

PRESERVE ANALYSIS: ONION PEAK

Prepared by
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OREGON NATURAL AREA PRESERVES
ADVISORY COMMITTEE
to the State Land Board

Salem, Oregon

September, 1979

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to the

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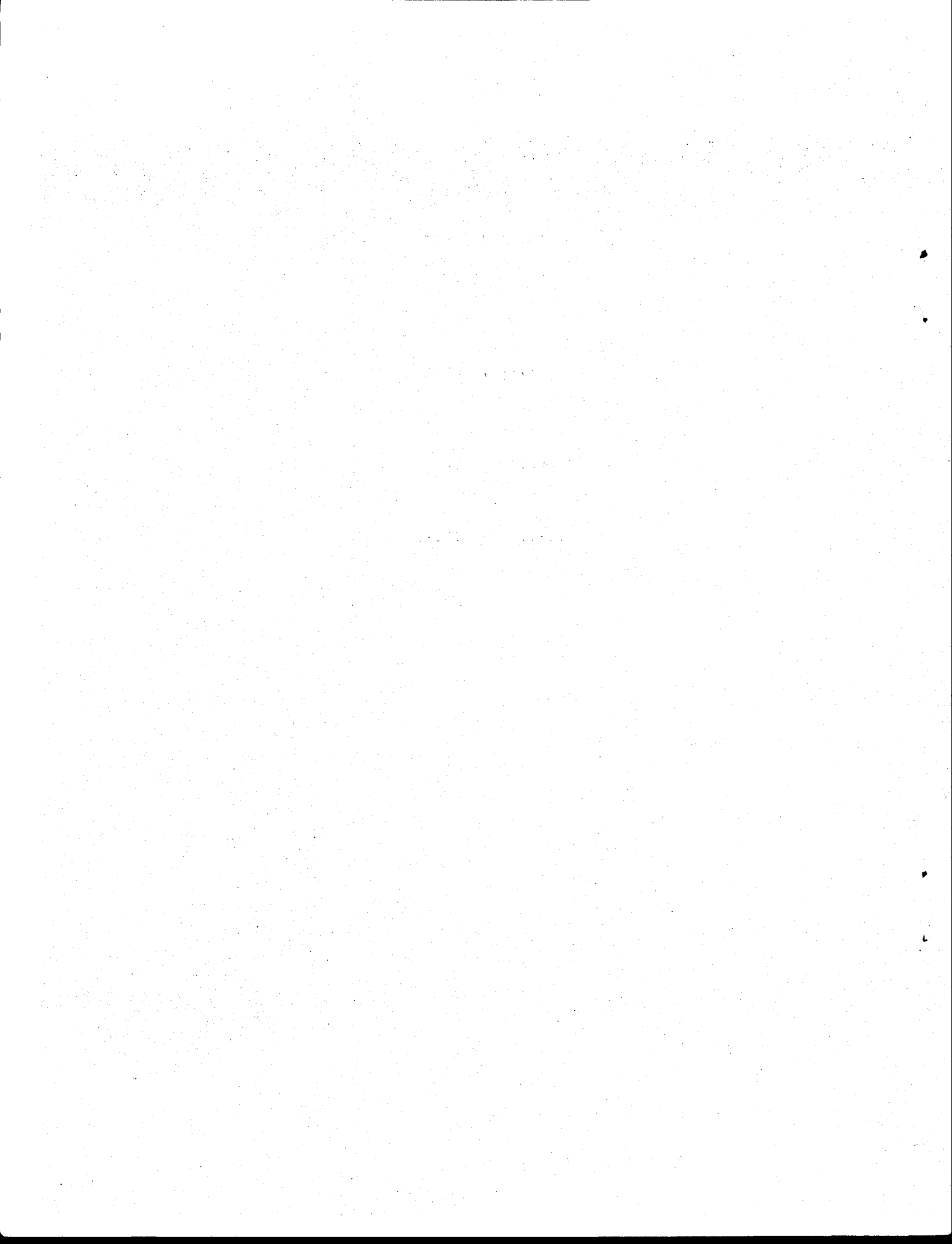
Natural Area Preserves Advisory Committee

to the

State Land Board

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PREFACE

Onion Peak, a massive basalt prominence rising abruptly from the surrounding sedimentary rocks of the northern Coast Range in Clatsop County, supports one of Oregon's outstanding rare plant assemblages. Although ownership of the summit area is shared between the State of Oregon and Crown Zellerbach Paper Company, the natural area proposed in this document is under state ownership. Acquisition of the private land would be very desirable to fully protect the summit's natural values but not absolutely necessary. The Nature Conservancy is presently negotiating with Crown Zellerbach to acquire their portion of the rocky summit but as of the date of this report negotiations are not complete.

Recent botanical explorations by Professor Kenton L. Chambers, Curator of the Oregon State University Herbarium initiated the interest of the Natural Area Preserves Advisory Committee in establishing a preserve in the summit area. Professor Chambers is particularly thanked for his continuing encouragement and comments concerning the Onion Peak flora. Professor Robert M. Storm, Oregon State University Department of Zoology, kindly prepared a tentative list of animals expected in the summit area. The cooperation of Crown Zellerbach Paper Company personnel in all phases of this project is gratefully acknowledged. Noreen Brown, Gregg Bonacker, Donna Hawes, Eve Prior, and Diana Ramey are thanked for assistance with graphics and typing.

SUMMARY

Under the authority of ORS 273.562-273.597, a natural area preserve is proposed for approximately 70.4 acres (28.5 ha) of state-owned land located on Onion Peak, Clatsop County. The parcel comprises approximately 18.6 acres (7.5 ha) of State Board of Forestry land in Section 23, T. 4 N., R. 10 W., and approximately 51.3 acres (20.8 ha) of State Land Board Common School Fund land in Section 22, T. 4 N., R. 10 W. The state-owned property is situated on east and west slopes of the northward extending ridge of Onion Peak. Onion Peak, proper, and its west slope are owned by Crown Zellerbach Paper Company. The Nature Conservancy is presently negotiating with Crown Zellerbach to acquire their portion of the peak (approximately 30 acres (12 ha)). Important natural area values are present in both ownerships, but either ownership would provide sufficient natural area values to warrant protection.

The rock peak and ridge are rugged basalt and breccia prominences in the surrounding sedimentary rock of the northern Coast Range. Only 4 miles (6.4 km) from the ocean, Onion Peak at 3,064 ft. (934 m) is the second highest peak in Clatsop County and one of the taller peaks in the Oregon Coast Range. Establishment of a preserve on Onion Peak will protect the following features:

- Pacific silver fir stands which are presently rare and unprotected in the Oregon Coast Range (Dyrness et al. 1975).
- Fourteen of 28 rare, threatened or endangered plant species listed for the Oregon Coast Range (Siddall and Chambers 1976). Included in this group is one federal candidate for endangered species listing

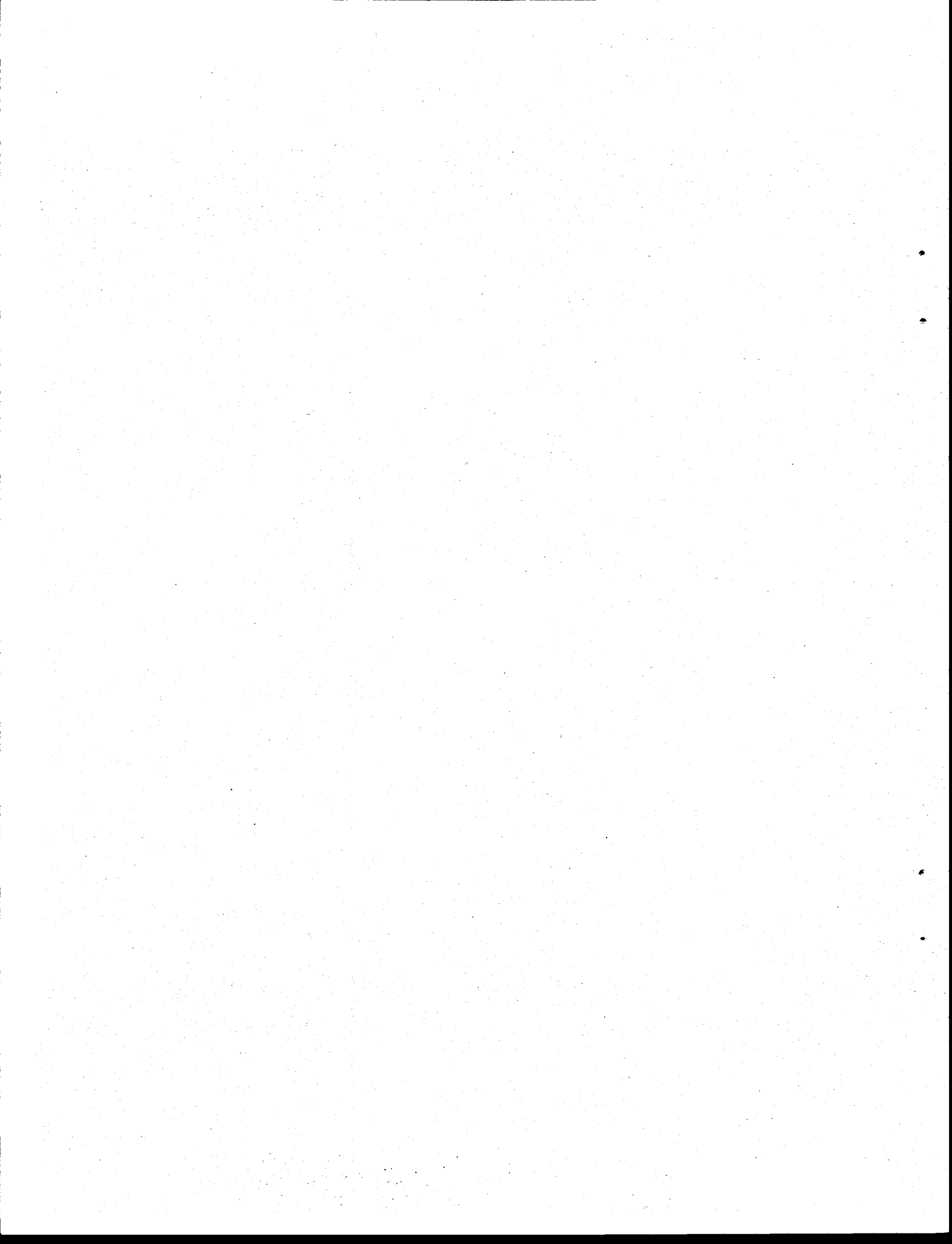
(Cardamine pattersonii) and three federal candidate threatened species (Filipendula occidentalis, Saxifraga occidentalis var. latipetiolata, Synthyris schizantha). Rarely does a site of such small size contain a comparable assemblage of rare plants.

- "Rock garden" community, which on Onion Peak is little disturbed and which contains most of the special plant species. This community is valuable for comparisons with other similarly isolated ecosystems elsewhere in the Coast Range, many of which have suffered greater disturbance.

The timber resource values of the forested portion of Onion Peak are, at best, marginal. No appraisal of land or timber is available.

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Name of Natural Area Preserve Candidate

Onion Peak Natural Area Preserve is suggested as the name for the preserve. It is the name of the peak and no other name is associated with the area. McArthur (1965:458) notes, "in December, 1945, Mrs. H.V. Alley of Nehalem informed the compiler that the peak was named for the wild onions growing near the summit ...; the name was used in early days." Two onions grow on the peak, Allium cernuum and A. crenulatum. Because of the precipitousness of the peak, its isolation, and difficulty in access, it is unlikely that the peak was much visited. The peak is a prominent landmark seen from the lower Nehalem valley settlements.

Reasons for Preservation

The ecological preserve framework for the Pacific Northwest is outlined in Research Natural Area Needs in the Pacific Northwest (Dyrness et al. 1975), a document which identifies ecosystems needing protection in a complete preserve system. Within this framework, the proposed Onion Peak Natural Area Preserve would protect two important ecosystem types in the Oregon Coast Range, one proposed federally endangered plant species, three proposed federally threatened plant species, and eight other Oregon plant species of concern.¹ These important natural features are briefly described below:

¹Plant species of concern are considered to be rare, threatened or endangered, either throughout their entire range, or throughout their Oregon range. Vascular plants proposed as threatened or endangered throughout their range are listed in the Federal Register, July 1, 1975 and June 16, 1976. Siddall and Chambers (1976) have developed a provisional list of vascular plants of concern for the State of Oregon.

1. Pacific Silver Fir - Western Hemlock Forest on Coast Range Mountain

This ecosystem need is difficult to fill adequately. Pacific silver fir is uncommon in the Coast Range and most stands have been logged or burned. The Onion Peak stand comprises about 15 ha (37 ac.). One of the few other known stands larger than a few hectares is on Saddleback Mountain, Lincoln County (Juday 1977) where the Bureau of Land Management has proposed a federal Research Natural Area protecting about 8 ha (20 ac.). The combined Pacific silver fir forest area of about 23 ha (57 ac.) on Onion Peak and Saddleback Mountain is judged marginally adequate to represent this forest type. Differences between the two areas of Pacific silver fir are discussed on page 15.

2. "Rock Garden" on Coast Range Mountain

The "rock garden" Coast Range ecosystem need is well represented on Onion Peak. Its isolation has left the vegetation relatively undisturbed. Even ungulate trampling, which is so noticeable on Saddle Mountain, has had little or no effect on the almost inaccessible Onion Peak. Four "rock garden" community phases are identified on Onion Peak and ecological data from them will be useful for comparisons with similar communities on other more disturbed peaks in the Coast Range.

