

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

ESTABLISHMENT RECORD  
ELDORADO CREEK RESEARCH NATURAL AREA  
WITHIN WENATCHEE NATIONAL FOREST  
KITITAS COUNTY, WASHINGTON



SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Eldorado Creek Research Natural Area

Wenatchee National Forest

Kittitas County, Washington

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 44063.21, Mapping and Recordation and FSM 4063.41 5.e(3) in arriving at this recommendation.

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**TITLE PAGE**

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## INTRODUCTION

Eldorado Creek Research Natural Area (RNA) is located in the central Wenatchee Mountains on the east slope of the Washington Cascade Range. It provides a prime example of vegetation on serpentine soils for the federal RNA system. It also provides habitat for four wildlife species listed as threatened or endangered, several special status plants and animals, and numerous other animal and plant species.

Soils derived from ultramafic rocks such as serpentine develop distinctive vegetation which contrasts sharply with plant life on other soils. Both species composition and the physiognomy of vegetation change in response to serpentine. In Eldorado Creek RNA, the particular responses include (1) dwarfing, lowered abundance, and altitudinal extensions of regionally widespread conifers; (2) omission of many woody and herbaceous species common to the region (i.e., reduced diversity of flora); (3) occurrence of a limited number of both serpentine indicator species and endemic ferns and flowering plants; and (4) development of a "pioneer-type community with much bare ground (Kruckeberg 1964a, 1969b; Franklin and Dyrness 1973).

Eldorado Creek was proposed as a Research Natural Area in 1968 by Dr. Arthur Kruckeberg (University of Washington). A preliminary establishment record was completed by Dr. Kruckeberg in 1972. A report on the area's mineral character (with the intent of withdrawal from mineral entry) followed. Daniel Y. Meschter (1974) concluded that land within the proposed RNA is "non-mineral in character for locatable minerals under the General Mining Law for lack of a showing of value for the mineral estate." The conclusion was challenged in 1975 by Alan R. Grant (consulting geologist representing claimants within the area). Action concerning mineral withdrawal for the proposed Eldorado Creek RNA was suspended pending enactment of federal wilderness legislation. At that time, Eldorado Creek was being considered for inclusion in the Alpine Lakes Wilderness Area.

Once the wilderness was established excluding Eldorado Creek, the Regional Research Natural Area Committee recommended that a biologically comparable alternative with fewer mineral conflicts be located for the RNA network. By 1981, however, it had been determined that there were no viable alternatives. Consequently, Eldorado Creek was designated as a Special Area (proposed RNA) in the Alpine Lakes Management Plan (USDA Forest Service 1981) and the Wenatchee National Forest Land and Resource Management Plan, hereafter referred to as Forest Plan (USDA Forest Service 1990a).

Eldorado Creek RNA is not within wilderness, national recreation area, or any other Congressionally designated area. No Wild and Scenic Rivers occur within the RNA boundary.

Dr. Kruckeberg's preliminary establishment record of 1972 is reproduced here in principle and spirit, and updated to conform to current policy and guidelines (FSM 4063.41). We are grateful to Steve Rust, currently with the Idaho Conservation Data Center in Boise, for preparation of an early draft.

## LAND MANAGEMENT PLANNING

The Forest Plan identified 1,336 ac (541 ha) as the proposed Eldorado Creek RNA (USDA Forest Service 1990b). The environmental consequences of establishing the RNA were analyzed in the Forest Plan FEIS (USDA Forest Service 1990c).

Additional analysis expanded the RNA to 1541ac (624 ha) in order to include certain unique microsites and provide a readily identifiable boundary on the ground. A recent Environmental Assessment (EA) evaluated the effects of establishing this expanded RNA (USDA Forest Service 1997).

## OBJECTIVES

The objective of the Eldorado Creek RNA is to protect in perpetuity an area which illustrates directly and through contrast, the influence of ultramafic parent materials on plant growth and distribution. The area encompasses both ultramafic (peridotite and serpentinite) and non-ultramafic (Swauk sandstone and metadiabase, a.k.a. greenstone) parent materials and the contrasting vegetation indigenous to these materials. It features and will protect a range of montane serpentine plant communities, including barrens and riparian streams and systems.

The RNA will contribute to the national network of pristine representative areas dedicated to research, education and the maintenance of biological diversity. It will serve as a reference area for the study of succession, as a baseline area for measuring long-term ecological change, and as a control area for comparing results from manipulative research and for monitoring effects of resource management. In particular, it preserves opportunities for long-term study of species diversity, mineral cycling under extreme cation status, and plant tolerance to high levels of magnesium and nickel and low levels of calcium. Results from these studies will be applicable to the management of forest and range lands on serpentine substrates elsewhere in the Region.

## JUSTIFICATION

The Eldorado Creek RNA superbly typifies plant communities indigenous to serpentine soils in the Wenatchee Mountains. It fulfills two ecosystem elements not represented elsewhere in the natural area system: serpentine barrens and mid-elevation serpentine stream and riparian systems (Dyrness et al. 1975; Washington Natural Heritage Program 1995) (Table 1).

**Table 1. Biological components present or suspected in the Eldorado Creek RNA and their priority for inclusion in the Natural Area network (Washington Natural Heritage Program 1995).**

<u>Element (Eastern Cascades Province)</u>	<u>Priority*</u>
Ecosystem:	
Serpentine barren	2
Mid-elevation serpentine streams and riparian systems	2
Special Animals:	
<i>Accipiter gentilis</i> (northern goshawk)	3
<i>Aquila chrysaetos</i> (golden eagle)	3
<i>Dryocopus pileatus</i> (pileated woodpecker)	3
<i>Martes pennanti</i> (fisher)	2
Special Plants:	
<i>Pellaea breweri</i> (Brewer's cliff-brake)	3
<i>Chaenactis thompsonii</i> (Thompson's chaenactis)	3

\*Priority 2 Ecosystem: These elements are at an intermediate priority largely because they are not in as much danger of being destroyed or degraded in the near future as Priority 1 elements. These elements typically have regional distribution in Washington and few occurrences exist in natural condition. Priority 2 elements usually have little or no representation in existing natural areas or protected areas, but may receive some *de facto* protection in other managed areas.

\*Priority 2 species: Taxa will become endangered in Washington if factors contributing to their population decline or habitat degradation or loss continue. These taxa are high priorities for preservation efforts.

\*Priority 3 species: These taxa are vulnerable or declining and could become endangered or threatened in the state without active management or removal of threats. These taxa should be important in the analysis of potential preserve sites.

Two plants listed as special by the Washington Natural Heritage Program occur here. They are *Chaenactis thompsonii* and *Pellaea breweri*. Both are also listed as sensitive by the Regional Forester (USDA Forest Service 1991). Establishment of the RNA will maintain habitat for both species.

Two endangered species, gray wolf (*Canis lupis*) and peregrine falcon (*Falco peregrinus*) potentially occur here. The federally threatened spotted owl (*Strix occidentalis caurina*) may use certain forest habitats within the RNA, as may grizzly bear (*Ursus horribilis*). Two sensitive species, lynx (*Lynx canadensis*) and wolverine (*Gulo gulo*) may use its high elevation *Pinus contorta* forests and talus slopes, respectively. Establishment of the RNA will protect their respective habitats.

## PRINCIPAL DISTINGUISHING FEATURES

Eldorado Creek RNA features both mixed coniferous forest and non-forest/scree vegetation on serpentine soils. Forested plant communities are in the *Abies amabilis*, *Abies grandis*, *Abies lasiocarpa*, *Pinus albicaulis*, *Pseudotsuga menziesii* and *Tsuga mertensiana* series. Tree-less serpentine barrens are found throughout the RNA.

Two contrasting parent materials dominate the bedrock geology of the RNA (Miller 1980; Tabor 1983). Both igneous and metamorphic forms of ultramafic rock (peridotite and serpentinite, respectively) predominate in the Eldorado Creek drainage and on over the ridge into the headwaters of Beverly Creek. The soils of the area are all shallow and stony (skeletal), but exhibit marked contrast in base composition, depending on the nature of the parent materials (serpentinite soils have high Mg and Ni levels and low Ca levels compared to normal rock types). See Kruckeberg (1969b) and Cooke (1994) for analyses of serpentine and adjacent non-serpentine soils.

It is the vegetation on soils derived from the serpentinite and peridotite, as well as the contrast with vegetation on the adjacent more normal soils that forms the basis for establishment of the Eldorado Creek Research Natural Area. Photographs 1-5 provide examples of the landscape character, vegetative composition and habitats found within the Eldorado Creek Research Natural Area.

## LOCATION

Eldorado Creek is located on the Cle Elum Ranger District, Wenatchee National Forest (Fig. 1). No other National Forest System lands are involved. It primarily occupies the south and west-facing slopes above the former Deroux Forest Camp, on the North Fork Teanaway River, Kittitas County, Washington. The RNA also extends eastward into upper Beverly Creek.

The center of the RNA is latitude 47° 24' north, longitude 120° 55' west. It is located in portions of sections 1, 2, 11 and 12, Township 22 North, Range 15 East, and section 7, Township 22 North, Range 16 East, W.M., Kittitas County, Washington.

### Boundary Description

The RNA boundary is located to provide maximum diversity of slope, exposure, parent material and flora. The contrasts between southwest-facing exposures and the north-facing exposure east of Iron Peak are striking and merit inclusion in the research natural area. Such alignment also permits the inclusion of

contacts between strongly contrasting geologies: sandstone and altered volcanic (metadiabase) with serpentine or peridotite (the two ferromagnesian rocks).

The boundaries of the Eldorado Creek RNA (Figs. 2 and 4) are more particularly described below. See Appendix 1 (Letter from Wenatchee NF Land Surveyor), which states that the following boundary is correctly described:

Beginning at the section corner of sections 2, 3, 10, and 11, T. 22 N., R. 15 E.; thence North along the section line between sections 2 and 3 to the 1/4 corner of sections 2 and 3; thence East along the East-West centerline in section 2 to the 1/4 corner of sections 1 and 2; thence North along the section line between sections 1 and 2 to the intersection of the section line and the Alpine Lakes Wilderness Boundary at the ridge top; thence Easterly along the wilderness boundary and ridge top approximately 4600 feet to a point on the wilderness boundary and 100 feet Westerly of the Beverly Creek and Turnpike Creek trail; thence South to the 5800 feet contour line; thence Southerly along the 5800 ft contour line through sections 1, 12, 7 and Westerly through section 12 (approximately 13,870 ft) to the intersection of the 5800 ft contour line and a prominent ridge bearing Southwest, in the Southwest quarter of section 12. This ridge descends South and then Southwest from Iron Peak which is located in the Northeast quarter of section 12; thence descend southwesterly along said prominent ridge to the intersection of ridge and the South boundary of section 12; thence West along section line between section 12 and 13 to the section corner of sections 11, 12, 13 and 14; thence West along the section line between 11 and 14 to the 1/4 corner of sections 11 and 14; thence N45°W to the intersection of the 4000 ft contour line; thence Northwesterly along the 4000 ft contour line through section 11 to the intersection of the North boundary of section 11; thence West along the section line between sections 2 and 11 to the section corner of sections 2, 3, 10 and 11, the point of beginning.

The elevations (contour lines) in this description are based on the National Geodetic Vertical Datum (NGVD) 1929.

#### **Area and Elevation**

Total area is 1,541 acres (624 ha). Elevations range from 3780 feet (1152 m) above sea level (point of intersection with Eldorado Creek) to 6779 feet (2066 m) above sea level along the northern boundary of the RNA.

#### **Access**

Access to Eldorado Creek RNA is via State Route 970 (north from Cle Elum), County Road 976 (west from S.R. 970 up the Teanaway River drainage), and F.S. Road 9737 (along the North Fork Teanaway River to Eldorado Creek) (Fig. 1b). Forest Service trail no. 1399 (Iron Peak) originates at Rd. 9737, and provides access to the interior of the RNA. It intersects with trail no. 1391 (Beverly Creek) just outside the RNA's eastern boundary. Eldorado Creek and access to the RNA are identified on the Forest Visitor Map, Wenatchee National Forest (1::126720; revised 1990).

#### **Maps**

Eldorado Creek RNA is located on the Mount Stuart Quadrangle (7.5 minute series USGS topographical map). Geologic Map of the Wenatchee 1:100,000 Quadrangle, Central Washington (Tabor et al. 1982) is also pertinent to the objectives of the RNA.

