassified	20.3	128	51.7
TOTALS	100.0	630	254.9
KUCHLER TYPES (Kuchler 1966)			
Mixed Conifer Forest (K-5)	79.7	502	203.2
Chaparral (K-29)	20.3	128	51.7
Unclassified	0.0	0	0.0
TOTALS	100.0	630	254.9
HOLLAND TYPES (Holland 1986)			
Mixed Montane Chaparral (37510)	20.3	128	51.7
Coast Range Mixed Conifer Forest (84110)	26.4	166	67.1
Sierran Mixed Conifer Forest (84230)	43.3	273	110.5
Sierran White Fir Forest (84240)	10.0	63	25.6
Unclassified	0.0	0	0.0
TOTALS	100.0	630	254.9

G. PHYSICAL AND CLIMATIC CONDITIONS

South Fork Mountain traditionally marks the boundary between the Klamath and the North Coast Range geological provinces (Irwin 1966). Although the northeastern slopes of this mountain are considered to retain some of the best old growth Douglas-fir forests in California (Taylor 1975, Shasta- Trinity National Forests 1995a,b), the southwestern slopes of the mountain have more patchily distributed coniferous forest alternating between montane chaparral and oak-conifer woodland. The history of extensive fire, slope instability and the predominant xeric aspect has combined to create the present vegetation mosaic.

At RRNA the best-developed forest corresponds to the areas with the deepest soils and relatively flat, mesic exposures. These benches are located in the central portion of the area and may have resulted from a

series of ancient massive slope failures on the southeastern slopes of Pickett Peak. There is no evidence of recent slope instability in the area.

The target element has patches of multi-aged stands alternating with patches of even-aged youthful stands with scattered large snags and senescent canopy individuals (photos 1 and 2). This structure suggests local crowning out of fires over the past 70-90 years. The mixed conifer forest has a more uniform canopy with less evidence of past crown fire and much of the understory is open and sparse.. The white fir forest varies from mixed-aged, open understory forest on flats to even-aged, young forest on the upper slopes. The upper elevation mountain chaparral is largely senescent and being invaded by white fir.

Although no weather recording stations exist within or adjacent to the RNA. Forest Glen, approximately 2.6 miles (4.2 km) northeast of the northern boundary of the RNA has been taking temperature and precipitation data since 1930. This station is located on the eastern side of South Fork Mountain at an elevation of 2340 ft (713 m). The mean annual temperature for this station is 51.8°F (11.0°C). with an annual range of mean monthly temperatures of 67.8°F (19.9°C). The following table summarizes the mean monthly and annual precipitation from Forest Glen between 1930 and 1980 (Goodridge 1981).

Table 1: Mean monthly precipitation in inches (and mm) at Forest Glen from 1930-1980.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann.
12.5	9.6	8.2	4.0	2.1	0.7	0.2	0.3	0.9	3.5	7.6	11.5	62.5
(316	244	208	102	53	18	5	8	23	89	193	292	1586)

As Table 1 indicates, summer drought is most intense in the months of August and September. On the average only approximately 3% of the total annual precipitation falls from June through September.

Snowfall is common at Forest Glen. The mean total annual snowfall is 50 inches (128 cm) with an average January total of 19 inches (48 cm). At Forest Glen snow can occur as late as mid-May and as early as late October. However, it rarely remains on the ground for an extended period.

Forest Glen is in the rain shadow of South Fork Mountain. Estimates of mean annual precipitation at the RRNA on the windward side of the mountain (Rantz 1972, Thornburgh 1981) are around 70 inches (1778 mm). Temperatures are substantially colder at the upper elevations of the RNA than at Forest Glen. Assuming a lapse rate of 3.5°F (1.9°C) for every 1000 ft (305 m) the average annual temperature near 4000 ft (1219 m) would be approximately 44°F (6.7°C) and at 5600 ft (1707 m) would be approximately 40.4°F (4.7°C). Snowfall is the most significant form of precipitation at the RRNA. However, due to the predominant xeric exposures of the area, snow melts rapidly and does not accumulate to any great depth. Only the upper elevation white fir forests have average winter snow depths of over about 2

ft (61 cm). Photos taken during the initial reconnaissance of the area (Roy et al. 1979) in early March show snow depths of about 1 ft (31 cm) at the median elevations.

H. DESCRIPTION OF VALUES

(1) Flora

The flora of the RRNA is not particularly diverse. Thornburgh (1981) identified 109 taxa and Keeler-Wolf (1990) noted an additional 49 taxa during the field work for the draft Establishment Record for a total of 158 (Appendix D). Since both field works were conducted in the fall months, it is likely that additional annual or spring flowering plants may occur. No rare, sensitive, or endangered plants listed by the Forest, State, or the California Native Plant Society (Skinner and Pavlik 1994) are known to occur within this RNA. Late spring and summer surveys are needed for a more thorough floristic assessment of the area.

The following is a brief account of the major vegetation types occurring at the RRNA. With the exception of the white alder riparian forest (which occurs as very narrow stringers along watercourses), these are depicted on the vegetation map (Map 3) with their area coverage noted in section F.

(a) Sierran Mixed Conifer Forest (Holland 84230):
SAF: Sierra Nevada mixed conifer (243)
Kuchler: Mixed conifer forest (5)

This type covers the largest portion of the RNA and corresponds to SAF type 243. It represents the true mixed phase of the mixed conifer forest with white fir, ponderosa pine, sugar pine, incense-cedar and Douglas-fir in all-aged climax stands. The topography is moderate with large areas of level benches and slight southwest-facing slopes. Stand structure is variable with any of the five principal tree species dominant (photos 3 and 4).

White fir has the highest densities in the younger age classes. Ponderosa pine dominates the largest size classes with Douglas-fir as the second dominant. Incense-cedar is scattered as individuals and small groves. Sugar pine is the least common tree, occurring typically as widely-scattered giants. Average basal area for this type is 600 ft^2/acre (137.7 m^2/ha), with site index for Douglas-fir averaging 130 ft (39.6 m) at 100 years. Shrub and herb layers average less than 5% cover and include Downy cheat (Bromus tectorum), white-flowered hawkweed (Hieracium albiflorum), white-veined shinleaf (Pyrola picta), bracken fern (Pteridium aquilinum var. pubescens), and trailplant (Adenocaulon bicolor).

(b) Coast Range Mixed Coniferous Forest (Holland 84110):
SAF: Pacific ponderosa pine-Douglas-fir (244)
Kuchler: Mixed conifer forest (5)

This is analogous to SAF type 244, the target element. It occurs on southwest- to southeast-facing slopes and is the most xeric of the three main forest types in the RNA.

The forest is dominated by small clumps and scattered individual large Douglas-fir and ponderosa pine over a dense pole-sized understory layer of the same species. Diameter of the typical dominants range from 50-60 inches (127-152 cm) with occasional large specimens up to 85 inches (216 cm) dbh. Pole-size trees are typically about 14 inches (36 cm) dbh. These trees resulted from a fire or fires about 70-90 years ago.

Variation in dominance of the two principal conifers is high. Incense-cedar, sugar pine, canyon live oak (Quercus chrysolepis) and California black oak (Quercus kelloggii) also occur as scattered mature and pole-size individuals. The latter species is particularly common in the southwestern portion of the RNA (photo 5) and grades into an oak pine woodland to the west.

Average basal area for this forest is 385 ft^2/acre (88 m^2/ha). Site index for Douglas-fir is 140 ft (42.7 m) for 100 years and 128 ft (39 m) for 100 year ponderosa pine.

The understory is very sparse with a few scattered saplings of canyon live oak and poison oak (Rhus diversiloba) and widely scattered herbs such as bracken fern and white-flowered hawkweed.

(c) Sierran White Fir Forest (84240):
SAF: White Fir (211)
Kuchler: Mixed Conifer Forest (5)

The white fir forest occupies the upper elevations, usually above ca. 5000 ft (1524 m). Typical sites are moderately sloping southwest-facing slopes with gravelly loam soils (photo 6). White fir is the only species with an all-age distribution. Other species such as ponderosa pine and incense-cedar usually only occur as large scattered individuals. The average basal area is 654 ft^2/acre (150.1 m^2/ha). The site index is 100 ft (30.5 m) for 100 year old white fir. The understory is very sparse (<1% cover) with scattered service-berry (Amelanchier alnifolia), wood rose (Rosa gymnocarpa), blue wild rye (Elymus glaucus), and bracken fern.

The majority of the upper elevation montane chaparral is undergoing colonization by white fir, and numerous patches of small firs are beginning to dominate the former shrub cover. Near the summit of Pickett Peak white fir does dominate in 80-90 years old stands with dbhs of approximately 2 ft (61 cm).

(d) Mixed Montane Chaparral (Holland 37510):
Kuchler: Chaparral (29)
no SAF equivalent

Much of the area above 5000 ft (1524 m) is covered by a mixed chaparral dominated by spindly brewer oak, huckleberry oak (Quercus vaccinifolia), Green-leaf manzanita (Arctostaphylos patula), and Fremont's silktassel (Garrya fremontii). Slopes are moderate to steep southwest-facing, and soils are very rocky gravelly loam. Within the chaparral are patches of larger Brewer oak up to 6 inches (15 cm) dbh and 20 ft (6.1 m) tall. Within these clumps of larger Brewer oaks are several understory species including snowberry (Symphoricarpos acutus), and service-berry. The majority of this vegetation type is successional with numerous saplings and small trees of white fir throughout all but the steepest, most xeric exposures.

(e) White Alder Riparian Forest (Holland 61510):
No SAF and Kuchler equivalents

This type is limited to a few acres (too small to indicate on vegetation type map) around the perennially moist springs and rivulets. It is actually transitional between Holland type 61510 and freshwater seep (Holland code 45400) because much of the spring-side vegetation has no true riparian overstory, being dominated by hydrophilic herbs (photo 7).

White alder (Alnus rhombifolia) is the typical dominant with scattered trees up to 2.5 ft (76 cm) dbh and 100 ft (30.5 m) tall lining the springs and rivulets. Other associated semi-riparian woody vegetation includes big-leaf maple, giant chinquapin, wild blackberry (Rubus ursinus), California hazel (Corylus cornuta ssp. californica), and large, old individuals of incense-cedar. Among the herbaceous species are wild ginger (Asarum hartwegii), common monkey flower (Mimulus guttatus), slimy monkeyflower (M. moschatus), stream violet (Viola glabella), piggy-back plant (Tolmia menziesii), leopard lily (Lilium pardalinum), tufted rush (Juncus effusus), lady fern (Athyrium felix-femina), brittle fern (Cystopteris fragilis), cow parsnip (Heracleum lanatum), bedstraw (Gallium triflorum), several sedges (Carex spp.), woodrush (Luzula parviflora), tinker's penny (Hypericum anagalloides), and swamp currant (Ribes lacustre).

(2) Fauna

The fauna of the RRNA is typical of largely undisturbed areas of the mid-elevation North Coast Ranges. Large game animals such as black bear (Euarctos americanus[2]) and black-tailed deer (Odocoileus hemonius

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[2]Authoritites are: Stebbins (1985) for reptiles and amphibians, Robbins et al. (1983) for birds, and Ingles (1965) for mammals.

columbianus) are relatively common in the area. Mountain lions (Felis concolor) have been sighted in the vicinity of the RNA (Mary Lee Steffenson, pers. comm. 1988) and a falcon (Falco sp.) (peregrine falcon is California fully protected species and Federal and California listed endangered species, prairie falcon is California species of special concern [Laudenslayer, Grenfell, and Zeiner 1991]) was seen during the field work for the ecological survey (Thornburgh 1981). Due to the late dates of field works made by Thornburgh (1981) and Keeler-Wolf (1990) a number of breeding birds and other spring and summer active animals were not detected. A list of the 22 vertebrates known from the area is provided in Appendix E.

(3) Geology

According to Blake and Jones (1981) the RRNA lies within the Franciscan Complex near its boundary with the Klamath Mountains Province. In this area the Franciscan Complex may be divided into the Yolla Bolly Belt and the Central Belt. In the RRNA the Yolla Bolly Belt is represented by the South Fork Mountain Schist, a metamorphosed mudstone and basaltic tuff with rare metagraywacke lenses. The most accurate age estimated for South Fork Mountain Schist is between 115-120 m.y. (Blake and Jones 1981). The best developed, most resistant South Fork Mountain Schist typically occurs at the higher elevations of the RNA. The summit area of Pickett Peak contains several outcrops of strongly foliated metavolcanic schist. Rocks of the Yolla Bolly belt at mid- and lower elevations tend to be less foliated and more like semischist described by Blake and Jones as typical of textural zone 2 of the Yolla Bolly Belt.

Rocks of the lowest elevations of the RNA (generally below 4100 ft or 1250 m) are part of the Central Belt of the Franciscan Complex. This belt is separated from the previous one by a thrust fault known as the South Fork Mountain Fault. The Central Belt rock is largely a melange with the principal matrix being graywacke and metagraywacke sandstone. The fault separating these two belts is considered to be sub-horizontal or gently east-dipping, with the Yolla Bolly belt overlying the Central Belt. Slivers of serpentinite are known from the fault zone, although none were seen in the RNA.

(4) Soils

The soils within the RRNA are mapped as four principal units in the order three soil survey of the area (Six Rivers National Forest 1982). Figure 1 shows the distribution of the units in the RNA. Following is a brief description of each mapping unit (see Appendix F for detailed descriptions of soil families). The number in parentheses following each unit name is its number symbol given on Figure 1.

(a) Bins-Nanny families, deep-Woodseye family, association 5-35% slopes (257):

This is the unit which underlies the level benches with the best developed mixed conifer and white fir forests. It is comprised of 35% Bins family, deep; 25% Nanny family, deep; 15% Woodseye family; and 25% inclusions of Deadman family, Althouse family, and rock outcrop.

