

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

Establishment Report

For

CANNON WELL RESEARCH NATURAL AREA

Winema National Forest

Chemult Ranger District

Klamath County, Oregon



SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Cannon Well Research Natural Area

Winema National Forest

Klamath County, Oregon

Prepared by Dick Vander Schaaf Date 12/19/94  
Dick Vander Schaaf,  
The Nature Conservancy

Recommended by Marc Whisler Date 12/28/94  
for District Ranger,  
Chemult Ranger District

Recommended by Bob Castaneda Date 12/22/94  
Forest Supervisor,  
Winema National Forest

Recommended by Richard J. DeJellen Date 1/24/95  
for Charles Philpot, Director,  
Pacific Northwest Research Station

Cover Page Info for RNA Establ. Record

Name: Canon Well RNA

Region: R06

Station: PNW

State: Oregon

County: Klamath

Boundary Certified on page 21

TMIS #: 00

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

Lat.: 43° 21' 45"

Long.: 121° 30' 05"

<u>1980 SAF</u>	<u>Acres</u>	<u>Ha</u>	<u>1966 Kuchler</u>	<u>Acres</u>	<u>Ha</u>
218	666	270	10	666	270
<hr/>					
<u>Total:</u>	666	270		666	270

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

Original maps, or photocopies? original

Photos included? NO

Abutted by non-FS land? NO

SAF & Kuchler types consistent? (see page \_\_\_\_\_)

Climate records: length of record? 84y Distance to weather sta.? 17 miles SW

Fauna & Flora authorities: Little 1979; Hitchcock and Congquist 1973; Burt & Grossenhiedler 1976; Nussbaum et al. 1983

Land use conflicts? Grazing? Trails? Recreation?

1. Within grazing allotment but no nearby water so receives no use.
2. Very minor recreation use, mostly by hunters.

TITLE PAGE

Establishment Record for  
Cannon Well Research Natural Area  
within Winema National Forest  
Klamath County, Oregon

ESTABLISHMENT RECORD FOR  
CANNON WELL RESEARCH NATURAL AREA  
WITHIN WINEMA NATIONAL FOREST  
KLAMATH COUNTY, OREGON

INTRODUCTION

Cannon Well Research Natural Area (RNA) is in the East Cascades pumice zone of Oregon and consists of conifer forests growing in deep air-laid dacite pumice deposits from the eruption of Mt. Mazama. The topography varies from gentle slopes to flats and depressions at an average elevation of 5500 feet (1677 m). The area is covered by lodgepole pine (*Pinus contorta*)<sup>1</sup> forests with transitions to ponderosa pine (*Pinus ponderosa*) on upper slopes. In flats and depressions, tree density drops dramatically, resulting in a pumice desert vegetative community. Many of the lodgepole pines are suffering from a bark beetle infestation that has resulted in significant numbers of dead and dying trees in the RNA. The infestation is a natural phenomenon that has been exacerbated by fire suppression efforts.

Land Management Planning

Cannon Well RNA was proposed as a candidate RNA by the Winema National Forest to meet an unfilled natural area cell need for lodgepole pine/bitterbrush (*Purshia tridentata*)/western needlegrass (*Stipa occidentalis*) (Oregon Natural Heritage Advisory Council 1993)<sup>2</sup>. It was included as a candidate RNA in the FEIS for the Winema National Forest (USDA Forest Service 1990a), in the Forest Plan (USDA Forest Service 1990b) and in the Record of Decision (USDA Forest Service 1990c).

Cannon Well includes the following RNA cell need (or element) in the East Slope Oregon Cascades Physiographic Province: lodgepole pine/bitterbrush/western needlegrass (Oregon Natural Heritage Advisory Council 1993). The site also contains a small example of lodgepole pine/western needlegrass.

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<sup>1</sup> Nomenclature for vascular plants follows Hitchcock and Cronquist (1973).

<sup>2</sup> Author's names in parentheses refer to references cited.

## OBJECTIVE

The objective of the Cannon Well RNA is to preserve in an undisturbed (by humans) condition the lodgepole pine/bitterbrush forest which is the research focus of the RNA. The RNA will serve as a reference area for study, as a baseline area for determining long-term ecological changes, and as a monitoring area to determine effects of management techniques and practices applied to similar ecosystems.

## JUSTIFICATION

Cannon Well RNA was selected originally to meet an unfilled RNA cell need for a lodgepole pine/bitterbrush/western needlegrass community type. The site is representative of forest stands in the East Cascades which have developed in deep deposits of Mt. Mazama pumice and ash. Also present is a small example of a lodgepole pine/western needlegrass community. This community is characteristic of flat terrain or depressions subject to low temperatures as a result of cold air drainage. The site exhibits a variety of stand conditions that include mistletoe infestations, bark beetle attacks, and an area which sustained a stand replacement fire approximately 100 years ago.

## PRINCIPAL DISTINGUISHING FEATURES

Cannon Well RNA contains the following principal features:

1. Lodgepole pine/bitterbrush/western needlegrass forest: Lodgepole pine/bitterbrush is the principal community at Cannon Well RNA covering 85% of the site and it dominates the concave basin where the RNA lies. It blankets the gently rolling terrain and transitions to scattered ponderosa pine forest on the upper third slope positions of the minor ridges that are situated in the southwest corner of the site. The lodgepole pine forest is comprised of mostly even-aged stands which are approximately 110 years old. Tree vigor is good but mistletoe and bark beetle infestation is severe. Stand reproduction is low, being restricted to small microsites with dense clumps of saplings. Bitterbrush dominates the shrub layer while the herb layer is depauperate with western needlegrass being the only consistent species present. Soils are derived from deep, 5 - 10 feet, (1.5 - 3 m) accumulations of Mt. Mazama pumice.

2. Lodgepole pine/western needlegrass forest: Lodgepole pine/western needlegrass community is located in the northeast corner of the RNA occupying approximately 15% of the site. This community is found on small flats or in depressions which are associated with frequent low temperatures. The low temperatures

result from cold air drainage which creates frost pockets that restrict establishment of some plant species. Forbs are more diverse in this community with such characteristic species as yarrow (Achillea millefolium), sulfur-flowered buckwheat (Eriogonum umbellatum), and pussypaws (Spraguea umbellata) as well as western needlegrass. Soils are similar to the more dominant community being derived from deep deposits of air-laid pumice.

3. Pumice desert community: A pumice desert community is not well defined at Cannon Well RNA but deserves mention as being at the extreme end of the forest community spectrum. In larger depressions which are dominated by lodgepole pine/western needlegrass community, trees become so widely spaced that they no longer are dominant in the community. These small areas have herbaceous communities that are best described as pumice desert. Very large examples of pumice desert, covering hundreds of acres, can be found at Crater Lake National Park. Smaller examples are found throughout the central Oregon pumice zone forests wherever very deep deposits of pumice are found. These sites are dominated by low lying, hardy herbaceous species such as yarrow, sulfur-flowered buckwheat, pussypaws, and least lupine (Lupinus lepidus var. aridus). Harsh microclimate restricts tree growth on the these sites.

#### LOCATION

Maps 1, 2, and 3 show the location of Cannon Well RNA. The RNA is located in the Chemult Ranger District of the Winema National Forest. The center of the RNA is at latitude 43° 21' 45" north and longitude 121° 30' 05" west. The 660 acre (267 ha.) site lies within Sections 26, 27, 34, 35 Township 25 South, Range 10 East and in Section 2 Township 26 South, Range 10 East Willamette Meridian (Map 3).

Described in aliquot parts as follows:

Township 25 South Range 10 East

Township 26 South Range 10 East

Section 26 - SW1/4 SW1/4, W1/2 SE1/4 SW1/4

Section 2 - NW1/4

Section 27 - SE1/4 SE1/4

Section 34 - E1/2 E1/2

Section 35 - W1/2 W1/2, W1/2 E1/2 W1/2

#### Boundary

Basis of bearing is astronomic north. Basis of elevation is mean sea level as shown on the USGS 7.5 minute topographic quadrangle map Sellers Marsh, Oreg. 1967.

#### Area

Total area for the Cannon Well Research Natural Area is approximately 666 acres (270 hectares).