#### **Photography**

The following aerial and ortho photography of Eldorado Creek RNA is available at the District Ranger's office in Cle Elum, and Forest Supervisor's office in Wenatchee:

7-15-92, USDA-FS, 16, 616170A, 592-198 through 592-201  
7-30-92, USDA-FS, 16, 616170A, 2392-64 through 2392-68  
USDA Forest Service Orthophoto Quad 73, Mt. Stuart

## AREA BY COVER TYPE

The serpentine vegetation of Eldorado Creek presents unusual species assemblages; it does not fit easily into current regional vegetation classification schemes (e.g., Eyre 1980). This is likely an expression of the effect of serpentine soils on the distribution of plant species. Forested vegetation on non-serpentine parent materials is more readily classified using standard practices. Much of the area on serpentine is non-forest: talus and scree, barren ridges, massive rock outcrops, and moist swales and seeps (Fig. 3). Plant communities occurring in Eldorado Creek RNA are listed in Table 2.

**Table 2. Vegetative cover in Eldorado Creek RNA. Acreages of SAF forest cover types are highly speculative, due to the inherent difficulties of classifying forest cover on serpentine soils, lack of field survey, and the wide variation in community types that occurs within these forested series. Figures were developed using GIS, aerial photo interpretation, district series maps, and personal communication with Dr. Arthur Kruckeberg, University of Washington.**

<u>Cover Type</u>	<u>Acres</u>	<u>Hectares</u>
A. Non-forest (from District 1995 Series Map)		
Riparian Streamside Vegetation	7	3
Wet Meadow	2	<1
Bedrock	158	164
Barren, talus, or scree	542	219
Total Non-forest	709	287
B. Forest		
using SAF forest cover types (Eyre 1980)		
210, Interior Douglas-fir	317	128
213, Grand fir	185	75
218, Lodgepole pine	150	61
206, Engelmann spruce-Subalpine fir	150	61
205, Mountain hemlock	30	12
Total	832	337
using Kuchler Types (Potential Natural Vegetation) (Kuchler 1966)		
grand fir-Douglas fir	236	96
Douglas-fir	300	120
subalpine fir - mountain hemlock	526	121
Total	832	337
using District 1995 Series Map		
Mesic grand fir	236	96
Subalpine fir	596	241
Total	832	337
<b>Total RNA Area</b>	<b>1541</b>	<b>624</b>



## PHYSICAL AND CLIMATIC CONDITIONS

The RNA predominantly encompasses southwest-facing slopes of moderate-to-steep aspect. Its northeast sector includes ridgetop, the summit of Iron Peak, and steep east- and north-facing slopes in upper Beverly Creek.

The climate of the area is fairly typical of mid-montane sites on the east slope of the northern Cascade Range. Precipitation is moderate at about 25 inches annually; most of this falls as snow. The dry season begins in late June and extends into September (Table 3).

**Table 3. Representative data from the nearest climatic station at Blewett Pass, located 12 mi (19km) southeast of Eldorado Creek RNA. Records span a 23-year period (1927-1949). Source: *Washington Climate for Chelan, Douglas, and Okanogan Counties. January, 1975.* W. R. Donaldson and C. Ruscha, eds. WSU Cooperative Extension Service, Pullman, WA. EM 3889.**

Mean January temperature	25 <sup>o</sup> F	(-3.8 <sup>o</sup> C)
Mean July temperature	64 <sup>o</sup> F	(17.8 <sup>o</sup> C)
Mean January minimum temperature	19 <sup>o</sup> F	(7.2 <sup>o</sup> C)
Mean July maximum temperature	78 <sup>o</sup> F	(25.6 <sup>o</sup> C)
Mean annual precipitation	24.22 inches	(61.5 cm)
Mean July precipitation	0.28 inches	(0.7 cm)

## DESCRIPTION OF VALUES

### Flora

A large number of plant species, including serpentine indicator and endemic species, have been documented in the RNA (See Appendix 2). Two plants listed as special (priority 3) under the Washington Natural Heritage program, occur here. They are *Chaenactis thompsonii* and *Pellaea breweri*. Both are listed as sensitive species in the Pacific Northwest Region.

### Plant Communities

Two types of riparian plant communities occur in the RNA--streamside riparian vegetation and wet seeps. Riparian vegetation is closely confined to the margins of Eldorado Creek, and includes the following notable species: *Ledum columbianum*, *Cirsium edule*, *Angelica canbyi* and *Adiantum aleuticum* (serpentine form). Interspersed among the dry low-site conifer stands are remarkable wet oases - seeps dominated by *Adiantum aleuticum* (often in massive pure swards), or with *Habenaria dilatata*, *Dodecatheon jeffreyi*, and *Gentiana calycosa*; *Ledum glandulosum* and *Salix brachycarpa* often occur at the edges of the seeps. These seeps are wholly confined to the serpentine portions of the RNA.

An unusual mix of conifers occurs in the RNA. Here, ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), whitebark pine (*Pinus albicaulis*), and lodgepole pine (*Pinus contorta latifolia*) coexist at 3500 ft. (1067 m) in elevation. The open conifer stands on serpentine permit the upward extension of ponderosa pine and the downward extension of whitebark pine. Moreover, *Juniperus communis montana* is a common shrub in low-elevation forests, occurring well below its usual high elevation habitats.

Generally, steep valley bottom toe slopes on southwestern aspects are vegetated by early- to mid-seral *Pseudotsuga menziesii* forest communities (*Pseudotsuga menziesii*/*Calamagrostis rubescens*-*Carex geyeri*) typically dominated by ponderosa pine. Many of these stands possess old growth forest structural characteristics. With elevation gain, *Abies grandis* and *Abies amabilis* forest communities are present (*Abies grandis*/*Holodiscus discolor*, *Abies grandis*/*Calamagrostis rubescens*-*Lupinus*, *Abies amabilis*/*Vaccinium membranaceum*).

Forested vegetation of serpentine soil is characterized by dispersed large diameter *Pinus ponderosa* and *Pseudotsuga menziesii*, with patchy (low-to-high density) pole-sized *Abies lasiocarpa* and *Pinus contorta*. *Juniperus communis* and *Arctostaphylos nevadensis* are typically abundant in the understory. Upslope, *Pseudotsuga menziesii* is increasingly less abundant and was once replaced by *Pinus albicaulis*. Severe mortality in *Pinus albicaulis* appears to have resulted from white pine blister rust. In moist swales and large depressions, *Tsuga mertensiana* plant communities are present that may be described as *Tsuga mertensiana*/*Rhododendron albiflorum* and *Tsuga mertensiana*/*Luzula hitchcockii*. An unusual *Tsuga mertensiana* species assemblage is characterized by high understory abundance of *Vaccinium scoparium*. *Tsuga mertensiana* forest within Eldorado Creek RNA is primarily late seral old growth..

Most striking are the treeless barrens on serpentine, on both gentle and steep slopes (Photo 1). The barrens may be wholly devoid of vegetation or thinly populated with the endemic grass, *Poa curtifolia* and other serpentine forbs (*Chaenactis thompsonii*, *Lomatium cuspidatum* and *Douglasia nivalis*).

#### **Fauna**

No formal records of fauna exist for this natural area. A systematic inventory of wildlife has not been conducted. Casual observations of birds and mammals by a wildlife biologist in 1996 are listed with suspected fauna in Appendix 3.

Six species of sensitive, endangered, and threatened wildlife potentially use habitats within the RNA. Dense late successional forests at lower elevations along the northern and southern boundaries provide potential nesting/foraging/roosting habitat for spotted owls (*Strix occidentalis caurina*). Deer (*Odocoileus hemionus*) likely fawn at lower elevations in the RNA, and provide a spring/summer/fall food source for large predators such as gray wolf (*Canis lupus*) and grizzly bear (*Ursos arctos*). Two R-6 sensitive species, lynx (*Lynx canadensis*) and wolverine (*Gulo gulo*), potentially use its higher elevation forests and talus slopes. These same areas may provide winter denning habitat for grizzly bear. The endangered peregrine falcon (*Falco peregrinus*) may nest on cliffs in or adjacent to the RNA.

The RNA is located in the North Cascades Grizzly Bear Recovery Zone. Establishment of the RNA is consistent with the draft Grizzly Bear Recovery Plan (USDI Fish and Wildlife Service 1993).

#### **Geology**

The geology of the land is fairly complex with at least five major rock units being represented. The structure is also complicated by numerous small faults and the effects of paleogeologic processes. The following description of the geology of the area is taken from Meschter (1974).

The dominant rock type in the study area is a Pre-Tertiary basic intrusive consisting of peridotite which has been almost entirely altered to serpentinite. The outcrops of this rock type characteristically form smooth slopes with a sterile soil. The soil tends to be sandy with a greenish-buff to greenish-tan color. Bedrock outcrops are rather rare; but where found, the rock is normal serpentinite with a green to green-black color and a slightly unctuous texture.

A wedge of igneous rocks is exposed in a fault block along the north edge of the area. These outcrops form a high ridge marked by steep bluffs on the south side. Two rock types are represented here. One type mapped as a basic intrusive, is a dark green-black gabbro containing mostly coarse amphibole crystals with subordinate dark colored calcic feldspars. The other type is mapped as Pre-Tertiary

volcanics with minor interbedded sedimentary rocks. Field observations indicate that this rock is almost entirely basaltic in this area.

Another wedge of Pre-Jurassic metamorphic rock outcrops in the southwest part of the area. These are the oldest rocks in the study area. The rock type is mostly thick bedded to possibly massive phyllite. The fresh rock is fine grained and dark gray in color. The rock, however, shows abundant ferruginous alteration and weathered surfaces commonly are reddish brown to deep brown or black.

The structural relationship between the Swauk sandstone and the serpentine and metamorphic rocks is of particular interest in this study. It is known that the peridotite and its alteration product, serpentinite, were exposed to moist tropical climate weathering prior to deposition of the Swauk sandstone. This type of weathering resulted in the formation of a zone of iron- and aluminum-rich laterite at the exposed surface.

In this process, the weathered serpentinite tended to be depleted of magnesium, calcium, and part of the silica in the original rock, thus enriching the remaining rock material in aluminum and iron. The aluminum-rich material was redeposited as the mixture of ferruginous clays known as bauxite. The iron was converted to hydroxides and after becoming mobile downward was deposited as hematite and magnetite in an iron-rich layer in and below the bauxite. Significant quantities of nickel and chromium, which are characteristic of most ultramafic rocks, also tended to be concentrated with the iron. Laterite deposits are known to be widely distributed along the top of the serpentinite for a distance of 20 miles from the Cle Elum River to Blewett. It is not believed, however, that the laterite zone was continuous throughout this distance. Irregularities in the erosion surface probably caused thicker development in some localities and little or no development in others so that the laterite deposits are almost certainly lenticular.

Stratigraphically, the Swauk sandstone was deposited on top of the serpentinite and other older rocks. Part of the laterite, especially the weaker bauxitic beds, was reworked by erosion during deposition of the Swauk sandstone and incorporated into the basal beds of the Swauk sandstone over a wide area. The entire rock sequence later was deformed by intrusion of the Mount Stuart granitic rocks further to the north and the contact zone folded and broken up by faulting.

Foot traverses across the areas of serpentine show that the soil in many places is noticeably sandy which may be the residuum of the overlapping Swauk sandstone rather than the result of mechanical degradation of the serpentine. Other traverses along the serpentine-metamorphic rock contact shows that the contact is offset by numerous right lateral transverse faults, often spaced as closely as several hundred feet. Small wedges of Swauk sandstone have been dropped down against the metamorphic rocks in fault blocks between these faults. It seemed likely during examination, but could not be satisfactorily confirmed, due to poor outcrops, that some erosional remnants of Swauk sandstone remain isolated on top of the underlying rocks.

Only a few fragments of rock even remotely resembling bauxite were found in the float in the southwest part of the area. The phyllites in this area locally display intense ferruginous alteration with the rock being a chocolate-brown to black color. The ferruginous rocks form bold outcrops which, however, appear to be limited in extent to a few hundred feet or less.