3. Twelve Species of Concern

Of 28 plant species of concern listed for the Oregon Coast Range (Siddall and Chambers 1976), 14 occur on Onion Peak. This remarkable

assemblage includes a candidate for federal endangered status (Cardamine pattersonii) and three candidates for federal threatened status (Filipendula occidentalis, Saxifraga occidentalis var. latipetiolata², and Synthyris schizantha). Two of the ten remaining species of concern are not discussed in detail because of taxonomic uncertainty (Saxifraga cespitosa var. emarginata), and because the species is now known to be more widespread (Allium crenulatum). The eight remaining species of concern are considered rare, threatened, and/or endangered in Oregon (Table 7, page 24).

4. Other Natural Features

a) Onion Peak is an excellent example of the extrusive igneous peak and ridge system characterizing high points in the Coast Range.

b) The flora is a diverse mix of subalpine elements (Senecio flettii, Lewisia columbiana var. rupicola), mid-elevation elements (Abies amabilis, Alnus sinuata), and coastal elements (Calamagrostis nutkaensis, Maianthemum dilatatum).

c) The peak is biogeographically significant because certain plant species are located at or near the periphery of the species' range at Onion Peak. Such populations are important to evolutionary change, and are often significantly divergent genetically from more central populations (Mayr 1963). Included in this group are Penstemon cardwellii, Prenanthes alata, and Lewisia columbiana var. rupicola.

²See Table 7 (Page 24) for discussion of the taxonomy of Saxifraga occidentalis var. latipetiolata.

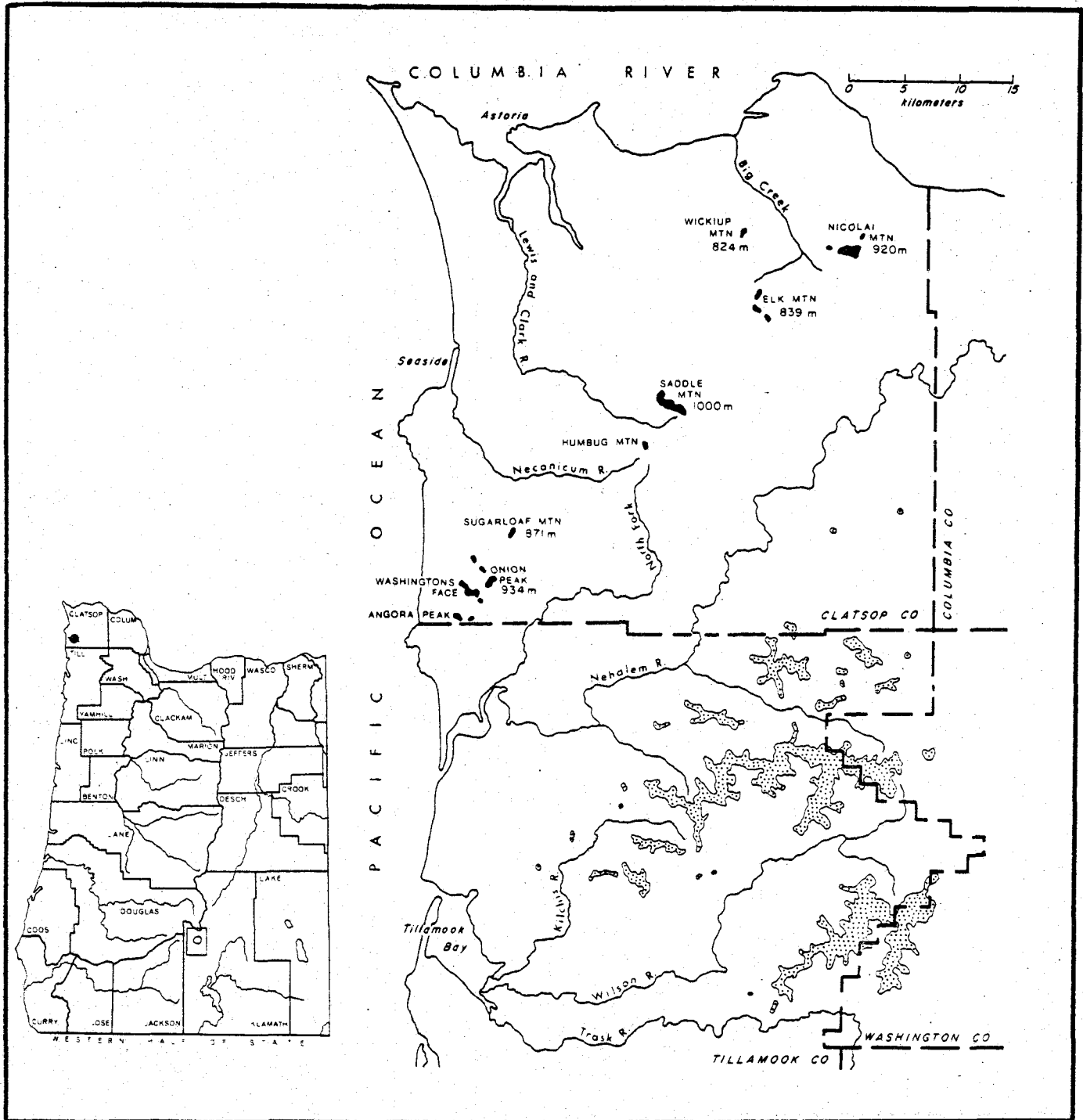


Figure 1. Location of Onion Peak, Clatsop County. Areas greater than 752 m elevation are shown in black for Clatsop County and are stippled for Tillamook and Washington Counties. Source: Chambers (1973).

A Research Natural Preserve is established on a portion of nearby Saddle Mountain State Park. Many, but not all, of the Onion Peak species of concern are in this preserve. A few others are partly protected in the Olympic and Mt. Rainier National Parks. Protection of more than a single small population is necessary for adequate protection of a species.

In discussing the forest management implications of old-growth forests in the Coast Range, Juday (1977:160) concluded that "remaining old-growth True Fir Zone stands are few and of limited extent and commercial significance. However, their research and educational values are great. The biogeography of these stands can offer clues to post-Pleistocene climates. Their spotty distribution can be compared to island biogeography [research situations], offering many research opportunities." The Onion Peak Pacific silver fir stand would be an important element in this scattered distribution.

Description of Area

General Description and Ownership

Onion Peak, 934 m, is located in the Coast Range of Northwest Oregon 6.4 km east of Cannon Beach (Figure 1). It is one of a number of basalt peaks, cliffs, and ridges in this part of the Coast Range which form steep prominences in the surrounding, more easily erodible, sedimentary rock that makes up most of the range. The following description of the peak is from Chambers (1973:107):

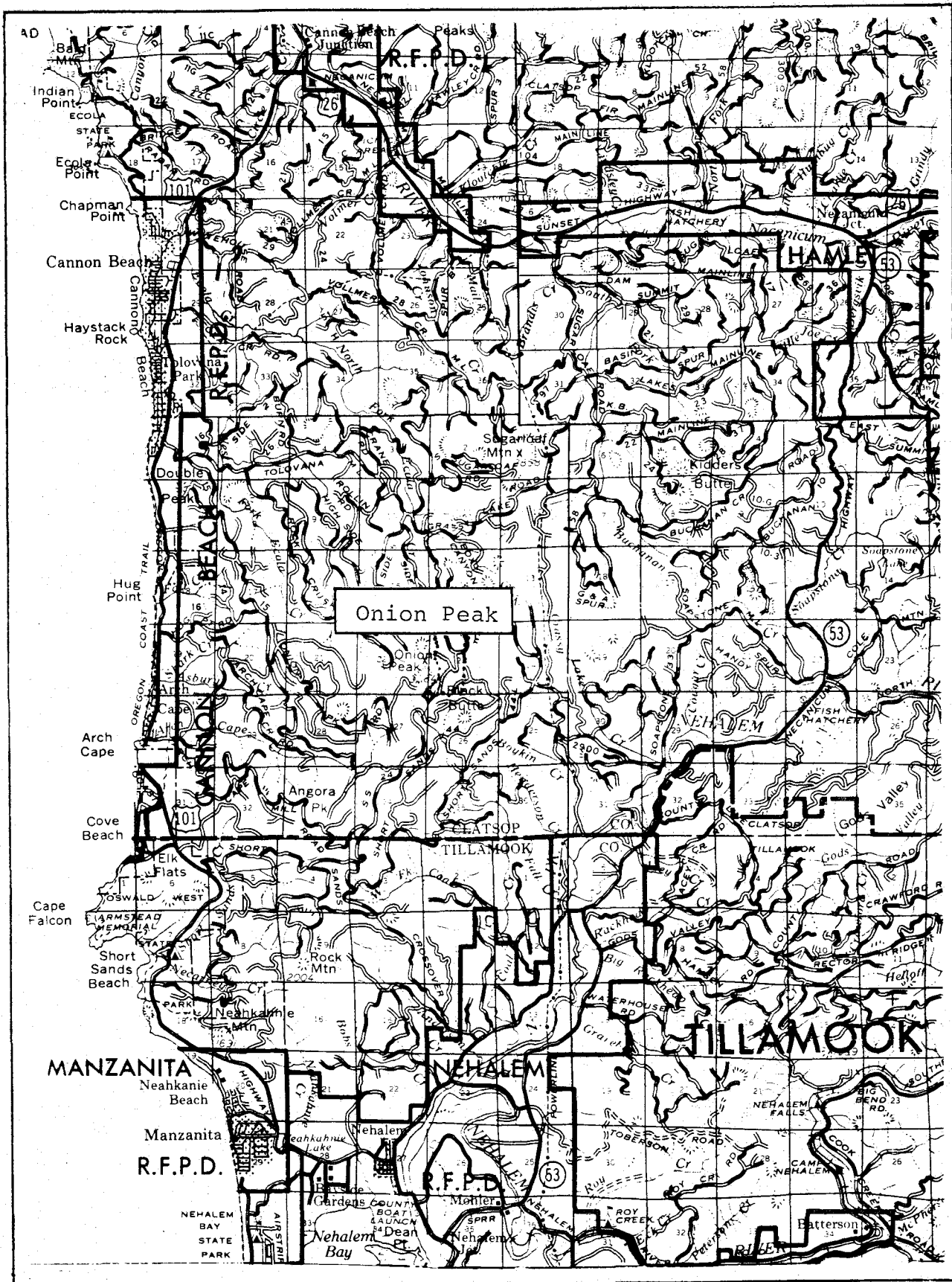


Figure 2. Onion Peak and vicinity. Source: Oregon State Forestry Department, Astoria Map.

Onion Peak is an approximately conical monolith, whose blocky north and west slopes were once forested from base to summit, but whose south and east faces are massive slopes of bare rock. From a base at 730 m elevation, these smooth cliffs rise steeply for 120-150 m and then slope somewhat more gently to the summit. In the top 30-60 m where the slope is only 30° to 40°, there is an area about two acres in extent on which extensive patches of thin soil occur, supporting a fairly rich flora of grasses, forbs, and cryptogams. This small "bald" is a miniature of the similar but much larger areas on Saddle Mountain, which were included in a survey of Coast Range "balds" by Aldrich (1972). The open summit area on Onion Peak gives way abruptly on the north and west sides to a forest of Abies amabilis and Tsuga heterophylla, with only a narrow shrub border of Cladothamnus pyrolaeiflorus and Acer circinatum.

A steep basalt ridge runs north from Onion Peak in Section 22. This ridge, as was Onion Peak, was logged to just below the ridgetop where steep, rugged basalt cliffs make access extremely difficult. A forest stand dominated by Pacific silver fir (Abies amabilis) is restricted to the ridgetop. Salmonberry (Rubus spectabilis) is presently the dominant cover on the logged slopes and tree regeneration is sparse. Landslide activity is not great in the preserve area, but gully erosion is common where logging has occurred on the steep slopes. The small, southeast-facing gravelly bald supports an herbaceous flora that includes most of the plant species of concern found on the peak.

The state land proposed for preserve dedication is the E-1/3 of the NE-1/4 of Section 22 and a portion of the west side of Section 23, T. 4 N., R. 10 W., Willamette Meridian. Approaches to the land are possible from the Tolovana Mainline Road or the Hug Point Road off Highway 101, south of Cannon Beach in the southwest corner of Clatsop County (Figure 2).