## Elevations

Elevations range from 5475 feet (1699 m.) in the northeast corner of the RNA to 5600 feet (1707 m.) at the west boundary.

## Access

The Cannon Well RNA is in the northeast corner of the Winema National Forest (Map 2) approximately 3.6 miles west of Stams Mountain and 17 miles east of Chemult, Oregon. It is accessible from Hwy 97 north of Chemult via Forest Service Roads. Forest Road #94 exits Hwy 97 four and a half miles north of Chemult and leads east towards Cannon Well. After approximately 17 miles Forest Road #9445 branches to the northeast for 2.5 miles to Cannon Well. To access the western border of the RNA, Forest Road #9411 is followed to the northwest for 2.8 miles to a spur road. A short .3 mile overland hike to the east brings one to the border of the RNA. To access the eastern border of the RNA proceed 1.6 miles east beyond Cannon Well on Forest Road #9445 to Forest Road #9450. Follow this road north approximately 4.3 miles to a spur road heading west towards the boundary of the RNA. Take the spur road for .7 miles then hike overland for approximately .2 miles to the northeast corner of the RNA.

## Maps

Cannon Well RNA is located on two USGS 7.5 minute topographic quadrangle maps, Sellers Marsh, Oreg. 1967 and Stams Mountain, Oreg. 1981. The Winema National Forest Recreation Map, 1980, is useful for ownership and general access information, however, this map does not delineate the RNA boundaries.

## Photos

The following aerial photos of the Cannon Well RNA site are available in the Forest Supervisor's and District Ranger's offices:

Line 6 #3-37, Flight No. 81-173, Sept. 14, 1981

## AREA BY TYPES

Vegetation of the RNA has been surveyed (Seyer 1980; Vander Schaaf 1993) during initial recommendation of the site for RNA status as well in preparation of drafting this document. The following determination of cover types and habitat types and their percent covers have been made from the survey information and from air photo interpretation. Map 4 depicts the locations



of the natural communities described below.

The most current information regarding the forested portion of the RNA is described in the plant association guide of Volland (1976). Three plant communities have been identified in the RNA (Map 4), all of which correlate to communities described in Volland (1976).

	Estimated	
	Acres	Hectares
<u>SAF Cover Types</u> (Eyre 1980)		
218 Lodgepole Pine.....	666	270
<u>Kuchler Types</u> (Kuchler 1966)		
10 Ponderosa shrub forest..... (Pinus)	666	270
<u>Plant Associations</u> (Volland 1976)		
1) Lodgepole/bitterbrush/needlegrass (Pinus contorta/Purshia tridentata/Stipa occidentalis).....	567	230
2) Lodgepole pine/needlegrass (Pinus contorta//Stipa occidentalis).....	99	40
3) Buckwheat flats (Rhyolite pumice).....	0	0
Total.....	666	270

### PHYSICAL AND CLIMATIC CONDITIONS

#### Physical Conditions

Cannon Well RNA is part of a broad, 2800 acre (1102 ha.) concave basin in the East Cascades Physiographic Province. Topography of the basin is gently rolling with east to northeast exposures. Small flat areas and depressions occur within the northeast portion of the site while the greatest elevation, 5600 feet (1696 m.) occurs on minor ridges in the southwest corner of the RNA. Even though the region has a distinctive volcanic past there is little evidence of such at the featureless site other than the derivation of the underlying soils.

The site lies within a region that has been significantly influenced by the eruption of Mt. Mazama, more than 6600 years ago. Air-laid pumice depositions buried the site to depths of up

to 10 feet (3 m.) putting it within one of the heavy depositional zones of the pumice showers from Mt. Mazama. Pumice at the site is gravel sized, generally less than 3 inches (7.5 cm) in diameter. Soil development is weak with coarse pumice being churned up where burrowing animals are present.

### Climatic Conditions

The central Oregon climate is characterized by warm summers and cold winters. Most of the limited precipitation falls as snow during the winter with significant rains often falling during the spring as well. Summers are dry with evening thunderstorms occurring in July and August. Cannon Well RNA is within the east Cascades Physiographic Province and receives typical central Oregon weather. Summer winds are predominantly from the northwest and are usually light to moderate. East winds may occur in the fall and spring, blowing at higher velocities and causing drying conditions that enhance the fire hazard for the season. During the winter, storms come in from the southwest bringing snow while occasional storms from the northwest bring frigid weather.

The closest recording NOAA weather station is located in Chemult, Oregon, 17 miles (27 km) to the southwest of the RNA. Climatic conditions at Chemult should be a fair approximation for Cannon Well RNA with differences being attributed to the additional 1000 feet (303 m) of elevation at the RNA. The station receives an annual precipitation of 24.11 inches (612 mm) and the mean annual temperature is 42.0 degrees F (5.5 degrees C) (National Oceanographic and Atmospheric Administration 1989). Over half of the precipitation falls between November and February. Summer high temperatures regularly reach into the 80's, while winter lows often dip into the 20's. The monthly climatic data for Chemult, Oregon averaged over the past 84 years is listed below (National Oceanographic and Atmospheric Administration 1989).

Climatic Records for Chemult, Oregon  
 Elevation 4760 feet (1451 m); 1905-1989  
 (National Oceanographic and Atmospheric Administration 1989)

Month	Mean Temperature		Mean Precipitation	
	°F	°C	inches	mm
January	25.4	-3.7	3.82	97.0
February	30.0	-1.1	2.98	75.7
March	32.9	0.5	2.34	59.4
April	39.1	3.9	1.07	27.2
May	46.7	8.2	0.99	25.1
June	54.0	12.2	1.00	25.4
July	60.4	15.8	0.48	12.2
August	58.1	14.5	0.71	18.0
September	52.6	11.4	0.80	20.3
October	43.8	6.6	1.67	42.4
November	33.7	0.9	3.58	90.9
December	27.4	-2.6	4.67	118.6
Mean Annual	42.0	5.5	24.11	612.4

DESCRIPTION OF VALUES

Flora

The flora of Cannon Well RNA is representative of the central Oregon pumice zone and lodgepole pine forests in particular, being relatively depauperate with few numbers of taxa present. The flora has not been systematically collected or studied other than those taxa encountered during a botanical inventory conducted during the course of the drafting of the Establishment Record. No state or federal threatened, endangered or sensitive plant species are known to occur within the RNA. Observations by Vander Schaaf (1993) have resulted in the following list of plants. The Habitat-types listed below refer to those noted previously on page 5. Species identifications were determined from Hitchcock and Cronquist (1973) and trees were determined from Little (1979).

Scientific name	Common name	Habitat-types		
		1	2	3
<u>TREES</u>				
<u>Pinus contorta</u>	lodgepole pine	X	X	
<u>Pinus ponderosa</u>	ponderosa pine	X	X	

SHRUBS AND SUBSHRUBS

<u>Arctostaphylos patula</u>	green-leaf	X		
	manzanita			
<u>Ceanothus velutinus</u>	sticky-laurel	X		
<u>Chrysothamnus viscidiflorus</u>	green rabbitbrush	X	X	
<u>Purshia tridentata</u>	bitterbrush	X	X	X
<u>Ribes cereum</u>	squaw currant	X		

FORBS

<u>Achillea millefolium</u> ✓	yarrow	X	X	X
<u>Agoseris glauca</u> ✓	pale agoseris		X	X
<u>Antennaria geyeri</u> ✓	Geyer pussy-toes		X	X
<u>Arabis sp.</u> ✓	rockcress			X
<u>Arceuthobium americanum</u>	American dwarf			
	mistletoe	X	X	
<u>Castilleja arachnoidea</u>	cobwebby paintbrush	X	X	X
<u>Cirsium scariosum</u>	elk thistle			X
<u>Epilobium sp.</u>	fireweed	X	X	
<u>Eriogonum umbellatum</u>	sulfur buckwheat		X	X
<u>Fragaria virginiana</u>	broadpetal			
	strawberry		X	X
<u>Gayophytum diffusum</u>	spreading			
	groundsmoke	X	X	X
<u>Haplopappus bloomeri</u>	rabbitbrush			
	goldenweed		X	X
<u>Lomatium triteratum</u>	nine-leaf lomatium			X
<u>Lupinus argenteus</u>				
var. <u>argenteus</u>	silvery lupine			X
<u>Lupinus lepidus</u> var. <u>aridus</u>	least lupine	X	X	X
<u>Machaeranthera canescens</u>	hoary aster		X	
<u>Penstemon cinicola</u>	ash penstemon			X
<u>Penstemon procerus</u>	small-flowered			
	penstemon	X	X	
<u>Pterospora andromedea</u>	pinedrops	X		
<u>Spraguea umbellata</u>	pussypaws	X	X	X
<u>Viola purpurea</u>	goosefoot violet	X	X	