An exceptional outcrop was found in the deeply incised drainage approximately in the NW 1/4 SW 1/4 of Section 12 about at the point where the phyllites pinch out against the serpentine-Swauk sandstone contact. A bold outcrop of ferruginous rock was found to be about 100 feet high and 75 to 100 feet in diameter. It could not be determined from field observations whether the ferruginous material was a laterite at the top of the serpentine or whether it was in the phyllite. In any case, the iron-rich mass is cut by a fault with part of the mass being laterally displaced about 200 feet against Swauk sandstone.

### Soils

Principal soils within the area are classified within the Limking, Skipeak, Serpen and Billyridge series (Cashmere Mountain Soil Survey). The Limking and Skipeak soils are formed in volcanic ash over granitic residuum and glacial outwash (respectively) and are deep to very deep; and well- to somewhat excessively-drained soils. Limking soils are sandy or sandy-skeletal, mixed, frigid Typic Haploorthods. Skipeak soils are sandy-skeletal, mixed, Typic Cryorthods. Serpen soils are formed in serpentine residuum with minor amounts of volcanic ash and loess. These are loamy-skeletal, serpentinitic, frigid Typic Argixerolls. Soils of the Billyridge series are formed in alluvium. These very deep, well-drained soils are coarse-loamy, mixed, mesic Ultic Haploxerolls.

Soil analyses (cation exchange values, meq./100gms soil) reveal marked contrasts between soils over serpentine and non-serpentine parent materials, as follows (Kruckeberg 1969):

Site/soil type	CEC	Ca	Mg	Ca:Mg	pH
Mixed conifer stand on serpentine	9.6	0.6	3.1	0.2	6.8
Serpentine barren	5.2	0.3	3.7	0.8	7.6
Open PSME stand on sandstone	6.6	1.5	0.0	---	6.1

### Lands

The area is entirely National Forest System, non-Congressionally designated land. It is adjacent to Alpine Lakes Wilderness Area, and the following Forest Plan allocations: SI-1, Classified Special Area - Scenic and/or Recreation; OG-2, (formerly) Mature Habitat; and ST-2, Scenic Travel - Partial Retention. Eldorado Creek RNA is within the Teanaway River watershed and the Teanaway Late-Successional Reserve (LSR). Management to attain the objectives of the RNA may, however, take precedence over LSR standards and guidelines (USDA Forest Service and USDI Bureau of Land Management, 1994, page C-11).

### Cultural

A comprehensive inventory of cultural values of the area has not been conducted.

## IMPACTS ON OTHER RESOURCE VALUES

### Mineral Resources

Potential conflicts with mineral resources exist. A number of claims have been located in the area in the past. As of February, 1994, all mineral claims in the Eldorado Creek RNA had been abandoned (J. D. Simmons, February 1, 1994, personal communication).

### Grazing

The area is not within a grazing allotment. A cattle allotment is active east of the research natural area. It is possible, though unlikely, that trespass livestock grazing could occur in the RNA.

### Timber

Establishment of the Eldorado Creek RNA will not result in withdrawal of any commercial forest from the Forest's timber base. The entire RNA is located within Late Successional Reserve, from which there is no programmed timber harvest.

### **Watershed Values**

The research natural area encompasses Eldorado Creek and another unnamed creek. These stream systems are important features of the research natural area. The RNA will maintain or enhance their value.

There is a domestic water supply system originating within the research natural area on Eldorado Creek. It serves a facility under special use permit outside the RNA. This system will be evaluated for consistency with RNA objectives when the current permit expires. If found inconsistent, then the system will be removed at that time.

### **Recreational Values**

The North Fork Teanaway area is renowned for a variety of recreational pursuits--hiking, camping, backpacking, horseback-riding, fishing, and hunting. Forest Service Trail 1399 passes through the heart of the RNA, and is used by hikers and equestrians almost exclusively for day trips. Trail 1391 (outside of the RNA) provides access from Beverly Creek to trail 1399. Overnight use tends to occur in Upper Beverly Creek rather than the RNA.

Trail 1399 is popular for wildflower-viewing. It is both an asset and potential liability to the RNA. It provides controlled access for research and education, but may also provide access for uses that are not compatible with RNA objectives. To date there has been no sign of off-trail activity. The trail should remain closed to off-road vehicles.

### **Wildlife and Plant Values**

The Teanaway country is well known for its rich diversity of native plant life, and particularly, its serpentine flora. Contrasting vegetation within the RNA provides a superb illustration of serpentine's effects on plants. Two R-6 sensitive plant species, *Chaenactis thompsonii* and *Pellaea breweri*, occur in the RNA. Specific locations have not been mapped.

Six species of sensitive, proposed, threatened and endangered wildlife potentially use habitats within the RNA, although their occurrence has not been documented. Diverse forested plant communities provide a wide range of habitat conditions for wildlife. Absence of roads, the somewhat confined nature of human use in the area, and complex topography result in ample habitat security for wildlife. The RNA will maintain and enhance these values.

### **Research on the Eldorado Creek RNA**

Studies on the soils, unique flora and vegetation as well as greenhouse experiments began in the 1960s. Initial results were presented at the International Botanical Congress, Edinburgh (Kruckeberg 1964b). A major paper based on studies at the site was published in 1969 (Kruckeberg 1969b). Other papers by Kruckeberg addressed ferns and ultramafics (1964a), racial tolerance to serpentine (1968), plant distribution in response to soil differences (1969a), plant speciation and soil diversity (1986), and nickel accumulation in plants (1993). Dr. Roger delMoral conducted community analyses on the site (delMoral, 1972, 1974, and 1982). Dr. John Main (1974) found that bluebunch wheatgrass (*Agropyron spicatum*) had serpentine tolerant races and that the endemic grass, *Poa curtifolia*, required high levels of magnesium for normal growth.

Research for two graduate theses were conducted in the RNA: Ms. C. Cymerman (1988) examined the morphological differences in serpentine and non-serpentine populations of *Achillea* and *Senecio pauperculus*. Dr. S. Cooke's field and greenhouse work on two serpentine forbs demonstrated their differentiation into serpentine and non-serpentine races (Cooke 1994). The fungal flora of the RNA and vicinity was described by Maas and Stuntz (1969). Serpentine tolerance of a *Rhizobium* (nitrogen-fixing) strain was described by Pegtel (1980).

## MANAGEMENT PRESCRIPTION

The Forest Plan provides management direction for research natural areas. Effects of implementation are disclosed in the Forest Plan FEIS (USDA Forest Service 1990c). In accordance with this plan and pursuant to FSM 4063.4, 5j, the following management prescriptions will ensure that high quality biological and physical elements and ecological processes are maintained in the RNA:

*The area is closed to commercial and recreational livestock grazing and fuelwood and timber cutting. The RNA is closed to overnight camping, campfires and firewood gathering. Recreational day use of the area will be monitored. Periodic assessments of the effects of recreational use will be the basis for application of more restrictive management guidelines, when appropriate. No new special use permits will be issued for the RNA, unless they are for approved research projects. A special use permit for the pre-existing water system may be issued if further study determines that it is consistent with RNA objectives and will not detract from RNA values. The area will be recommended for mineral withdrawal.*

### **Vegetation Management**

The objective of the RNA is to maintain high representative quality of its serpentine and nonserpentine plant communities. Vegetation management activities are not planned at this time but may be needed in the future to maintain ecological processes related to fire disturbance in Douglas-fir forest communities and/or to protect other key biological values from catastrophic loss due to wildfire. The need for vegetation management activities will be identified through discussion between Pacific Northwest Region and Pacific Northwest Research Station.

If and when needed, vegetation management activities will occur through an adaptive management strategy involving these (ordered) activities: inventory, plan and implement, and monitor and evaluate. Prior to execution, a plan detailing the objectives of the proposed treatment, operative precautions, and criteria for evaluation of the attainment of objectives will be submitted for approval by the Station Director (Pacific Northwest Research Station), and concurrence of the Forest Supervisor (Wenatchee National Forest) and District Ranger (Cle Elum Ranger District).

As wildfire will originate within, and/or approach from outside the area, a plan for the management of wildfire (including, for example, the location of water and fuel breaks) within and around the research natural area will be developed and made available to the wildfire incident manager.

If and when needed, wildfire suppression activities within the RNA will result in the least possible ground-disturbance. Minimal impact suppression standards will be utilized. Machine-constructed fireline and use of chemical fire retardants will not occur within the research natural area.

If rehabilitation of the area becomes necessary, only plant materials collected within the natural area (or immediate vicinity) will be used.

No measures for control of insects or diseases will be undertaken unless forests on adjacent lands are endangered. All reasonable measures will be taken to prohibit the introduction of alien plants and animals into the RNA.

### **Monitoring**

The RNA should be visited annually by Forest Service personnel or cooperative partners to ensure that only authorized use is occurring. Biological monitoring efforts will fill basic inventory needs (identified in the descriptions of biological values and the discussion of vegetation management above) and contribute to refinement of the description of vegetation within the RNA. Permanent monitoring plots should be established to ensure the objectives of the research natural area are maintained.

## ADMINISTRATIVE RECORDS AND PROTECTION

The Station Director, Pacific Northwest Research Station, in consultation with the Forest Supervisor, Wenatchee National Forest and District Ranger, Cle Elum Ranger District, will approve all management plans and oversee and coordinate approved research. The Forest Supervisor will execute approved management plans for this RNA and administer, manage, and protect the area. Authority to approve all mining plans of operation is reserved to the Forest Supervisor, in consultation and concurrence with the Station Director. The District Ranger has responsibility for direct administration, protection, and management of the RNA in accordance with this Establishment Record.

Requests to conduct research in the RNA are referred to the Station Director, Pacific Northwest Research Station, who will be responsible for any studies or research conducted. The Director will evaluate research proposals, and prior to the initiation of any projects, will coordinate the project or activity with the District Ranger. All plant and animal specimens collected in the course of research conducted in the area will be properly preserved and maintained within the University of Washington Herbarium or Federal agency herbaria and museums approved by the Pacific Northwest Research Station Director.

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

Washington Office of Forest Management Research (original Establishment Record)  
Pacific Northwest Regional Forester's Office; Portland, OR  
Wenatchee National Forest Supervisor's Office; Wenatchee, WA  
Cle Elum Ranger District Office; Cle Elum, WA  
Pacific Northwest Research Station; Portland, OR  
Pacific Northwest Research Station, Forestry Sciences Laboratory; Wenatchee, WA

## ARCHIVING

The Wenatchee Forestry Sciences Laboratory, Pacific Northwest Research Station will be responsible for maintaining the Eldorado Creek RNA research file and list of herbarium and museum samples collected.

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**Appendix 1.**

**Affirmation of RNA Boundary Description**



United States  
Department of  
Agriculture

Forest  
Service

Wenatchee  
National  
Forest

215 Melody Lane  
Wenatchee, WA 98801-5933  
TTY (509) 662-4396  
VOICE (509) 662-4335

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September 29, 1997

Re: Eldorado Creek Research Natural Area (R.N.A.)

I have reviewed the map and description for the Eldorado Creek Research Natural Area. The map and description used jointly will adequately describe and locate the R.N.A..

If you have questions please, give me a call.

Leland D. Fischer, PLS.  
LAND SURVEYOR



Appendix 2.

Flora of Eldorado Creek RNA

Names follow Little (1969) and Hitchcock and Cronquist (1973)

Appendix 2. Vascular plant species known within Eldorado Creek RNA on both ultramafic and non-ultramafic substrates. Species marked with an asterisk (\*) are largely restricted to the serpentines, either as indicators, range extensions or serpentine endemic species. Those marked "E" are local endemics on Wenatchee Mountains ultramafics (A. R. Kruckeberg, pers. commun.). Names follow Little (1969) and Hitchcock et al. (1973).