(b) Albus-Race families association, deep, 35-70% slopes (258):

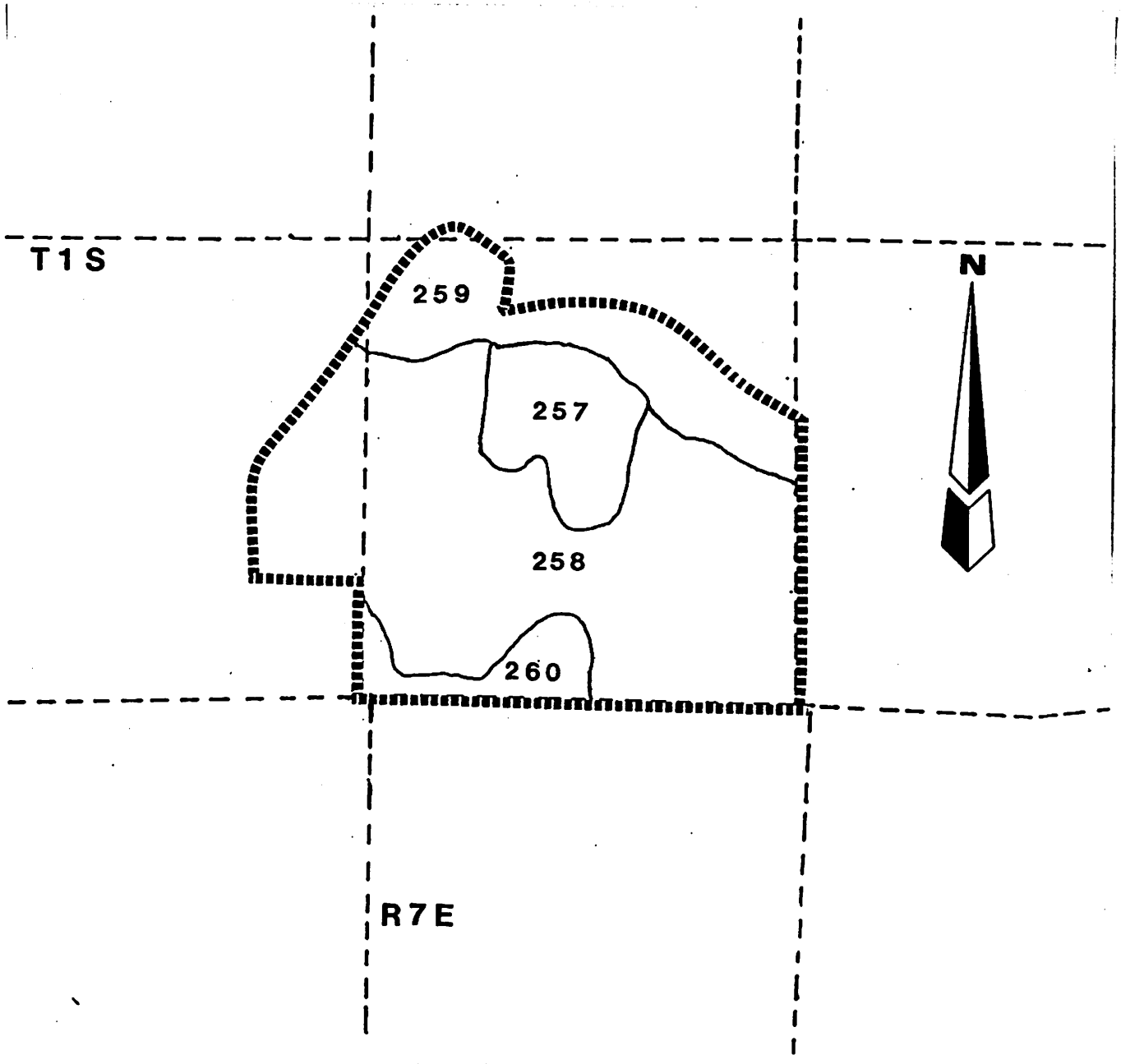
This is the most extensive soil unit in the RRNA. It occupies the majority of the middle elevations. It is composed of 45% Albus family deep, 35% Race family deep, and 25% inclusions of principally metasedimentary rock outcrop.

(c) Nanny family, moderately deep-Woodseye family-Bins family, deep associations, 35-70% slopes (259):

This unit occurs at the uppermost elevations in areas principally vegetated with montane chaparral and young white fir forest. It is composed of 30% Nanny family moderately deep, 30% Woodseye family, 20% Bins family, with 20% inclusions of Deadman family, Althouse family, and metasedimentary rock outcrop. This soil type is similar to the previously described map unit 257. The principal difference between these two units is the proportion of the three families and the steeper slopes in this unit.

(d) Skalan-Kistirn-Holland families association, deep, 35-70% slopes (260):

This unit underlies portions of the target element SAF 244 at the lowest elevations of the RNA. It is composed of 30% Skalan family deep, 25% Kistirn family deep, 20% Holland family deep, and 25% inclusions of mostly Soulajule and Melbourne families.



scale 1:24,000

Legend:
257...Bins-Nanny families, deep-Woodseye family association 5-35%
258...Albus-Race families association, deep, 35-70%
259...Nanny family moderately deep-Woodseye family-Bins family, deep associations, 35-70%
260...Skalan-Kistirn-Holland families association, deep, 35-70%

Fig. 1: Soils in Ruth Research Natural Area
(from: Six Rivers National Forest 1982)

(5) Lands:

All land within the boundaries of the RRNA is under the management of the Six Rivers National Forest. There are no private inholdings.

(6) Cultural

There are no known cultural or archaeological sites in the RRNA. According to Forest Archaeologist Tom Keter (pers. comm. October 1988) there are a few Native American cultural sites scattered along the summit of South Fork Mountain in the vicinity of the RNA. These were probably sites used both by the Lassik and the Wintu, since the crest of South Fork Mountain served as a boundary between the two tribes.

The Lassik was the tribe most likely to have frequented the RRNA, as their territory stretched westward from South Fork Mountain to the South Fork of the Eel River (Elsasser 1978). A given population group of Lassiks divided its time between streams such the Mad River (where the main village sites were), the slopes of the hills, and even well into the cool forest in the summer. Summer life had a mobile quality and the only occupancy of hilly areas such as the RNA was likely to have been in poorly marked temporary camps during the summer months (Elsasser 1978).

It is likely that the Lassik regularly burned the understory of oak woodlands and forests (Tom Keter pers. comm. 1988) and one may assume that these fires did affect the RNA, maintaining an open quality to the understory and perhaps promoting the spread of oak woodlands with grassy understories such as that occurs to the west of the RNA. Little specific information exists about the Lassik's use of fire. However, throughout the former Lassik territory there is widespread evidence of loss of grassland and other open habitats. Annihilation of the Lassik and other neighboring tribes and subsequent disruption of the anthropological fire cycles may have occurred by the early 1860s (Elsasser 1978).

(7) Other

No other significant values are known from the area.

I. IMPACTS AND POSSIBLE CONFLICTS

(1) Mineral Resources

The mineral development potential for the RRNA has been classified as moderate, which means it is included in the 242,840 acres (25%) of the Six Rivers National Forest lands on at least a portion of which mineral development is expected to occur during the 50-year planning horizon (see Appendix G).

There are no claims in the RRNA since claim holders were first required to send copies of location notices to Bureau of Land Management by the Federal Land Policy and Management Act of 1976.

There will be no conflict when the area is removed from mineral entry following designation.

(2) Grazing

Currently, the RRNA is not within any grazing allotment. During his field reconnaissance for the draft Establishment Report, Keeler-Wolf found there was no evidence of cattle grazing within any part of the RNA (Keeler-Wolf 1990).

Grazing was active in the neighboring areas during the 1980s. Cattle use was observed in the pine-oak woodland adjacent to the present western boundary around 1980 (Thornburgh 1981) and Keeler-Wolf (1990) noticed cattle use in areas along the crest (Road 1S04) of South Fork Mountain in October 1988.

Range allotments of those areas have not been used in many years since then. Hence, the grazing use of the area and the establishment of the RRNA will have no conflicts.

(3) Timber

Following the initial nomination of the RRNA the Six Rivers National Forest amended the proposal to exclude the majority of Section 35. It was proposed that this area (the area of best timber) become part of the Ruth Timber Sale. Following negotiations with the Region 5 RNA Committee the Forest agreed to drop this portion of the timber sale (Unit 16). According to the draft Establishment Record (Keeler-Wolf 1990) the area contains 440 acres (178 ha) of marketable timber. The potential annual yield of this timber is approximately 0.2 million board feet (MMBF).

Many years prior to the proposed cut of Unit 16, a tractor trail was constructed through portions of Section 35 and a minor amount of logging was conducted adjacent to this route. At present the track is still noticeable in places, but does not significantly impact the natural values of the area. The few trees that were cut were done so approximately 50 years ago and may have largely been associated with windfall clearing.

(4) Watershed Values

There are several springs within the RNA. These typically occur at the head of ancient slope failures. These springs support the white alder riparian forest and associated wildlife, both of which greatly increase the biodiversity value of the area. The main beds of Hobart and Choptoy creeks at the lowest elevations are dry during the summer months.

(5) Recreation Values

The RRNA receives most recreational use from hunters who in the past entered the area from the private land to the south and west via the old tractor trail. It is likely that use even during the peak deer season is light. No evidence of campsites exist in the area.

The impact of the current recreational use of the area has minimal impact on the RNA and it will not be affected by the RNA establishment.

(6) Wildlife and Plant Values

Both wildlife and plant values have been affected somewhat over the long interval since the last fire. This is particularly true for the browsers and other herbivores. Chaparral vegetation at the upper elevations is largely senescent. Fire-invigorated stands would display increased productivity, diversity, and forage value. Understory vegetation of the forested areas would also increase in diversity following fire. However, the glades mentioned earlier are also vulnerable to yellow star thistle (Centaurea solstitialis, an exotic weedy species) encroachment which is documented on the District.

(7) Special Management Area Values

The RRNA is not within any congressionally designated area, but is partially overlapped by Late-Successional Reserves (LSR) (Management Area 8 - Special Habitat). Management direction, standards and guidelines for LSR can be found in Appendix B). Establishment of the RNA will have no conflict with the Special Management Area values.

(8) Transportation Plans

There are no plans to construct roads or trails in any part of the RRNA and the nearby areas. Establishment of the RNA will have no conflict on the transportation plans of the area.

J. MANAGEMENT PRESCRIPTION

The primary management direction for the RRNA will be to maintain the target element (SAF 244) and associated coniferous forests in a natural pre-settlement state. Appendix B contains management direction for RNAs on the Six Rivers National Forest.

1) RNA management strategy

A detailed RRNA management strategy, including the introduction of a natural fire regime into the area, will be developed by the Six Rivers N. F. in consultation with the Pacific Southwest Research Station to provide additional management direction to maintain the values for which the RRNA is established.

K. ADMINISTRATION RECORDS AND PROTECTION

The official responsibility for administration and protection of the RRNA is with the District Ranger, Mad River Ranger District, Star Route Box 300, Bridgeville, CA 95526.

The research coordinator is the Director, Pacific Southwest Research Station, 800 Buchanan St., Albany, CA 94710. The Director is responsible for approving and coordinating observational or non-manipulative applied research in the area and maintaining research data files.

L. ARCHIVING

The Station Director shall establish and maintain a system for archiving data and reports from Research Natural Areas in a manner that will facilitate the exchange and transfer of information among Stations, Forests, and scientists.

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APPENDICES:

Appendix A: Land ownership of areas surrounding Ruth Research Natural Area

Appendix B: Information excerpted from the Six Rivers National Forest Land and Resource Management Plan

Appendix C: Information excerpted from the Environmental Impact Statement for the Six Rivers National Forest Land and Resource Management Plan

Appendix D: Vascular plants known from the Ruth RNA

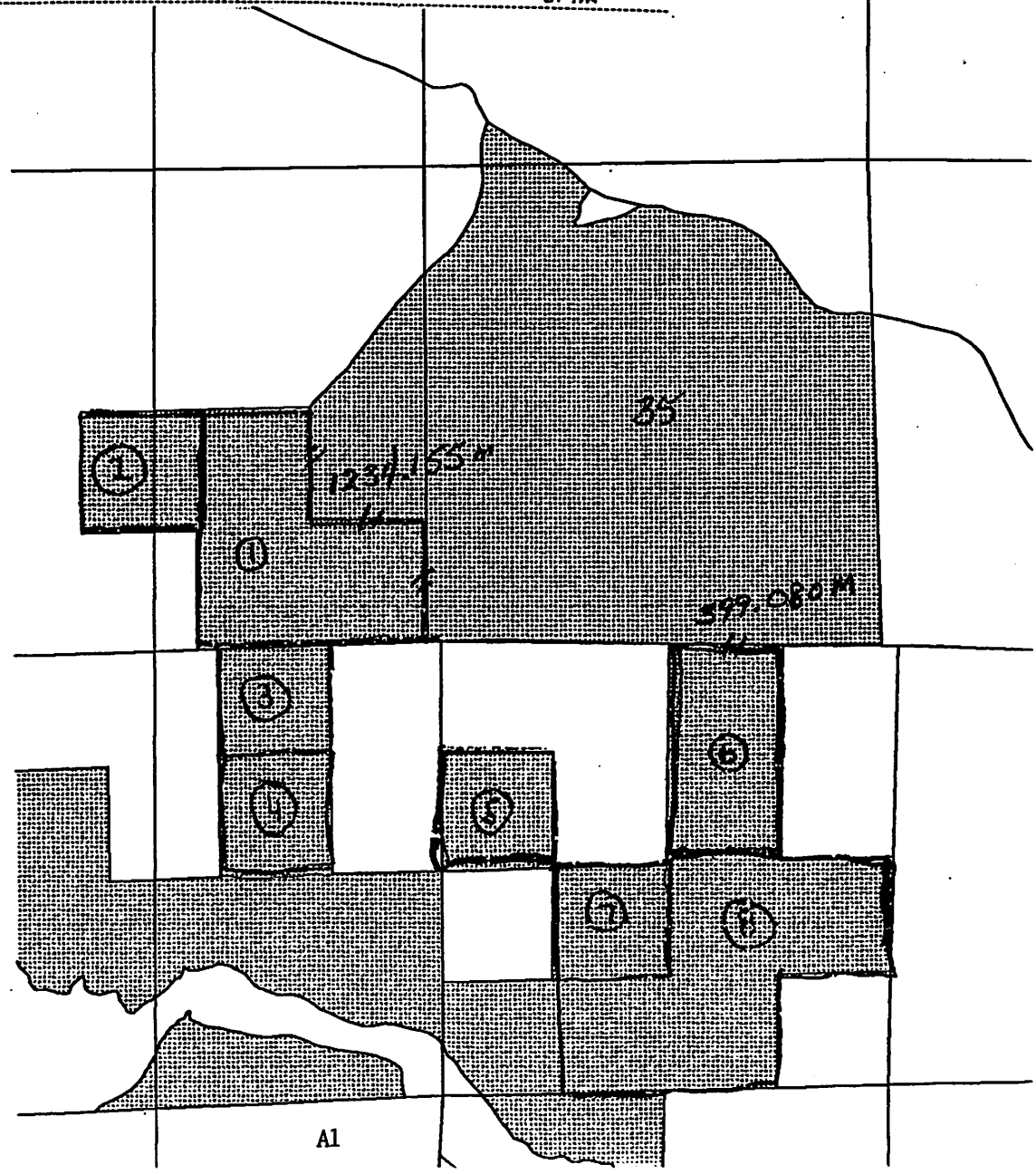
APPENDIX E: Vertebrate list of Ruth RNA

Appendix F: Description of soil families found in the Ruth RNA

Appendix G: Lands and Mineral Status and Uses of Ruth Research Natural Area (Smith 1994, per. comm. on file at PSW Research Station)