GRAMINOIDS

<u>Carex rossii</u>	Ross' sedge	X	X	
<u>Sitanion hystrix</u>	bottlebrush			
	squirreltail	X	X	X
<u>Stipa occidentalis</u>	Western needlegrass	X	X	X

CRYPTOGAMS

<u>Bryoria sp.</u>				
<u>Cladonia sp.</u>				
<u>Letharia vulpina</u>				
<u>Polytrichum sp.</u>				

Cannon Well RNA has three natural communities or plant associations represented within its boundaries (Map 4). Over three quarters of the RNA is covered by the lodgepole pine/bitterbrush/western needlegrass association. This community is characteristic of well-drained soils of the pumice region and is found on level to gently sloping terrain. Scattered ponderosa pine occur on the upper slopes of minor ridges near the southwest corner of the RNA. The ponderosa pine represent transitions to a ponderosa pine/bitterbrush-greenleaf manzanita (Arctostaphylos patula)/needlegrass community that would occur at slightly higher elevations or on more well-developed soils. A variant of the lodgepole pine/bitterbrush/needlegrass association occurs on approximately 15% of the RNA and is characterized by an absence of bitterbrush. This community is characteristic of depressions that are sumps to cold air drainage and subsequently have frequent frosts and low temperatures. The two primary associations occur as a mosaic within the RNA with boundaries between them being gradual and generally nondistinct. Found within the lodgepole pine/needlegrass plant association are small openings, usually smaller than an acre (0.5 ha.) in size, that have an absence of trees. These sites are called buckwheat flat plant associations (Volland 1976) and are characterized by the presence of buckwheat species (Eriogonum sp.) and bottlebrush squirreltail (Sitanion hystrix) growing in coarse pumice.

The lodgepole pine stands on the RNA are quite uniform in stature and age, being 6-7 inches (15-17 cm) DBH and approximately 110 years in age. Patches of older lodgepole pine occur sporadically within the RNA, apparently bypassed by the stand-replacing wildfire that occurred 110 years ago. Overall vigor is good, however, infestations of dwarf mistletoe and western gall rust are present and the bark beetle epidemic is threatening the site. Lichen growth is quite heavy on the trees with Bryoria sp. and Letharia vulpina the more common species.

Where bitterbrush occurs in the shrub layer it has approximately 10-15% cover. The herbaceous layer is sparse with low percent cover overall and few species present. Western needlegrass is the dominant species in the herb layer but it has only 1% cover. Other herbs include Ross sedge (Carex rossii), bottlebrush squirreltail, smallflower penstemon (Penstemon cinicola), and pussypaws (Spraguea umbellata). The buckwheat flats sites have richer herbaceous assemblages with yarrow, sulfur-flowered buckwheat, least lupine, silvery lupine, elkthistle, and strawberry along with many of the herbaceous species noted for the forested communities.

## Fauna

Faunal species have not been systematically studied or inventoried in Cannon Well RNA. Observations of animal species taken during surveys conducted at the site (Wilson 1993) as well as surveys on nearby areas are included below. The following terrestrial vertebrates are among those most likely to be encountered in the RNA (Burt and Grossenbieder 1976; National Geographic Society 1987; Nussbaum et al 1983):

<u>Scientific name</u>	<u>Common name</u>
<b>Anguidae</b> <u>Elgaria coerulea</u>	Northern alligator lizard
<b>Iguanidae</b> <u>Phrynosoma douglasii</u> <u>Sceloporus occidentalis</u>	Short-horned lizard Western fence lizard
<b>Colubridae</b> <u>Contia tenuis</u> <u>Thamnophis ordinoides</u> <u>Thamnophis sirtalis</u>	Sharptail snake Northwestern garter snake Common garter snake
<b>Bufo</b> <u>Bufo boreas</u>	Western toad
<b>Hylidae</b> <u>Hyla regilla</u>	Pacific treefrog
<b>Cathartidae</b> <u>Cathartes aura</u>	Turkey vulture
<b>Accipitridae</b> <u>Accipiter striatus</u> <u>Accipiter gentilis</u> <u>Buteo jamaicensis</u>	Sharp-shinned hawk Northern goshawk Red-tailed hawk
<b>Columbidae</b> <u>Zenaida macroura</u>	Mourning dove
<b>Strigidae</b> <u>Bubo virginianus</u>	Great horned owl
<b>Caprimulgidae</b> <u>Chordeiles minor</u>	Common nighthawk
<b>Apodidae</b> <u>Chaetura vauxi</u>	Vaux's swift
<b>Trochilidae</b> <u>Selasphorus rufus</u>	Rufous hummingbird

**Picidae**

Picoides pubescens  
Picoides villosus  
Picoides arcticus  
Colaptes auratus

Downy woodpecker  
Hairy woodpecker  
Black-backed woodpecker  
Northern flicker

**Tyrannidae**

Contopus sordidulus  
Empidonax oberholseri

Western wood-pewee  
Dusky flycatcher

**Alaudidae**

Eremophila alpestris

Horned lark

**Corvidae**

Perisoreus canadensis  
Cyanocitta stelleri  
Corvus corax  
Nucifraga columbiana

Gray jay  
Steller's jay  
Common raven  
Clark's nutcracker

**Paridae**

Parus atricapillus  
Parus gambeli

Black-capped chickadee  
Mountain chickadee

**Sittidae**

Sitta carolinensis  
Sitta canadensis  
Sitta pygmaea

White-breasted nuthatch  
Red-breasted nuthatch  
Pygmy nuthatch

**Certhiidae**

Certhia americana

Brown creeper

**Troglodytidae**

Troglodytes aedon  
Salpinctes obsoletus

House wren  
Rock wren

**Sylviidae**

Regulus calendula  
Regulus satrapa

Ruby-crowned kinglet  
Golden-crowned kinglet

**Muscicapidae**

Sialia currucoides  
Sialia mexicana  
Catharus ustulatus  
Catharus guttatus  
Myadestes townsendi  
Turdus migratorius  
Ixoreus naevius

Mountain bluebird  
Western bluebird  
Swainson's thrush  
Hermit thrush  
Townsend's solitaire  
American robin  
Varied thrush

**Emberizidae**

Dendroica coronata  
Piranga ludoviciana  
Spizella passerina

Yellow-rumped warbler  
Western tanager  
Chipping sparrow

Melospiza melodia  
Zonotrichia leucophrys  
Junco hyemalis  
Euphagus cyanocephalus  
Molothrus ater

Song sparrow  
White-crowned sparrow  
Dark-eyed junco  
Brewer's blackbird  
Brown-headed cowbird

**Fringillidae**

Carpodacus cassinii  
Loxia curvirostra  
Carduelis pinus  
Coccothraustes vespertinus  
Chlorura chlorura

Cassin's finch  
Red crossbill  
Pine siskin  
Evening grosbeak  
Green-tailed towhee

**Soricidae**

Sorex vagrans

Vagrant shrew

**Talpidae**

Scapanus orarius

Pacific mole

**Verperilionidae**

Myotis lucifugus  
Myotis yumanensis  
Myotis evotis  
Myotis volans  
Myotis californicus  
Anthrozous pallidus  
Lasionycteris noctivagrans  
Eptesicus fuscus  
Lasiurus cinereus  
Plecotus townsendii

Little brown myotis  
Yuma myotis  
Long-eared myotis  
Long-legged myotis  
California myotis  
Pallid bat  
Silver-haired bat  
Big brown bat  
Hoary bat  
Townsend's big-eared bat

**Leporidae**

Sylvilagus nuttalli  
Lepus americanus

Mountain cottontail  
Snowshoe hare

**Sciuridae**

Eutamias townsendii  
Eutamias minimus  
Eutamias amoenus  
Citellus lateralis  
Tamiasciurus douglasii