Scientific name	Common name
<b>TREES</b>	
<i>Abies grandis</i>	grand fir
<i>Abies lasiocarpa</i>	subalpine fir
<i>Acer glabrum douglasii</i>	Douglas maple
<i>Alnus incana</i>	white alder
<i>Larix occidentalis</i>	western larch
<i>Picea engelmannii</i>	Englemann spruce
<i>Pinus albicaulis</i>	white bark pine
<i>Pinus contorta latifolia</i>	lodgepole pine
<i>Pinus monticola</i>	western white pine
<i>Pinus ponderosa</i>	ponderosa pine
<i>Populus trichocarpa</i>	black cottonwood
<i>Prunus emarginata emarginata</i>	bittercherry
<i>Pseudotsuga menziesii menziesii</i>	Douglas fir
<i>Salix scouleriana</i>	Scouler's willow
<i>Taxus brevifolia</i>	Pacific yew
<i>Tsuga mertensiana</i>	mountain hemlock
<b>SHRUBS</b>	
<i>Alnus sinuata</i>	Sitka alder
<i>Amelanchier alnifolia cusickii</i>	western serviceberry
<i>Arctostaphylos nexadensis</i>	pinemat manzanita
<i>Cassiope mertensiana mertensiana</i>	Merten's mountain heather
<i>Ceanothus velutinus</i>	snowbrush ceanothus
<i>Cornus stolonifera</i>	redosier dogwood
<i>Holodiscus discolor</i>	ocean spray
<i>Juniperus communis montana</i> *	mountain juniper
<i>Ledum glandulosum glandulosum</i>	mountain labrador-tea
<i>Lonicera involucrata</i>	twinberry
<i>Pachistima myrsinites</i>	mountain-box
<i>Phyllodoce empetriformis</i>	pink mountain heather
<i>Phyllodoce glanduliflora</i>	yellow mountain-heather
<i>Potentilla fruticosa</i>	shrubby cinquefoil
<i>Rhododendron albiflorum</i>	Cascade azalea
<i>Ribes lacustre</i>	swamp gooseberry
<i>Ribes viscosissimum viscosissimum</i>	sticky currant
<i>Rosa woodsii</i>	Wood's rose
<i>Rubus leucodermis</i>	black cap
<i>Rubus parviflorus</i>	thimble berry
<i>Salix barclayi</i>	Barclay's willow
<i>Salix brachycarpa</i> *	short-fruited willow
<i>Sambucus cerulea</i>	blue elderberry
<i>Sambucus racemosa arborescens</i>	red elderberry
<i>Sorbus scopulina scopulina</i>	Cascade mountain ash

*Sorbus sitchensis sitchensis*  
*Spiraea betulifolia lucida*  
*Spiraea pyramidata*  
*Symphoricarpos albus*  
*Symphoricarpos mollis*  
*Vaccinium deliciosum*  
*Vaccinium membranaceum*  
*Vaccinium scoparium*

mountain ash  
shiny leaf spirea  
pyramid spirea  
common snowberry  
creeping snowberry  
blue-leaved huckleberry  
thin-leaved blueberry  
grouse whortleberry

#### HERBS

*Achillea millefolium lamulosum*  
*Achlys triphylla*  
*Aconitum columbianum*  
*Actaea rubra*  
*Adenocaulon bicolor*  
*Agoseris aurantiaca aurantiaca*  
*Agoseris glauca dasycephala*  
*Agoseris glauca glauca*  
*Agoseris heterophylla heterophylla*  
*Anaphalis margaritacea*  
*Anemone drummondii drummondii \**  
*Angelica arguta*  
*Antennaria alpina media*  
*Antennaria microphylla*  
*Antennaria racemosa*  
*Apocynum androsaemifolium pumilum*  
*Aquilegia formosa*  
*Arabis furcata*  
*Arabis holboellii*  
*Arabis lyallii*  
*Arceuthobium americanum*  
*Arceuthobium douglasii*  
*Arenaria capillaris americana*  
*Arenaria macrophylla*  
*Arenaria nuttallii nuttallii*  
*Arenaria obtusiloba*  
*Arnica cordifolia cordifolia*  
*Arnica latifolia latifolia*  
*Arnica longifolia*  
*Arnica mollis*  
*Arnica parryi parryi*  
*Artemisia ludoviciana*  
*Artemisia michauxiana*  
*Aster alpigenus alpigenus*  
*Aster engelmannii*  
*Aster foliaceus parryi*  
*Aster modestus*  
*Astragalus whitneyi sonneanus*  
*Balsamorhiza sagittata*  
*Berberis nervosa*  
*Brickellia grandiflora*  
*Campanula rotundifolia*  
*Campanula scabrella*  
*Castilleja elmeri*

yarrow  
vanilla leaf  
Columbian monkshood  
baneberry  
trail plant  
orange agoseris  
pale agoseris  
pale agoseris  
annual agoseris  
pearly-everlasting  
Drummond's anemone  
Lyall's angelica  
alpine pussytoes  
rosy pussy-toes  
raceme pussytoes  
spreading dogbane  
red columbine  
fork-haired rockcress  
Holboell's rockcress  
Lyall's rockcress  
lodgepole dwarf mistletoe  
Douglas dwarf mistletoe  
mountain sandwort  
bigleaf sandwort  
Nuttall's sandwort  
arctic sandwort  
heart-leaf arnica  
mountain arnica  
seep-spring arnica  
hairy arnica  
nodding arnica  
western mugwort  
Michaux mugwort  
leafy aster  
Engelmann's aster  
leafy aster  
few-flowered aster  
balloon milk-vetch  
arrowleaf balsam root  
Oregon grape  
large-flowered brickellia  
Scotch bellflower  
rough harebell  
Elmer's paintbrush



<i>Heracleum lanatum</i>	wild cowparsnip
<i>Heuchera cylindrica alpina</i>	roundleaf alumroot
<i>Heuchera cylindrica cylindrica</i>	roundleaf alumroot
<i>Hieracium albiflorum</i>	white-flowered hawk weed
<i>Hieracium gracile</i>	slender hawkweed
<i>Hieracium scouleri</i>	woolyweed
<i>Hydrophyllum fendleri albifrons</i>	waterleaf
<i>Ivesia tweedyi</i> *	Tweedy's ivesia
<i>Kelloggia galioides</i>	kelloggia
<i>Leptarrhena pyrolifolia</i>	false saxifrage
<i>Lewisia columbiana columbiana</i>	Columbia lewisia
<i>Lewisia rediviva</i>	bitterroot
<i>Ligusticum canbyi</i>	Canby's lovage
<i>Lilium columbianum</i>	tiger lily
<i>Linnaea borealis longiflora</i>	twinflower
<i>Lomatium brandegei</i>	Brandegee's lomatium
<i>Lomatium cuspidatum</i> *E	Wenatchee Mtn. lomatium
<i>Lomatium nudicaule</i>	barestem lomatium
<i>Lonicera ciliosa</i>	trumpet honeysuckle
<i>Luetkea pectinata</i>	partridgefoot
<i>Luina hypoleuca</i>	silverbacked luina
<i>Luina nardosmia glabrata</i>	silvercrown luina
<i>Lupinus laxiflorus laxiflorus</i>	spurred lupine
<i>Lupinus lepidus lobbii</i>	prairie lupine
<i>Lupinus polyphyllus burkei</i>	bigleaf lupine
<i>Lupinus sericeus</i>	silky lupine
<i>Mertensia paniculata</i>	tall bluebells
<i>Microsteris gracilis humilior</i>	pink microsteris
<i>Mimulus guttatus guttatus</i>	yellow monkey flower
<i>Mimulus lewisii</i>	Lewis' monkey-flower
<i>Mimulus moschatus moschatus</i>	musk-flower
<i>Mimulus tilingii caespitosus</i>	large mountain monkey-flower
<i>Mitella pentandra</i>	alpine mitrewort
<i>Monardella odoratissima discolor</i>	mountain monardella
<i>Montia cordifolia</i>	broadleaved montia
<i>Montia parvifolia parvifolia</i>	littleleaf montia
<i>Montia perfoliata</i>	miner's lettuce
<i>Orobanche fasciculata</i>	clustered broomrape
<i>Osmorhiza chilensis</i>	mountain sweet-cicely
<i>Osmorhiza occidentalis</i>	western sweet-cicely
<i>Oxyria digyna</i>	mountain sorrel
<i>Parnassia fimbriata fimbriata</i>	fringed grass-of-Parnassus
<i>Pedicularis bracteosa bracteosa</i>	bracted lousewort
<i>Pedicularis contorta contorta</i>	white coil-beak lousewort
<i>Pedicularis groenlandica</i>	elephant's head
<i>Penstemon confertus</i>	yellow penstemon
<i>Penstemon davidsonii menziesii</i>	Davison's penstemon
<i>Penstemon fruticosus fruticosus</i>	shrubby penstemon
<i>Penstemon procerus tolmiei</i>	small-flowered penstemon
<i>Penstemon rupicola</i>	cliff penstemon
<i>Penstemon serrulatus</i>	Cascade penstemon
<i>Phacelia hastata leptosepala</i>	whiteleaf phacelia
<i>Phacelia procera</i>	tall phacelia
<i>Phacelia sericea</i>	silky phacelia



<i>Phlox diffusa</i>	spreading phlox
<i>Physaria alpestris</i>	alpine twinpod
<i>Pinguicula vulgaris</i>	common butterwort
<i>Plantago lanceolata</i>	English plaintain
<i>Polemonium elegans</i>	elegant polemonium
<i>Polemonium pulcherrimum pulcherrimum</i>	skunk-leaved polemonium
<i>Polygonum bistortoides</i>	mountain dock
<i>Polygonum newberryi newberryi</i> *	Newberry's fleecflower
<i>Potentilla flabellifolia</i>	fan-leaf cinquefoil
<i>Potentilla glandulosa pseudorupestris</i>	gland cinquefoil
<i>Potentilla gracilis</i>	northwest cinquefoil
<i>Prunella vulgaris</i>	self heal
<i>Pterospora andromedea</i>	woodland pinedrops
<i>Pyrola asarifolia purpurea</i>	alpine pyrola
<i>Pyrola dentata</i>	toothleaf pyrola
<i>Pyrola picta</i>	white veined pyrola
<i>Pyrola secunda secunda</i>	one sided wintergreen
<i>Ranunculus repens</i>	creeping buttercup
<i>Ranunculus uncinatus</i>	little buttercup
<i>Rubus lasiococcus</i>	dwarf bramble
<i>Rumex acetosella</i>	sheep sorrel
<i>Sanicula graveolens</i>	Sierra sanicle
<i>Satureja douglasii</i>	savory
<i>Saxifraga arguta</i>	brook saxafrage
<i>Saxifraga bronchialis austromontana</i>	matted saxifrage
<i>Saxifraga caespitosa emarginata</i>	tufted saxifrage
<i>Saxifraga ferruginea macounii</i>	Tolmie's saxafrage
<i>Saxifraga mertensiana</i>	Mertens' saxifrage
<i>Sedum divergens</i>	spreading stonecrop
<i>Sedum lanceolatum rupicolum</i>	lance-leaved stonecrop
<i>Sedum stenopetalum</i>	wormleaf stonecrop
<i>Senecio fremontii fremontii</i>	dwarf mountain butterweed
<i>Senecio integerrimus exaltatus</i>	western groundsel
<i>Senecio pauperculus</i>	balsam groundsel
<i>Senecio serra</i>	butterweed groundsel
<i>Senecio streptanthifolius</i>	Rocky mountain butterweed
<i>Senecio triangularis triangularis</i>	arrowleaf groundsel
<i>Sibbaldia procumbens</i>	creeping sibbaldia
<i>Silene menziesii menziesii</i>	Menzie's silene
<i>Silene parryi</i>	Parry's silene
<i>Silene suksdorfii</i>	Suksdorf's silene
<i>Smilacina racemosa</i>	feather solomon plume
<i>Smilacina stellata</i>	star flowered Solomon-plume
<i>Solidago multiradiata scopulorum</i>	
<i>Stenanthium occidentale</i>	western stenanthium
<i>Streptopus amplexifolius americanus</i>	clasping-leaved twisted-stalk
<i>Taraxacum officinale</i>	dandelion
<i>Thalictrum occidentale</i>	meadowrue
<i>Thlaspi fendleri glaucum</i>	Fendler's pennycress
<i>Tiarella trifoliata</i>	foam flower
<i>Tofieldia glutinosa brevistyla</i>	sticky tofieldia
<i>Tragopogon dubius</i>	common salsify
<i>Trientalis latifolia</i>	starflower
<i>Trillium ovatum</i>	western trillium

*Valeriana sitchensis*  
*Veratrum viride*  
*Veronica cusickii*  
*Veronica wormskjoldii*  
*Viola glabella*  
*Viola purpurea venosa*

Sitka valerian  
green false-hellebore  
Cusick's speedwell  
American alpine speedwell  
stream violet  
goosefoot violet

#### GRASSES, SEDGES AND RUSHES

*Agropyron spicatum*  
*Calamagrostis rubescens*  
*Carex geeyeri*  
*Carex hoodii*  
*Carex mertensii*  
*Deschampsia cespitosa*  
*Eriophorum polystachion*  
*Festuca viridula*  
*Juncus mertensianus*  
*Phleum alpinum*  
*Poa curtifolia*\*E  
*Sitanion jubatum*

bluebunch wheat grass  
Cascade reedgrass  
elk sedge  
Hood's sedge  
Merten's sedge  
tufted hairgrass  
many-spiked cotton-grass  
green fescue  
Merten's rush  
alpine timothy  
Mt. Stuart bluegrass  
big squirreltail

#### FERNS AND FERN ALLIES

*Adiantum pedatum calderii* (= *A. aleuticum*) \*  
*Aspidotis densa* \*  
*Athyrium distentifolium americanum*  
*Cheilanthes gracillima*  
*Cryptogramma crispa acrostichoides*  
*Equisetum arvense*  
*Gymnocarpium dryopteris*  
*Pellaea breweri*  
*Polypodium amorphum*  
*Polystichum lemmonii* \*E  
*Polystichum lonchitis*  
*Polystichum munitum*  
*Polystichum scopulinum* \*  
*Pteridium aquilinum pubescens*  
*Selaginella densa scopulorum*  
*Woodsia scopulina*

northern maidenhair fern  
podfern  
alpine lady-fern  
lace lip-fern  
rock-brake  
field horsetail  
oak-fern  
Brewer's cliff-brake  
licorice-fern  
Shasta holly fern  
mountain holly fern  
sword fern  
rock swordfern  
bracken fern  
dense selaginella  
Rocky Mountain woodsia

Appendix 3.