Appendix A: Land ownership of areas surround Ruth Research Natural Area

1	010-380-04	06 6002	PAVAN JOHN C & CHRISTINE B * 390 HILL HOUSE RD, BOULDER CREEK CA -- SINGLE FAMILY RESIDENTIAL	--	95006	02/01/95 95-0000465 USE-C1001	$102,000 $62,910 LND $40,220 IMP $103,130 MET EFF 1995	123.70
			L16					
2	010-380-03	06 6002	DILLON LYNN P & STONE LONELL E * STAR ROUTE BOX 110, MAD RIVER CA -- VACANT LAND RESIDENTIAL	--	95552	341-443 USE-A100X	$7,962 LND $7,962 MET	40.00
3	020-070-01	06 6002	RUNDELL G & B TRST RUNDELL GUIANA E BETH TRUSTEE * 349 MAIN ST, FORTUNA CA -- SINGLE FAMILY RES 2 UNITS	--	95540	321-619 USE-C102 PHN-(707)725-3525	$23,692 LND $17,678 IMP $41,579 MET EFF 1975	39.41
4	020-320-06	06 6002	JEAMS A & M REV LVG TRST JEAMS ALBERT & MARYLU TRSTE' * 10133 OLD OREGON TRL, REDDING CA -- RES W/ MINOR IMPR	--	96003	95-0001019 196-914 USE-B00X PHN-(916)221-1677	$14,560 LND $4,151 IMP $18,720 MET EFF 1975	39.57
5	020-070-03	06 6002	JONES SIDNEY H & MYRTLE M * 1702 WOOD ST, FORTUNA CA -- MOBILE HOME ON OWNER LAND	--	95540	150-544 USE-E01 PHN-(707)725-2004	$15,920 LND $10,001 IMP $25,934 MET EFF 1988	40.00
6	020-070-04	06 6002	ACUNA RONALD & MARGO * 454 SPRING ST, FORTUNA CA -- SINGLE FAMILY RESIDENTIAL	--	95540	03/10/92 92-0001021 $65,000 LOAN- $55,000 USE-C001 PHN-(707)725-4198	$65,144 LND $27,243 IMP $92,387 MET EFF 1992	80.00
7	020-070-27	06 6002	WEBSTER PEGGY L ETAL C/O PORT EDWARD RANCH * STAR ROUTE, BARNUMVILLE CA -- VACANT LAND RESIDENTIAL	--	95440	09/03/96 96-0003181 USE-A100X	$33,853 LND $33,853 MET	147.50
	TRINITY, CA.		E05					
8	020-070-52	06 6002	NELSON WINFRED A & DORTHY * 6101 MILL ST, FORTUNA CA -- RES W/ MINOR IMPR	--	95540	08/04/89 89-0002925 $45,000 USE-B00X PHN-(707)725-5998	$50,031 LND $1,773 IMP $52,604 MET EFF 1994	39.00



Appendix B: Information excerpted from the Six Rivers National Forest Land and Resource Management Plan

United States
Department of
Agriculture

Forest
Service

Pacific
Southwest
Region

Six Rivers
National Forest

Land and Resource Management Plan

Forest investment in recreation, fisheries, and wildlife present opportunities to increase contributions to the local economy from these non-commodity outputs such as increased recreation, commercial and sport fishing, hunting and non-consumptive wildlife uses.

New programs are being developed to assist rural communities in diversifying their economies in order to help compensate for economic losses due to decreasing timber outputs. The Forest is helping rural communities tap into sources of funding, such as assistance for water and waste disposal facilities, loans to develop community facilities for public use, and business and industrial guaranteed loans in rural communities.

RESOURCE MANAGEMENT PROGRAMS

RESEARCH NATURAL AREAS

Research Natural Areas (RNAs) are part of a National network of reserved public lands, representing a diversity of ecosystems, that provide opportunities for research and ecological study.

A Regional program has identified major types of forest vegetation that should be represented in the National RNA network. The Yurok RNA has been established within the Yurok Experimental Forest to study old growth redwood; it is managed by the Pacific Southwest Forest and Range Experiment Station. Six areas, representing various elements, were evaluated as candidates and dropped from consideration for RNA status. Horse Linto has been nominated for further consideration; six other areas are being considered for two more nominations. Eight areas are recommended in this Plan for establishment as RNAs: Adorni, Craigs Creek, North Trinity Mountain, Ruth, L.E. Horton, Soldier, Hennessy Ridge, and Upper Goose Creek.

Projected Demands and Opportunities

Opportunities and demands for restoration and research will be identified in the management assessment developed for each RNA.

SPECIAL INTEREST AREAS

Special Interest Areas: Special Interest Areas (SIAs) are established to protect areas on the Forest with unique characteristics. The goal is to interpret the surroundings for public enjoyment and increased understanding of natural resources.

SIAs can be established to highlight areas with botanical, ecological, cultural, geological or other special values. Botanical areas contain outstanding examples of some part of the Forest flora. Ecological areas contain a variety of plant communities. Geological areas are sites with unique or outstanding features that demonstrate the earth's development and processes. The following areas have been identified as SIAs: Bear Basin Butte North Fork Smith River, and Horse Mountain (botanical areas), Myrtle Creek (botanical and cultural), the Lassics (botanical and geological), Broken Rib Mountain (ecological), and Bluff Creek (geological).

There are other areas on the Forest that are of special interest. Some are geologic features such as the surface trace of the Coast Range fault, giant landslide features, elevated stream terraces, and exposures of distinctive geologic materials. National Park Service candidates for designation as National Natural Landmarks include the Siskiyou Mountains, Trinity Alps, Yolla Bolly Mountains, the Lassics, Stony Creek Bog, and Bear Basin Butte. Significant Natural Areas of California, identified by the California Department of Fish and Game, are also included.

Projected Demands and Opportunities

Designated SIAs and other areas of special interest provide opportunities for interpretation and public education as well as cooperation with various organizations for studies and monitoring.

HUMBOLDT NURSERY

Humboldt Nursery is located near the coast about 15 miles north of Eureka. The Nursery produces tree seedlings for reforesting National Forest System and Bureau of Land Management lands in California, Oregon, and Washington, as well as for the Bureau of Indian Affairs, Redwood National Park, and state agencies. The Nursery produces the following commercial species: Douglas-fir, the largest component of its crop, redwood, and several species each of true fir, cedar, spruce, pine, and hemlock. The Nursery, in recent years, has begun to cultivate non-commercial species: red and white alder, digger pine, big leaf maple, tanoak, Brewer oak, and Oregon white oak; woody shrubs such as California redbud, coast coffeeberry, buckbrush ceanothus, and blue blossom (wild lilac); and experimental plots of Pacific yew, cottonwood, and various willows grown from cuttings.

MANAGEMENT AREA 5 - RESEARCH NATURAL AREA

Research Natural Areas (RNAs) are part of a national network of field ecological areas designated for non-manipulative research, observation, and to study and maintain biological diversity on National Forest System lands. The objectives of establishing RNAs are: (1) to preserve a wide spectrum of pristine, representative areas that typify target vegetation types and/or types considered of scientific interest; (2) to serve as control areas for comparing landscapes manipulated by humans; (3) to serve as baseline areas for measuring long-term ecological change; and (4) to preserve and maintain genetic diversity and to provide a laboratory for the study of ecological succession. RNAs may serve as education and research sites on plant and animal communities, and may also help to implement provisions of special acts, such as the Endangered Species Act and the monitoring provisions of the National Forest Management Act. Research should be limited to non-consumptive, non-destructive, and essentially observational activities. Collecting soil, plants, or animal specimens (with California state collecting permits) may be permitted on a case-by-case basis.

Although the Yurok RNA has been established on the Forest (within the Experimental Forest), it is not included in this Management Area because it is managed by the Pacific Southwest Forest and Range Experiment Station. All research proposals will be approved by the PSW Station Director.

Goals

Manage RNAs for the maintenance of unmodified conditions and natural ecological processes. Preclude impacts from human activities that would modify the value of the RNA. Maintain the area's value as a significant contribution of the Forest's biological and physical diversity and also as a gene pool for plant and animal species. Promote and use RNAs for non-manipulative research and as baseline or control sites for Forest management comparisons. Form partnerships with research and university communities and other interested partners.

Desired Condition

RNAs will be examples of functioning native ecological communities. Ecological processes will influence the biological and physical elements within each RNA. Non-manipulative research, monitoring, and educational activities will be ongoing; knowledge gained from these activities will serve as baseline information and will be incorporated into Forest management. Human activities and manipulations will be minimal, and will further the management goals of the area.

Standards and Guidelines

General

1. This Forest Plan and FSM 4063 shall provide management direction for RNAs. Project-level direction for each RNA shall be documented in the establishment record and in the individual RNA implementation schedule. The intent of additional management direction shall be to maintain the values for which the RNA has been established. Individual RNA implementation schedules should be completed no later than four fiscal years after the official establishment of the RNA. Post RNA boundaries as soon after establishment as possible.

Fire/Fuels Management

1. Prescribed fire can be employed as a management tool to control noxious weeds and/or to maintain the target element for which the RNA was established.

2. Fires determined to endanger RNA attributes shall be extinguished with minimum ground and vegetative disturbance. Bulldozers and other machinery will be used only when authorized by the Forest Supervisor. Incident bases shall be located outside the RNA boundary.

3. Allow wildfires to burn only within a prescription designed to accomplish the objectives of the specific RNA.

4. If fire rehabilitation is deemed necessary, plans shall consider: (a) reliance on germination of seed stored in the soil surface layer (the seed bank) instead of active revegetation; and (b) the use of non-vegetative means of erosion control or non-persistent, non-native seed until local plant material can be collected and propagated.

Geology, Soils and Watershed Management

1. Soil, fish, wildlife and watershed resource projects shall be developed in cooperation with the PSW Research Station.. Projects considered are those which serve to restore and/or enhance the features for which the area was established.

2. Noxious weeds shall be controlled to maintain the diversity of the area. Activities which are likely to increase the potential of introducing non-native seed are not compatible with RNA management direction.

3. Any revegetation deemed necessary for erosion control and/or to restore degraded sites must use locally collected, native plants grown from seeds or cuttings. Revegetation plans should utilize the ecological classification of the Klamath Province (Jimerson 1993) for a list of species occurring within the plant association of interest.

4. The introduction of non-indigenous animal species is prohibited. Reintroduction of former native species may be permitted if consistent with RNA management area direction.

Lands

1. All new special uses will be denied except for research permits approved by the PSW Experiment Station.

2. Noncompatible existing special uses will be terminated, except rights-of-way authorizations existing before RNA establishment. Upgrading that would compromise the objectives of the RNA will be discouraged.

3. The Forest Service should recommend against FERC licenses or permits that compromise the objectives of the RNA.

Minerals Management

1. RNAs will be considered for recommendation to withdraw from mineral entry, subject to valid existing rights. If surface-disturbing activities are permitted, all undue or unnecessary degradation of RNA characteristics will be avoided. Existing rights will be verified by a Forest Service mineral examiner prior to authorizing any significant surface-disturbing mineral activities.

Pest Management

1. No action shall be taken against endemic insects or pathogens unless such action in necessary to protect the features for which the area was established.

2. In order to reduce the spread of Port-Orford-cedar root disease, a risk analysis will be completed for all projects (see 20-7) in watersheds containing Port-Orford-cedar.

3. Access and/or projects proposed in uninfected watersheds which have potential risk for infection shall have a risk analysis performed.

Range

1. Grazing may be permitted if it is determined that such an activity will achieve certain RNA management objectives.

2. Where it is determined that grazing is not compatible with the maintenance of RNA features, the Regional Forester and Station Director shall establish a level of incidental livestock use that can be tolerated and is consistent with RNA management objectives.

Recreation

1. Recreation activities and uses within an RNA will be discouraged if they threaten the values for which the RNA is established. If other recreation uses threaten research or education values, closures or permits should be instituted.

2. Existing trails may be allowed to remain as long as the RNA objectives are not compromised.

3. Recreational access shall be addressed on an area-by-area basis. To prevent the spread of Port-Orford-cedar root fungus disease, existing routes and trails shall be assessed and managed according to standard and guideline 2 in the Pest Management section above.

4. Maintain a ROS class of primitive.

5. High-intensity recreational development is inconsistent with the management area direction for these areas.

Timber and other Forest Products

1. Cutting and removing vegetation, including firewood and Christmas tree cutting, will be prohibited, except as part of an approved scientific investigation.

2. Collection of plant material as a special forest product for personal or commercial use is not compatible with the management direction for RNAs.

3. Plants collected for scientific purposes as a component of a research project proposal require a collection permit from the Supervisor's Office.

Transportation and Facilities Management

1. New facilities will not be built except on or to access valid existing mining claims with approved operating plans, or as required by an authorized study. New roads, trails, fences, or signs will not be permitted on RNAs unless they contribute to the objectives or protection of the area.

2. Existing roads or trails identified as contributing to resource damage shall be repaired to mitigate the problem, closed on a seasonal or year-round basis, or decommissioned. The course of action will depend on the severity of the resource problem and the potential for continued damage.