Townsend's chipmunk  
Least chipmunk  
Yellow-pine chipmunk  
Golden-mantled squirrel  
Douglas' squirrel

**Geomyidae**

Thomomys mazama

Mazama pocket gopher

**Cricetidae**

Peromyscus maniculatus  
Neotoma cinerea  
Lagurus curtatus

Deer mouse  
Bushy-tailed woodrat  
Sagebrush vole



<b>Erethizontidae</b>	
<u>Erethizon dorsatum</u>	Porcupine
<b>Canidae</b>	
<u>Canis latrans</u>	Coyote
<b>Ursidae</b>	
<u>Ursus americanus</u>	Black bear
<b>Mustelidae</b>	
<u>Martes americana</u>	Marten
<u>Mustela frenata</u>	Long-tailed weasel
<u>Spilogale gracilis</u>	Western spotted skunk
<u>Mephitis mephitis</u>	Striped skunk
<u>Taxidea taxus</u>	Badger
<b>Felidae</b>	
<u>Felis rufus</u>	Bobcat
<b>Cervidae</b>	
<u>Odocoileus hemionus</u>	Mule deer
<u>Cervus canadensis</u>	Elk

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### Aquatic

Aquatic habitat types are not present on Cannon Well RNA.

### Geology

Geology of Cannon Well RNA is heavily influenced by the eruptions of Mt. Mazama 6600 years ago and the Paulina shield volcano 4000 years ago. The site is covered with heavy depositions of pumice that average 5 - 10 feet (1.5-3.0 m) in depth. Because of its proximity to Crater Lake and because Cannon Well is to the northeast of the former Mt. Mazama, the site is within one of the heavy depositional portions of the northeast trending pumice showers (Baldwin 1964). The pumice has acted to smooth out the landscape of the RNA such that it consists of mostly level to gently sloping terrain. Minor ridges occur in the southwest portion of the site.

### Soils

The soils in the RNA are derived from Mt. Mazama pumice and ash that overlay bare lava or soils derived from basaltic lava. The soils have developed in place from these coarse pumice and ash air-laid mantles from Mt. Mazama and in general are very young, displaying weak soil profile development. The A horizons extend 12-18 inches (30-45 cm) in depth and consist of gravelly, loamy

coarse sands. There is no B horizon evident and the C horizons, consisting of upwards to 70% coarse fragments greater than 2 mm, extend to 5 feet (1.5 m) or more where they contact buried soil horizons or bedrock. Productivity in these soils is relatively low with low levels of nitrogen, phosphorus, and sulfur present; low bulk density which causes instability, displacement, and susceptibility to wind erosion; high water holding capacity but with a water repellent surface; and unique thermal properties that result in temperature extremes at the surface, frost heaving, and cold air accumulation in basins (Seyer 1980).

### Lands

Cannon Well RNA is completely surrounded by lands which are managed by the Winema National Forest. Surrounding the RNA on all sides are Timber Production lands (Management Area 12) which are in various stages of harvest (USDA 1990b). The goal of Timber Production lands is to emphasize high levels of wood production using a variety of treatments and investment levels. Past timber harvest focused on selective cutting of ponderosa pine but more recently lodgepole pine is being harvested removing most trees older than sapling stages. Salvage harvest has also become more prominent in the area as bark beetles have created large pockets of dead trees, creating intense fire hazards. The RNA is unsigned and indistinguishable from Timber Production lands, hence it may be susceptible to firewood cutting or timber theft.

Bordering the RNA on the east side in section 35 is a patch of old growth forest that is included in Management Area 7--Old Growth Management. The focus of Management Area 7 is to provide old-growth forest communities for wildlife habitat, vegetative diversity, preservation of natural gene pools, and aesthetic values. Management techniques for Management Area 7 can involve limited harvest and stand improvement to enhance low quality stands. This management direction is therefore not the same as that for the RNA which focuses on natural processes. Nevertheless the eventual development of an old growth condition stand adjacent to the RNA is compatible with management direction for the RNA as it will provide a complementary forest stand that will allow for a continuation of wildlife habitat and ecosystem processes between the two management areas.

### Cultural

There are no known cultural resources located within the Cannon Well RNA. Cultural resource inventories of timber sales which bordered the RNA revealed no cultural sites.

## IMPACTS AND POSSIBLE CONFLICTS

### Grazing Resources

Cannon Well RNA is within the Antelope C & H grazing allotment on the Chemult Ranger District of the Winema National Forest. Because there are no water sources on the RNA or within approximately a mile (1.6 km) of the RNA there is little or no actual grazing on the RNA. During the survey of the RNA conducted in preparation of the establishment record no evidence of livestock use was found.

### Mineral Resources

There are no reported hardrock mining claims in Cannon Well RNA.

### Timber

The RNA is surrounded on all sides by Winema National Forest lands whose primary goal is to produce timber while maintaining other forest resources (USDA Forest Service 1990b).

Virtually the entire RNA, 666 acres (270 ha.), is forested to some extent with only small areas of buckwheat dominated flats devoid of trees. While scheduled timber harvest will not occur on the RNA there is a potential for impact to the RNA when timber is cut adjacent to the RNA. Timber harvests adjacent to the RNA can result in invasions of exotic plant and animal species as well as cause blowdown in the natural area. Timber trespass in the form of firewood cutting is also possible in the RNA as adjacent harvest areas allow for greater access to the area.

### Watershed Values

There are no substantial watershed values present at Cannon Well RNA.

### Recreation Values

Cannon Well RNA receives limited recreation use, primarily in the fall from hunters. There is a primitive hunting stand in the SW 1/4 of section 35 in the RNA which was apparently accessed from the south using All-Terrain-Vehicles. The stand is not used on a frequent basis. Casual recreation use has not seriously impacted the RNA to date, however, use does increase fire danger in the area. Recreational use and identification of the site as an RNA on general forest recreation maps should be discouraged.

## Wildlife and Plant Values

There have been no listed threatened or endangered wildlife species located within the RNA to date. There is a potential for pumice grapefern (*Botrychium pumicola*) to occur in the pumice desert communities that are present in the northeast portion of the RNA. However, recent inventory of the site did not discover any populations of the species (Vander Schaaf 1993).

## Adjacent Private Lands

There are no private lands adjacent to the RNA.

## MANAGEMENT PRESCRIPTION

Management and protection of Cannon Well RNA will be directed toward maintaining natural ecological processes. No activities of humans will be permitted that will disturb or modify ecological processes.

Cannon Well RNA is included, along with other RNAs, in the Winema National Forest Plan in Management Area 13, Research Natural Areas (USDA Forest Service 1990b). Standards and guidelines for management are noted in the Forest Plan for the Management Area.

## Vegetation Management

Standards and guidelines for RNAs, Management Area 13, address vegetation management under several different headings (USDA Forest Service 1990b). The overall management direction for all RNAs is to preserve the naturally occurring physical and biological processes at the site.

Wildfire will be actively suppressed unless plans approved by the Director of the Pacific Northwest Experiment Station provide for letting natural fires burn. Fire suppression will use methods and equipment that will minimize disturbance to the special features of the area (USDA Forest Service 1990b). Prescribed burning will be used only as specified in approved research projects or when needed to meet RNA management goals.

A special concern at Cannon Well RNA is insect infestation. Mountain pine beetle infestations are occurring in epidemic proportions in central Oregon forests. Lodgepole pine stands have been particularly hard hit as hundreds of thousands of acres now stand dead or highly infected. The standing dead has created a tremendous fire hazard in the region. Cannon Well and the immediate surrounding forest currently have significant insect infestations and there is real concern for the maintenance of the

stand in terms of wildfire potential.

Monitoring forest health in the RNA and the surrounding forest is recommended. The Forest Plan specifies that insect and disease outbreaks shall not be suppressed. As the RNA continues to be attacked by bark beetles and much of the stand dies because of the infection, the seral stage of the RNA will be set back but the viability of the area will not be irretrievably lost.

Introduced species and weedy native species are also a concern at the RNA. At this time there are no known significant weed infestations or populations of introduced species in the RNA. Monitoring in the form of annual surveys of the RNA should be conducted to detect weedy invasions as well as to assess the defensibility of the area.

#### Transportation Plan

No roads or trails are planned for this area.