Fauna of Eldorado Creek RNA

Appendix 3. Fauna known or suspected in the Eldorado Creek RNA (D=documented, S=suspected). Fish are omitted, due to absence of information regarding stream conditions. Documented occurrences are based on casual observations by Cle Elum Ranger District Wildlife Biologist, Jo Richards, during preliminary field reconnaissance of the area in July, 1996. Names follow footnoted authors.

Scientific Name	Common Name	Inventory Status
<b>AMPHIBIANS<sup>1</sup></b>		
<i>Taricha granulosa</i>	rough-skinned newt	S
<i>Ambystoma macrodactylum</i>	long-toed salamander	S
<i>Ascaphus truei</i>	tailed frog	S
<i>Bufo boreas</i>	western toad	S
<i>Pseudocris regilla</i>	western treefrog	S
<i>Rana cascadae</i>	Cascades frog	S
<b>REPTILES<sup>2</sup></b>		
<i>Elgaria coerulea</i>	northern alligator lizard	S
<b>BIRDS<sup>3</sup></b>		
<i>Cathartes aura</i>	turkey vulture	S
<i>Aquila chrysaetos</i>	golden eagle	S
<i>Falco peregrinus</i>	peregrine falcon	S
<i>Accipiter striatus</i>	sharp-shinned hawk	S
<i>Accipiter cooperii</i>	Cooper's hawk	S
<i>Accipiter gentilis</i>	northern goshawk	S
<i>Buteo jamaicensis</i>	red-tailed hawk	S
<i>Dendragapus obscurus</i>	blue grouse	S
<i>Lagopus leucurus</i>	white-tailed ptarmigan	S
<i>Columba fasciata</i>	band-tailed pigeon	S
<i>Columba livia</i>	rock dove	S
<i>Bubo virginianus</i>	great-horned owl	S
<i>Strix occidentalis</i>	spotted owl	S
<i>Otus kennicotti</i>	western screech owl	S
<i>Glaucidium gnoma</i>	northern pygmy owl	S
<i>Aegolius acadicus</i>	northern saw-whet owl	S
<i>Chordeiles minor</i>	common night-hawk	S
<i>Chaetura vauxi</i>	Vaux's swift	S
<i>Selasphorus rufus</i>	rufous hummingbird	S
<i>Stellula calliope</i>	calliope hummingbird	S
<i>Colaptes auratus</i>	northern flicker	S
<i>Syphyrapicus nuchalis</i>	red-naped sapsucker	S
<i>Picoides pubescens</i>	downy woodpecker	S
<i>Picoides villosus</i>	hairy woodpecker	S
<i>Picoides tridactylus</i>	three-toed woodpecker	S
<i>Picoides arcticus</i>	black-backed woodpecker	S
<i>Dryocopus pileatus</i>	pileated woodpecker	D
<i>Contopus borealis</i>	olive-sided flycatcher	D
<i>Contopus sordidulus</i>	western wood peewee	S
<i>Empidonax olberhoseri</i>	dusky flycatcher	S
<i>Empidonax hammondii</i>	Hammond's flycatcher	D
<i>Empidonax traillii</i>	willow flycatcher	S
<i>Empidonax difficilis</i>	western flycatcher	S

<i>Eremophila alpestris</i>	horned lark	S
<i>Tachycineata bicolor</i>	tree swallow	S
<i>Tachycineata thalassina</i>	violet-green swallow	S
<i>Cyanocitta stelleri</i>	Stellar's jay	S
<i>Perisoreus canadensis</i>	gray jay	S
<i>Nucifraga columbiana</i>	Clark's nutcracker	S
<i>Corvus corax</i>	common raven	D
<i>Parus atricapillus</i>	black-capped chickadee	D
<i>Parus gambeli</i>	mountain chickadee	D
<i>Parus rufescens</i>	chestnut-backed chickadee	S
<i>Certhia americana</i>	brown creeper	S
<i>Sitta canadensis</i>	red-breasted nuthatch	D
<i>Troglodytes troglodytes</i>	winter wren	S
<i>Regulus satrapa</i>	golden-crowned kinglet	D
<i>Regulus caluendula</i>	ruby-crowned kinglet	D
<i>Sialia currucoides</i>	mountain bluebird	S
<i>Myadestes townsendi</i>	Townsend's solitaire	D
<i>Catharus fuscescens</i>	veery	S
<i>Catharus guttatus</i>	hermit thrush	D
<i>Ixoreus naevius</i>	varied thrush	S
<i>Turdus migratorius</i>	American robin	D
<i>Anthus rubescens</i>	American pipit	S
<i>Cinclus mexicanus</i>	American dipper	S
<i>Vireo solitarius</i>	solitary vireo	S
<i>Vermivora celata</i>	orange-crowned warbler	S
<i>Vermivora ruficapilla</i>	Nashville warbler	S
<i>Dendroica nigrescens</i>	black-throated gray warbler	S
<i>Dendroica townsendi</i>	Townsend's warbler	D
<i>Dendroica coronata</i>	yellow-rumped warbler	D
<i>Oporornis tolmiei</i>	MacGillivray's warbler	S
<i>Wilsonia pusilla</i>	Wilson's warbler	S
<i>Seiurus noveboracensis</i>	northern waterthrush	S
<i>Setophaga ruticilla</i>	American redstart	S
<i>Pheucticus melanocephalus</i>	black-headed grosbeak	S
<i>Pipilo erythrophthalmus</i>	rufous-sided towhee	S
<i>Melospiza melodia</i>	song sparrow	S
<i>Spizella passerina</i>	chipping sparrow	D
<i>Junco hyemalis</i>	dark-eyed junco	D
<i>Zonotrichia leucophrys</i>	white-crowned sparrow	D
<i>Zonotrichia atricapilla</i>	golden-crowned sparrow	S
<i>Passerella iliaca</i>	fox sparrow	S
<i>Melospiza lincolni</i>	Lincoln's sparrow	S
<i>Piranga ludoviciana</i>	western tanager	D
<i>Carduelis pinus</i>	pine siskin	D
<i>Loxia curvirostra</i>	red crossbill	D
<i>Pinicola enucleator</i>	pine grosbeak	S
<i>Leucosticte arctoa</i>	rosy finch	S
<i>Carpodacus purpureus</i>	purple finch	S
<i>Carpodacus cassinii</i>	Cassin's finch	S
<i>Coccothraustes vespertinus</i>	evening grosbeak	S

#### MAMMALS<sup>4</sup>

<i>Sorex obscurus</i>	dusky shrew	S
<i>Sorex vagrans</i>	vagrant shrew	S

<i>Sorex palustris</i>	water shrew	S
<i>Sorex trowbridgii</i>	Trowbridge's shrew	S
<i>Sorex cinereus</i>	masked shrew	S
<i>Scapanus orarius</i>	coast mole	S
<i>Neurotrichus gibbsii</i>	shrew-mole	S
<i>Myotis lucifugus</i>	little brown myotis	S
<i>Myotis californicus</i>	California myotis	S
<i>Myotis volans</i>	hairy-winged myotis	S
<i>Myotis evotis</i>	long-eared myotis	S
<i>Lasiurus cinereus</i>	hoary bat	S
<i>Lasionycteris noctivagans</i>	silvery-haired bat	S
<i>Eptesicus fuscus</i>	big brown bat	S
<i>Ochotona princeps</i>	pika	D
<i>Lepus americanus</i>	snowshoe hare	S
<i>Aplodontia rufa</i>	mountain beaver	S
<i>Marmota flaviventris</i>	yellow-bellied marmot	S
<i>Marmota claigata</i>	hoary marmot	S
<i>Callospermophilus saturatus</i>	Cascades golden-mantled ground squirrel	S
<i>Eutamias amoenus</i>	yellow pine chipmunk	S
<i>Eutamias townsendii</i>	Townsend's chipmunk	S
<i>Tamiasciurus douglasii</i>	Douglas squirrel	S
<i>Glaucomys sabrinus</i>	northern flying squirrel	S
<i>Thomomys talpoides</i>	northern pocket gopher	S
<i>Peromyscus maniculatus</i>	deer mouse	S
<i>Neotoma cinerea</i>	bushy-tailed woodrat	S
<i>Phenacomys intermedius</i>	heather vole	S
<i>Clethrionomys gapperi</i>	red-backed vole	S
<i>Microtus longicaudus</i>	long-tailed meadow mouse	S
<i>Microtus oregoni</i>	Oregon meadow mouse	S
<i>Microtus richardsoni</i>	water rat	S
<i>Zapus trinotatus</i>	Pacific jumping mouse	S
<i>Erithizon dorsatum</i>	porcupine	S
<i>Vulpes fulva</i>	Red fox	S
<i>Canis latrans</i>	coyote	D
<i>Canis lupus</i>	gray wolf	S
<i>Euarctos americanus</i>	black bear	D
<i>Ursus chelan</i>	grizzly bear	S
<i>Martes americana</i>	marten	D
<i>Martes pennanti</i>	fisher	S
<i>Mustela frenata</i>	long-tailed weasel	S
<i>Mustela erminea</i>	ermine	S
<i>Gulo luscus</i>	wolverine	S
<i>Felis concolor</i>	cougar	S
<i>Lynx canadensis</i>	lynx	S
<i>Lynx rufus</i>	bobcat	S
<i>Cervus canadensis</i>	elk	S
<i>Odocoileus hemionus</i>	mule deer	D
<i>Oreamnos americanus</i>	mountain goat	S

<sup>1</sup>Leonard, W. P., Brown, H. A., Jones, L. L. C., McAllister, K. R., and R. M. Storm. 1993. Amphibians of Washington and Oregon. Seattle Audubon Society,

Seattle, Washington.

<sup>2</sup>Nussbaum, R. A., Brodie, E. D. Jr., and R. M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, Idaho.

<sup>3</sup>Birds of North America, Second Edition. 1987. National Geographic Society, Washington, D.C..

<sup>4</sup>Ingles, L. G. 1965. Mammals of the Pacific states: California, Oregon, and Washington. Stanford University Press, Stanford, California.

DECISION NOTICE/DESIGNATION ORDER  
AND  
FINDING OF NO SIGNIFICANT IMPACT

ELDORADO CREEK RESEARCH NATURAL AREA  
ESTABLISHMENT  
(Kittitas County, Washington)

WENATCHEE LAND AND RESOURCE MANAGEMENT PLAN  
AMENDMENT NUMBER 15

USDA Forest Service  
Wenatchee National Forest  
Cle Elum Ranger District

Introduction

The 1990 Record of Decision for the Wenatchee National Forest Land and Resource Management Plan (Forest Plan) recommended the establishment of the Eldorado Creek Research Natural Area (RNA). That recommendation was the result of an analysis of factors listed in 36 CFR 219.25 and Forest Service Manual 4063.41. Results are documented in the Forest Plan and Final Environmental Impact Statement.