The Section 23 property is owned by the Department of Forestry,

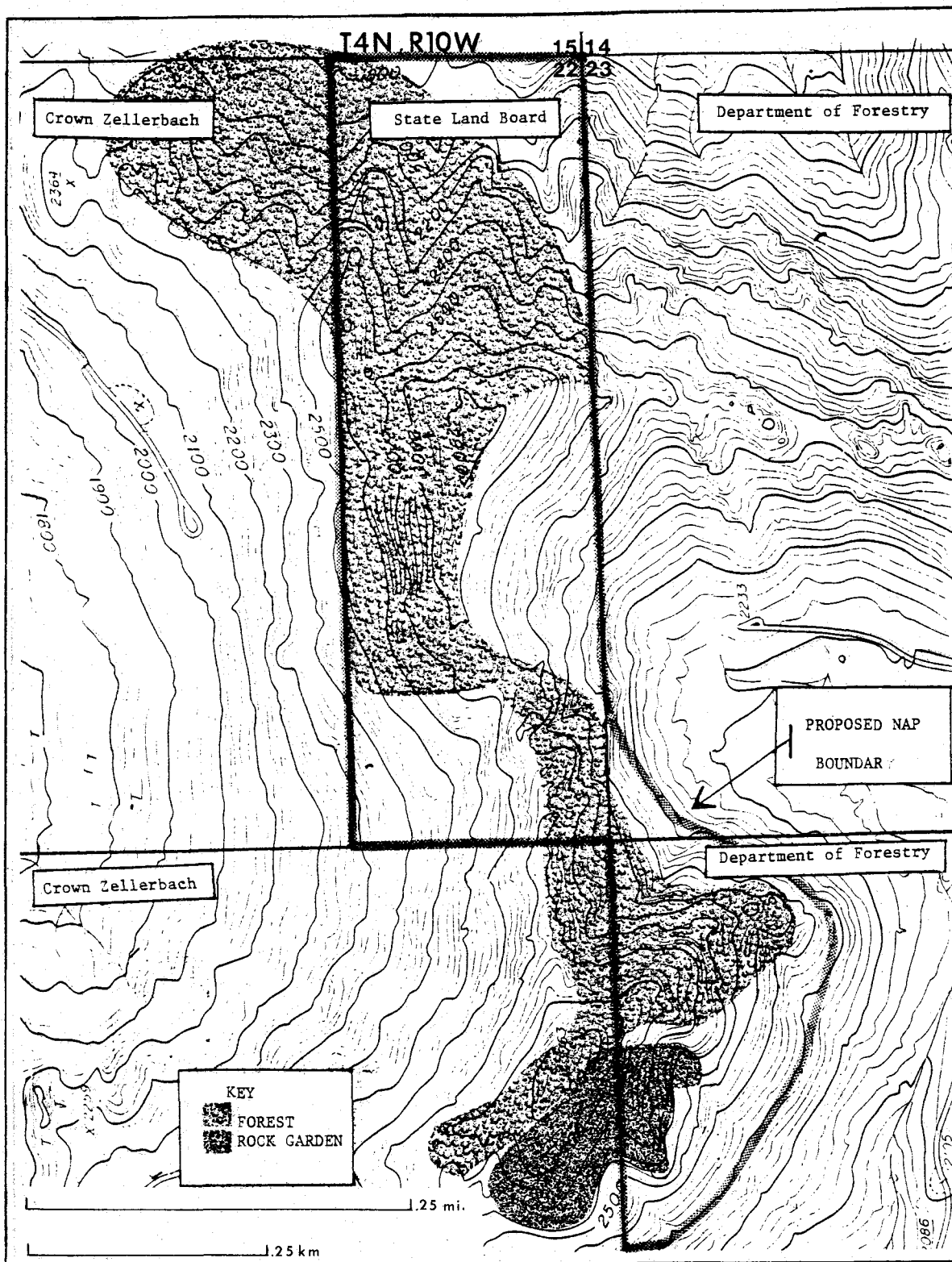


Figure 3. Ownership, proposed preserve boundaries, and vegetation on Onion Peak.

while Section 22 is owned by the State Land Board and managed under statute, by the Department of Forestry, as Common School Fund Forest Land. The remainder of the forest and bald is in Section 22 and is owned by the Crown Zellerbach Paper Company (Figure 3).

Boundary Selection: The Need for State and Private Cooperation

The proposed boundaries around the State of Oregon parcels have been selected to encompass habitat for the plant species of concern and for the Pacific silver fir stand (Figure 3). They are drawn to include a small buffer below the forested slopes for protection of the forest edge against wind throw and to include potential habitat for forest dwelling species of concern. Many of the species of concern are found in the "rock garden" on Onion Peak, and preservation of this 0.7 ha (1.8 ac.) area is essential.

Ideal protection of the Onion Peak ecological complex will require land owned by the State of Oregon and Crown Zellerbach. The State/Crown Zellerbach property line cuts north-south across the "rock garden" just east of the highest point of the peak (Figure 3). The total area covered by these natural features in both ownerships is quite small (35 ha or 85 ac.).

There are two ways to set boundaries for the preserve. The first involves a description that is tied in to the section lines. This may be impractical because the exact location of the boundary between Sections 22 and 23 is not known. The southeast corner of Section 22 has recently been relocated (Appendix 6), but the exact position of the northeast corner is not known. Maps differ in placement of the boundary

line, and controversy about the land protected by a preserve could develop. The second method involves location of the preserve boundaries on the ground and transfer of these to aerial photographs. Using this method, any relocation of the section line would not alter the boundaries of the preserve on the ground. The boundaries can be tied-in by survey to the relocated southeast corner of Section 22 or to the U.S. Coast and Geodetic Survey marker on Onion Peak.

Vegetation

Although Onion Peak is over 900 m (3000 ft.) high, it is so close to the coast that coastal as well as mid-elevation influences are present. Franklin and Dyrness (1973) identify three forest zones from coast to high elevation in the Coast Range of Oregon, the Sitka Spruce Zone, the Western Hemlock Zone, and the Pacific Silver Fir Zone. Elements of all three zones are present. In considering the more generalized forest types of Küchler (1964), Vegetation Type 3, Pacific Silver Fir - Douglas-fir Forest (Abies-Pseudotsuga), and minor elements of Type 1, Spruce-Cedar-Hemlock Forest (Picea-Thuja-Tsuga) are present.

Plant communities in the proposed area include a Pacific silver fir - western hemlock forest community; the edge assemblage of shrubs which rings the "rock garden"; the "rock garden" assemblage; and a successional shrubland in moist seeps and lower slopes dominated by Rubus spectabilis (Figure 3).

Pacific silver fir - western hemlock forest. The 15 to 17 ha (36-40 ac.) remnant forest stand on Onion Peak and its north ridge system consists primarily of western hemlock (Tsuga heterophylla)

and Pacific silver fir (Abies amabilis) as codominants in all forest strata. The overstory has been severely disturbed by wind-throw, particularly along the narrow south ridge. Extremely shallow soils underlain by basalt occurred beneath wind-throws. The overstory consists of trees averaging 12-17 m in height and 0.5-1.0 m DBH. Overstory tree cover ranges from 20 to 70 percent, the densest cover on the north ridges. Pole size trees of the codominant species, 2-5 m in height, are evident in about the same proportion as in the overstory. Reproduction of codominants is present, especially in the vicinity of wind-throw wads. Two major stands of Pacific silver fir occur in the proposed preserve, one along the northeast-trending Onion Peak ridge, the other on the west and north slopes of the northwest extension of the Onion Peak ridge system (Figure 3).

Four reconnaissance plots of about 300 m² each were established and are described in Table 1 and 2. Western red cedar (Thuja plicata) was present in Plots No. 3 and 4, both somewhat more sheltered locations than the other two plots. Although Sitka spruce (Picea sitchensis) occurs in scattered distribution in the summit area, none was present in our forest plots. A few increment borings suggested the Tsuga heterophylla trees were twice as old as the Abies amabilis. In one instance, a fire scar dated at 130 years was present, suggesting that the younger Abies may have originated since the fire and the larger, more "fire-proof", Tsuga may have weathered this disturbance (Table 1).

Shrub cover (50 to 80 percent) is dominated by Vaccinium ovalifolium with Cladothamnus pyrolaeiflorus and V. parvifolium. Maianthemum dilatatum and Rubus pedatus are two species common in the relatively sparse

undercover. The greater species richness in Plot No. 2 is accounted for by its proximity to the summit "rock garden" as indicated by several individuals from this very different community, e.g., Lomatium, Saxifraga, and Senecio.

Table 1. Environmental and tree data¹ from three Onion Peak forest reconnaissance plots, August 14, 1979.

	Plot Number		
	1	2	3
ENVIRONMENTAL DATA			
General location	S. ridge	NE. ridge	NE. ridge
Slope (degrees)	2	30	45
Aspect (degrees)	180	40	45
Approx. elevation (m)	900	920	850
Approx. Area (m ²)	300	300	300
Remarks	blow-down	wind-firm	partial blow-down
TREES			
<u>Abies amabilis</u>			
Trees	1	2	2
Poles	2	2	1
Reproduction	2	2	1
Age (1) ² (yr)	-	90	119
DBH (4) ² (cm)	-	37	53
<u>Tsuga heterophylla</u>			
Trees	1	2	4
Poles	4	3	1
Reproduction	1	2	1
Age (1) ² (yr)	-	253	280
DBH (3) ² (cm)	-	44	51
<u>Thuja plicata</u>			
Trees	-	-	2
Poles	-	-	1
Reproduction	-	-	1

¹Tree cover data is based on Daubenmire's cover classes (see Table 2). Ages are based on increment boring and DBH was measured in the field.

²Number in parentheses is the sample number.

Table 2. Plant cover¹ from three Onion Peak forest reconnaissance plots, August 14, 1979¹, and one plot June 29, 1971.

Species	Plot Number ²			
	1	2	3	4
TREES				
<u>Abies amabilis</u>	2	3	2	2
<u>Tsuga heterophylla</u>	4	2	4	4
<u>Thuja plicata</u>			2	1
SHRUBS AND SUBSHRUBS				
<u>Vaccinium ovalifolium</u>	4	4	3	4
<u>Cladothamnus pyrolaeiflorus</u>	2	2	1	2
<u>Gaultheria shallon</u>	2	1	1	
<u>Vaccinium parvifolium</u>	1	1	1	2
<u>Rubus spectabilis</u>	1	1	1	1
<u>Ribes lacustre</u>	1	1		
<u>Acer circinatum</u>		1		
<u>Berberis nervosa</u>	+	1	1	
<u>Rosa gymnocarpa</u>			1	
HERBS				
<u>Maianthemum dilatatum</u>	2	1	2	2
<u>Rubus pedatus</u>	1	1	1	1
<u>Prenanthes alata</u>	1	1	1	1
<u>Claytonia sibirica</u>	1	1	1	1
<u>Montia parvifolia</u>	1	1	1	1
var. <u>flagellaris</u>				
<u>Hieracium albiflorum</u>	1	1	1	
<u>Clintonia uniflora</u>	1	1	1	2
<u>Boykinia elata</u>	1	1	1	1
<u>Calamagrostis nutkaensis</u>	2	2		1
<u>Hypochaeris radicata</u>	1	1		
<u>Carex mertensii</u>	1	1		3
<u>Tiarella trifoliata</u>	1		1	1
<u>Mimulus dentatus</u>	1		1	1
<u>Luzula parviflora</u>		1	1	
<u>Vancouveria hexandra</u>		1	1	
<u>Bromus pacificus</u>		1	1	
<u>Anemone oregana</u>		1	1	
<u>Polystichum munitum</u>		1	1	
<u>Polypodium vulgare</u>	+	1	1	
<u>Trillium ovatum</u>		1	1	1
<u>Streptopus amplexifolius</u>	+	1	1	1
<u>Viola sempervirens</u>		1	1	2
<u>Listera cordata</u>	1			
<u>Anaphalis margaritacea</u>	1			

Table 2. Continued.

Species	Plot Number ²			
	1	2	3	4
<u>Luzula campestris</u>	1			
<u>Deschampsia elongata</u>	1			
<u>Nothochelone nemorosa</u>	1			
<u>Stellaria crispa</u>	1			
<u>Oxalis oregana</u>		2		2
<u>Smilacina stellata</u>		1		
<u>Viola glabella</u>		1		
<u>Actaea rubra</u>		1		
<u>Heracleum sphondylium</u>		1		
<u>Pyrola picta</u>		1		1
<u>Lomatium martindalei</u> var. <u>flavum</u>		1		
<u>Saxifraga ferruginea</u> var. <u>macounii</u>		1		
<u>Senecio flettii</u>		1		
<u>Pyrola dentata</u>		1		
<u>Blechnum spicant</u>	+	1		
<u>Coptis laciniata</u>			1	2
<u>Agrostis diegoensis</u>			1	
<u>Arnica latifolia</u>			1	1
<u>Castilleja</u> sp.			1	
NO. SPECIES	27	41	33	26

¹Cover values follow Daubenmire (Mueller-Dombois and Ellenberg 1974)
1 = 0-5% cover, 2 = 5-25% cover, 3 = 25-50% cover, 4 = 50-75% cover,
5 = 75-95% cover, 6 = 95-100% cover, and + = < 0.5% cover.

²Plots surveyed August 14, 1979 were located as follows: No. 1 -
about 200 m S. of peak on south ridge, approximately 30 m below
summit; No. 2 about 50 m N. of peak on steeply sloping north ridge;
No. 3 about 250 m N. of peak on steeply sloping north ridge about
80 m below summit. Plot No. 4, surveyed June 29, 1971 was located
approximately 50 m NW of peak on steeply sloping N. ridge to W. of
plot No. 2.

The Onion Peak forest community relates broadly to other high elevation plant communities identified in the Oregon Coast Range. Hines (1971) described three Abies amabilis communities of which his Tsuga heterophylla-Abies amabilis/Vaccinium ovalifolium/Oxalis oregana association is closest to that on Onion Peak. Hines found this community in the north Coast Range on cool, east and north slopes having soils of basalt origin between 1500 ft. (460 m) elevation in the interior Coast Range, and at 2,000 ft. (610 m) elevation, closer to the Pacific. Another closely related community identified by Hines (1977) was the Tsuga heterophylla-Abies amabilis/Gaultheria shallon/Tiarella unifoliata association found near the coast on steep rocky terrain of basalt origin.