#### Fences and Protective Barriers

Fences are not required at the RNA. Signs on the RNA boundaries along Forest roads may be needed to alert the public of the presence of the natural area.

### ADMINISTRATION RECORDS AND PROTECTION

Administration and protection of Cannon Well RNA will be the responsibility of the Winema National Forest. The District Ranger, Chemult Ranger District, has direct responsibility.

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

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

Regional Forester, Portland, Oregon  
Forest Supervisor, Winema National Forest, Klamath Falls,  
Oregon  
District Ranger, Chemult Ranger District, Chemult, Oregon  
Director, Pacific Northwest Research Station, Portland,  
Oregon  
Forest Sciences Laboratory, Oregon State University,  
Corvallis, Oregon

### Archiving

The Portland office of the Pacific Northwest Research Station will be responsible for maintaining the Cannon Well RNA research data file and list of herbarium and species samples collected. The Forest Sciences Lab in Corvallis, Oregon is establishing a data base for maintaining research data and lists of species for all RNAs in the region. Computerized files for the RNA will be maintained at the Forest Sciences Lab.

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CANNON WELL  
RESEARCH NATURAL AREA

Legal Description

An area of land situated on the Chumult Ranger District of the Winema National Forest in Klamath County, Oregon. Described in aliquot parts as follows:

Township 25 South Range 10 East

Section 26 - SW1/4 SW1/4, W1/2 SE1/4 SW1/4

Section 27 - SE1/4 SE1/4

Section 34 - E1/2 E1/2

Section 35 - W1/2 W1/2, W1/2 E1/2 W1/2

Township 26 South Range 10 East

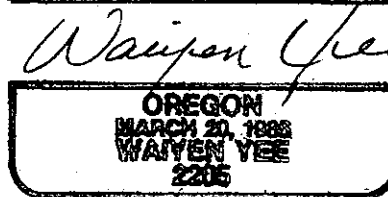
Section 2 - NW1/4

The total area of land reserved in this description is approximately 660 Acres, more or less.

The above written description accurately depicts, to the best of my knowledge and ability, that parcel of land intended for use as a Research Natural Area.

*Waiyen Yee*

Waiyen Yee, PLS  
FOREST LAND SURVEYOR



6/30/96

DECISION NOTICE  
DESIGNATION ORDER  
AND  
FINDING OF NO SIGNIFICANT IMPACT  
CANNON WELL RNA ESTABLISHMENT  
ENVIRONMENTAL ASSESSMENT

USDA Forest SERVICE  
CHEMULT RANGER DISTRICT  
WINEMA NATIONAL Forest  
KLAMATH COUNTY, OREGON

By virtue of the authority vested in me by the Chief of the Forest Service, in Forest Service Manual Section 4063, I hereby establish the Cannon Well Research Natural Area (RNA). It shall be comprised of 660 acres (267 hectares) of lands in Klamath County, Oregon, on the Chemult Ranger District of the Winema National Forest, as described in the section of the Establishment Record entitled "Location".

The Cannon Well Research Area was recommended for establishment in the Record of Decision of the Winema National Forest Land and Resource Management Plan (Forest Plan) in 1990. That recommendation was the result of an analysis of the factors listed in 36 CFR 219.25 and Forest Manual 4063.41. Results of the Regional Forester's analysis are documented in the Forest Plan and Final Environmental Impact Statement, which are available to the public.

The Cannon Well area has been re-examined to ensure the environmental effects of establishing it as an RNA have not changed since 1990. This analysis is documented in the attached environmental assessment. Based on the analysis in the environmental assessment, it is my decision to adopt Alternative A, to establish the Cannon Well Candidate RNA. Alternative A is selected because it provides long-term protection and recognition of a Forest cell type not currently adequately represented in the RNA system. The Cannon Well RNA will be managed in compliance with all relevant laws, regulations, and Forest Service Manual direction regarding RNA's, and in accordance with the management direction identified in the Forest Plan.

The alternative considered was Alternative B, the "No Action" alternative, which would continue management of Cannon Well as a candidate RNA. This alternative was not selected because it would only provide short-term protection of the Cannon Well area.

The Winema Forest Plan is hereby amended to change Cannon Well RNA from a candidate RNA to an established RNA. This is a non-significant amendment of the Forest Plan (36 CFR 219.10(f)).

Legal notice of this decision will appear in the Federal Register. The Forest Supervisor of the Winema National Forest shall notify the public of this decision and mail a copy of the Decision Notice and Designation Order to all persons on the Forest Plan mailing list.

It has been determined through the environmental assessment that the proposed action is not a major Federal action that would significantly affect the quality of the human environment; therefore, an environmental impact statement is not needed. This determination is based on the following factors:

A. CONTEXT

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

B. INTENSITY

1. There are no known effects on public health and safety.
2. There are no known effects on historic or cultural resources, actual or eligible National Register of Historic Places sites, park lands, prime farmlands, wetlands, or wild and scenic rivers. Effects on ecologically critical areas are minimal.
3. Effects on the human environment are not uncertain, do not involve unique or unknown risks, and are not likely to be highly controversial.
4. The action is not likely to establish a precedent for future actions with significant effects.
5. There are no known cumulative effects.
6. The proposed action will not adversely affect an endangered or threatened species or its critical habitat.
7. The proposed action is consistent with Federal, State, and local laws and requirements for the protection of the environment.

This decision is subject to appeal pursuant to 36 CFR Part 217.

Notice of Appeal must be in writing and submitted to:

Chief, USDA Forest Service  
14th & Independence Ave., S.W.  
P.O. Box 96090  
Washington, D.C. 20090-6090

The Notice of Appeal prepared pursuant to 36 CFR 217.9(b) must be submitted within 45 days from the date of legal notice of this decision.



Regional Forester  
NANCY GRAYBEAL (for)  
Deputy Regional Forester

March 29, 1995

Date

For further information regarding the Cannon Well RNA, contact Carol Goularte, Winema National Forest, Chemult Ranger District, P. O. Box 150, Chemult, OR 97731 or by phone at 503-365-7001.

**PUBLIC NOTICES**

8

**Public Notices**

8

**LEGAL NOTICE**

**OREGON FRYER PRODUCERS COMMISSION ELECTION**  
 Notice is hereby given that a producer election will be held April 13, 1995 through May 4, 1995 pursuant to provisions of OR 576, for election of commissi  
 OREGON F

**Lost and Found**

\$200 REWARD. Lost in sunnyside area

FOUND 3/26 Bl- Banks area.

FOUND male I for J.C.

FOUND approx area

FOI

THE OREGONIAN, FRIDAY, MARCH 31, 1995

**NOTICE OF DECISION.** On March 29, 1995, Regional Forester made a decision to establish the 691 acre Three Creek Research Natural Area on the Sweet Home Ranger District of the Willamette National Forest in Linn County, Oregon. This decision will be implemented after April 7, 1995. A copy of the Decision Notice/Designation Order and Finding of No Significant Impact is available upon request from the Regional Office, Environmental Coordination, 333 S.W. First Avenue, (P.O. Box 3623), Portland, Oregon 97208. This decision is subject to appeal pursuant to Forest Service regulations 36 CFR Part 217. Any written Notice of 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 Jack Ward Thomas, 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 regarding Three Creek Research Natural Area, contact Alice Smith, Sweet Home Ranger District at (503) 367-5168.

**NOTICE OF DECISION.** On March 29, 1995, Regional Forester made a decision to establish the 660 acre Cannon Well Research Natural Area on the Chemult Ranger District of the Winema National Forest in Klamath County, Oregon. This decision will be implemented after April 7, 1995. A copy of the Decision Notice/Designation Order and Finding of No Significant Impact is available upon request from the Regional Office, Environmental Coordination, 333 S.W. First Avenue, (P.O. Box 3623), Portland, Oregon 97208. This decision is subject to appeal pursuant to Forest Service regulations 36 CFR Part 217. Any written Notice of 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 Jack Ward Thomas, 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 regarding Cannon Well Research Natural Area, contact Carol Gouarte, Chemult Ranger District at (503) 365-7001.