Visual Resources

1. RNAs should meet preservation VQOs, except in limited areas containing existing roads and trails.

MANAGEMENT AREA 6 - NATIVE AMERICAN CONTEMPORARY USE AREA (NACUA)

The need for the designation of NACUAs was identified specifically on the Forest for eleven cultural sites as a result of the Blue Creek Unit Plan administrative review decision by Forest Service Chief Max Peterson (11-17-81). The sites have been included in the Helkau District which is eligible for the National Register of Historic Places. Established is a one-half mile radius protective zone to minimize potential for conflicts between recreation and Native American spiritual uses around each of the following cultural sites: (1) Dr. Rock #1, (2) Peak 8, (3) Bad Place, (4) Chimney Rock, (5) South Red Mountain #1, (6) South Red Mountain #2, (7) Dr. Rock #2, (8) Meadow Seat, (9) Classic Prayer Seat, and (10) Turtle Rock. Also, a one-quarter mile wide protective zone was established along the Golden Stairs Trail from the Forest boundary to Road 15N01. Other dispersed recreation uses of the areas are not prohibited, and will undoubtedly occur, but this use will be secondary to the intent for the establishment of this management area.

Goals

These NACUA sites will be preserved and protected for the solitude and privacy of Native American users. Provide protection of the ceremonial values that exist in these areas.

Desired Condition

NACUAs will be influenced primarily by ecological processes. Native American spiritual use will be the most frequent activity in these areas, and other types of visitation will be rare. Signs of management activity will not be readily apparent. The integrity of the areas will be maintained in a manner consistent with Indian Tribes' customs and culture.

MANAGEMENT AREA 7 - SMITH RIVER NATIONAL RECREATION AREA

The Smith River National Recreation Area (SRNRA) was established in November of 1990, by SB 2566/HB 4309. The SRNRA is managed under direction provided by eight management areas. The primary goals are to emphasize, protect, and enhance the unique biological diversity; anadromous fisheries; and the wild, scenic, and recreational potential of the Smith River while providing sustained yields of forest products. See Smith River NRA Plan (attached as Appendix A) for additional information.

MANAGEMENT AREA 8 - SPECIAL HABITAT

This management area is intended to provide a core of relatively natural, undisturbed habitat for plants and animals associated with mature and old-growth forests. This management area includes protection for nest site protection zones and winter roosts for bald eagle and peregrine falcon as well as Late-Successional Reserves for a number of species, including the northern spotted owl and the marbled murrelet.

Characteristics of individual areas will vary somewhat according to the species for which they are managed. Although individual mature and old-growth stands may survive for many decades, these habitat areas will not provide suitable conditions indefinitely, and may require management towards an uneven-aged condition, or finding substitute areas in other parts of the Forest. There may be vegetative manipulation to enhance the value of the stands to wildlife or plant species.

Goals : Late-Successional Reserves

Late-Successional Reserves have been designated based on five elements: (1) areas mapped as part of an interacting reserve system; (2) LS/OG 1 and 2 areas within Marbled Murrelet Zone 1, and certain owl additions, mapped by the Scientific Panel on Late-Successional Forest Ecosystems (1991); (3) sites occupied by marbled murrelets; (4) known spotted owl activity centers; and (5) Protection Buffers for specific endemic species identified by the Scientific Analysis Team (SAT)(1993). Additional areas are protected under the Survey and Manage section of the Forest-wide standards and guidelines. *(FSEIS ROD page C-9)

Late-Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem. *(FSEIS ROD page C-11)

Exceptions: Research Natural Areas and activities required by recovery plans for listed threatened and endangered species take precedence over Late-Successional Reserve standards and guidelines. *(FSEIS ROD page C-11)

Late-Successional Reserves are designed to serve a number of purposes. First, they provide a distribution, quantity, and quality of old-growth forest habitat sufficient to avoid foreclosure of future management options. Second, they provide habitat for populations of species that are associated with late-successional forests. Third, they will help ensure that late-successional species diversity will be conserved. *(FSEIS ROD page B-4)

Desired late-successional and old-growth characteristics that will be created as younger stands change through successional development include: (1) multispecies and multilayered assemblages of trees, (2) moderate-to-high accumulations of large logs and snags, (3) moderate-to-high canopy closure, (4) moderate-to-high numbers of trees with physical imperfections such as cavities, broken tops, and large deformed limbs, and (5) moderate-to-high accumulations of fungi, lichens, and bryophytes. Although they may not be duplicates of existing old-growth forests, these stands could provide adequate habitat for many species in the long term. *(FSEIS ROD pages B-4 to B-5)

Silvicultural systems proposed for Late-Successional Reserves have two principal objectives: (1) development of old-growth forest characteristics including snags, logs on the forest floor, large trees, and canopy gaps that enable establishment of multiple tree layers and diverse species composition; and (2) prevention of large-scale disturbances by fire, wind, insects, and diseases that would destroy or limit the ability of the reserves to sustain viable forest species populations. Small-scale disturbances by these agents are natural processes, and will be allowed to continue. *(FSEIS ROD Page B-5)

Stand management in Late-Successional Reserves should focus on stands that have been regenerated following timber harvest or stands that have been thinned. These include stands that will acquire late-successional characteristics more rapidly with treatment, or are prone to fire, insects, diseases, wind, or other disturbances that would jeopardize the reserve. Depending on stand conditions, treatments could include, but should not be limited to: (1) thinning or managing the overstory to produce large trees; release advanced regeneration of conifers, hardwoods, or other plants; or reduce risk from fire, insects, diseases, or other environmental variables; (2) underplanting and limiting understory vegetation control to begin development of multistory stands; (3) killing trees to make snags and coarse woody debris; (4) reforestation; and (5) use of prescribed fire. Thinning prescriptions should encourage development of diverse stands with large trees and a variety of species in the overstory and understory. Prescriptions should vary within and among stands. *(FSEIS ROD page B-6)

Protection Buffers are additional standards and guidelines from the Scientific Analysis Team Report for specific rare and locally endemic species, and other specific species in the upland forest matrix. The listed rare and locally endemic species are likely to be assured viability if they occur within reserves. However, there might be occupied locations outside these areas that will be important to protect as well. Established protocols will be used to ensure a high likelihood of locating these occupied sites, and such surveys will be conducted prior to ground-disturbing activities within the known or suspected ranges and within the habitat types or vegetation communities occupied by these species, according to the implementation schedule for Survey and Manage components 1 and 2 described under the survey and manage section of the Forest-wide standards and guidelines in this chapter. When located, the occupied sites need to be protected as described in this section. *(FSEIS ROD page C-19)

Desired Condition: Late-Successional Reserves

Late-successional reserves will contain multi-storied diverse assemblages of plant and animal species with moderate to high accumulations of down logs, snags, and tree cavities, as well as fungi, lichens, and bryophytes. Natural processes will occur, including fire. Populations of late-successional and old-growth related species will contribute to viability throughout their range. Materials for Native American uses will be available as directed under treaty rights. Fire and other disturbance regimes will resemble the natural rates under which the forest ecosystem evolved.

Goals: Bald Eagle and Peregrine Falcon Areas

Nesting and roosting habitat for bald eagles and peregrine falcons would be managed to achieve the population levels that each species is capable of achieving. The desired number of nesting territories are intended to provide sufficient habitat to contribute to recovery plan population goals for breeding pairs, and accounts for expected variations in annual occupancy and reproduction at protected sites. Six bald eagle areas (territories) are managed to achieve the Forest's contribution to meeting the recovery goal of four breeding pairs and two winter roosts. Fourteen falcon areas (territories) are managed to achieve the Forest's contribution to meeting the recovery goal of seven breeding pairs. Unoccupied habitat is expected to become occupied as bald eagle or peregrine numbers increase in the local area. Increases in successful reproduction and fledgling survival are also expected.

Nesting habitat for bald eagles and peregrine falcons will be managed through the zone concept. Each territory is divided into three zones; a nest site protection zone, a primary disturbance zone, and a feeding zone. The nest site protection zone is included in this management area; disturbance and feeding zones are managed through Forest-wide standards and guidelines.

The bald eagle and peregrine falcon zones that are in this management area are described below:

(a) **The Nest Site Protection Zone** contains the nest tree or cliff and habitat which directly influences nest site conditions. Management activities within this zone are intended to protect the biological and physical integrity of the nest site and minimize human disturbance and are included in the Dedicated Wildlife Management Area.

(b) **Winter Roosts** of bald eagle are areas frequented by bald eagles for communal roosting during the winter. Maintain essential habitat characteristics within 5-10 acres of roost trees.

Desired Condition: Bald Eagle and Peregrine Falcon Areas

Bald eagle winter roost areas: these areas will be fairly dense stands of mature and old-growth conifers. Large snags and live conifers with open crowns and stout lateral limbs for perching will be common. The vegetative features of the stands will provide protection from weather. These sites will be isolated from areas of excessive human activity.

Bald eagle nest areas: these areas will be mature conifers; nest trees and alternate nest trees within the stand will be tall and large in diameter. They will provide a good view of the surrounding landscape. The stands will contain thrifty mature and immature trees that will be available for future nesting use.

Peregrine falcon nest areas: these areas will be on high cliffs across the Forest. Adjacent habitat areas, especially riparian zones, will provide the nesting birds with an adequate supply of prey species. Human disturbance during the breeding season will be infrequent.

Standards and Guidelines: Late-Successional Reserves

Management Assessments

A management assessment should be prepared for each large Late-Successional Reserve (or group of smaller Late-Successional Reserves) before habitat manipulation activities are designed and implemented. Land management agencies may choose to develop these assessments as components of legally-mandated plans (e.g., Forest or District Plans), as part of province-level planning, or as stand-alone assessments. If developed to stand alone, the assessments should be closely coordinated with subsequent watershed analysis and province-level planning. Standards and guidelines should be refined at the province level, prior to development of Late-Successional Reserve assessments. Late-Successional Reserve assessments should generally include: (1) a history and inventory of overall vegetative conditions within the reserve, (2) a list of identified late-successional associated species known to exist within the Late-Successional Reserve and information on their locations, (3) a history and description of current land uses within the reserve, (4) a fire management plan, (5) criteria for developing appropriate treatments, (6) identification of specific areas that could be treated under those criteria, (7) a proposed implementation schedule tiered to higher order (i.e., larger scale) plans, and (8) proposed monitoring and evaluation components to help evaluate if future activities are carried out as intended and achieve desired results. Only in unusual circumstances would silvicultural treatments, including prescribed fire, precede preparation of this management

assessment. Late-Successional Reserve assessments are subject to review by the Regional Ecosystem Office. Until Late-Successional Reserve assessments are completed, fire suppression activities should be guided by land allocation objectives in coordination with local resource management specialists. *(FSEIS ROD page C-11)

Projects and activities within Late-Successional Reserves (including restoration, recreation, projects for public safety, thinning and salvage) may proceed in fiscal years 1995-96 using initial Late-Successional Reserve assessments done at a level of detail sufficient to assess whether the activities are consistent with the objectives of the Late-Successional Reserves. *(FSEIS ROD Page A-7)

Occupied Marbled Murrelet Sites

Timber harvest is prohibited within occupied marbled murrelet habitat at least until completion of the Marbled Murrelet Recovery Plan. Silvicultural treatments in non-habitat within the 0.5-mile circle must protect or enhance the suitable or replacement habitat. When objectives of the Marbled Murrelet Recovery Plan have been identified, direction will be amended or revised as appropriate. *(FSEIS ROD page C-12)

Silviculture

This direction was taken from the FSEIS ROD pages C-12 to C-13.

Thinning or other silvicultural treatments inside reserves are subject to review by the Regional Ecosystem Office to ensure that the treatments are beneficial to the creation of late-successional forest conditions. The Regional Ecosystem Office may develop criteria that would exempt some activities from review. Stand and vegetation management of any kind, including prescribed burning, is considered a silvicultural treatment. Excepted from review are reforestation activities legally required by, and planned as part of, existing sold timber sales, where the reforestation prescription has been modified as appropriate to meet the objectives of the Late-Successional Reserve.

Activities permitted in the California Coast Range and California Klamath Provinces are described separately below. Salvage of dead trees is described separately below, and is limited to stand-replacing disturbance events exceeding 10 acres.

California Coast Range: There is no harvest allowed in stands over 80 years old. Thinning (precommercial and commercial) may occur in stands up to 80 years old regardless of the origin of the stands (e.g., plantations planted after logging or stands naturally regenerated after fire or blowdown). The purpose of these silvicultural treatments is to benefit the creation and maintenance of late-successional forest conditions. Examples of silvicultural treatments that may be considered beneficial include thinnings in existing even-age stands and prescribed burning. For example, some areas within Late-Successional Reserves are actually young single-species stands. Thinning these stands can open up the canopy, thereby increasing diversity of plants and animals and hastening transition to a forest with mature characteristics.

California Klamath Province: Given the increased risk of fire in these areas due to lower moisture conditions and the rapid accumulation of fuels in the aftermath of insect outbreaks and drought, additional management activities are allowed in Late-Successional Reserves. Guidelines to reduce risks of large-scale disturbance are as follows:

Large-scale disturbances are natural events, such as fire, that can eliminate spotted owl habitat on hundreds or thousands of acres. Certain risk management activities, if properly planned and implemented, may reduce the probability of these major stand-replacing events. Elevated risk levels are attributed to changes in the characteristics and distribution of the mixed-conifer forests resulting from past fire protection. These forests occur in drier environments, have had repeated insect infestations, and are susceptible to major fires. Risk reduction efforts are encouraged where they are consistent with the overall recommendations in these guidelines.

Silvicultural activities aimed at reducing risk shall focus on younger stands in Late-Successional Reserves. The objective will be to accelerate development of late-successional conditions while making the future stand less susceptible to natural disturbances. Salvage activities should focus on the reduction of catastrophic insect, disease, and fire threats. Treatments should be designed to provide effective fuel breaks wherever possible. However, the scale of salvage and other treatments should not generally result in degeneration of currently suitable owl habitat or other late-successional conditions.

In some Late-Successional Reserves in this province, management that goes beyond these guidelines may be considered. Levels of risk in those Late-Successional

Reserves are particularly high and may require additional measures. Consequently, management activities designed to reduce risk levels are encouraged in those Late-Successional Reserves even if a portion of the activities must take place in currently late-successional habitat. While risk-reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if: (1) the proposed management activities will clearly result in greater assurance of long-term maintenance of habitat, (2) the activities are clearly needed to reduce risks, and (3) the activities will not prevent the Late-Successional Reserves from playing an effective role in the objectives for which they were established.

Such activities in older stands may also be undertaken in Late-Successional Reserves in other provinces if levels of fire risk are particularly high.

Salvage

This direction was taken from the FSEIS ROD pages C-13 to C-16.

Salvage of dead trees is based on the following standards and guidelines, and is subject to review by the Regional Ecosystem Office. The Regional Ecosystem Office may develop criteria that would exempt some activities from review. Salvage of dead trees is not generally considered a silvicultural treatment within the context of these standards and guidelines.