Juday (1977) surveyed four plots in the True Fir Zone (= Abies amabilis/A. procera Zone) in the Coast Range, two of which reputedly contained Abies amabilis. Juday identified a Tsuga heterophylla-(Abies amabilis)/Vaccinium alaskense community. Inspection of Juday's plot data suggests problems in taxonomy.¹ However, Juday's floristic list indicates only broad similarities between his stands and those on Onion Peak. Meurisse and Youngberg (1968) identified an Abies procera-Tsuga heterophylla/Vaccinium ovalifolium-Rubus spectabilis community on high elevation sites in the northern Coast Range, a community appearing close to that found on Onion Peak.

It is clear from this brief review of other studies that differences exist among various stands of Abies amabilis and these differences point to the importance of retaining samples of each community type. Those

¹Juday (1977) analyzed a Saddleback Mtn. stand which contained A. amabilis and a Saddle Mtn. stand which contained A. procera. Juday apparently mistook A. procera for A. amabilis at Saddle Mtn. The same problem of misidentification is possible with respect to Vaccinium alaskense and V. ovalifolium.

few existing stands of Pacific silver fir in the Coast Range are extremely small, often in quite disturbed condition, and, as discussed above, represent different plant communities than that found on Onion Peak.

Table 3. Summary of Onion Peak "rock garden" community phases.

HABITAT	DESCRIPTION	CHARACTERISTIC SPECIES
Grass	Pockets of deeper soil Grass dominated	<i>Festuca rubra</i> <i>Elymus glaucus</i> <i>Poa gracillima</i> <i>Cardamine pattersonii</i> <i>Collinsia parviflora</i> <i>Lomatium martindalei</i>
Moss	5 - 10 cm moss layer over rock Little soil Moss provides moisture, insulation, and shade for roots of associated plants	<i>Saxifraga occidentalis</i> var. <i>latipetiolata</i> (= <i>S. latipetiolata</i>) <i>S. caespitosa</i> var. <i>emarginata</i> <i>S. bronchialis</i> var. <i>vespertina</i> <i>Cryptogramma crispa</i> <i>Selaginella oregana</i> <i>S. wallacei</i>
Gravel	Surface gravelly Hot and dry in sun Unstable Vegetative cover low	<i>Lewisia columbiana</i> var. <i>rupicola</i> <i>Allium crenulatum</i> <i>Allium cernuum</i> <i>Erysimum asperum</i> <i>Phlox diffusa</i> var. <i>longistylis</i> <i>Castilleja hispida</i> <i>Castilleja</i> sp.
Rocky Cliffs	Crevices, ledges, dikes, etc. Shaded to sunny Wet to dry Little soil	<i>Cystopteris fragilis</i> <i>Stenanthium occidentale</i> <i>Penstemon cardwellii</i> <i>Saxifraga occidentalis</i> var. <i>latipetiolata</i> <i>S. bronchialis</i> var. <i>vespertina</i> <i>Sedum oreganum</i> <i>S. spathulifolium</i>

"Rock Garden" community. The Onion Peak "rock garden" is typical of meadow vegetation growing on thin soil derived from basalt bedrock on scattered Coast Range peaks. Elevations of these balds range from 780 m to 1250 m. Species lists are available for Marys Peak (Merkle 1951), Saddle Mountain (Detling 1954, Alaback and Frenkel 1978) and Sugarloaf Mountain (Chambers 1974) in addition to Onion Peak (Chambers 1973, 1974).

The Onion Peak "rock garden" exists on the upper part of the southeast, steeply facing slope which falls abruptly 330 m (1000 ft.) to the cut forest below. Occupying about 2.2 ha (5.4 ac.) in both ownerships, the "rock garden" is developed on very shallow basalt-derived "soils". Average slope is about 30 degrees. Most plants are green and flowering only in late spring and early summer. By late July, the "rock garden" assemblage is tawny and most plants have already set seed.

At least four phases of the "rock garden" community have been identified, each related to differences in soil development and soil moisture conditions. These are summarized in Table 3. Five reconnaissance "rock garden" plots were analyzed June 1971 and are presented in Table 4. Plots 5,6 and 7 represent the "moss habitat" as described in Table 3. Plots 8 and 9 represent "grass habitat" on deeper soil. Additional floristic characteristics of the "rock garden" are discussed below under "Flora", and Table 5 lists most of the Onion Peak "rock garden" species.

Bald and "rock garden" vegetation in the Coast Range has received scant study. The only plant community analysis of bald vegetation is

Table 4. Percent cover in five reconnaissance plots¹ on Onion Peak "rock garden", June 29, 1971.

Data and Species	Plot Number				
	5	6	7	8	9
Plot area (m ²)	30	30	16	1	40
Vegetation cover (%)	20	15	15	80	90
Litter cover (%)	2	2	3	15	15
Cryptogams (% cover moss and lichens)	40	65	40	60	20
<u>Lomatium martindalei</u> var. <u>flavum</u>	5 ²	3	5	5	10
<u>Allium crenulatum</u>	+	3	+	+	+
<u>Allium cernuum</u>	+	+	5	3	+
<u>Arenaria rubella</u>	+	+	2	2	+
<u>Microseris gracilis</u>	+	+	+		+
<u>Sedum spathulifolium</u> (c.f. <u>S. oreganum</u>)	8	5	3	+	
<u>Castilleja hispida</u>		+	+	+	+
<u>Selaginella wallacei</u> (c.f. <u>S. oregana</u>)	20	15	10		
<u>Lewisia columbiana</u> var. <u>rupicola</u>	10	8	5		
<u>Saxifraga bronchialis</u> var. <u>vespertina</u>	3	2	+		
<u>Polygonum nutallii</u> (c.f. <u>P. minutum</u>)	+	+	+		
<u>Collinsia parviflora</u>	+	+	+		
<u>Epilobium minutum</u>	+		+		
<u>Koeleria nitida</u>		+	+		
<u>Phlox diffusa</u> var. <u>longistylis</u>		2	+		5
<u>Calamagrostis nutkaensis</u>		+	+	70	15
<u>Poa gracillima</u>		+		8	5
<u>Cirsium edule</u>		+			5
<u>Cerastium arvense</u>				2	2
<u>Saxifraga occidentalis</u> var. <u>latipetiolata</u>	+			+	+
<u>Luzula campestris</u>				+	+
<u>Conioselinum chinense</u>				+	+
<u>Castilleja</u> sp.				+	
<u>Senecio flettii</u>					10
<u>Camassia quamash</u>					5
<u>Achillea millefolium</u>					5
<u>Festuca rubra</u>					2
<u>Danthonia californica</u>					2
<u>Sisyrinchium augustifolium</u>					+
<u>Prunella vulgaris</u>					+
<u>Epilobium alpinum</u>					+
<u>Dodecatheon pulchellum</u>					+

¹Plot locations: (5) Middle of slope, approx. 20 m below summit, steep and rocky; (6) 25 m below and 25 m SW. of plot 1, steep and rocky; (7) at SW. edge of "rock garden" approx. 20 m below summit, steep and rocky; (8) area of accumulation of soil adjacent and below plot 1, 10° slope; (9) large area of soil accumulation to S. of plot 1, 15° slope.

²+ = < 2% cover.

by Aldrich (1972), who, in his study of six Coast Range balds (not including Onion Peak) identified five plant communities including two main provisional climax communities. These are the Lomatium martindalei association and the Elymus glaucus association. According to Aldrich (1972), the Lomatium association is limited to shallow soils adjacent to rock outcrop areas and is made-up of low growing mosses, grasses, and herbs. Important characteristic species are Lomatium martindalei, Aira praecox (introduced) and Hypochaeris radicata (introduced).

Other species often present include Lupinus lepidus, Aira caryophyllea (introduced), Koeleria cristata (=K. nitida) and Agoseris heterophylla.

The Elymus glaucus association occurs on deeper soils and is characterized by Elymus glaucus, Bromus carinatus, Galium aparine, Carex pachystachya and Poa pratensis (Franklin and Dyrness 1973: 90). Most of Aldrich's bald sites are south of Clatsop County beyond the southern boundary of some of the characteristic Onion Peak species, such as Prenanthes alata and Lewisia columbiana var. rupicola. Based on reconnaissance at Onion Peak the "rock garden" assemblages would best be classified in Aldrich's (1972) Lomatium martindalei provisional association.

Cladothamnus-Acer thickets. A dense fringe or seam of shrubs dominated by copper bush (Cladothamnus pyrolaeiflorus) and vine maple (Acer circinatum) separates the "rock garden" from the Pacific silver fir forest. Associated species include Sitka alder (Alnus sinuata), fool's huckleberry (Menziesia ferruginea), oval-leaf huckleberry (Vaccinium ovalifolium), and mountain arnica (Arnica latifolia).

Table 5. Onion Peak "rock garden" and bald vegetation species based on Chambers (1973, 1974).

<i>Achillea millefolium</i>	<i>Lewisia columbiana</i> var. <i>rupicola</i>
<i>Agrostis diegoensis</i>	<i>Lomatium martindalei</i> var. <i>flavum</i>
<i>Allium cernuum</i>	<i>Luzula campestris</i>
<i>Allium crenulatum</i>	<i>Luzula divaricata</i>
<i>Anaphalis margaritacea</i>	<i>Lotus micranthus</i>
<i>Arenaria rubella</i>	<i>Luzula parviflora</i>
<i>Calamagrostis nutkaensis</i>	<i>Microsteris gracilis</i>
<i>Camassia quamash</i>	<i>Montia parvifolia</i>
<i>Cardamine pattersonii</i>	<i>Nothochelone nemorosa</i>
<i>Castilleja hispida</i>	<i>Orthocarpus pusillus</i>
<i>Castilleja</i> sp.	<i>Penstemon cardwellii</i>
<i>Cerastium arvense</i>	<i>Phleum alpinum</i>
<i>Cirsium edule</i>	<i>Phlox diffusa</i> ssp. <i>longistylis</i>
<i>Cladothamnus pyrolaeiflorus</i>	<i>Poa gracillima</i>
<i>Collinsia parviflora</i>	<i>Prenanthes alata</i>
<i>Cryptogramma crispa</i>	<i>Prunella vulgaris</i>
<i>Cystopteris fragilis</i>	<i>Romanzoffia sitchensis</i>
<i>Danthonia californica</i>	<i>Saxifraga bronchialis</i> var.
<i>Delphinium menziesii</i> var. <i>pyramidale</i>	<i>vespertina</i>
<i>Dodecatheon pulchellum</i>	<i>Saxifraga caespitosa</i> var.
<i>Elymus glaucus</i>	<i>emarginata</i>
<i>Epilobium alpinum</i> var. <i>lactiflorum</i>	<i>Saxifraga ferruginea</i> var. <i>macounii</i>
<i>Epilobium angustifolium</i>	<i>Saxifraga mertensiana</i>
<i>Epilobium glandulosum</i>	<i>Saxifraga occidentalis</i> var.
<i>Epilobium minutum</i>	<i>latipetiolata</i> (=S. <i>latipetiolata</i>)
<i>Epilobium watsonii</i>	<i>Selaginella oregana</i>
<i>Erigeron peregrinus</i> ssp. <i>peregrinus</i>	<i>Selaginella wallacei</i>
<i>Eriophyllum lanatum</i>	<i>Sedum oreganum</i>
<i>Erysimum asperum</i>	<i>Sedum spathulifolium</i>
<i>Erythronium revolutum</i>	<i>Senecio flettii</i>
<i>Festuca rubra</i>	<i>Sisyrinchium angustifolium</i>
<i>Heuchera micrantha</i> var. <i>diversifolia</i>	<i>Stachys mexicana</i>
<i>Hieracium albiflorum</i>	<i>Stenanthium occidentale</i>
<i>Iris tenax</i>	<i>Valeriana scouleri</i>
<i>Koeleria nitida</i>	<i>Viola adunca</i>
	<i>Viola glabella</i>