**NOTICE OF DECISION.** On March 29, 1995, Regional Forester made a decision to establish the 241 acre Sand Lake Research Natural Area on the Hebo Ranger District of the Siuslaw National Forest in Tillamook County, Oregon. This decision will be implemented after April 7, 1995. A copy of the Decision Notice/Designation Order and Finding of No Significant Impact is available upon request from the Regional Office, Environmental Coordination, 333 S.W. First Avenue, (P.O. Box 3623), Portland, Oregon 97208. This decision is subject to appeal pursuant to Forest Service regulations 36 CFR Part 217. Any written Notice of 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 Jack Ward Thomas, 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 regarding Sand Lake Research Natural Area, contact Cindy McCain, Siuslaw National Forest at (503) 750-7000.

ENVIRONMENTAL ASSESSMENT - CANNON WELL  
RESEARCH NATURAL AREA ESTABLISHMENT  
CHEMULT RANGER DISTRICT  
WINEMA NATIONAL FOREST  
KLAMATH COUNTY, OREGON

I. PURPOSE AND NEED FOR ACTION

A. INTRODUCTION

1. DESCRIPTION

This environmental assessment evaluates a proposal to amend the Winema National Forest Land and Resource Management Plan of 1990 (Forest Plan) and change the candidate Cannon Well Research Natural Area (RNA) on the Chemult Ranger District to an established RNA. This assessment will document the analysis of the Proposed Action and one alternative.

2. CURRENT CONDITION

The Cannon Well RNA Establishment Record (1994) describes the current condition of the RNA in detail. Cannon Well includes the following RNA cell need (or element) in the East Slope Oregon Cascades. Physiographic Province: lodgepole pine/bitterbrush/western needlegrass (Oregon Natural Heritage Advisory Council 1993). The site also contains a small sample of lodgepole pine/western needlegrass. This site is representative of Forest stands in the East Cascades, which have developed in deep deposits of Mt. Mazama pumice and ash. The lodgepole pine/western needlegrass community is characteristic of flat terrain or depressions subject to low temperatures as a result of cold air drainage. The site exhibits a variety of stand conditions that include mistletoe infestations, bark beetle attacks, and an area which sustained a stand replacement fire approximately 100 years ago. Cannon Well RNA has three natural communities or plant associations represented within its boundaries. Additional information is indicated in the Establishment Record (1994).

3. MANAGEMENT STATUS

The Forest Plan currently lists Cannon Well as a candidate RNA. The 660 acre site is designated as Management Area 13, Research Natural Area. This management provides for the preservation of undisturbed Forest and rangeland ecosystems for scientific and educational purposes.

## B. PROPOSED ACTION

The proposed action is to establish the 660 acre Cannon Well RNA and to manage it according to direction provided in the Winema Forest Plan. As the Forest Plan currently lists the Cannon Well RNA as a candidate for establishment, formal designation of the RNA as an established RNA, by the Chief of the Forest Service, will amend the Forest Plan. The proposed action will also finalize the boundary of the RNA (Management Area 13).

## C. PURPOSE AND NEED

The purpose of establishing the Cannon Well RNA is to contribute to a series of RNA's designated to "...illustrate adequately or typify for research or education purposes the important Forest and range types in each Forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance" (36 CFR 251.23). The Cannon Well RNA represents an unfilled RNA cell need for a lodgepole pine/bitterbrush/western needlegrass community type, but also includes lodgepole pine/western needlegrass Forest and pumice desert community.

The boundary description finalization is necessary to clarify the RNA boundary of Management Area 13.

Designation of the Canon Well RNA is consistent with the Forest Plan, which directs that an establishment record shall be developed for each potential area. The Cannon Well RNA was identified in the Forest Plan as a candidate RNA, based on the represented unfilled cell need it provides, including the pumice desert vegetative communities. Internal and public scoping supported establishment of an RNA in the area. Site conditions and public concerns have been reviewed during this analysis; and no important changes have occurred.

## II. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

### A. ALTERNATIVE A, PROPOSED ACTION

The proposed action is to establish the 660-acre Cannon Well Research Natural Area. This will provide long-term protection of the area. Management will follow direction provided in the Winema Forest Plan. Specifically, a management and monitoring plan will be developed. Dispersed recreation will be allowed to the extent that it does not reduce the research or education values of the area, and no physical improvements will be constructed. Wildlife habitat improvements will not be allowed. Livestock grazing will be excluded from the area. Timber harvest and firewood gathering will not be allowed. Salable mineral material sources will not be developed, surface occupancy will not be allowed, and the area will be recommended for withdrawal from mineral entry. Special-use permits will be limited to research and related activities. Transportation

facilities will have minimum impacts on the area and helispots for fire control will not be allowed. Insect and disease outbreaks will not be suppressed. Wildfires that endanger the RNA will be extinguished as quickly as possible. Prescribed fire will be carried out only in conjunction with approved research, or to meet management plan objectives.

The acreage and boundary of the RNA, in Management Area 13, will be finalized with this action.

The environmental consequences of implementing Alternative A are the same as those described in the FEIS for the Forest Plan, with the exception of recommending the area for withdrawal from mineral entry. Because the Forest has no known locatable or leasable minerals, it is unlikely that the area contains significant metallic mineral or geothermal energy resources, and there are no reported hardrock mining claims in Cannon Well RNA (Vanderschaff, 1994). Therefore, the consequences of future mineral entry withdrawal would be insignificant.

The RNA is located within the Antelope C & H livestock grazing allotment. However, there are no water sources on the RNA or within approximately a mile (1.6 km) of the RNA; therefore, there is little or no actual grazing on the RNA. No actual evidence of livestock grazing was found, during 1993 surveys of the RNA conducted in preparation of the established record. Establishment, therefore, is not expected to have an effect on domestic livestock grazing.

Roaded natural and semiprimitive recreation, including activities such as hunting, hiking, camping, and horseback riding, may currently occur in the RNA at low levels. These activities may continue after establishment, unless conflicts with RNA management objectives develop.

Establishment of the RNA supports the Oregon Natural Heritage Act and will help maintain species and genetic diversity in the area (FEIS Chapter 4-114) over the long-term.

The proposed boundary descriptions and their subsequent adaptation will have no effect on the importance and use of the area for research and education.

Implementation of Alternative A will have no adverse or irreversible environmental effects. Irretrievable effects, resulting from the loss or reduction of resource outputs, are expected to be insignificant. There will be no significant cumulative effects.

#### B. ALTERNATIVE B, NO ACTION

Alternative B continues management of the Cannon Well as a candidate RNA, according to direction in the Forest Plan. Management will be the same as for Alternative A until the Forest Plan is revised or replaced. The boundary will remain as shown in the Forest Plan.