Salvage is defined as the removal of trees from an area following a stand-replacing event such as those caused by wind, fires, insect infestations, volcanic eruptions, or diseases. Salvage guidelines are intended to prevent negative effects on late-successional habitat, while permitting some commercial wood volume removal. In some cases, salvage operations may actually facilitate habitat recovery. For example, excessive amounts of coarse woody debris may interfere with stand regeneration activities following some disturbances. In other cases, salvage may help reduce the risk of future stand-replacing disturbances. While priority should be given to salvage in areas where it will have a positive effect on late-successional forest habitat, salvage operations should not diminish habitat suitability now or in the future.

Tree mortality is a natural process in a forest ecosystem. Diseased and damaged trees are key structural components of late-successional forests. Accordingly, management planning for Late-Successional Reserves must acknowledge the considerable value of retaining dead and dying trees in the forest as well as the benefits from salvage activities.

In all cases, planning for salvage should focus on long-range objectives, which are based on desired future condition of the forest. Because Late-Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions. The rate of development of this habitat will vary among provinces and forest types and will be influenced by a complex interaction of stand-level factors that include site productivity, population dynamics of live trees and snags, and decay rates of coarse woody debris. Because there is much to learn about the development of species associated with these forests and their habitat, it seems prudent to only allow removal of conservative quantities of salvage material from Late-Successional Reserves and retain management opportunities until the process is better understood.

The following guidelines are general. Specific guidelines should be developed for each physiographic province, and possibly for different forest types within provinces.

1. The potential for benefit to species associated with late-successional forest conditions from salvage is greatest when stand-replacing events are involved. Salvage in disturbed sites of less than 10 acres is not appropriate because small forest openings are an important component of old-growth forests. In addition, salvage should occur only in stands where disturbance has reduced canopy closure to less than 40 percent, because stands with more closure are likely to provide some value for species associated with these forests.

2. Surviving trees will provide a significant residual of larger trees in the developing stand. In addition, defects caused by fire in residual trees may accelerate development of structural characteristics suitable for associated species. Also, those damaged trees that eventually die will provide additional snags. Consequently, all standing live trees should be retained, including those injured (e.g., scorched) but likely to survive. Inspection of the cambium layer can provide an indication of potential tree mortality.

3. Snags provide a variety of habitat benefits for a variety of wildlife species associated with late-successional forests. Accordingly, following stand-replacing disturbance, management should focus on retaining snags that are likely to persist until late-successional conditions have developed and the new stand is again producing large snags. Late-successional conditions are not associated with stands less than 80 years old.

4. Following a stand-replacing disturbance, management should retain adequate coarse woody debris quantities in the new stand so that in the future it will still contain amounts similar to naturally regenerated stands. The analysis that determines the amount of coarse woody debris to leave must account for the full period of time before the new stand begins to contribute coarse woody debris. As in the case of snags, province-level specifications must be provided for this guideline. Because coarse woody debris decay rates, forest dynamics, and site productivity undoubtedly will vary among provinces and forest types, the specifications also will vary.

   Province-level plans will establish appropriate levels of coarse woody debris and decay rates to be used. Levels will be "typical" and will not require retention of all material where it is highly concentrated, or too small to contribute to coarse woody debris over the long time frames discussed. This standard and guideline represents one item to be considered and may indeed result in no salvage following windthrow in low density stands. As for other management activities, it is expected that salvage standards and guidelines will be refined through the implementation and adaptive management processes.

5. Some salvage that does not meet the preceding guidelines will be allowed when salvage is essential to reduce the future risk of fire or insect damage to late-successional forest conditions. This circumstance is most likely to occur in the eastern Oregon Cascades, eastern Washington Cascades, and California Cascades Provinces, and somewhat less likely to occur in the Oregon Klamath and California Klamath Provinces. It is important to understand that some risk associated with fire and insects is acceptable because they are natural forces influencing late-successional forest development. Consequently, salvage to reduce such risks should focus only on those areas where there is high risk of large-scale disturbance.

6. Removal of snags and logs may be necessary to reduce hazards to humans along roads and trails, and in or adjacent to campgrounds. Where materials must be removed from the site, as in a campground or on a road, a salvage sale is appropriate. In other areas, such as along roads, leaving material on site should be considered. Also, material will be left where available coarse woody debris is inadequate.

7. Where green trees, snags, and logs are present following disturbance, the green-tree and snag guidelines will be applied first, and completely satisfied where possible. The biomass left in snags can be credited toward the amount of coarse woody debris biomass needed to achieve management objectives.

8. These basic guidelines may not be applicable after disturbances in younger stands because remnant coarse woody debris may be relatively small. In these cases, diameter and biomass retention guidelines should be developed consistent with the intention of achieving late-successional forest conditions.

9. Logs present on the forest floor before a disturbance event provide habitat benefits that are likely to continue. It seldom will be appropriate to remove them. Where these logs are in an advanced state of decay, they will not be credited toward objectives for coarse woody debris retention developed after a disturbance event. Advanced state of decay should be defined as logs not expected to persist to the time when the new stand begins producing coarse woody debris.

10. The coarse woody debris retained should approximate the species composition of the original stand to help replicate preexisting suitable habitat conditions.

11. Some deviation from these general guidelines may be allowed to provide reasonable access to salvage sites and feasible logging operations. Such deviation should occur on as small a portion of the area as possible, and should not result in violation of the basic intent that late-successional forest habitat or the development of such habitat in the future should not be impaired throughout the area. While exceptions to the guidelines may be allowed to provide access and operability, some salvage opportunities will undoubtedly be foregone because of access, feasibility, and safety concerns.

Standards and Guidelines for Multiple-Use Activities Other Than Silviculture

This direction was taken from the FSEIS ROD pages C-16 to C-19.

The following standards and guidelines apply to Late-Successional Reserves and Managed Late-Successional Areas.

As a general guideline, nonsilvicultural activities located inside Late-Successional Reserves that are neutral or beneficial to the creation and maintenance of late-successional habitat are allowed.

While most existing uses and development are envisioned to remain, it may be necessary to modify or eliminate some current activities in Late-Successional Reserves that pose adverse impacts. This may require the revision of management guidelines, procedures, or regulations governing these multiple-use activities. Adjustments in standards and guidelines must be reviewed by the Regional Ecosystem Office.

Road Construction and Maintenance

Road construction in Late-Successional Reserves for silvicultural, salvage, and other activities generally is not recommended unless potential benefits exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, be routed through non-late-successional habitat where possible, and be designed to minimize adverse impacts. Alternative access methods, such as aerial logging, should be considered to provide access for activities in reserves.

Road maintenance may include felling hazard trees along rights-of-way. Leaving material on site should be considered if available coarse woody debris is inadequate. Topping trees should be considered as an alternative to felling.

Fuelwood Gathering

Fuelwood gathering will be permitted only in existing cull decks, where green trees are marked by silviculturists to thin (consistent with standards and guidelines), to remove blowdown blocking roads, and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large-scale disturbances. In all cases these activities should comply with the standards and guidelines for salvage and silvicultural activities.

American Indian Uses

The exercise of tribal treaty rights will not be restricted by these standards and guidelines unless the Regional Interagency Executive Committee determines that the restriction is (1) reasonable and necessary for preservation of the species at issue, (2) the conservation purpose of the restriction cannot be achieved solely by regulation of non-Indian activities, (3) the restriction is the least restrictive available to achieve the required conservation purpose, (4) the restriction does not discriminate against Indian activities either as stated or as applied, and (5) voluntary tribal conservation measures are not adequate to achieve the necessary conservation purpose.

Mining

The impacts of ongoing and proposed mining actions will be assessed, and mineral activity permits will include appropriate stipulations (e.g., seasonal or other restrictions) related to all phases of mineral activity. The guiding principle will be to design mitigation measures that minimize detrimental effects to late-successional habitat.

Developments

Development of new facilities that may adversely affect Late-Successional Reserves should not be permitted. New development proposals that address public needs or provide significant public benefits, such as powerlines, pipelines, reservoirs, recreation sites, or other public works projects will be reviewed on a case-by-case basis and may be approved when adverse effects can be minimized and mitigated. These will be planned to have the least possible adverse impacts on Late-Successional Reserves. Developments will be located to avoid degradation of habitat and adverse effects on identified late-successional species. Existing developments in Late-Successional Reserves such as campgrounds, recreation residences, ski areas, utility corridors, and electronic sites are considered existing uses with respect to Late-Successional Reserve objectives, and may remain, consistent with other standards and guidelines. Routine maintenance of existing facilities is expected to have less effect on current old-growth conditions than development of new facilities. Maintenance activities may include felling hazard trees along utility rights-of-way, trails, and other developed areas.

Land Exchanges

Land exchanges involving Late-Successional Reserves will be considered if they provide benefits equal to or better than current conditions. Consider land exchanges especially to improve area, distribution, and quality (e.g., connectivity, shape, contribution to biodiversity) of Late-Successional Reserves, especially where public and private lands are intermingled (e.g., checkerboard ownership).

Habitat Improvement Projects

Projects designed to improve conditions for fish, wildlife, or watersheds should be considered if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible. Projects required for recovery of threatened or endangered species should be considered even if they result in some reduction of habitat quality for other late-successional species. For example, watershed rehabilitation projects, such as felling trees along streams, will be coordinated with a wildlife biologist and may include seasonal restrictions. Design and implement watershed restoration projects in a manner that is consistent with Late-Successional Reserve objectives.

Range Management

Range-related management that does not adversely affect late-successional habitat will be developed in coordination with wildlife and fisheries biologists. Adjust or eliminate grazing practices that retard or prevent attainment of reserve objectives. Evaluate effects of existing and proposed livestock management and handling facilities in reserves to determine if reserve objectives are met. Where objectives cannot be met, relocate livestock management and/or handling facilities.

Fire Suppression and Prevention

Each Late-Successional Reserve will be included in fire management planning as part of watershed analysis. Fuels management in Late-Successional Reserves will utilize minimum impact suppression methods in accordance with guidelines for reducing risks of large-scale disturbances. Plans for wildfire suppression will emphasize maintaining late-successional habitat. During actual fire suppression activities fire managers will consult with resource specialists (e.g., botanists, fisheries and wildlife biologists, hydrologists) familiar with the area, these standards and guidelines, and their objectives, to assure that habitat damage is minimized. Until a fire management plan is completed for Late-Successional Reserves, suppress wildfire to avoid loss of habitat in order to maintain future management options.

In Late-Successional Reserves a specific fire management plan will be prepared prior to any habitat manipulation activities. This plan, prepared during watershed analysis or as an element of province-level planning or a Late-Successional Reserve assessment, should specify how hazard reduction and other prescribed fire applications will meet the objectives of the Late-Successional Reserve. Until the plan is approved, proposed activities will be subject to review by the Regional Ecosystem Office. The Regional Ecosystem Office may develop additional guidelines that would exempt some activities from review. In all Late-Successional Reserves watershed analysis will provide information to determine the amount of coarse woody debris to be retained when applying prescribed fire.

In Riparian and Late-Successional Reserves the goal of wildfire suppression is to limit the size of all fires. When watershed analysis, province-level planning, or a Late-Successional Reserve assessment are completed, some natural fires may be allowed to burn under prescribed conditions. Rapidly extinguishing smoldering coarse woody debris and duff should be considered to preserve these ecosystem elements.

Special Forest Products

Special forest products include but are not limited to posts, poles, rails, landscape transplants, yew bark, shakes, seed cones, Christmas trees, boughs, mushrooms, fruits, berries, hardwoods, forest greens (e.g., ferns, huckleberry, salal, beargrass, Oregon grape, and mosses), and medicinal forest products. In all cases, evaluate whether activities have adverse effects on Late-Successional Reserve objectives. Sales will ensure resource sustainability and protection of other resource values such as special status plant or animal species. Where these activities are extensive (e.g., collection of Pacific yew bark or fungi), it will be appropriate to evaluate whether they have significant effects on late-successional habitat. Restrictions may be appropriate in some cases.

Recreational Uses

Dispersed recreational uses, including hunting and fishing, generally are consistent with the objectives of Late-Successional Reserves. Use adjustment measures such as education, use limitations, traffic control devices, or increased maintenance when dispersed and developed recreation practices retard or prevent attainment of Late-Successional Reserve objectives.

Research

A variety of wildlife and other research activities may be ongoing and proposed in late-successional habitat. These activities must be assessed to determine if they are consistent with Late-Successional Reserve objectives. Some activities (including those within experimental forests) not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of these standards and guidelines, will produce results important for habitat development, or if the activities represent continuation of long-term research. These activities should only be considered if there are no equivalent opportunities outside Late-Successional Reserves.

Rights-of-Way, Contracted Rights, Easements, and Special Use Permits

Access to nonfederal lands through Late-Successional Reserves will be considered and existing right-of-way agreements, contracted rights, easements, and special use permits in Late-Successional Reserves will be recognized as valid uses. New access proposals may require mitigation measures to reduce adverse effects on Late-Successional Reserves. In these cases, alternate routes that avoid late-successional habitat should be considered. If roads must be routed through a reserve, they will be designed and located to have the least impact on late-successional habitat. Review all special use permits and when objectives of Late-Successional Reserves are not being met, reduce impacts through either modification of existing permits or education.

Nonnative Species

In general nonnative species (plant and animal) should not be introduced into Late-Successional Reserves. If an introduction of nonnative species is proposed, complete an assessment of impacts and avoid any introduction that would retard or prevent achievement of Late-Successional Reserve objectives. Evaluate impacts of nonnative species (plant and animal) currently existing within reserves, and develop plans and recommendations for eliminating or controlling nonnative species that are inconsistent with Late-Successional Reserve objectives. These will include an analysis of the effects of implementing such programs to other species or habitats within Late-Successional Reserves.

Other

Other activities should be evaluated by local interdisciplinary teams and appropriate guidelines should be written and documented. Activities deemed to have potentially adverse effects on Late-Successional Reserve objectives are subject to review of the Regional Ecosystem Office. The Regional Ecosystem Office may develop additional criteria for exempting some additional activities from review.

Standards and Guidelines for Protection Buffers

This direction was taken from FSEIS ROD pages C-20 to C-21.