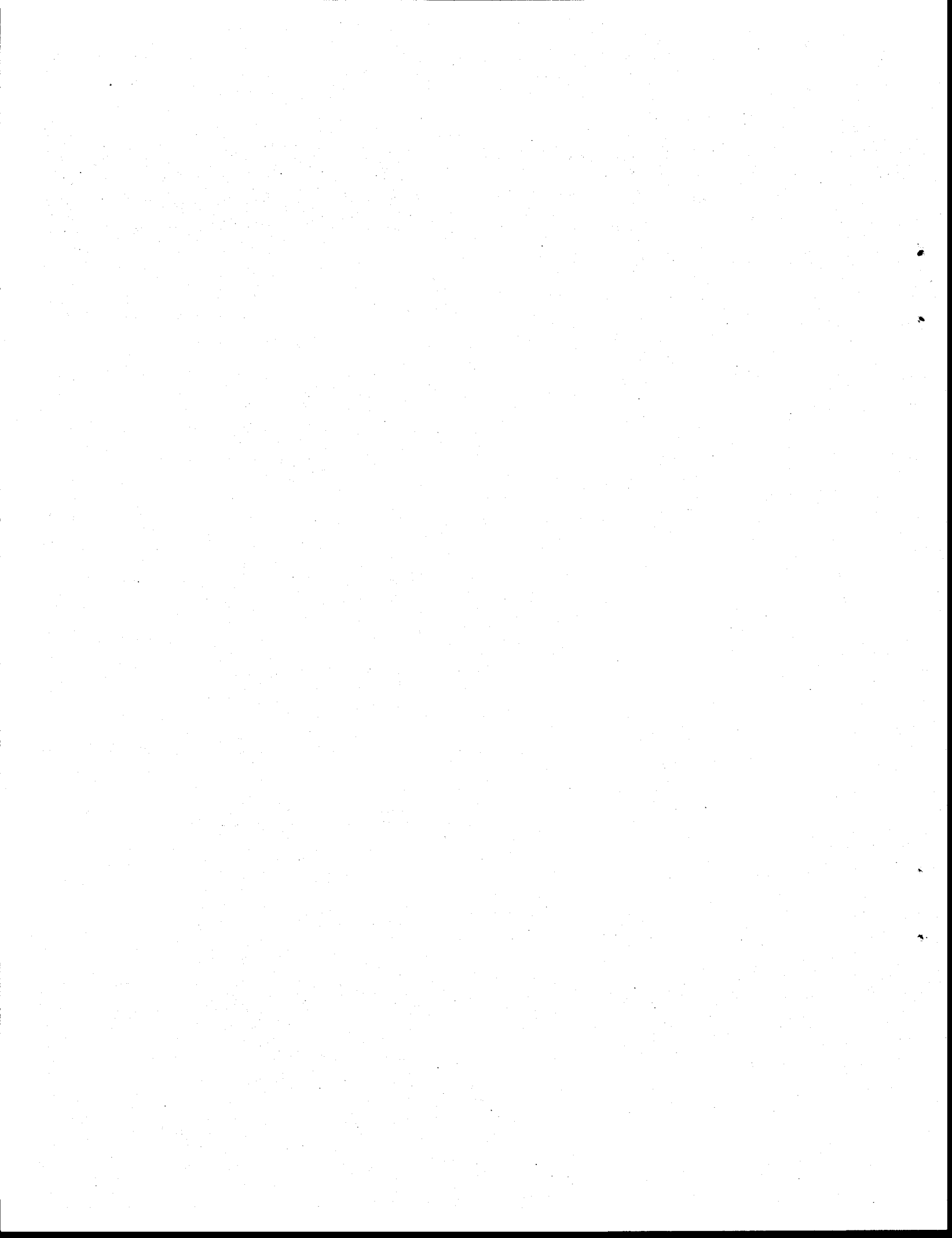
The area covered by this shrub fringe is less than one hectare. Table 6 shows typical vegetation characteristic of the Cladothamnus-Acer thickets. In the sample along the north side of the "rock garden", little Acer circinatum was present. Elsewhere in the fringe, Acer was prominent.

Table 6. Typical percent cover values for the Cladothamnus-Acer thicket fringing the Onion Peak rock garden, June 29, 1971.

Species	% Cover	Species	% Cover
<u>Cladothamnus pyrolaeiflorus</u>	80	<u>Fragaria virginiana</u>	+
<u>Calamagrostis nutkaensis</u>	50	<u>Maianthemum dilatatum</u>	+
<u>Iris tenax</u>	15	<u>Conioselinum chinense</u>	+
<u>Achillea millefolium</u>	15	<u>Sisyrinchium augustifolium</u>	+
<u>Gaultheria shallon</u>	10	<u>Cirsium edule</u>	+
<u>Festuca rubra</u>	5	<u>Erigeron peregrinus</u> ssp.	+
<u>Vaccinium ovalifolium</u>	3	<u>peregrinus</u>	
<u>Rosa nutkana</u>	3	<u>Claytonia sibirica</u>	+
<u>Berberis aquifolium</u> (dwarf)	2	<u>Senecio flettii</u>	+
<u>Vaccinium parvifolium</u>	2 ¹	<u>Acer circinatum</u>	+
<u>Prunella vulgaris</u>	+	<u>Rubus spectabilis</u>	+
<u>Lilium columbianum</u>	+	<u>Castilleja</u> sp.	+
<u>Danthonia californica</u>	+	<u>Arnica latifolia</u>	+

¹+ = < 2% cover.

Rubus spectabilis shrubland. On cut-over slopes below the forest, salmonberry (Rubus spectabilis), oval-leaf huckleberry (Vaccinium ovalifolium) and Pacific reedgrass (Calamagrostis nutkaensis) are prominent species. The assemblage comprises about 13 ha (33 ac.) of the proposed preserve. Thickets of salmonberry are one of the hazards encountered in climbing Onion Peak. Among the open, upper slope forest species residual after logging, is the rare queen-of-the-forest (Filipendula



occidentalis). A population has been found on the upper west slope of Onion Peak at about 900 m elevation, and another population about 300 m northeast of the summit in a steep gully. The plant may be located in moist areas to the north and east, as well. This shrubland and the massive rock outcrops are important as buffer around the Pacific silver fir stand and as habitat for Filipendula.

Flora

Chambers (1973) lists 150 vascular plants from Onion Peak above 730 m. Almost all the proposed preserve lies above this elevation. These plants together with 5 additional species encountered during the present reconnaissance are listed in Appendix 5.

Vascular plants of concern. Table 7 summarizes data on twelve plants of concern. Cardamine pattersonii, a candidate of the U.S. Fish and Wildlife Service for listing as a nationally endangered plant, is known from two other similar locations in Clatsop County: Saddle Mountain and Sugarloaf Mountain. Filipendula occidentalis, Saxifraga latipetiolata, and Synthyris schizantha have all been identified by the U.S. Fish and Wildlife Service as candidates for national listing as threatened species.

There are also eight species of concern for the State of Oregon. The southernmost populations of the western rattlesnake root (Prenanthes alata) and the southernmost population of Columbia lewisia (Lewisia columbiana var. rupicola) are present on the peak.

Table 7. Species of national and state concern on Onion Peak.

	<u>SPECIES</u>	<u>DISTRIBUTION</u>	<u>SA</u>	<u>SU</u>
	<u>Lewisia columbiana</u> var. <u>rupicola</u>	Mount Rainier and Olympic Mountains; Saddle Mountain, Clatsop County; Sugarloaf Mountain; near southern limit	X	X
E	<u>Cardamine pattersonii</u>	Saddle Mountain at high & low elevations, and Sugarloaf Mountain, Clatsop County	X	X
	<u>Saxifraga bronchialis</u> var. <u>vespertina</u>	Columbia River Gorge and adjacent Cascades of Oregon and Washington, N. to Mt. Rainier, Olympic Mountains Saddle Mountain Clatsop County Sugarloaf Mountain, Tillamook Co.	X	X
*T	<u>Saxifraga occidentalis</u> var. <u>latipetiolata</u> (=S. <u>latipetiolata</u>)	Saddle Mountain; Sugarloaf Mountain, Clatsop County; one or two other high peak locations in Clatsop and Tillamook Counties	X	X
I	<u>Filipendula occidentalis</u>	Coast slopes of Coast Range Clatsop, Tillamook, and Lincoln Counties, regional endemic		
	<u>Cladothamnus</u> <u>pyroclaeiflorus</u>	Alaska to northern Tillamook County, not common; near southern limit	X	X
**	<u>Castilleja</u> sp.	New species; also on Sugarloaf Mountain		X
T	<u>Synthyris schizantha</u>	Washington Cascades and Olympic Mountains, Saddle Mountain, southern limit in Tillamook Co., uncommon throughout range	X	
	<u>Erigeron peregrinus</u> ssp. <u>peregrinus</u>	Coastal and Cascade Mountains from Central Washington north; Saddle Mountain and Sugarloaf Mountain, southern limit; three known Oregon sites	X	X

Table 7. (Continued)

<u>SPECIES</u>	<u>DISTRIBUTION</u>	<u>SA</u>	<u>SU</u>
<u>Senecio flettii</u>	Olympic Mountains and from near Mount Rainier south to Tillamook County; Sugarloaf Mountain; three known Oregon sites		X
<u>Erythronium revolutum</u>	Southern British Columbia to Northwest California. Scattered in Washington, more common near the coast of Oregon. Populations declining	X	
<u>Scoliopus hallii</u>	West slopes of Cascades and coastal mountains of Oregon from Tillamook County (Clatsop Co.) south almost to California		

NOTES

- E Candidate endangered species. Federal Register, Vol. 40, No. 127, July 1, 1975, Part V and Vol. 41, No. 117, June 16, 1976, Part IV.
- T Candidate threatened species. Federal Register, Vol. 40, No. 127 July 1, 1975, Part V.
- *
a Saxifraga occidentalis var. latipetiolata has been recognized as a distinct species [S. latipetiolata (C. L. Hitchc.) Perk. & Elvand.]. This name is to be published soon (Information from Dr. Kenton Chambers).
- ** New species under examination.
- SA Species also occurs on Saddle Mountain, Clatsop County.
- SU Species also occurs on Sugarloaf Mountain, Clatsop County.

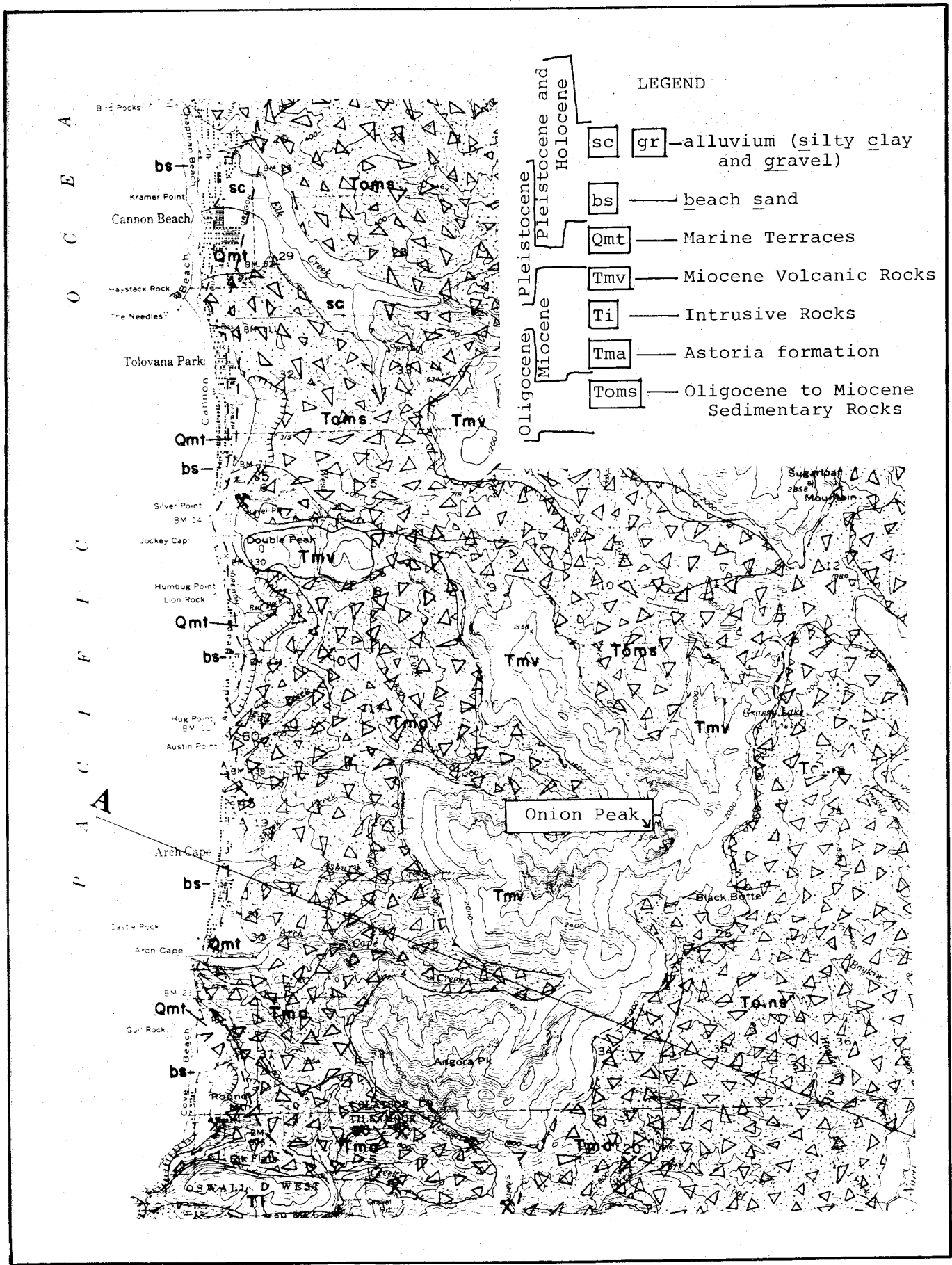


Figure 4. Geology of Onion Peak and Vicinity. Source: Schlicker et al. 1972.

Fauna

No formal surveys have been made to date. Dr. Robert Storm has kindly modified the lists of animals likely to be found at nearby Saddle Mountain (Alaback and Frenkel 1978). The tentative lists are found in Appendices 1-4. Although extensive use of the lower slopes by elk was observed, no elk droppings were found on the summit area. Rodent mounds and rodent grazing was evident.

Geology and Hydrology

Onion peak and the ridge to the north consist of extrusive igneous basalt of Miocene age (Tmv) that penetrates the surrounding older sedimentary rock. The rocky pinnacles, cliffs and ridges consist of breccias, basalt flow rock and pillow basalt (Figure 4).