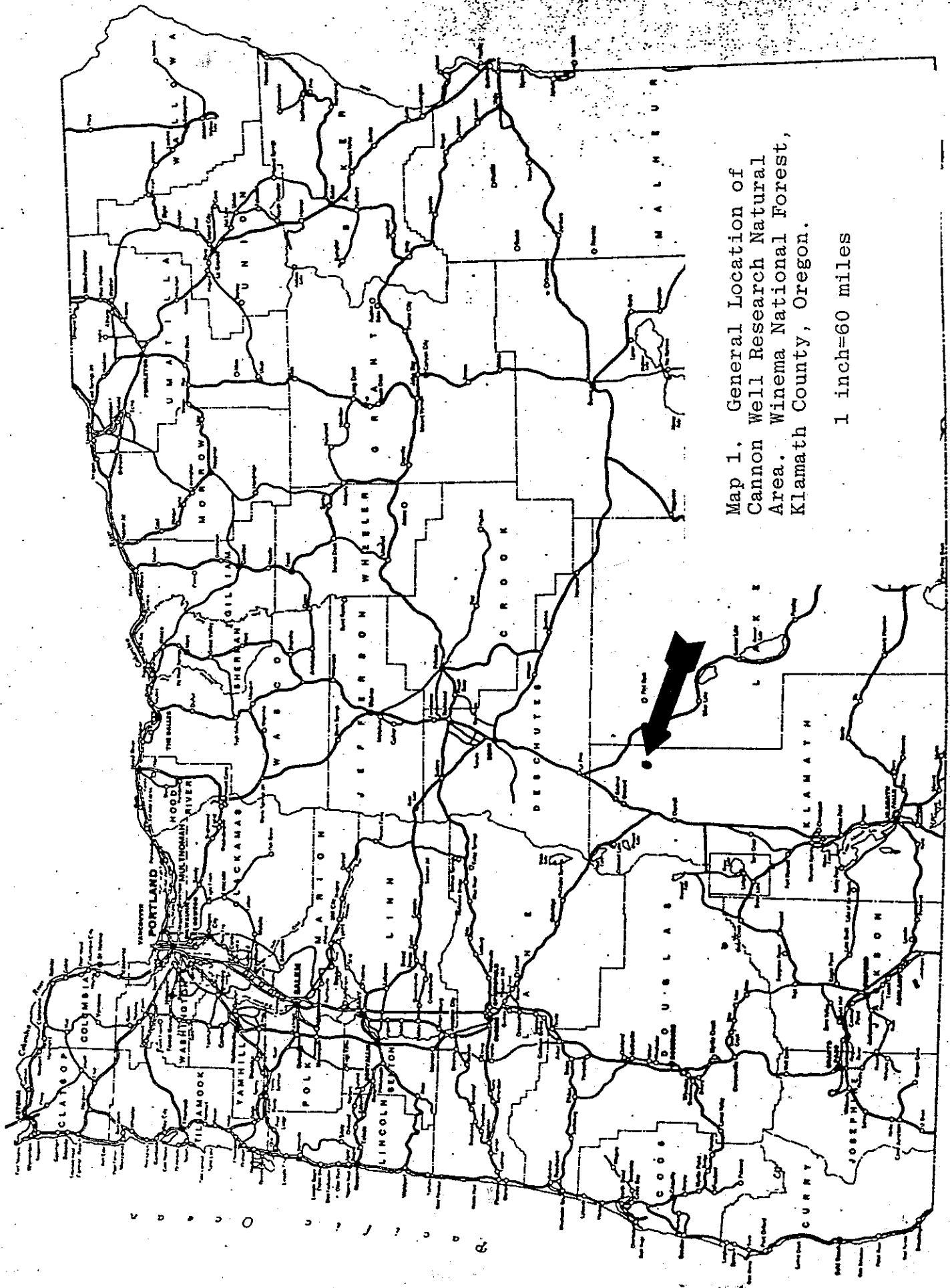
The environmental consequences of implementing Alternative B are the same as those listed in the FEIS for the Forest Plan and described under Alternative A above. An exception is the Forest would not recommend the area for withdrawal from mineral entry with implementation of Alternative B.

### III. AGENCIES AND PERSONS CONSULTED

Scoping was conducted during the process of updating information to determine whether to proceed with establishment of the RNA, as proposed in the Forest Plan. Scoping began in May, 1993, when Forest specialists reviewed the existing condition of the RNA and finalized the proposed boundary of the RNA. Public scoping was initiated on April 4, 1994, when a letter describing the Proposed Action, showing the finalized boundary, and inviting input was sent to 16 persons on the Chemult Ranger District mailing list. This list includes government agencies, The Klamath Tribe, timber companies, environmental and other special interest groups, and individuals who have expressed an interest in Forest activities.

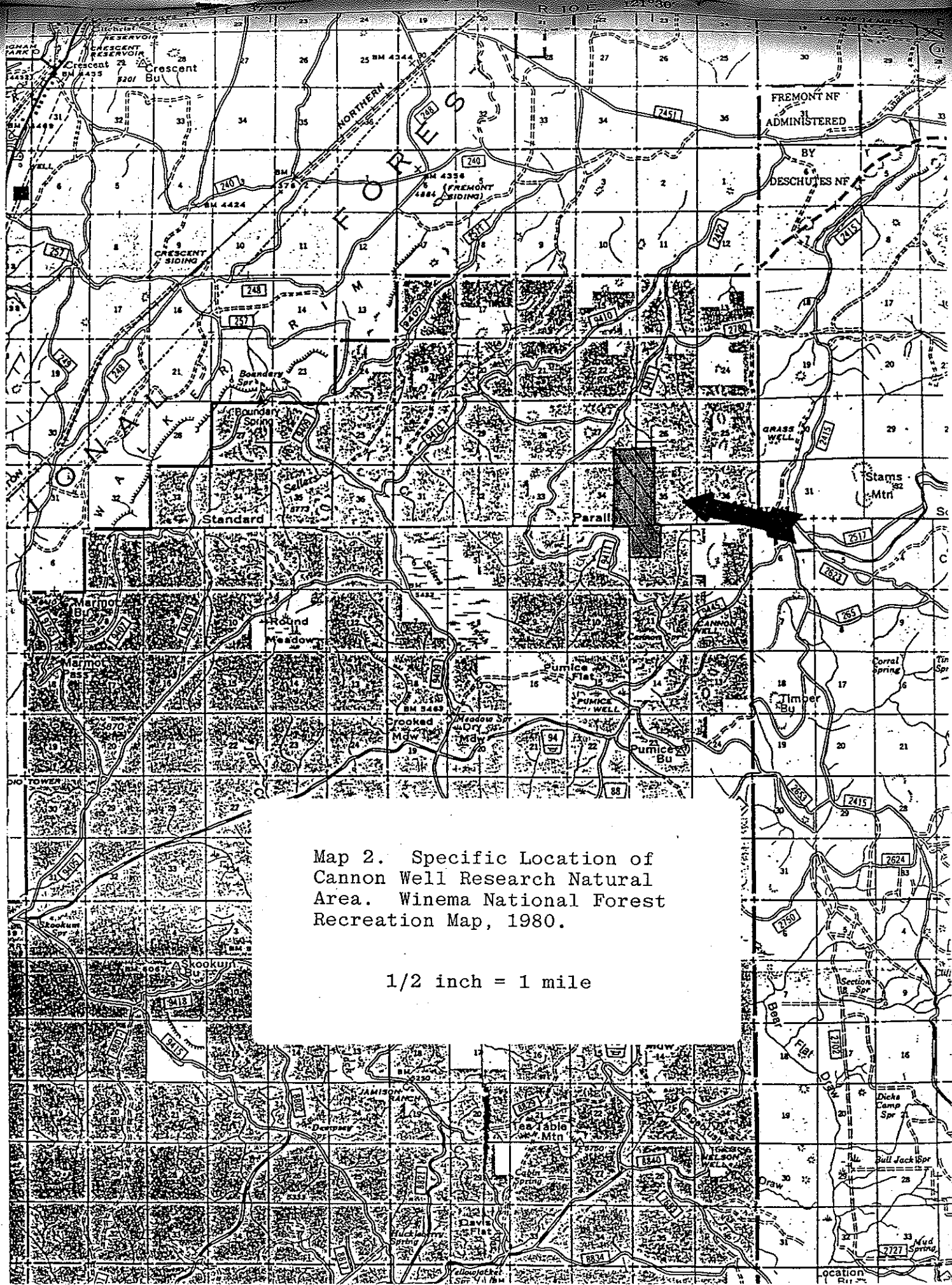
Three comments were received. A request was made for more specific information as to the cell need and why the proposed area is only 666 acres. These questions were answered directly. The cell need was for a lodgepole pine/bitterbrush/needle grass community as it occurs on deep pumice soils. It is proposed for 666 acres simply because that is the largest contiguous block of this type that is in good condition and exhibits little disturbance.

The two other comments supported the need to preserve a network of research. And of the two, one commented to the fact that the knowledge base could be maintained on an area somewhat smaller, in this particular cell type, because the subject area impacts a fairly continuous area that appears to be somewhat uniform.



Map 1. General Location of Cannon Well Research Natural Area. Winema National Forest, Klamath County, Oregon.