This environmental analysis evaluates a proposal to amend the Forest Plan by changing the "candidate" Eldorado Creek RNA to an "established" RNA (the proposed action). Two alternatives are documented in this analysis: the proposed action and "no action" (continue managing as a candidate RNA).

The Eldorado creek RNA Establishment Record (1996) describes the current condition of the RNA in detail. This 1,541 acre RNA encompasses the majority of the Eldorado Creek subdrainage and adjoining unnamed subdrainages (tributaries to the North Fork Teanaway River), as well as a portion of upper Beverly Creek (around Iron Peek). The RNA encompasses a wide range of elevations, aspects, and land forms influenced by serpentine geology, and provides a prime, essentially undisturbed illustration of serpentine's impacts on vegetation.

Decision

By the authority delegated to me by the Chief of the Forest Service (FSM 4063), it is my decision to select Alternative A (Proposed Action) and establish the 1,541 acre Eldorado Creek RNA. The Forest Plan is hereby amended to change the Eldorado Creek RNA from a "candidate" RNA to an "established" RNA. This is a nonsignificant amendment (Amendment Number 15) to the Forest Plan.



This decision is based on the analysis documented in the environmental assessment. Alternative A is selected because it provides long-term protection and recognition of plant communities indigenous to serpentine on the east slope of the Washington Cascades and not protected under any other established RNA. The Eldorado Creek RNA will be managed in compliance with all relevant laws, regulations, Forest Service policy regarding RNAs, and in accordance with the management direction identified in the Forest Plan.

Alternative A finalizes the RNA boundary. Its final acreage is 1,541 acres. Adjustments were made to ensure that the RNA would encompass certain unique microsites, and that its boundary could be easily identified on the ground (Appendix A - Boundary Description, Establishment Report).

#### Alternatives Considered

The other alternative considered was Alternative B, No Action. This alternative would continue management of the Eldorado Creek Research Natural Area as a candidate RNA. Alternative B was not selected because it would not provide long-term protection of the area's unique features.

#### Public Involvement

Internal scoping began in May 1996, when the Cle Elum Ranger District Planning Team reviewed existing conditions in the RNA and within previously proposed boundaries. The public was notified through publication of the proposed action in the Wenatchee National Forest's quarterly Schedule of Proposed Actions (Spring 1996) which was mailed to other agencies, Indian tribes, timber companies, individual citizens, and environmental and other interest groups. There was only one response from an individual who operates a private recreation facility on National Forest System land adjacent to the proposed RNA. Representatives of that facility attended a subsequent field trip into the RNA. They expressed concern that establishment of the RNA not impede continued operations under their special use permit. Input from both internal and external scoping, however, supports establishment of the RNA as proposed.

#### Finding of No Significant Impact

I have determined through the environmental assessment that this is not a major federal action that would significantly affect the quality of the human environment; therefore, an environmental impact statement is not needed. This determination is based on the following factors:

##### Context:

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

##### Intensity:

There are no known impacts on public health and safety.

There are no known impacts on historic or cultural resources, actual or eligible National Federal Register of Historic Places, sites, park

land, prime farm land, wetlands or wild and scenic rivers. Effects in ecologically critical areas are minimal (Establishment Record pp. 6-9).

There are no uncertain impacts on the human environment. Effects do not involve unique or unknown risks and are not likely to be controversial (Environmental Assessment pp. 2-3; Establishment Record pp. 9-10).

The decision is not likely to establish a precedent for future actions with significant effects (Establishment Record p. 11).

The decision will not adversely affect any endangered or threatened species or critical habitats (Establishment Record pp. 6-7, 10).

The decision is consistent with federal, state, and local laws and requirement for the protection of the environment.

#### Implementation

Implementation of this decision shall not occur within 7 calendar days following publication of the legal notice of the decision in The Seattle Post-Intelligencer.

The Forest Supervisor of the Wenatchee National Forest shall notify the public of this decision and mail a copy of this Decision Notice/Designation Order to all persons interested in or affected by the decision.

#### Appeal Opportunities

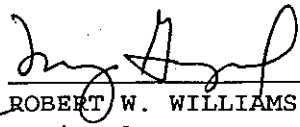
This decision is subject to appeal pursuant to 36 CFR Part 217. A copy of the Notice of Appeal must be in writing and submitted to:

Chief  
USDA, Forest Service  
ATTN: NFS Appeals  
14th and Independence Avenue, SW  
P. O. Box 96090  
Washington, D.C. 20090-6090

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

#### Contact Person

For further information on Eldorado Creek RNA, contact: Terry Lillybridge, Wenatchee National Forest, 215 Melody Lane, Wenatchee, Washington 98801-5933, phone 509-662-4233.

  
\_\_\_\_\_  
ROBERT W. WILLIAMS  
Regional Forester  
Pacific Northwest Region

January 28, 1998

\_\_\_\_\_  
Date

(Signed by Nancy Graybeal  
Deputy Regional Forester)

Friday, January 30, 1998

Seattle Post-Intelligencer

**NOTICE OF DECISION**

On January 28, 1998, USDA, Forest Service, Pacific Northwest Regional Forester made a decision to establish the 1,541 acre Eldorado Creek Research Natural Area on the Cle Elum Ranger District of the Wenatchee National Forest in Kittitas County, Washington. This decision will be implemented after February 6, 1998.

A copy of the Decision Notice/Designation Order and Finding of No Significant Impact is available upon request from the Regional Office, Environmental Coordination, P.O. Box 3623, Portland, Oregon 97208.

This decision is subject to appeal pursuant to Forest Service regulation 36 Code of Federal Regulation (CFR) Part 217. Any written Notice or Appeal must be fully consistent with 36 CFR 217.9 (Content of a Notice of Appeal) and must include the reasons for appeal. Any written appeal must be postmarked or received by the Appeal Deciding Officer, Chief Mike Dombek, USDA - Forest Service, ATTN: NFS Appeals, P.O. Box 96090, Washington, D.C. 20090-6090 within 45 days of the date of this legal notice.

For further information about Eldorado Creek RNA, contact Terry Lillybridge, Wenatchee National Forest, 215 Melody Lane, Wenatchee, Washington 98801-5933, phone 509-662-4233.

Environmental Assessment

For Establishment of

ELDORADO CREEK RESEARCH NATURAL AREA  
(Kittitas County, Washington)

Wenatchee National Forest  
Cle Elum Ranger District

I. INTRODUCTION

The Wenatchee National Forest Land and Resource Management Plan (Forest Plan, 1990) proposed Eldorado Creek as a Research Natural Area (RNA). An RNA is "an area of unique vegetation and associated biotic, soil, geologic, and aquatic features" (Forest Plan pp. G1-19). Research natural Areas are part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System land. They are intended for nonmanipulative research, observation, and study (FSM 4063).

This environmental assessment evaluates a proposal to amend the Forest Plan by changing the status of the Eldorado Creek RNA from "proposed" to "established" (the Proposed Action). This action will finalize the RNA boundary, and formally establish standards for its long-term protection and management. Formal designation as an established RNA is the responsibility of the Regional Forester.

This assessment analyzes the proposed action and one alternative (no action, continue managing as a proposed RNA).

Purpose and Need for Action

The purpose of establishing the Eldorado Creek RNA is to provide in the overall RNA network, an illustration of serpentine effects on vegetation from the east slope of the Washington Cascades. Dyrness et al. (1975) identified montane serpentine vegetation as an element that needed to be represented in the RNA system. Eldorado Creek provides a prime, essentially undisturbed example of the serpentine vegetation phenomenon seen in a 100-square-mile area of the Wenatchee Mountains of Washington (Kruckeberg 1972).

Vegetation influenced by serpentine is generally characterized by lowered abundance, restricted distribution, and reduced stature of conifer trees; an absence of many woody and herbaceous species common to the region; and the occurrence of certain serpentine indicator species and/or serpentine tolerant races, as well as rare, endemic flowering plants and ferns.

In the Eldorado RNA, one may observe both directly and through contrast the influence of serpentine geology on vegetation. The landscape is a mosaic of forest and nonforest vegetation that reflects highly localized geology, soil structure and soil composition. One frequently encounters barren or sparsely

vegetated openings on shallow, stoney soils derived from ultramafic rock (seperentinite and/or peridotite). In these areas, high levels of magnesium, iron, and nickel, and low levels of calcium exclude many forms of plantlife, but provide harbor for species and/or races of plants--some endemic to the area--that can tolerate the harsh chemical and physical soil environment. These barrens contrast starkly with nearby conifer and meadow communities located on more hospitable soils, i.e., those derived from nonmafic rock types also found in the area.

#### Current Condition and Management Status

The Eldorado Creek RNA Establishment Report (Kruckeberg 1996, attached) describes the current condition of the RNA in detail. Briefly, the 1,541-acre RNA encompasses Eldorado Creek and the majority of adjacent unnamed subdrainages to the north and southeast, as well as a small portion of the Beverly Creek subdrainage (the upper east slope of Iron Peak). All are tributaries of North Fork Teanaway Creek.

The Eldorado RNA is located entirely on National Forest System lands, and adjoins the following Forest Plan allocations: Wilderness, SI-1 (Classified Special Area -Scenic and/or Recreation), and ST-2 (Scenic Travel - Partial Retention). The RNA and adjacent ST-2 areas are located within the Teanaway Late Successional Reserve (LSR) designated under the Northwest Forest Plan (1994). Management to attain the objectives of the RNA may supercede LSR Standards and Guidelines (USDA Forest Service and USDI Bureau of Land Management, 1994a, page C-11 of the Record of Decision).

Conditions in the RNA are essentially the same today as they were in 1990 when it was formally proposed. With the exception of a water pipeline running from a developed recreation facility outside the RNA to an upland spring within the RNA, there has been no new development. The pipeline constitutes a minor intrusion into the RNA and does not negate its essentially undisturbed character. Its consistency with RNA management direction is in question, however, whether or not the RNA is established or proposed. A decision regarding the pipeline will be made independent of the decision to establish the RNA, most likely, when the current permit expires and the operation is reviewed for consistency with the Northwest Forest Plan.

There is one prior development within the RNA: a 2-mile portion of the 3.5-mile-long Iron Peak Trail #1399. This scenic trail (renown for wildflower viewing) climbs east from FS Road 9732 to a saddle north of Iron Peak, and then descends into Beverly Creek where it intersects with Trail #1391 (Beverly Turnpike). The Iron Peak Trail is open to hiker and horse use, but is closed to motorized vehicles.

## II. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

### A. ALTERNATIVE A, Proposed Action

The Proposed Action is to establish 1,541-acre Eldorado Creek Research Natural Area. This action will finalize the boundary and provide long-term protection

of the area in accordance with the Wenatchee Forest Plan and the the Eldorado Creek Research Natural Area Establishment Record (Appendix A).

Under Alternative A, the RNA boundary is adjusted slightly from that mapped in the Forest Plan for ease of identification in the field and to include a broader spectrum of serpentine microsities within the RNA. The revised boundary encompasses serpentine barrens north of the Iron Peak Trail and on upper slopes east of Iron Peak (in Beverly Creek). It excludes the Beverly Turnpike Trail and popular dispersed camping sites in Beverly Creek from the RNA.

The adjustment will enlarge the RNA from 1,336 acres mapped in the Forest Plan (FEIS pp. III-90) to 1,541 acres (a 15 percent increase).

**Consequences:** The environmental consequences of implementing Alternative A are the same as those described in the FEIS for the Forest Plan. Establishment of the RNA will facilitate collaboration between managers and scientists regarding long-term use, protection, and study within the RNA.

The proposed adjustment of the RNA boundary will have no adverse or irreversible environmental effects. It will not result in additional loss or reduction of resource outputs. Because the revised boundary was drawn to exclude popular camping areas in Beverly Creek from the RNA, it will not affect traditional recreational use of the area. It will not result in cumulative effects on any resource outputs or ecological functions.