Wickiup Mountain, Onion Peak, and similar topographic highs in the Cannon Beach quadrangle consist primarily of massive basaltic breccia... The breccia fragments are very angular and so closely packed that no intervening matrix is present. These are probably shatter breccias formed as thick bodies of basalt welled up on the sea floor. More easily eroded palagonitic breccias dominate in the valley east of Double Peak to the north....

In the Onion Peak area, undercutting of the softer sedimentary rocks below the breccias has produced massive landslides covering several square miles.

Schlicker et al. 1972: 20.

The basalt is petrochemically indistinguishable from the Yakima Basalt (upper Columbia River Group). It is structurally and texturally distinct as a result of the chilling effects of sea water at the time of extrusion (Schlicker et al. 1972). A number of other basalt peaks in Clatsop County are arrayed along a northeast-southwest trending line from the southwest corner of the county (Figure 1).

The surrounding sedimentary rocks are mapped in two formations (Figure 4). To the west and south is the Astoria Formation (Tma) consisting of Miocene sandstone and siltstone. To the east and north, the older Oligocene to Miocene rock is primarily siltstone and claystone (Toms).

Small seeps are common on the slopes below the peak and ridge within the boundaries of the proposed preserve. Lower down the slopes these water sources become intermittent streams, but intermittent and permanent streams are outside the boundaries of the NAP. No other aquatic features are known.

Climate

The Onion Peak climate combines high elevation characteristics with the moderating influence of the ocean. Summers are cool and winters relatively cold. Annual rainfall varies from 200 cm (80 in.) along the coast to over 300 cm (120 in.) in mountainous areas. Astoria, at sea level to the north, receives 200 cm average annual rainfall while Tillamook to the south receives 230 cm. Precipitation on Onion Peak is higher than that on the coast and may approach 300 cm annually. Approximately 80 percent of the precipitation occurs from October to March, much of it in the form of snow. Summer rainfall is low, but frequent fogs add to the effective moisture for plant growth on the peak.

Coastal temperatures are mild with July mean under 15.6° C (60° F) and January mean just over 4.4° c (40° F). The mean temperatures of Onion Peak are considerably lower. Based on a normal lapse rate of 6° C/1000 m (3.5° F/1000 ft.), one might anticipate the January mean lower than -1.6° C (29.1° F), and, considering the distance of the peak

from the moderating influence of the ocean, January mean temperature may even be lower.

Resource Base

Access

A number of logging roads end close to the base of Onion Peak or the ridge to the north (Figure 2). The closest approach is by the Hug Point Road which starts approximately 5.5 mi. (8.8 km) south of Cannon Beach east of Highway 101. The Hug Point Road joins the Onion Peak Road which switches back and then traverses south beneath Washington's Face to a small pass from which Onion Peak can be seen about one mile (1.6 km) to the northeast. The road then leads to a small saddle at the southwest base of the peak. Alternatively one can take the Tolovana Main Line, 2.5 mi. (4 km) south of Cannon Beach and turn south off Tolovana M.L. onto the unmarked Arch Cape road about 0.6 mi. (1.0 km) from Highway 101. To approach the north ridge of Onion Peak take the Tolovana Main Line and turn south after 1.6 mi. (2.6 km) onto Rock Crusher Road. It is recommended that visitors obtain the Astoria Map from Oregon State Forestry Department which shows the main roads. Checking with Crown Zellerbach field office in Seaside (738-6351) is worthwhile, as road conditions are frequently poor, with slides and washouts common.

The climb to the peak is best initiated by driving to the shallow saddle southwest of the summit from where one can climb the 800 ft. slope, northeast through steep cut-over land, ascending some broad gullies in the center of the steep, brushy west slope. Avoid the basalt pinnacles south and southwest of the peak. Salmonberry and slippery logs present

difficulties in getting to the peak. Access to the north ridge forest in straight-forward.

Historical Use and Resource Value

With exception of the surrounding logging, there is no known use of Onion Peak and ridge other than the recent botanical collection. Two botanical explorations of the Onion Peak area known. The first was by Dr. Larry Heckard of the University of California at Berkeley on 7 July 1967. This was followed by Dr. Kenton Chambers' visits in 1971 and 1972 (Chambers 1973).

The surrounding land was logged in the early 1960's (Dennis Rittenback, pers. comm.). The small tract of timber on the ridge was left, in part, because of logging difficulties and ownership.

State Forestry Department recognizes two types of forest cover in the Onion Peak parcel: (1) an older forest cover, stocked at an average of 25 overstory trees (270+ years of age) per acre of mixed conifers, predominantly western hemlock and true fir with an understory of the same species mix; (2) a logged forest which is regenerating and is a mixture of 70% Douglas-fir, 20% western hemlock, and 10% true fir with a stocking density of 350 trees per acre, age 11 years (1979). The cut-over forest covers about 13.4 ha (33 ac.), the older forest about 16 ha (40 ac.). The forested area is classified by State Forestry as "limited production, damageable" meaning that the tract is considered production land but harvesting is limited by low site (poor potential for growth), long rotations, fragile soils, and rough topography.

No cruise or appraisal of timber or land is available nor has there been an economic analysis as to the feasibility of long term management for timber production. The Astoria office of State Forestry states that because of topography, access and damageable site, any harvesting would have to be done by helicopter or balloon. Considering the high costs of these methods, low quality of timber, difficulty and costs of reforestation, low forest site class, and long rotation; it is possible the area is at best marginal for commercial timber production (pers. comm. Wm. Phelps, State Forestry, 2-10-79).

Fire protection is provided by the State Forester pursuant to ORS 477.205 to 477.300 and both the State Land Board and State Board of Forestry pay per acre Forest Patrol assessment for fire protection.

Leases and Easements

The 20.8 ha (51.3 ac.) State Land Board property is managed by the State Forestry Department in the same way and under the same policies as is the State Board of Forestry Land.¹ Granting of permanent easements, leases, and permits for other uses are handled separately by the two boards. Income from the State Land Board goes to the Common School Fund.

¹ Areas reported here are based on our planimentering from airphotos and maps provided by the State Department of Forestry. State Forestry estimates State Land Board land at 21.6 ha (53.3 ac.) and Forestry land at about 8.5 ha (21 ac.) or a total public ownership of 30.1 ha (74.3 ac.). No cadastral survey has been made and these acreages are close to those reported herein.

Educational and Scientific Values

Opportunities for scientific study abound. Plant geographers and plant geneticists can study the characteristics of the small isolated populations of species that occur on a few northern Oregon Coast Range peaks and in the Olympic Mountains. Genetic divergence between the populations can be studied. Researchers could also study the biology of small populations. Pacific silver fir is the dominant conifer at Onion Peak; while 24 km away, at Saddle Mountain, noble fir (Abies procera) is the dominant in otherwise equivalent forests. This curious distribution invites investigation. The vegetation of Onion Peak is little disturbed and data from there can be used to unravel the consequences of ungulate and human disturbance of other peaks. Finally, the area is important as a gene pool for the special species of concern.

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APPENDIX I

Amphibians Most Likely to be Seen on Onion Peak

(Compiled by Professor Robert M. Storm)

CAUDATA

Olympic salamander (Rhyacotriton olympicus). Should occur in streams, except adults confined to stream edges. May occur in permanent rock seeps.

Rough-skinned newt (Taricha granulosa). Probably present. Needs quiet water, lasting into later summer for breeding. May wander into area.

Dunn's salamander (Plethodon dunnii). Occurs in moist talus slopes.

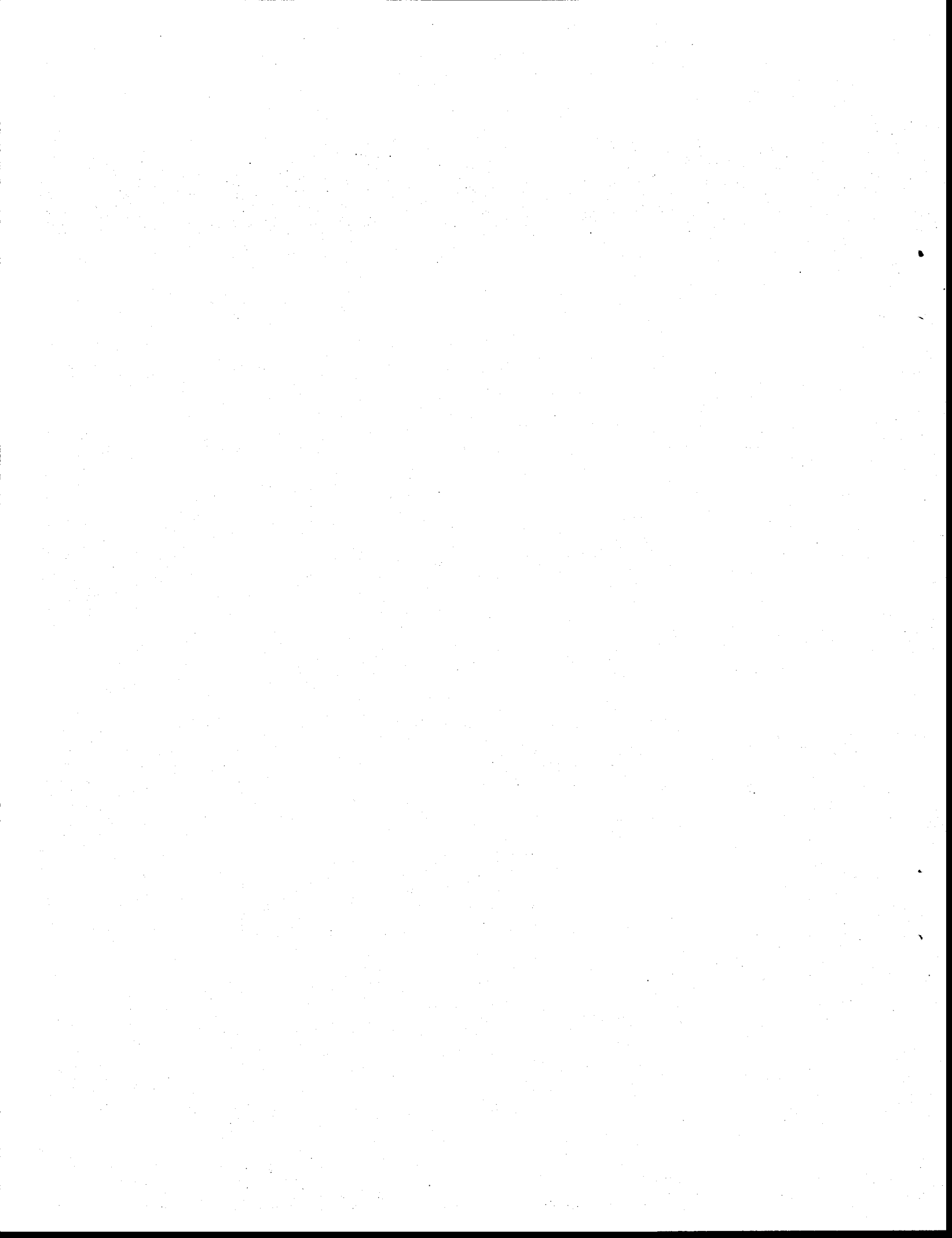
Western red-backed salamander (Plethodon vehiculum). Probably throughout in wooded areas.

Oregon salamander (Ensatina eschscholtzi). Occurs in more open wooded areas.

SALIENTIA

Pacific treefrog (Hyla regilla). Probably throughout. Breeds in small amounts of temporary water.

Red-legged frog (Rana aurora). Should be present. Adult life in moist woods. Breeds in temporary ponds. May occur, if breeding waters within 1/4 to 1/2 mile.