Nonvascular Plants

Ptilidium californicum (Liverwort): This species is rare and has a very limited distribution in old white fir forests with fallen trees. It occurs on trunks of trees at about 5000-feet elevation. Mitigation options include finding locations and maintaining stands of overmature white fir at about 5000-feet elevation for inoculum and dispersal along corridors; and studying specific distribution patterns. Protect known occupied locations if distribution patterns are disjunct and highly localized by deferring timber harvest and avoiding removal of fallen trees and logs.

Ulota meglospora (Moss): This species occurs in northern California and southwest Oregon. It is best developed (locally abundant) in very old stands of tanoak, Douglas-fir, and other conifer species further north, but is generally scarce throughout its range. The species is poorly known ecologically. Mitigation activities include conducting basic ecological studies, and surveying for presence, particularly in Oregon. Protect known occupied sites if distribution patterns are disjunct and highly localized. Defer timber harvest or other activities which would not maintain desired habitat characteristics and population levels.

Otidea leporina, *O. onotica*, and *O. smithii* (Fungi): These mushrooms occur in conifer duff, and are widespread in distribution but uncommon. They are dependent on older-age forests. Specific mitigation options include protecting older forests from ground disturbance where the species are located.

For the plants listed above, it is recommended that Regional or State office-level ecologists or botanists should: (1) maintain a spatially explicit data base of all known sites in National Forests and BLM Districts, and (2) develop species or area management plans, to be implemented under the guidance of regional botany programs.

Birds

Great Gray Owl: Within the range of the northern spotted owl, the great gray owl is most common in lodgepole pine forests adjacent to meadows. However, it is also found in other coniferous forest types. In some locations, such as on the Willamette National Forest west of the crest of the Cascade Range, at least some shelterwood harvesting seems to be beneficial for the species by opening up otherwise closed canopy cover for foraging. In doing so, consequences to species such as northern goshawk and American marten must be evaluated. Specific mitigation measures for the great gray owl, within the range of the northern spotted owl, include the following: provide a no-harvest buffer of 300 feet around meadows and natural openings and establish 1/4-mile protection zones around known nest sites. Within one year of the signing of the Record of Decision for these standards and guidelines, survey for nest locations using the established protocol. Protect all future discovered nest sites as previously described.

Standards and Guidelines for Bald Eagle and Peregrine Falcon

Fire/Fuels Management

1. Contingency plans to protect these areas during wildfire suppression activities should be developed and available to fire management personnel. Particularly critical are essential nesting and foraging habitat areas designated for threatened and endangered species.

Minerals Management

1. Operating plans for mining activities which have the potential to adversely affect habitat (including streams and rivers) or species occupying these areas will not be approved without appropriate mitigation measures.

Pest Management

1. In order to reduce the spread of Port-Orford-cedar root disease, a risk analysis will be completed for all projects (see 20-7) in watersheds containing Port-Orford-cedar.

Recreation

1. Restrictions on noise generating activities (frequent vehicle or boat traffic, popular motorized recreation routes, large groups of people, etc.) are listed under wildlife resource management standards and guidelines. All motorized vehicle use will be prohibited or restricted within bald eagle and peregrine falcon nest site protection zones during the breeding season. Activities such as hiking, rock climbing, photography, bird watching, skiing, horseback riding, rafting, mountain biking and snowshoeing should also be restricted when they have the potential to adversely affect breeding activities.

2. In areas managed as ROS class semi-primitive non-motorized, semi-primitive recreation opportunities would be provided, facilities for the convenience of the user would not be provided, use levels would be low.

3. Motor vehicle use would be restricted to designated routes. Road and trail density would be at low to moderate levels. High standard roads would generally not occur. Traffic service level 1 or 2 roads would occur.

Timber Management

1. Timber harvest will not be scheduled, but may occur if it is required to maintain habitat quality, ecosystem health, or if it is crucial to improve the quality of habitat within an area. Restrictions on noise generating activities (timber harvest, hauling, heavy equipment, etc.) are described in the standards and guidelines.

Transportation and Facilities Management

1. Minimize the mileage of open roads. Road or trail construction should not occur closer than 1,000 feet from known nest sites and should be designed to minimize impacts on threatened and endangered wildlife.

2. Roads not providing a primary travel access should be closed, if possible, as soon after use as practicable. Existing roads not serving as a main system access route should be closed (gated or barricaded) to nonessential traffic.

3. Noise generating activities (e.g., road construction and reconstruction, blasting, hauling, etc.) should be restricted during the breeding season in accordance with the locations and dates listed under wildlife resource management standards and guidelines. The predicted frequency of use of both trails and roads, and their proximity to known den and nest sites will be considered in the need for restrictions on their use.

4. Permanent structures and recreational facilities that would be occupied during breeding periods will not be constructed within peregrine falcon and bald eagle nest site protection zones, or eagle winter roosts.

5. Power line structures that are regularly used by bald eagles or peregrine falcons should be identified. The Forest should coordinate with appropriate agencies and follow accepted guidelines to prevent raptor electrocutions at regularly used use sites.

6. Proposed power lines will not be constructed within one mile of bald eagle winter roosts or peregrine falcon nest sites.

Visual Quality Management

1. Manage for a VQO of retention, with small amounts of partial retention.

MANAGEMENT AREA 9 - RIPARIAN RESERVES

The prescribed widths of Riparian Reserves apply to all watersheds until watershed analysis is completed, a site-specific analysis is conducted and described, and the rationale for final Riparian Reserve boundaries is presented through the appropriate NEPA decision-making process. (FSEIS ROD page B-13)

Riparian Reserve Widths

This direction was taken from the FSEIS ROD pages C-30 to C-31.

Riparian Reserves are specified for five categories of streams or waterbodies as follows:

Fish-bearing streams - Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.

Permanently flowing nonfish-bearing streams - Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.

Constructed ponds and reservoirs, and wetlands greater than 1 acre - Riparian Reserves consist of the body of water or wetland and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the wetland greater than 1 acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest.

Lakes and natural ponds - Riparian Reserves consist of the body of water and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of two

Appendix C: Information excerpted from the Environmental Impact Statement for the Six Rivers National Forest Land and Resource Management Plan

United States
Department of
Agriculture

Forest
Service

Pacific
Southwest
Region

**Six Rivers
National Forest**

Final Environmental Impact Statement

Land and Resource Management Plan

produce 20,000,000 seedlings annually, with actual production levels depending on demand. Douglas-fir comprises 95% of the species grown, with the other 5 percent being ponderosa pine, Jeffrey pine, red and white fir, noble fir, grand fir, western hemlock, Sitka spruce, western red-cedar, incense cedar, alder and redwood. Nursery operations involve seed preparation, sowing, culturing, genetics, harvesting, grading, packing, tree storage, and shipping. Integrated in these activities are soil management, pest management and administrative studies of effectiveness of nursery practices and cultural methods.

Management Area 5 - Research Natural Areas

Research Natural Areas (RNAs) are part of a national network of field ecological areas designated for non-manipulative research, observation, and to study and maintain biological diversity on National Forest System lands. The goal is preservation of naturally occurring physical and biological units for the purposes of: 1) comparison with those lands influenced by humans, 2) ecological and environmental studies, and 3) preservation of gene pools for typical and rare and endangered plants and animals. RNAs are removed from the timber land base, and are not designated for recreational use or other forms of resource management. RNAs may serve as education and research sites on plant and animal communities, and may also help to implement provisions of special acts, such as the Endangered Species Act and the monitoring provisions of the National Forest Management Act. Research should be limited to non-consumptive, non-destructive, and essentially observational activities. Collecting soil, plants, or animal specimens (with California state collecting permits) may be permitted on a case-by-case basis.

Although the Yurok RNA has been established on the Forest (within the Experimental Forest), it is not included in this management area because it is managed by the Pacific Southwest Forest and Range Experiment Station. All research proposals will be approved by the PSW Station Director.

Management Area 6 - Native American Contemporary Use Area (NACUA)

The need for the designation of NACUAs was identified specifically on the Forest for 11 cultural sites as a result of the Blue Creek Unit Plan administrative review decision by Forest Service Chief Max Peterson (11-17-81). These NACUA sites are preserved and protected for the solitude and privacy of Native American users. The sites have been included in the Helkau District which is eligible for the National Register of Historic Places. Established is a one-half mile radius protective zone to minimize potential for conflicts between recreation and Native American spiritual uses around each of the following cultural sites: 1) Dr. Rock #1, 2) Peak 8, 3) Bad Place, 4) Chimney Rock, 5) South Red Mountain #1, 6) South Red Mountain #2, 7) Dr. Rock #2, 8) Meadow Seat, 9) Classic Prayer Seat; and 10) Turtle Rock. Also, a one-quarter mile wide protective zone was established along the Golden Stairs Trail from the Forest boundary to Road 15N01. Other dispersed recreation uses of the areas are not prohibited, and will undoubtedly occur, but this use will be secondary to the intent for the establishment of this management area.

Management Area 7 - Smith River National Recreation Area

The SRNRA was established in December of 1990, by SB 2566/HB 4309. The SRNRA is managed under direction provided by eight management areas. The primary goals are to emphasize, protect, and enhance the unique biological diversity; anadromous fisheries; and the wild, scenic, and recreational potential of the Smith River while providing sustained yields of forest products. See Smith River NRA Plan (Appendix A of the Plan) for additional information.

Management Area 8 - Special Habitat

This management area is intended to provide a core of habitat for plants and animals associated with mature and old-growth forests. This management area contributes to the networks described in managed habitat (Management Area 14); but also provides additional protection of nest zones for bald eagle, peregrine falcon, habitat for the northern spotted owl, and in some alternatives, habitat for the northern goshawk and marten. Vegetative manipulation to enhance the value of stands for wildlife may occur in this area.

Characteristics of individual areas will vary somewhat according to the indicator species for which they are managed. Although individual mature and old-growth stands may survive for many decades, these habitat areas will not provide suitable conditions indefinitely, and may require management towards an uneven-aged condition, or finding substitute areas in other parts of the Forest.

Wildlife: A system of managed and special habitat management areas would be maintained to provide for viable populations of all native and desired non-native species. Timber harvesting would not occur within northern spotted owl HCAs and nest protection zones for bald eagle and peregrine falcon. Habitat within eight peregrine falcon territories would be maintained or improved to meet the recovery target of seven nesting pairs. Habitat would be maintained or improved within six bald eagle territories to meet the recovery goal of four nesting pairs and two wintering areas. Sixteen goshawk territories would be maintained outside HCAs and other reserved lands. Timber management within designated northern spotted owl critical habitat areas occurring outside HCAs would emphasize maintenance or replacement of functional late-successional habitat.

Forty marten habitat management areas and 18 fisher habitat management areas would be established throughout the Forest. The habitat management areas would follow the habitat parameters described in "A Literature Review for the Management of Marten and Fisher on National Forests in California" (Freel 1992). These areas are well distributed throughout the Forest and provide sufficient habitat to support successful breeding units and contribute to the maintenance of a viable population. Twenty of the marten and 14 of the fisher habitat management areas are located in HCAs and other reserved areas; the remaining 20 marten and 4 fisher habitat management areas are located throughout the forest matrix to meet spatial distribution guidelines. Forest records indicate that marten have been reported in or adjacent to 8 of the proposed marten habitat management areas, and fisher have been reported in or adjacent to 15 of the proposed fisher habitat management areas.

The forest landscape would be managed to maintain travel corridors for wildlife at approximately 1-mile spacing. Corridors would be comprised of closed canopy stands with relatively open understory conditions which provide required thermal and escape cover for wildlife. Corridors would follow stream courses and continue upslope and over ridgetops to connect drainages.

Riparian Zones: Inner gorge and high and extreme landslide areas would have no regulated harvest. Areas outside inner gorge and landslide areas have riparian reserves depending on stream class. Ephemeral streams would have a 50 foot reserve each side, intermittent streams would have a 75 foot reserve, and perennial stream reserves would vary from 100 to 300 feet, depending on stream size. The riparian reserves would be managed for marginal timber yields.

Fisheries: Emphasis would be placed upon protecting and maintaining stream and lake ecosystems, including streamside and riparian communities. Stream and watershed integrity would be protected by correcting road and culvert failures, controlling landslides and fine sediment sources, and maintaining sources of large woody debris for channel stability. Water quality would be protected by maintaining temperature at optimum levels. Stream habitat conditions would be improved by increasing the abundance and effective distribution of important instream habitat forming elements (large woody debris and boulders) through the enhancement of natural recruitment and by direct placement.

Over the first 10 years, 1/2 of the available low and medium quality habitat would be improved. Fish habitat on the Forest would be maintained through strict application of standards and guides for all designated riparian reserves, with the specific objectives of limiting potential impacts upon channel and bank stability, maintaining adequate shade canopy, and providing for recruitment of large wood into the channel. Warm water fish habitat capability would be evaluated, and improvement projects would be implemented as appropriate. Opportunities for habitat protection and improvement in resident trout streams would be investigated, particularly where recreational usage or unique characteristics indicate a special value.

Direction: Resource Management Programs

Research Natural Areas: Eight research natural areas and three candidate research natural areas would be managed to maintain their research values.

Special Interest Areas: Six botanical areas (Bear Basin, Horse Mountain, Lassics, North Fork Smith River, Broken Rib, Myrtle Creek) and the Bluff Creek geologic area would be managed to maintain their unique botanical values.

To prevent the introduction of the Port-Orford-cedar root fungus disease into uninfested areas of the North Fork Smith River Botanical Area, Forest Service Roads 18N09, 18N13, and associated spur roads would be open to high clearance vehicle access (street legal and non-street legal) with a limited operating season. Gates would be in place and would be closed during the wet season.