1 inch=60 miles



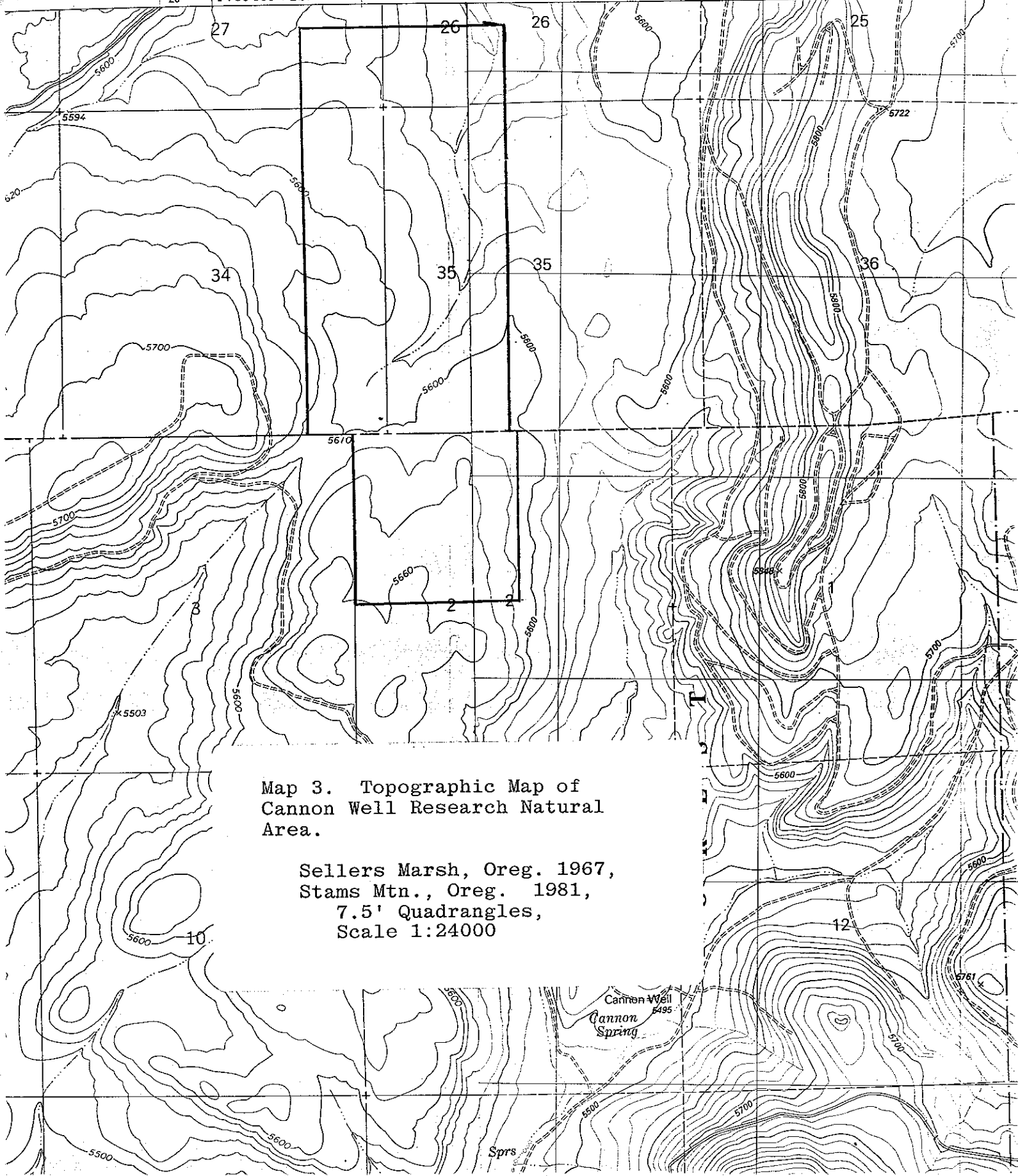
Map 2. Specific Location of Cannon Well Research Natural Area. Winema National Forest Recreation Map, 1980.

1/2 inch = 1 mile

SELLERS MARSH QUADRANGLE  
OREGON - KLAMATH CO.  
7.5 MINUTE SERIES (TOPOGRAPHIC)

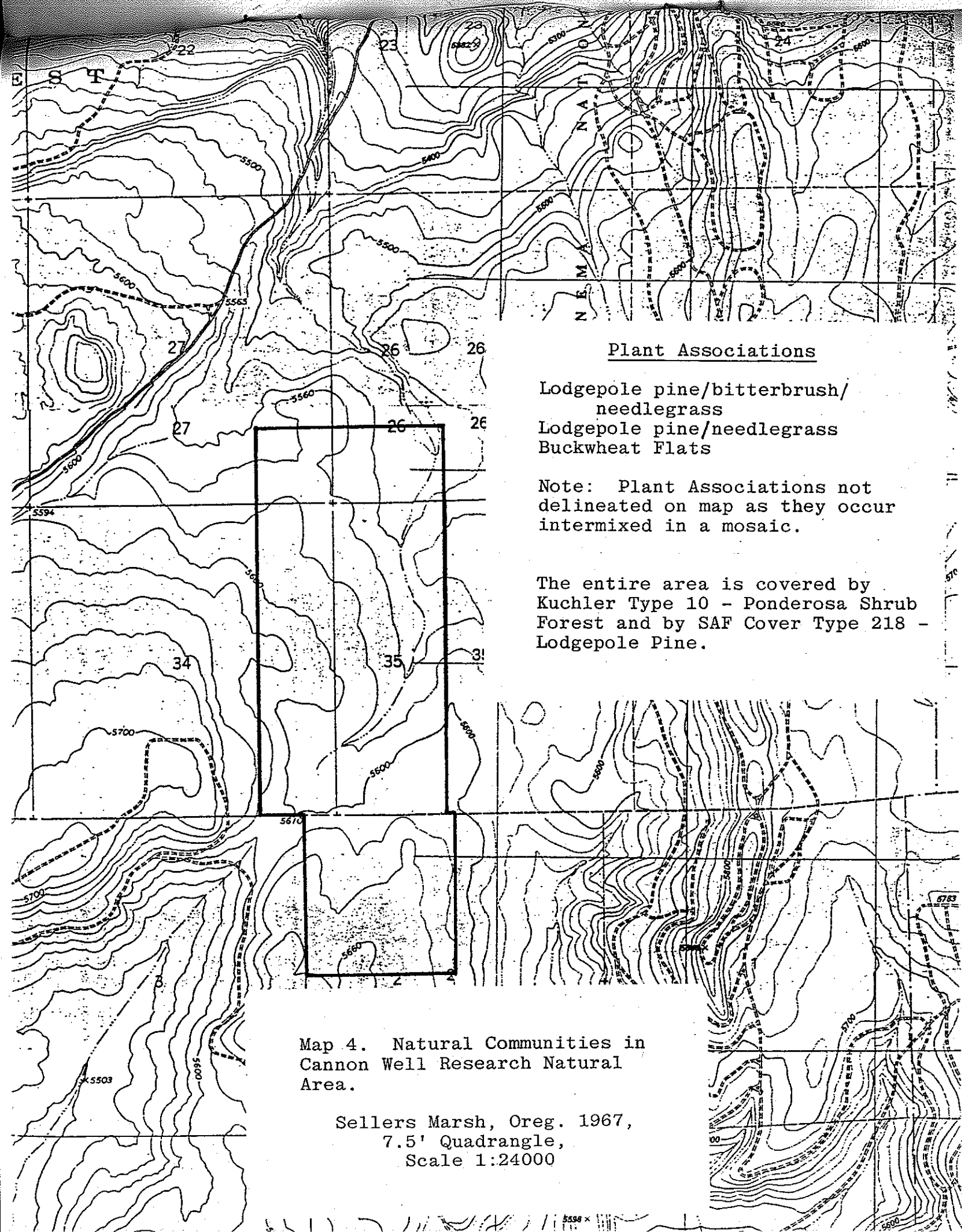
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

620 1 730 000 FEET 621 121°30' 622°00' E 623 R 10 E



Map 3. Topographic Map of  
Cannon Well Research Natural  
Area.

Sellers Marsh, Oreg. 1967,  
Stams Mtn., Oreg. 1981,  
7.5' Quadrangles,  
Scale 1:24000



Plant Associations

- Lodgepole pine/bitterbrush/  
needlegrass
- Lodgepole pine/needlegrass
- Buckwheat Flats

Note: Plant Associations not delineated on map as they occur intermixed in a mosaic.

The entire area is covered by Kuchler Type 10 - Ponderosa Shrub Forest and by SAF Cover Type 218 - Lodgepole Pine.

Map 4. Natural Communities in Cannon Well Research Natural Area.

Sellers Marsh, Oreg. 1967,  
7.5' Quadrangle,  
Scale 1:24000