General effects of RNA establishment on mineral development were previously discussed under the Wenatchee Forest Plan (FEIS pp. IV-110). Mineral values in the Eldorado Creek RNA have been disputed in the past. Although it has been recognized as a potential source of iron and nickel, an examiner classified this area as "nonmineral" in character for locatable minerals (Meschter 1974). That finding was contested by another party engaged in nickel exploration at the time. Currently, there are no active claims in the area.

#### B. ALTERNATIVE B, NO ACTION

Alternative B continues management of the Eldorado area as a proposed RNA according to direction in the Forest Plan. It will be managed to maintain its suitability as a RNA until the Forest Plan is revised or replaced (FEIS for the LRMP, pp. II-144). The recommended boundary will remain as mapped in the Forest Plan. The RNA will encompass approximately 1,337 acres,

**Consequences:** The environmental consequences of implementing Alternative B are the same as those listed in the FEIS for the Forest Plan and those described under Alternative A. However, these effects would only be short-term: for the life of the Wenatchee Forest Plan. The long-term ecological protection resulting from mineral withdrawal and comprehensive planning, monitoring, and scientific study will not be initiated.

Under alternative B, the RNA boundary is located on the Iron Peak Ridge, and therefore, the botanically unique serpentine barrens and swales in upper Beverly Creek would be excluded from the RNA's protective umbrella. The spectrum of microsities represented within the RNA would be narrower.

### III. AGENCIES AND PERSONS CONSULTED

Proposed establishment of the Eldorado Research Natural Area was first described in the Schedule of Proposed Actions for the Wenatchee National Forest in January, 1996. That document was mailed to individuals, organizations, government agencies, and the Yakama Indian Nation. There was one respondent. The operator of the neighboring recreational camp expressed concerns about the effects of RNA establishment on that facility, and specifically, their use of piped water from within the RNA.

Internal discussions among members of the Cle Elum Ranger District's Planning Team focused on proposed boundary changes and their potential impacts on mining and recreation. The following specialists provided substantive input to these discussions:

Jim Bannister, Cultural Resources, Trails, Dispersed Recreation

Lin Cole, Developed Recreation

Keith Kelly, Geologist

George Greene, Engineering

Dr. Arthur Kruckeberg, author of the Establishment Report, presented a slide show and lecture on serpentine vegetation of the Wenatchee Mountains to Cle Elum Ranger District personnel and representatives of the permittee who responded to scoping for the project.

Cover Page Info for Cover of RNA Establ. Record

Name: Eldorado Creek

Region: R06

Station: PNW

State: Washington

County: Kittitas

Boundary Certified on - Appendix 1

TMIS #: 00

Date Reg. Forester signed: \_\_\_\_\_

Lat.: 47 degrees 24 N

Long.: 120 degrees 55' W

1980 SAF	Acres	Ha
210 Interior Douglas-fir	317	128
213 Grand fir	185	75
218 Lodgepole pine	150	61
206 Engelmann spruce-Subalpine fir	150	61
205 Mountain hemlock	30	12
<u>Totals:</u>	832	337

1966 Kuchler	Acres	Ha
Grand fir-Douglas fir	236	96
Douglas-fir	300	120
Subalpine fir-Mountain hemlock	526	121
<u>Totals:</u>	832	337

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

Original maps, or photocopies? Originals and photocopies

Photos included? yes

Abutted by non-FS land? No

SAF & Kuchler types consistent? no

Climate records: length of record 23 yr Distance to weather sta. 12 miles

Fauna & Flora authorities: Birds of North America 1987; Hitchcock and Cronquist 1973; Little 1979; Ingles 1965; Leonard et al. 1993; Nussbaum et al. 1983.

Land use conflicts? Grazing? Trails? Recreation? Potential conflicts with minerals; potential threat from trail, none now.

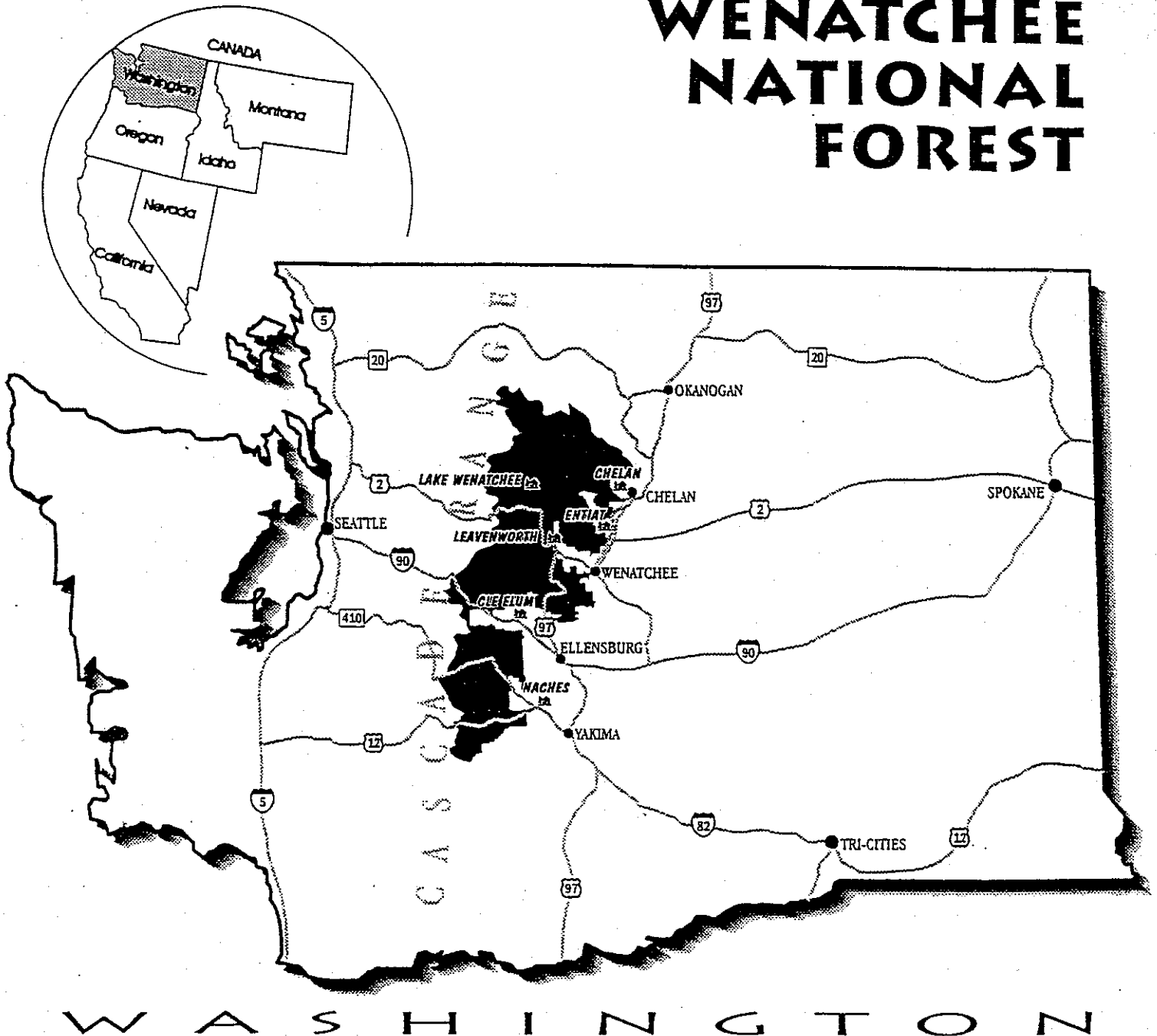
Commercial Forest Land: in Wilderness ; P.