Table II-4, Acres and Total Standing Timber Volume by Management Area for PRF Alternative

Management Area 1/, 3/	Total		Not Suited for Timber Harvest		Not Appropriate for Timber harvest under this Alternative		Timber Suited Under This Alternative	
	Acres	MMBF	Acres	MMBF	Acres	MMBF	Acres	MMBF
Wilderness	123,150	3,090	123,150	3,090	0	0	0	0
Wild River	14,260	250	13,090	210	1,170	40	0	0
Experimental Forest	1,080	0	1,080	0	0	0	0	0
Humboldt Nursery	210	0	210	0	0	0	0	0
Research Natural Area	6,980	140	4,770	50	2,210	90	0	0
Native Am. Cont. Use Area	1,140	10	1,140	10	0	0	0	0
Smith River NRA Dedicated	124,100	1,670	124,100	1,670	0	0	0	0
Smith River NRA Managed	28,360	250	16,150	40	24,420	430	12,210	220
Special Habitat Area	366,790	10,680	116,830	2,280	249,960	8,400	0	0
Riparian	141,510	2,980	76,070	1,000	65,440	1,980	0	0
Special Interest Area	660	0	530	0	130	0	0	0
Special Regeneration	34,230	950	4,020	100	30,210	850	0	0
Scenic River	640	20	210	0	860	30	430	10
Retention	9,030	180	3,660	20	10,730	320	5,360	160
Managed Habitat Area	2,760	150	780	30	3,970	240	1,990	120
Partial Retention	31,310	760	7,840	60	46,940	1,400	23,470	700
Recreational River	Contained in Riparian Management Area							
General Forest	72,480	1,610	28,240	170	88,480	2,890	44,240	1,450
Total	958,480	22,740	521,660	8,730	524,520	16,670	87,700	2,660

1/ For descriptions of Management Areas, see Chapter IV in the Forest Plan. Acreages shown here have had the overlap acres between different resource areas subtracted; see discussion in Chapter IV of the Forest Plan.

2/ This total does not include the Humboldt Nursery.

3/ Order displayed is from most restrictive Management Area to least restrictive Management Area.

RESOURCE MANAGEMENT PROGRAMS

RESEARCH NATURAL AREAS

Public Issue

Issue 14 What areas will be recommended for establishment as Research Natural Areas?

Introduction

Research Natural Areas (RNAs) on the National Forests are part of a national network of areas that, when complete, will identify and preserve a representative array of major North American ecosystems. RNAs are designated by the Regional Forester for non-manipulative research, observation, and study and to contribute to maintaining biological diversity on National Forest System lands. RNAs are intended to serve as outdoor laboratories for students and researchers; they are not designed for general public recreation use. RNAs may also help to implement provisions of special acts, such as the Endangered Species Act, and the monitoring provisions of the National Forest Management Act.

Current Situation

The Forest Service has designed a national target system for the National Forests to assist in completing the national RNA network. Six Rivers National Forest lies within two physiographic provinces in this target system: the Klamath Mountains and the Coast Ranges (North). There are 19 target RNAs within the Klamath Mountain province and 17 within the Coast Ranges (North) province. These target RNAs are grouped into elements: forest, woodland, scrub and chaparral, grassland and meadow, marsh and bog, and special elements. In conjunction with the Klamath, Shasta-Trinity, and Mendocino National Forests, the Six Rivers is identifying RNAs on the Forest that will represent these target elements within the two provinces.

Eleven RNAs on the Six Rivers (total targeted) currently are being considered to help complete this network; inventory for the remaining target elements is in progress.

The process used to establish RNAs is as follows:

1. The Forest nominates candidate areas to meet the Region's targets.

2. The Forest, in conjunction with the Region, conducts preliminary screening of these candidate areas to determine basic acceptability (the type is represented in the area, accessibility is OK, and so on). The Golden Stairs, Rocky Knob, Doublegate, and Pine RNAs were eliminated from further consideration at this step.

3. In-depth ecological surveys of these candidate areas are conducted.

4. If the ecological surveys indicate, that the areas warrant RNA status, the areas are recommended to the Regional Forester for establishment. The proposed Pearch Creek RNA and the western half of the Hennessy Ridge RNA were eliminated from further consideration at this step.

5. The Forest Plan, or an amendment to the Forest Plan, serves as an establishment report for those areas that are recommended.

Figure III-29. Research Natural Area contains noteworthy examples of North American ecosystems, such as this darlingtonia bog type.

Table III-23.

Potential Research Natural Areas

Nominated Candidate	Ranger District	Acres	Ecosystem
Horse Linto	Lower Trinity	1,000	Aquatic
Three areas being evaluated*	Orleans/ Lower Trinity	500-2,000	Douglas-fir-tanoak-madrone
Two areas being evaluated*	Mad River	1,000+	Pacific Douglas-fir
*. One of these areas being evaluated will be nominated.			
Recommended for establishment:			
Adorni	Orleans	430	Port-Orford-cedar
Craig's Creek	Smith River NRA	1,150	Knobcone pine
N. Trinity Mtn[1]	Lower Trinity	540	White fir
Ruth	Mad River	1,030	Ponderosa pine/ Douglas-fir
L.E. Horton	Smith River NRA	1,560	Darlingtonia bog
Soldier	Mad River	750	Oregon white oak
Hennessy Ridge	Lower Trinity	1,640	Douglas-fir-tanoak-madrone
Upper Goose Cr.	Smith River NRA	760	Douglas-fir/western hemlock

[1] The North Trinity Mountain RNA is within the boundary of the Trinity Alps Wilderness.

Table III-23 displays the 11 areas on the Six Rivers National Forest currently nominated or recommended as Research Natural Areas. Descriptions and detailed maps of these areas are available in the Forest Supervisor's office.

The Yurok RNA has been established within the Yurok Experimental Forest to study old growth redwood. This RNA is managed by the Pacific Southwest Forest and Range Experiment Station.

Guidelines to ensure the integrity of the RNAs are not compromised will be detailed in management strategies for the areas. Components of the management strategies would include analysis of boundaries, and modification if necessary, a description of the ecological attributes of the area, accessibility, management concerns/conflicts (prevention of the spread of Port-Orford-cedar root disease), restoration needs (for example, the use of prescribed fire to restore that natural process to the system), research and monitoring needs, and a timeline for completion of management actions. It should be emphasized that uses in existence prior to RNA establishment would be identified in the management strategy and an analysis made concerning the compatibility of a specific use with the area's RNA objectives. One example of an existing use is grazing. Grazing allotments either overlap with RNA boundaries or are proximal so as to have potential off-site effects (for example, North Trinity Mountain). Altering allotment boundaries to exclude portions within RNAs will be considered. Until such time that boundaries can be changed, interim measures to mitigate the effects of grazing would be employed; these would include identifying alternative water sources, placing salt blocks to alter travel patterns, and moving the cattle from areas during certain times of the year. Concurrently, management strategies would outline a monitoring plan to ascertain the effects of grazing on the resources of concern.

Opportunities

The eight recommended RNAs are allocated through the Forest Plan.These RNAs, as well as the three candidate RNAs (if established), would be managed according to the direction provided for the Research Natural Area Management Area (see description in Chapter IV of the Forest Plan). If any of the three candidate areas are not established as RNAs, the areas would be managed as portions of the management areas surrounding them. Until they are established or released, these areas will be managed to protect their research and educational values.

Opportunities would be identified in the management strategy prepared for each RNA. Restoration is a key area of development, especially with regard to restoring fire to the system and erosion control (the latter often due to ill-maintained roads). Marketing the RNAs to research and academic institutions through brochures and other forms of printed media, initializing infrastructural links for research (for example, campus computer or laboratory facilities) and publishing research papers are other areas for further development.

The schedule for developing management strategies is outlined in Chapter 5 of the Forest Plan. As is the case with most activities conducted by the Forest, implementation is dependent on the priority placed on RNA management assessment development, which can be defined in terms of the funding the RNA program receives.

Affected Environment in Context with Alternatives

The number and acreages of the 11 proposed research natural areas do not vary by alternative. Effects from establishment of the areas would be the same under all alternatives: timber is not available for harvest; new road construction is not allowed unless consistent with the objectives inherent in RNA management; recreational use discouraged; and possible recommendation for withdrawal from mineral entry, subject to valid existing rights. In light of the management direction and the protective measures to be outlined in the management assessments, the impacts to these areas are minimized. Therefore, consequences in regard to this issue would not vary among the management alternatives and are not analyzed further in Chapter 4.

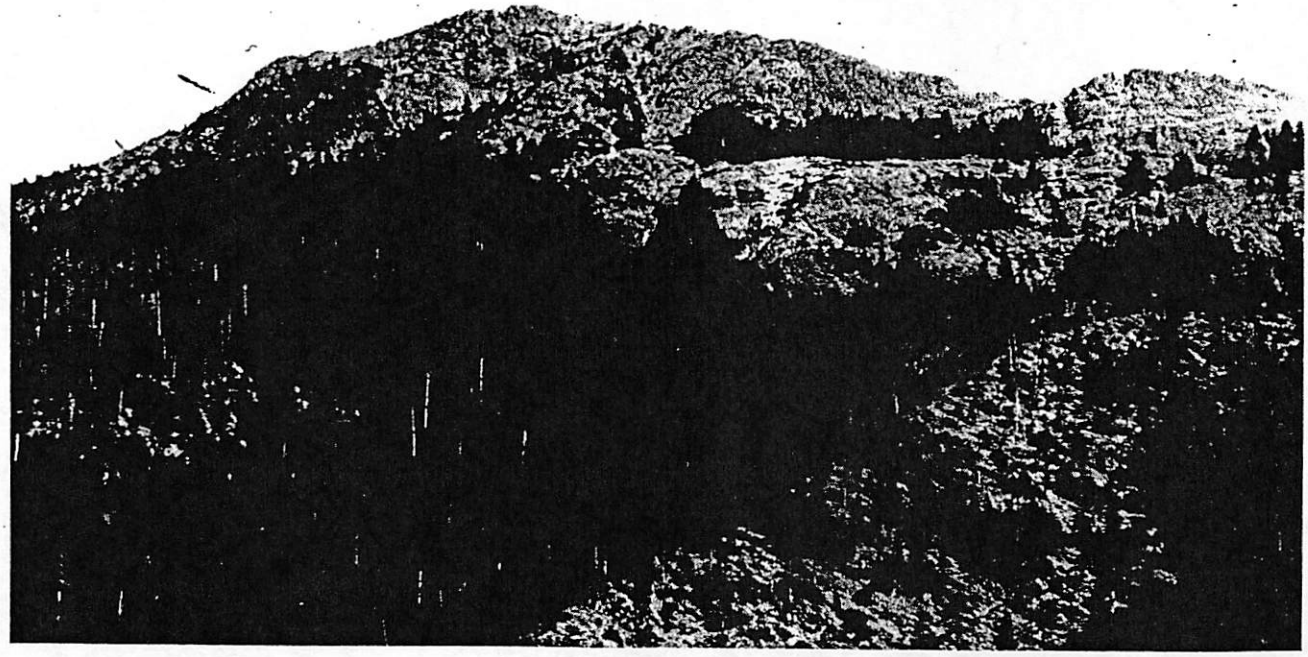
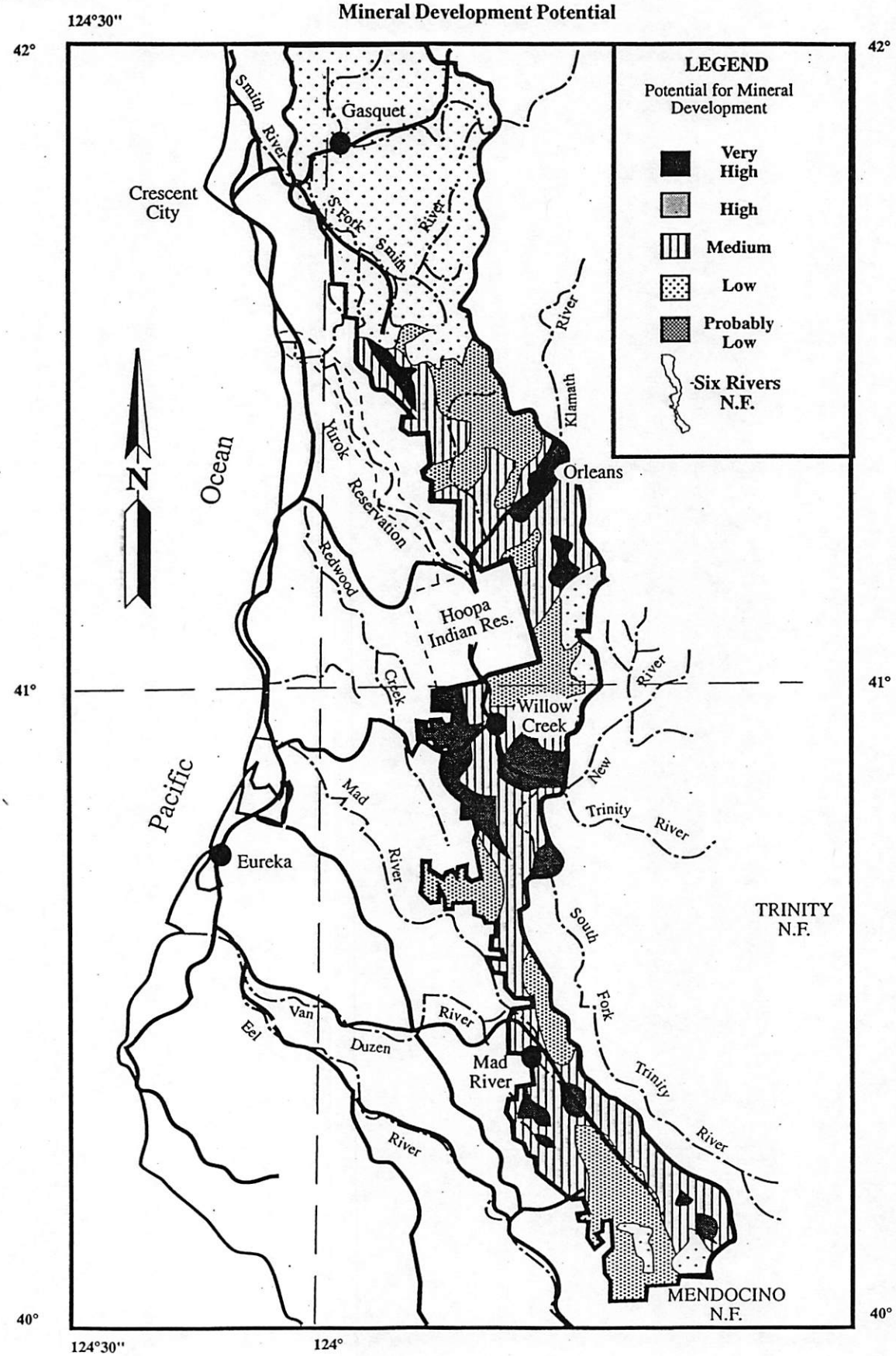


Figure III-30. The Broken Rib Mountain Ecological Area contains a very diverse plant community. In contains Federally listed species and an enriched mixed conifer forest type.

Figure III-41.