APPENDIX 2

Reptiles Most Likely to be Seen on Onion Peak

(Compiled by Professor Robert M. Storm)

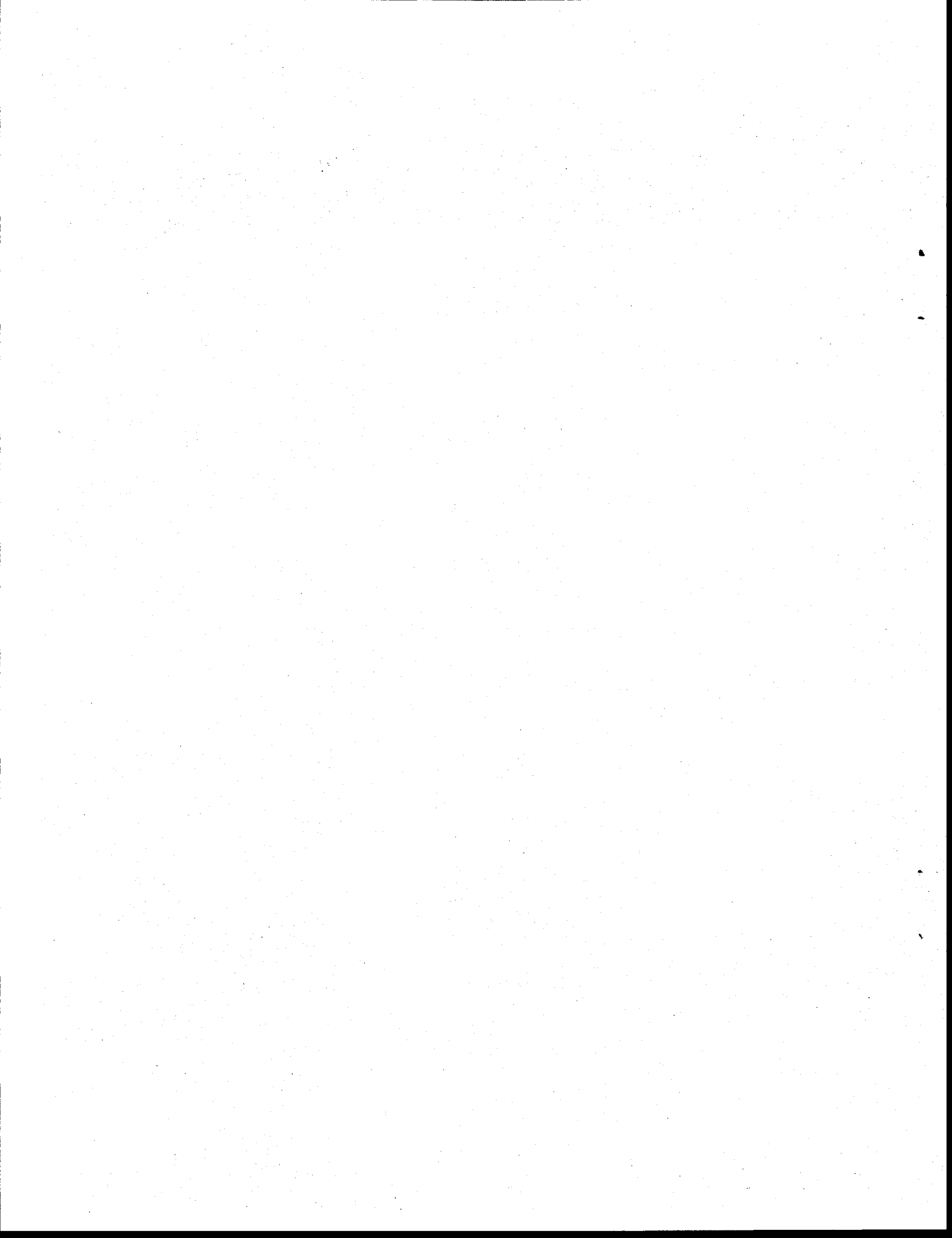
SQUAMATA

Northern alligator lizard (Gerrhonotus coeruleus). Probably present in rocky areas as at lower elevations.

SERPENTES

Rubber boa (Charina bottae). Requires somewhat open well-drained areas. Possible in and near bald area.

Northwestern garter snake (Thamnophis ordinoides). Prefers brushy edges with open areas for sunning. Probably fairly common in area.



APPENDIX 3

Birds Most Likely to be Seen on Onion Peak

(Compiled by Professor Robert M. Storm)

Birds listed are those most likely to be seen in Onion Peak area. Special emphasis is on those that may nest there. Most remarks apply to spring and summer.

Order: Falconiformes - hawks, vultures, falcons

Turkey vulture (Cathartes aura). Frequently seen soaring over area. May nest in forest or on cliff faces.

American kestrel (Falco sparverius). Possible nester in cliff crevices.

Order: Galliformes - chickenlike birds

Blue grouse (Dendragapus obscurus). Permanent resident of coniferous forest.

Mountain quail (Oreortyx pictus). Permanent resident of brushy to partly open areas.

Order: Columbiformes - pigeons and doves

Band-tailed pigeon (Columba fasciata). Nests high in coniferous trees.

Order: Strigiformes - owls

Northern screech owl (Otus asio). Permanent resident in broken coniferous forest and in alder.

Great horned owl (Bubo virginianus). Permanent resident in coniferous forests.

Pygmy owl (Glaucidium gnoma). Mixed coniferous forests and deciduous forests. Needs woodpecker holes (flicker size) for nesting.

Northern spotted owl (Strix occidentalis). Nests in mature old-growth coniferous forests.

APPENDIX 3 (Continued)

Order: Apodiformes - swifts and hummingbirds

Vaux's swift (Chaetura vauxi). Nests in hollow, burned-out trees, if present. Forages over openings in forest.

Rufous hummingbird (Selasphorus rufus). Brushland and mountainsides where suitable flowers occur.

Order: Piciformes - woodpeckers

Pileated woodpecker (Dryocopus pileatus). Resident of old forests where dead and dying trees furnish food.

Yellow-bellied sapsucker (Sphyrapicus varius). Deciduous trees.

Hairy woodpecker (Dendrocopos villosus). Mixed conifers and deciduous trees.

Order: Passeriformes - perching birds

Western flycatcher (Empidonax difficilis). Shaded coniferous or mixed forests.

Western wood pewee (Contopus sordidulus). Woodland or broken coniferous forest.

Olive-sided flycatcher (Nuttallornis borealis). Coniferous forest open or interrupted stands.

Violet-green swallow (Tachycineta thalassina). May nest in cliff crevices or in tree holes at edge of forest. Also buildings.

Grey jay (Perisoreus canadensis). Coniferous forests. Not common.

Steller's jay (Cyanocitta stelleri). Coniferous forests.

Common raven (Corvus corax). Nests on cliff ledges. Forages widely over area.

Chestnut-backed chickadee (Parus rufescens). Coniferous forests.

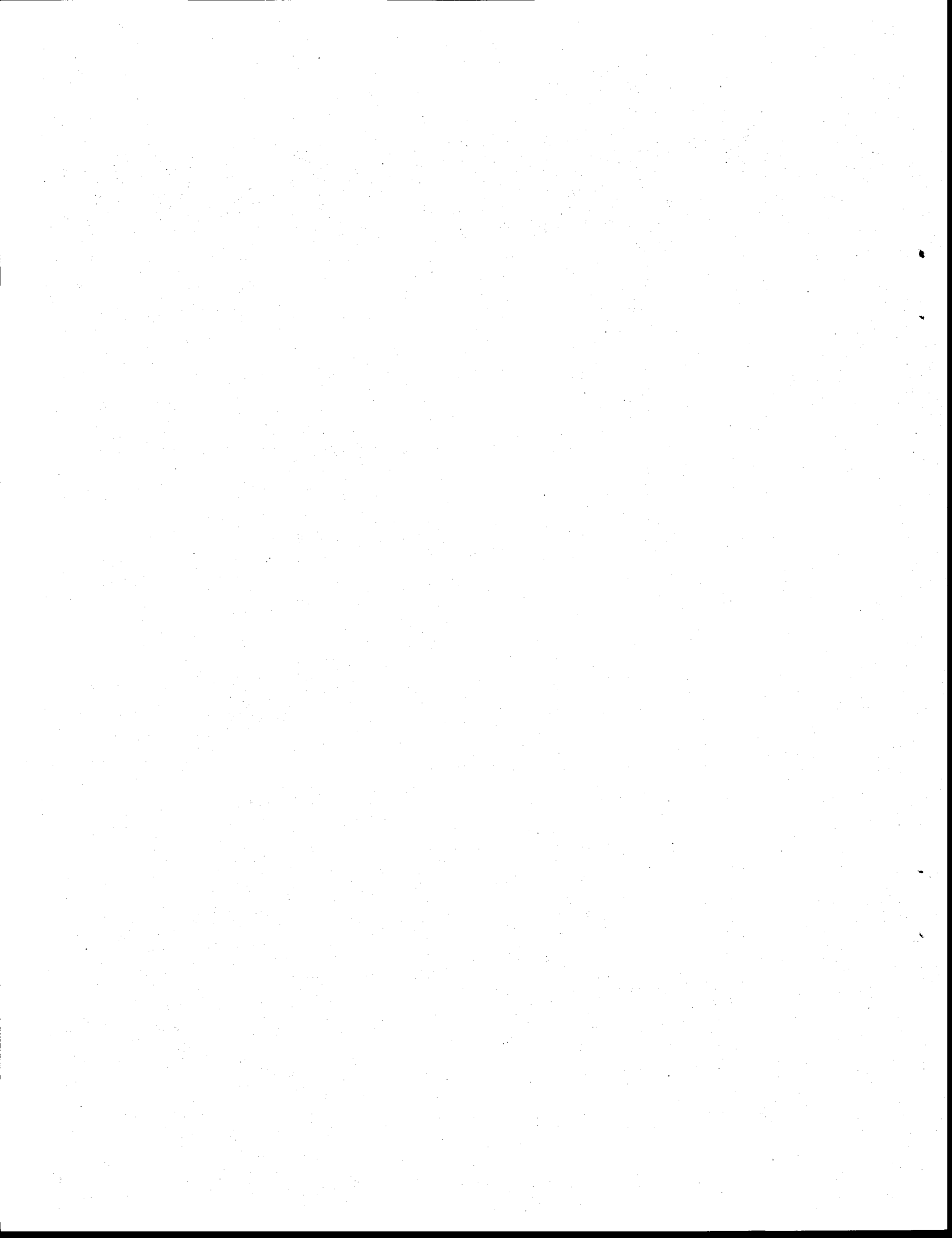
Red-breasted nuthatch (Sitta canadensis). Coniferous forests.

Brown creeper (Certhia familiaris). Dense old coniferous forests.

Wrentit (Chamaea fasciata). Brushy areas.

APPENDIX 3 (Continued)

- Winter wren (Troglodytes troglodytes). Matted vegetation and root tangles in shaded forests.
- Varied thrush (Ixoreus naevius). Nests in heavy stand of mature conifers.
- Swainson's thrush (Hylocichla ustulata). Willow and alder thickets near streams, dense forest understory on moist slopes.
- Golden-crowned kinglet (Regulus satrapa). Coniferous forests often high in trees.
- Hutton's vireo (Vireo huttoni). Status uncertain, but probably nests in broken conifer situations.
- Hermit warbler (Dendroica occidentalis). Fairly dense and shaded coniferous forests.
- Western tanager (Piranga ludoviciana). Open coniferous forest.
- Evening grosbeak (Hesperiphona vespertina). Dense mature coniferous forests.
- Purple finch (Carpodacus purpureus). Probably in mixed coniferous and deciduous areas.
- Pine siskin (Spinus pinus). Coniferous forests.
- Red crossbill (Loxia curvirostra). Coniferous forests.
- Rufous-sided towhee (Pipilo erythrophthalmus). Fairly thick brush with open ground beneath.
- Dark-eyed junco (Junco hyemalis). Open coniferous forests with low ground cover.
- White crowned sparrow (Zonotrichia leucophrys). Brushy areas on un-forested slopes - bald area.
- Song sparrows (Melospiza melodia).



APPENDIX 4

Mammals Most Likely to be Seen on Onion Peak

(Compiled by Professor Robert M. Storm)

Most of this list is deduced on the basis of general Oregon distribution habitats available in Onion Peak area.

INSECTIVORA

Vagrant shrew (Sorex vagrans). Usually in more open moist areas.

Dusky shrew (Sorex obscurus). Brushy to forested areas, usually near water.

Trowbridge shrew (Sorex trowbridgei). Brushy areas and forests.

Shrew-mole (Neurotrichus gibbsi). Forests and wooded areas.

Coast mole (Scapanus orarius). Forests and small clearings.

Little is known of bat distribution in Oregon. The following list is a tentative one, based on probability of occurrence in the Onion Peak area.

CHIROPTERA

Little brown myotis (Myotis lucifugus).

Yuma myotis (M. yumanensis).

Long-eared myotis (M. evotis).

Fringed myotis (M. thysanodes).

Long-legged myotis (M. volans).

California myotis (M. californicus).

Silver-haired bat (Lasionycteris noctivagans).

Big brown bat (Eptesicus fuscus).

Hoary bat (Lasiurus cinereus).

Western big-eared bat (Plecotus townsendi).

APPENDIX 4 (Continued)

LAGOMORPHA

Snowshoe hare (Lepus americanus). Dense thickets in coniferous forests.

RODENTIA

Mountain beaver (Aplodontia rufa). Usually in coniferous forest or advanced brushy growth near water.

Townsend chipmunk (Eutamias townsendi). Forests and dense brush.

Chickaree (Tamiasciurus douglasi). Throughout area in coniferous timber.

Northern flying squirrel (Glaucomys sabrinus). Advanced second growth and mature forests.

Mazama pocket gopher (Thomomys mazama). Probably uncommon, but should occur in meadows, if present.

Deer mouse (Peromyscus maniculatus). Throughout in better-drained areas. Avoids wet, marshy places.

Bushy-tailed woodrat (Neotoma cinerea). Rocky areas and around logs in forests.

California red-backed vole (Clethrionomys californicus). Around down logs in cool parts of advanced second growth and mature forests.

White-footed vole (Arborimus albipes). Rare if present. Ground dweller in dense forests.

Red tree vole (Arborimus longicaudus). Known to nest in coniferous trees, where they feed on the needles.

Creeping vole (Microtus oregoni). Most likely to occur in brushy cut-overs or small grassy clearings within the forest.

Pacific jumping mouse (Zapus trinotatus). Most often occur in meadows or near water within the forest.

CARNIVORA

Coyote (Canis latrans). Throughout area.

Black bear (Ursus americanus). Undoubtedly present in wilder timbered portions.

APPENDIX 4 (Continued)

Marten (Martes americana). Very rare, if present. Would occur in heavy coniferous forest.

Short-tailed weasel (Mustela erminea). Brushy areas, second growth.

Long-tailed weasel (Mustela frenata). Rocky places.

Spotted skunk (Spilogale putorius). Logs and undergrowth in forests.