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

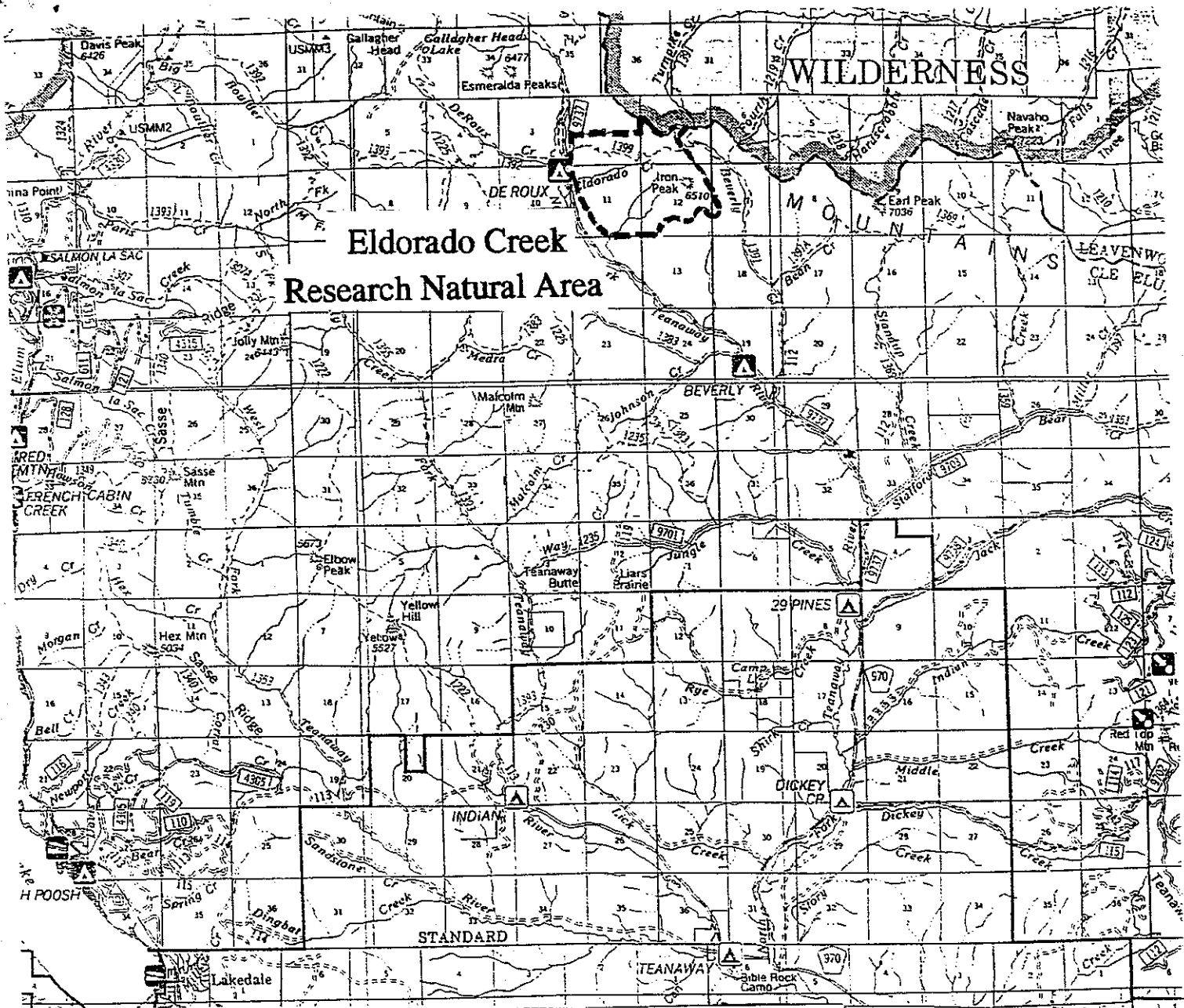


FIGURE 1. VICINITY MAP

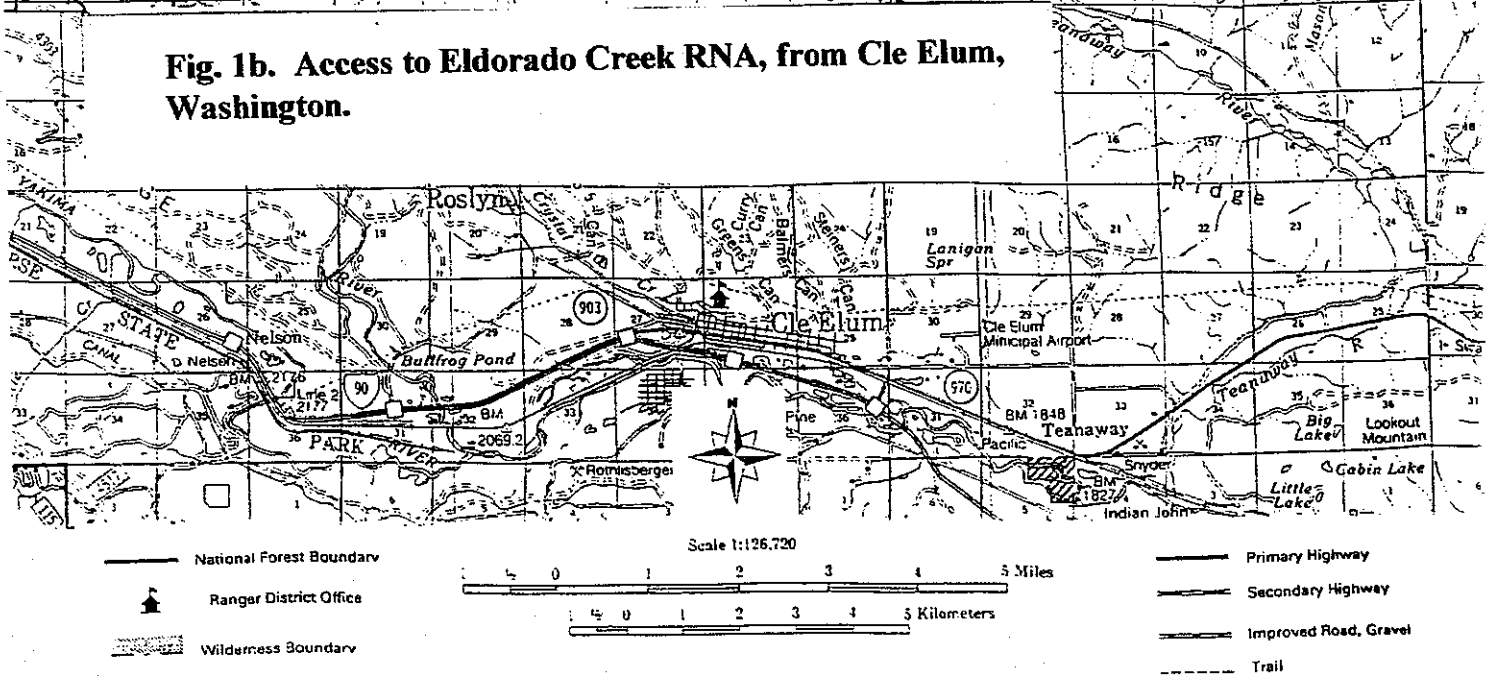
# WENATCHEE NATIONAL FOREST



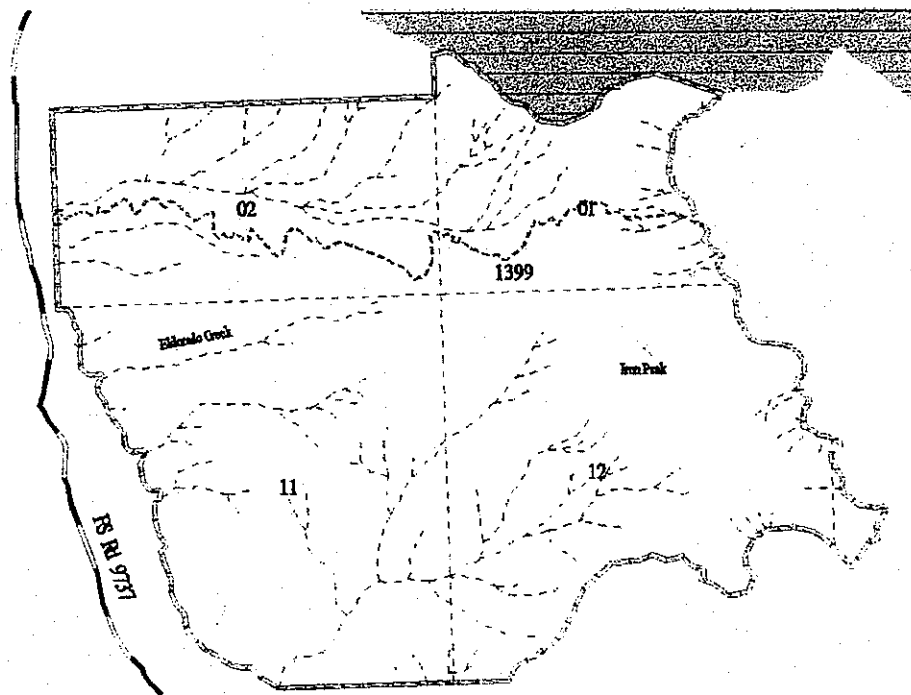
 RANGER DISTRICT OFFICE








**Fig. 1b. Access to Eldorado Creek RNA, from Cle Elum, Washington.**

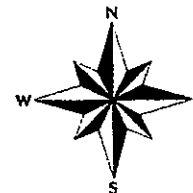


# Figure 2: Boundary of Eldorado Creek Research Natural Area Wenatchee National Forest, Washington



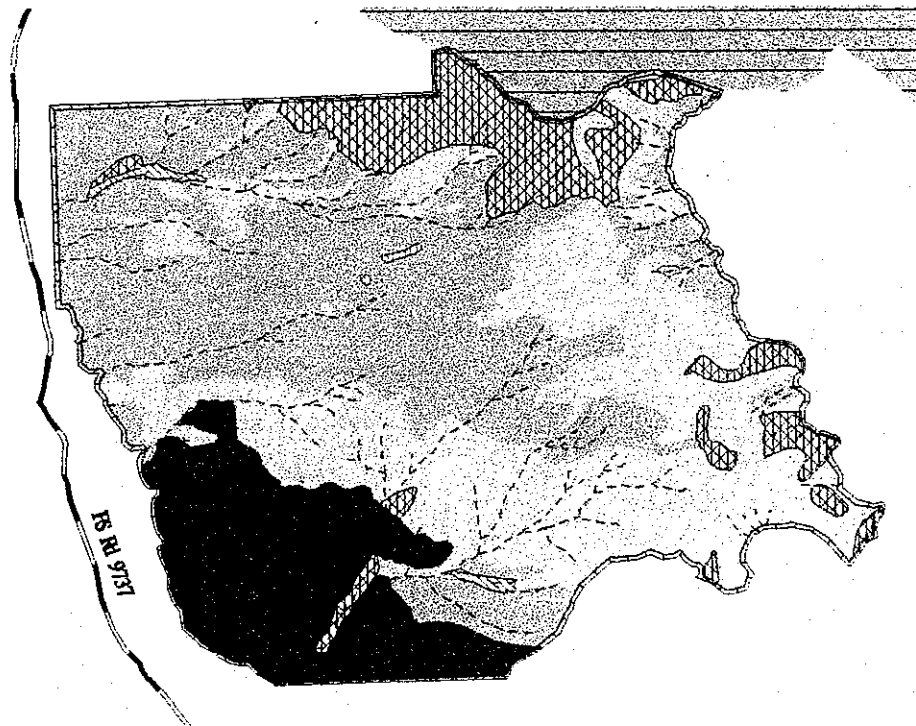
**Legend:**

- |   |               |   |                 |
|---|---------------|---|-----------------|
|  | Streams       |  | Trail           |
|  | RNA Boundary  |  | Wilderness Area |
|  | Improved Road |   |                 |



*Scale = 1:31,680  
2 inches = 1 mile*

# Figure 3: Cover Types of Eldorado Creek RNA



Non-Forest



Riparian Streamside Vegetation



Wet Meadow



Bedrock



Barren, Talus, or Scree

Forest (after Kuchler 1966) \*

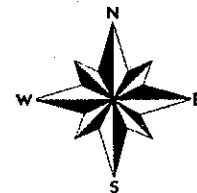


Grand fir - Douglas fir (K-3)



Subalpine fir - Mountain Hemlock (K-4)

\* per District Vegetation Series map



Other



Streams



RNA Boundary



Wilderness Area

Scale = 1:31,680

2 inches = 1 mile

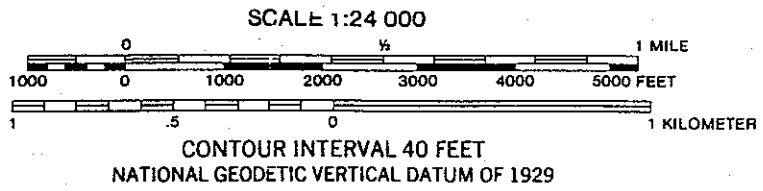
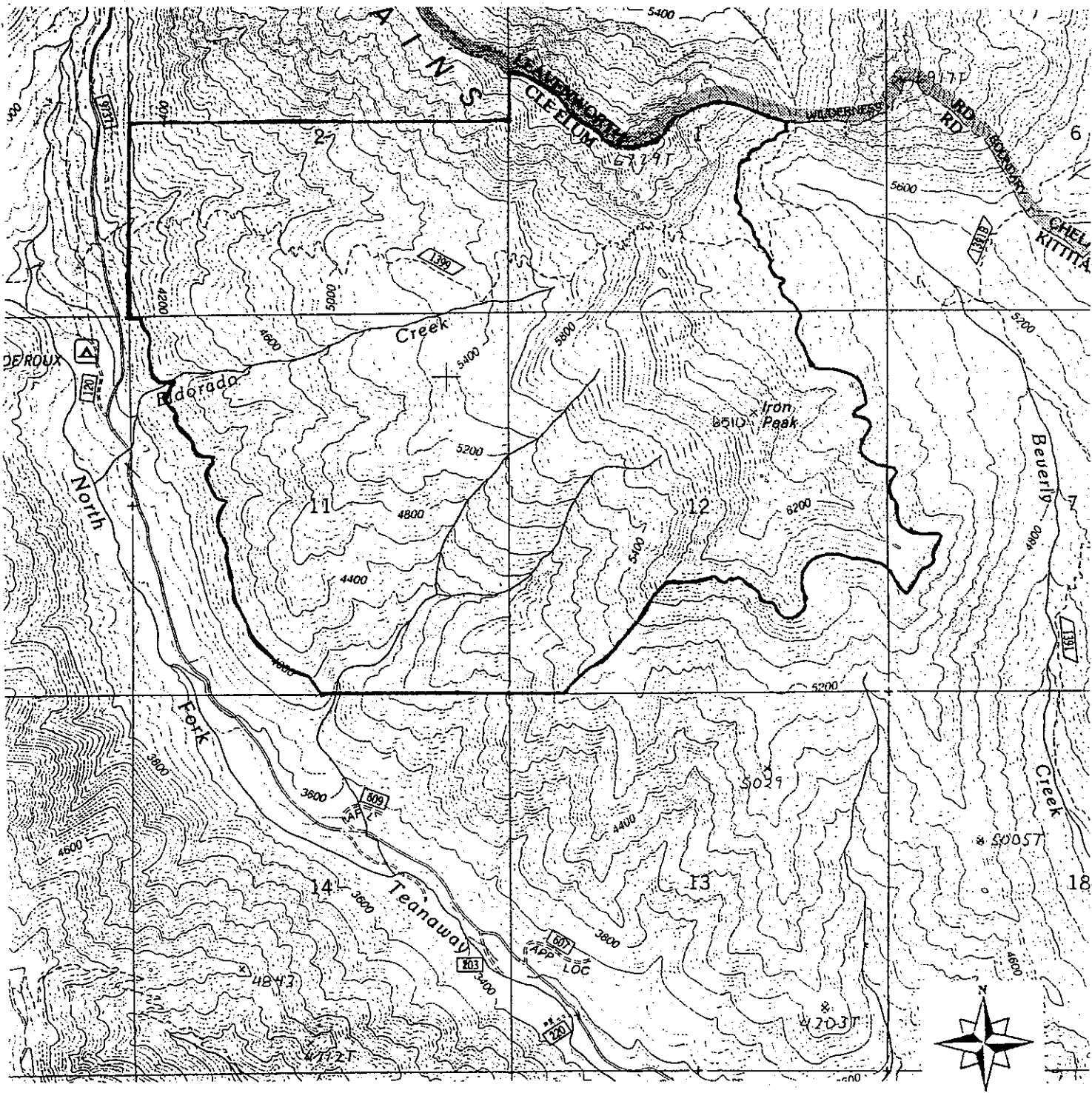


Fig. 4. Contour map of Eldorado Creek RNA.