Mineral Development Potential



Opportunities

The potential for mineral development has been mapped for the Forest, based on available information such as known mineral resource occurrences, past or present mineral-related activities, mining claim locations, geology, and existing withdrawals. Figure III-40 shows the Forest's potential for mineral development. Table III-31 defines each of the mineral development potential categories and estimates the number of acres within each category.

Future demand for minerals from the Forest will depend on market conditions in combination with the cost of mineral exploration, extraction, and processing. This demand is hard to forecast due to the number of variables, but certain near-term market trends indicate a general rise in the price of mineral commodities with a resulting increase in exploration and possibly development. The Forest Plan may have an effect on demand through the conditions or mitigation measures that may be placed on mineral operations, thereby increasing the cost to mine. Management of riparian ecosystems has become a driving issue for this Forest that will require operating plans for all mining within Riparian Reserves. These operating plans will require coordination with Federal and State agencies, measures to mitigate the effects of operations on Riparian Reserves, reclamation, and reclamation bonding. Effects on supply resulting from the Forest Plan are related to the acres available for mineral entry.

The potential for occurrence of chromite, copper, cobalt, and nickel within the Smith River NRA is particularly important because of the critical and strategic significance of these minerals. The United States imports a very large percentage of its chromium, cobalt, and nickel, and the value of these commodities may rise within the planning horizon. Much of the area containing a potential for the occurrence of these minerals lies within the Smith River NRA, where mineral development is prohibited, subject to valid existing rights.

Table III-31.

Acres of Forest Land by Mineral Development Potential Rating

Mineral Development Potential Rating	Description	Forest Acres (Percent of Total Forest)
Very high	Includes areas with active mines. Mineral development will take place during the planning horizon within at least a portion of the area.	9,800 (1%)
High	Does not include areas with active mines, but mineral development will take place during the planning horizon within at least a portion of the area.	82,580 (9%)
Moderate	Mineral development is expected to occur within at least a portion of the area during the planning horizon.	242,840 (25%)
Low	Mineral development may take place during the planning horizon within at least a small part of the area. Includes areas withdrawn from mineral entry, where future mineral development will only be where prior existing rights have been established.	380,780 (40%)
Probably Low	Based on existing data, the area appears to have a low potential, but the data base is inadequate to classify the area without question as low. Mineral development is not anticipated to occur during the planning horizon.	242,340 (25%)

APPENDIX D: VASCULAR PLANTS KNOWN FROM THE RUTH RNA

This list is a combination of the list provided by Thornburgh (1981) and those species identified during reconnaissance for this Establishment Record (October 28-29, 1988). Taxonomy follows Munz (1968) except for trees which are listed in accordance with Little (1979). The total number of taxa is 158. The letters following the names indicate known habitat types as described:

MCF.....Sierran mixed coniferous forest
PP-DF.....Ponderosa pine/Douglas-fir forest
WF.....White fir forest
MC.....mixed montane chaparral
WA.....White alder/seep

Abies concolor; MCF, WF, PP-DF
Acer macrophyllum; WA, MCF
Achillea millefolium; PP-DF
Adenocaulon bicolor; WA, MCF, PP-DF
Agoseris auriantina;
Agoseris sp.; PP-DF
Agropyron trachycaulum;
Alnus rubra;
Amelanchier alnifolia; MC, WF,
Amelanchier pallida;
Anemone deltoidea; MCF, WA
Apocynum androsaemifolium; PP-DF
Arbutus menziesii; PP-DF
Arceuthobium campylopodium; on Pinus
Arctostaphylos patula; MC, MCF
Arnica discoidea; PP-DF
Artemisia douglasiana; WA
Athyrium filix-femina; WA
Berberis nervosa; WA, MCF
Bromus laevipes; PP-DF, WA
Bromus tectorum; PP-DF
Campanula prenanthoides
Carex multicaulis; PP-DF, MCF
Carex sp. 2; WA
Carex sp.; WA
Ceanothus cordulatus; MCF, MC
Chimaphila menziesii, PP-DF,MCF
Chimaphila umbellata
Chlorogalum pomeridianum; PP-DF
Chrysolepis chrysophylla var. minor; MC
Chrysolepis chrysophylla; MCF, WA
Circaea alpina ssp. pacifica; WA
Cirsium vulgare; WA, MC
Collinsia sp.; MC
Collomia grandiflora;
Corallorhiza maculata; MCF
Cornus stolonifera

Corylus cornuta var. californica; WA, PP-DF, MCF, WF
Cuscuta ceanothi;
Cynasurus echinatus; PP-DF
Cystopteris fragilis; WA
Dactyloctenium aegyptium;
Delphinium sp; MCF
Deschampsia elongata
Disporum hookeri ssp. trachycaulum; MCF, PP-DF, WA
Dryopteris arguta
Eburophyton austinae; MCF
Elymus caput-medusae
Elymus glaucus; PP-DF, MCF, MC
Elymus macounii;
Epilobium adenocaulon; WA
Epilobium brachycarpum;
Equisetum hyemale var. affine; WA
Erigeron inornatus; MCF
Eriogonum nudum; MC, MCF
Festuca californica; PP-DF
Festuca myuros; MC
Festuca sp.; WA
Fragaria californica
Galium aparine;
Galium bolanderi;
Galium triflorum; WA
Garrya fremontii; MC
Gayophytum nuttallii; MCF, PP-DF
Glyceria striata; WA
Goodyera oblongifolia; MCF, WA
Habenaria unalascensis;
Heracleum lanatum; WA
Hieracium albiflorum; PP-DF, MCF
Hieracium greenei;
Holodiscus discolor; MC, MCF
Hypericum anagalloides; WA
Iris tenuissima; PP-DF
Juncus effusus var. pacificus; WA
Juncus mertensianus;
Kelloggia galioides; MC
Koeleria macrantha;
Lagophylla ramosissima
Lathyrus sp; MCF
Libocedrus decurrens; PP-DF, MCF, WF
Lilium pardalinum; WA
Lomatium macrocarpum, MC
Lotus crassicaulis; MCF, PP-DF
Lotus sp. PP-DF
Lupinus andersonii; PP-DF, MCF
Lupinus latifolius;
Lupinus sp; PP-DF
Luzula parviflora; WA
Madia sp.; PP-DF
Marah oreganus;
Melica sp.; PP-DF

Mimulus guttatus; WA
Mimulus moschatus; WA
Mimulus platylaemus;
Monardella odoratissima; MC
Monardella purpurea;
Monardella villosa;
Montia perfoliata; WA
Osmorhiza chilensis;
Osmoronia cerasiformis;
Pellaea brachyptera; MC, MCF
Penstemon azureus; MC
Penstemon coryombosus; MCF
Penstemon rattanii;
Penstemon sp; MCF
Phacelia mutabilis; MCF
Philadelphus lewisii ssp. gordonianus; MCF
Phleum pratense; MCF
Pinus lambertiana; PP-DF, MCF, WF
Pinus ponderosa; PP-DF, MCF
Plectritis sp; PP-DF
Poa pratensis; WA
Polygala cornuta
Polygonum spergulariaeforme;
Polystichum imbricans; MCF, PP-DF
Polystichum munitum; WA
Potentilla glandulosa; PP-DF, MCF
Prunus emarginata; MCF, WF, MC
Prunus subcordata; MC, MCF
Prunus virginiana;
Pseudotsuga menziesii; PP-DF, MCF, WF, MC
Pteridium aquilinum var. pubescens; PP-DF, MCF, MC
Pterospora andromedea; MCF
Pyrola picta forma aphylla; PP-DF, MCF
Pyrola picta ssp. dentata; MCF
Pyrola picta; PP-DF, MCF, WF
Quercus chrysolepis; PP-DF, MCF
Quercus garryana var. breweri; MC
Quercus garryana; MC
Quercus kelloggii; PP-ODF, MCF, MC, WF
Quercus vaccinifolia; MC
Ribes lacustre; WA
Ribes roezlii; MCF
Rosa gymnocarpa; PP-DF, MCF
Rubus leucodermis; WA. MCF
Rubus ursinus; WA
Rumex acetosella;
Rumex angiocarpus;
Rumex salicifolius
Salix scouleriana;
Sambucus caerulea; PP-DF
Sedum laxum ssp. perplexum; MCF
Silene californica
Sitanion hystrix; MC
Stachys rigida;

Stipa lemmonii; PP-DF
Symphoricarpos mollis
Symphoricarpos acutus; MC
Taxus brevifolia; WA
Thelypteris oregana; WA
Tolmiea menziesii; WA
Toxicodendron diversilobum; PP-DF
Trientalis latifolia; MCF, PP-DF, WA
Vancouveria hexandra; MCF
Veratrum californicum; WA
Verbascum thapsus; MCF, WF
Viola glabella; WA, MCF

APPENDIX E: Vertebrate list of Ruth RNA

This list is restricted to those species observed within the RRNA during the field work for the draft Establishment Record (October 28-29, 1988) by Keeler-Wolf. Authorities are Stebbins (1985), Robbins et al. (1983) and Ingles (1965).

Northern alligator lizard (Gerrhonotus careueus)

Great horned owl (Bubo virginianus)
Western screech owl (Otus kennicottii)
Downy woodpecker (Picoides pubescens)
Hairy woodpecker (Picoides villosus)
White-headed woodpecker (Picoides albolarvatus)
Steller's jay (Cyanocitta stelleri)
Common raven (Corvus corax)
Red-breasted nuthatch (Sitta canadensis)
Winter wren (Troglodytes troglodytes)
American robin (Turdus migratorius)
Western bluebird (Sialia mexicana)
Golden-crowned kinglet (Regulus satrapa)
Rufous-sided towhee (Pipilo erythrophthalmus)

Townsend chipmunk (Eutamias townsendii)
Douglas squirrel (Tamiasciurus douglasii)
Botta Pocket gopher (Thomomys bottae)
Deer mouse (Peromyscus maniculatus)
Porcupine (Erethizon dorsatum)
Gray fox (Urocyon cineroargenteus)
Coyote (Canus latrans)
Black bear (Euarctos americanus)

Appendix F: Description of soil families found in the Ruth RNA

Bins Family:

A Horizon: yellowish brown loam, weak granular structure, slightly acid.
B Horizon: light olive brown loam, moderate subangular blocky structure, breaks to moderate granular structure, slightly to strongly acid.
Underlying Rock: sedimentary or metasedimentary.
Depth to Rock: 40-60 inches (100-150 cm).
Drainage: well
Profile Permeability: moderate

Nanny Family:

A Horizon: Very dark grayish brown gravelly loam, weak granular structure, slightly acid.
B Horizon: Brown to pale yellow very gravelly loam, weak subangular blocky structure, slightly acid.
Underlying Rock: sedimentary or metasedimentary.
Depth to Rock: 40-60 inches (100-150 cm)
Drainage: Well
Profile Permeability: Moderate to moderately rapid

Woodseye Family:

A Horizon: Yellowish brown gravelly loam, moderate to strongly granular structure, slightly acid.
B Horizon: Yellowish brown extremely gravelly loam, moderate to strong granular structure, medium acid.
Underlying Rock: Sedimentary or metasedimentary
Depth to Rock: 12-20 inches (30-50 cm)
Drainage: Well to somewhat excess
Profile Permeability: Moderately rapid

Albus Family:

A Horizon: Light olive gray gravelly loam, moderate granular structure, slightly to medium acid.
B Horizon: Light gray to grayish brown very gravelly clay loam, moderately subangular blocky structure, slightly to medium acid.
Underlying Rock: Mica schist
Depth to Rock: 40-60 inches (100-150 cm)
Drainage: Well
Profile Permeability: moderate

Race Family:

A Horizon: Light olive gray gravelly loam, strong granular structure, neutral.
B Horizon: Light gray to yellow gravelly silt loam to gravelly clay loam, moderately subangular blocky structure, slightly to medium acid.
Underlying Rock: Mica schist
Depth to Rock: 40-60+ inches (100-150+ cm)
Drainage: Well
Profile Permeability: Moderate

Skalan Family:

A Horizon: Very dark gray to pale brown very gravelly loam, moderate granular structure, strongly acid.
B Horizon: Dark reddish brown gravelly clay loam, moderate subangular blocky structure, medium to strongly acid.
Underlying Rock: metasedimentary
Depth to Rock: 40-60+ inches (100-150+ cm)
Drainage: Well
Profile Permeability: Moderate

Kistirn Family:

A Horizon: Yellowish brown very gravelly loam, weak granular structure, neutral.
B Horizon: Light yellowish brown to strong brown very gravelly loam to clay loam moderate subangular blocky structure, strongly acid.
C Horizon: Very pale brown very gravelly silty clay, moderate subangular blocky structure, strongly acid.
Underlying Rock: Metasedimentary
Depth to Rock: 40-60+ inches (100-150+ cm)
Drainage: Well
Profile Permeability: Moderate

Holland Family:

A Horizon: Pale brown loam, moderate granular structure, medium to strongly acid.
B Horizon: Strong brown to reddish yellow clay loam, moderate subangular gravelly structure, strongly acid.
C Horizon: Reddish yellow very gravelly loam, moderate subangular blocky structure to massive, medium to strongly acid.
Underlying Rock: Metasedimentary
Depth to Rock: 40-60+ inches (100-150+ cm)
Drainage: Well
Profile Permeability: Moderately slow

Appendix G: Lands and Mineral Status and Uses of Ruth Research Natural Area (Smith 1994, per. comm. on file at PSW Research Station)

Nominated Research Natural Area (RNA) Candidate
Lands and Minerals Status and Uses

Candidate Area: Ruth RNA

Status checked for: HM, T1S, R7E, Sec 34 (E1/2E1/2) and 35. See attached map.

Lands reserved from public domain: 02/03/1908, sec 34; 04/26/1905, sec 35.

Use restrictions: None

Special uses: The only authorized use in the area is a road within the W1/2SW1/4SW1/4 Sec 35 under eprmit to John D. Boyl (see map). The permit authorizes a 12' wide right-of-way with additional lands needed for cuts and fills.

Withdrawals from mineral entry: None

Existing mining claims: None. BLM microfiche geographic index shows no claims have been located in the area since claim holders were first required to send copies of location notices to BLM by the Federal Land Policy and Management Act of 1976.

Mineral Development Potential: A Forest Service Minerals Geologist has identified the mineral development potential in the area as moderate; that is, it is included in the 242,840 acres (25 percent) of Forest lands on at least a portion of which mineral development is expected to occur during the 50-year planning horizon.

Prepared by Meredith Smith, Realty Specialist, 11/4/94.