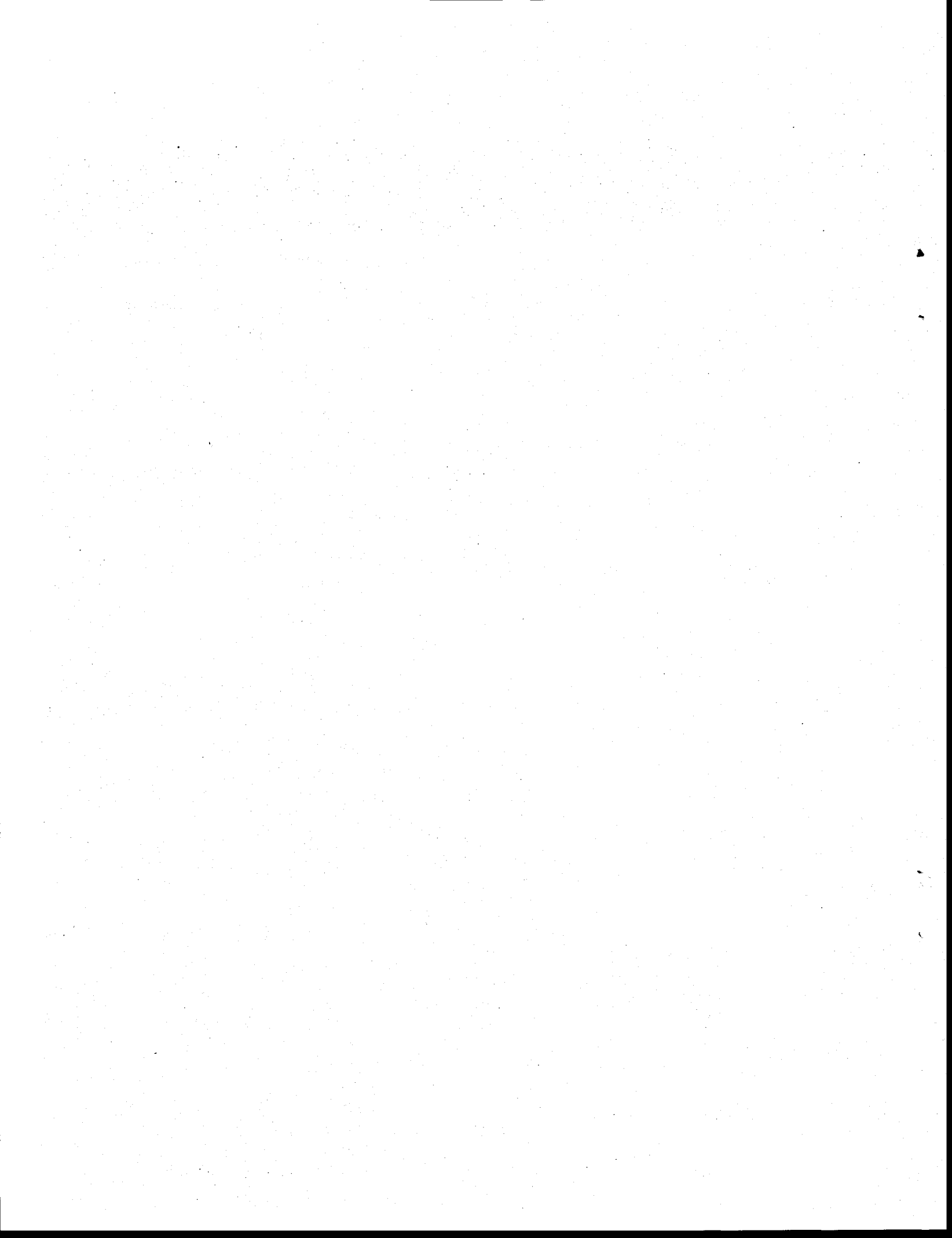
Mountain lion (Felis concolor). Probably moves through wilder parts of area.

Bobcat (Felis rufus). Numbers are down at present. Should occur in timbered parts of area.

ARTIODACTYLA

Roosevelt elk (Cervus elaphus roosevelti).

Blacktail deer (Odocoileus hemionus columbianus).



APPENDIX 5

Flora of Onion Peak

Compiled from Chambers (1973,1974) and field reconnaissance.

<u>FAMILY</u>	<u>SPECIES</u>
ACERACEAE	<u>Acer circinatum</u> Pursh <u>Acer glabrum</u> Torr. var. <u>douglasii</u> (Hook.) Dippel
ARALIACEAE	<u>Oplopanax horridum</u> (J. E. Smith) Miq.
BERBERIDACEAE	<u>Berberis aquifolium</u> Pursh <u>Berberis nervosa</u> Pursh <u>Vancouveria hexandra</u> (Hook.) Morr. & Dcne.
BETULACEAE	<u>Alnus sinuata</u> (Regel) Rydb.
CAPRIFOLIACEAE	<u>Sambucus racemosa</u> L. var. <u>leucocarpa</u> (T. & G.) Cronq.
CARYOPHYLLACEAE	<u>Arenaria macrophylla</u> Hook. <u>Arenaria rubella</u> (Wallenb.) Smith <u>Cerastium arvense</u> L. <u>Stellaria crispa</u> Cham. & Schlect.
COMPOSITAE	<u>Achillea millefolium</u> L. <u>Anaphalis margaritacea</u> (L.) Benth. & Hook. <u>Arnica latifolia</u> Bong. <u>Cirsium edule</u> Nutt. <u>Erigeron peregrinus</u> (Pursh) Greene ssp. <u>peregrinus</u> <u>Eriophyllum lanatum</u> (Pursh) Forbes <u>Hieracium albiflorum</u> Hook. <u>Hypochaeris radicata</u> L. <u>Prenanthes alata</u> (Hook.) Dietr. <u>Senecio flettii</u> Wieg.
CRASSULACEAE	<u>Sedum oreganum</u> Nutt. <u>Sedum spathulifolium</u> Hook.
CRUCIFERAE	<u>Cardamine pattersonii</u> Hend. <u>Erysimum asperum</u> (Nutt.) DC.

APPENDIX 5 (Continued)

- CUPRESSACEAE Thuja plicata D. Don
- CYPERACEAE Carex mertensii Bong.
- ERICACEAE Cladothamnus pyrolaeiflorus Bong.
Gaultheria shallon Pursh
Menziesia ferruginea Smith
Pyrola dentata Smith
Pyrola picta Smith
Pyrola uniflora L.
Vaccinium ovalifolium Smith
Vaccinium parvifolium Smith
- FUMARIACEAE Dicentra formosa (Andr.) Walp.
- GRAMINAE Agrostis diegoensis Vasey
Agrostis exarata Trin. ssp. minor (Hook.)
 C. L. Hitchc.
Bromus pacificus Shear
Bromus vulgaris (Hook.) Shear var. eximium Shear
Calamagrostis nutkaensis (Presl) Steud.
Danthonia californica Boland.
Deschampsia elongata (Hook.) Benth.
Elymus glaucus Buckl.
Elymus hirsutus Presl
Festuca rubra L.
Glyceria elata (Nash) M. E. Jones
Holcus lanatus L.
Koeleria nitida Nutt.
Melica subulata (Griseb.) Scribn.
Phleum alpinum L.
Poa gracillima Vasey
Poa marcida A. S. Hitchc.
Trisetum cernuum Trin.
- HYDROPHYLLACEAE Hydrophyllum tenuipes Heller
Romanzoffia sitchensis Bong.
- IRIDACEAE Iris tenax Dougl. ex Lindl.
Sisyrinchium bermudianum L. [= S. angustifolium
 Mill.]

APPENDIX 5 (Continued)

JUNCACEAE

Luzula campestris (L.) DC.
Luzula divaricata Wats.
Luzula parviflora (Ehrh.) Desv.

LABIATAE

Prunella vulgaris L.
Stachys mexicana Benth.

LEGUMINOSAE

Lotus micranthus Benth.

LILIACEAE

Allium cernuum Roth
Allium crenulatum Wieg.
Camassia quamash (Pursh) Greene var. maxima
(Gould) C.L. Hitchc.
Clintonia uniflora (Schult.) Kunth
Disporum smithii (Hook.) Piper
Erythronium revolutum Smith
Lilium columbianum Hanson
Maianthemum dilatatum (Wood) Nels. & Macbr.
Scoliopus hallii Wats.
Smilacina racemosa (L.) Desf.
Smilacina stellata (L.) Desf.
Stenanthium occidentale Gray
Streptopus amplexifolius (L.) DC.
Streptopus roseus Michx.
Trillium ovatum Pursh

LYCOPODIACEAE

Lycopodium clavatum L.

ONAGRACEAE

Epilobium alpinum L. var. lactiflorum
(Hauskn.) C. L. Hitchc.
Epilobium angustifolium L.
Epilobium glandulosum Lehm.
Epilobium minutum Hook.
Epilobium watsonii Barbey

ORCHIDACEAE

Corallorhiza mertensiana Bong.
Habenaria saccata Greene
Listera cordata (L.) R. Br.

OXALIDACEAE

Oxalis oregana Nutt.

APPENDIX 5 (Continued)

- PINACEAE
Abies amabilis (Dougl.) Forbes
Picea sitchensis (Bong.) Carr.
Tsuga heterophylla (Raf.) Sarg.
- POLEMONIACEAE
Microsteris gracilis (Hook.) Greene
Phlox diffusa Benth. ssp. longistylis Wherry
- POLYGONACEAE
Polygonum minimum Wats.
Polygonum nuttallii Small
- POLYPODIACEAE
Adiantum pedatum L.
Athyrium filix-femina (L.) Roth ssp. cyclosorum
(Rupr.) C. Chr.
Blechnum spicant (L.) With
Cryptogramma crispa (L.) R. Br. var.
acrostichoides (R.Br.) Clarke
Cystopteris fragilis (L.) Bernh.
Dryopteris austriaca (Jacq.) Woynar
Polypodium glycyrrhiza D. C. Eaton
Polystichum munitum (Kaulf.) Presl
- PORTULACACEAE
Claytonia sibirica L.
Lewisia columbiana (Gray) Robins. var. rupicola
(English) C. L. Hitchc.
Montia parvifolia (Moc.) Greene var. flagellaris
(Bong.) C. L. Hitchc.
- PRIMULACEAE
Dodecatheon pulchellum (Raf.) Merrill
Trientalis latifolia Hook.
- RANUNCULACEAE
Actaea rubra (Ait.) Willd.
Coptis laciniata Gray
Delphinium menziesii DC. var. pyramidale
(Ewan) C.L. Hitchc.
Ranunculus uncinatus D. Don var. parviflorus
(Torr.) Benson
Trautvetteria caroliniensis (Walt.) var.
occidentalis (Gray) C.L. Hitchc.
Anemone oregana Gray
- RIBESACEAE
Ribes lacustre (Pers.) Poir.

APPENDIX 5 (Continued)

ROSACEAE

Aruncus sylvester Kostel.
Filipendula occidentalis (Wats.) How.
Fragaria vesca L.
Fragaria virginiana Duchesne var. platypetala
(Rydb.) Hall
Rosa gymnocarpa Nutt.
Rosa nutkana Presl
Rubus pedatus J.E. Smith
Rubus spectabilis Pursh
Rubus ursinus Cham. & Schlect.

RUBIACEAE

Galium triflorum Michx.

SAXIFRAGACEAE

Boykinia elata (Nutt.) Greene
Heuchera micrantha Lindl. var. diversifolia
(Rydb.) R.B. & L.
Saxifraga bronchialis L. var. vespertina
(Small) Rosend.
Saxifraga caespitosa L. var. emarginata
(Small) Rosend.
Saxifraga ferruginea Grah. var. macounii
Engl. & Irmsch.
Saxifraga mertensiana Bong.
Saxifraga occidentalis var. latipetiolata C.L.
Hitchc. [= S. latipetiolata (C. L. Hitchc.) Perk.
& Elvand.]
Tellima grandiflora (Pursh) Dougl.
Tiarella trifoliata L.
Tolmiea menziesii (Pursh) T. & G.

SCROPHULARIACEAE

Castilleja hispida Benth.
Castilleja sp. (endemic? new species?)
Collinsia parviflora Lindl.
Mimulus dentatus Nutt. ex Benth.
Nothochelone nemorosa (Dougl. ex Lindl.) Straw
Orthocarpus pusillus Benth.
Penstemon cardwellii How.
Penstemon serrulatus Smith
Synthyris schizantha Piper

SELAGINALLACEAE

Selaginella oregana D. C. Eaton
S. wallacei Hieron.

APPENDIX 5 (Continued)

TAXACEAE

Taxus brevifolia Nutt.

UMBELLIFERAE

Conioselinum chinense (L.) B. S. P.

Heracleum sphondylium L.

Lomatium martindalei C. & R. var. flavum
(G. N. Jones) Cronq.

Osmorhiza purpurea (C. & R.) Suksd.

VALERIANACEAE

Valeriana scouleri Rydb.

VIOLACEAE

Viola adunca Smith

Viola glabella Nutt.

Viola sempervirens Greene

APPENDIX 6

Restored Corner for State of Oregon-Department of Forestry
Section Corner

Section corner common to Sections 22, 23, 26 and 27,
T4N, R10W, W.M., Clatsop County, Oregon.

ORIGINAL

Post (now missing) from which a:

- 9" cedar bears N14 $\frac{1}{2}$ °E 29 lks.; now 18" wind fall, no scribes remaining.
- 24" Larch bears S42°E 27 lks.; missing.
- 24" Hemlock bears S9°W 31 lks.; missing.
- 60" Cedar bears N54°W 3 lks.; now 60" wind fall with scribe marks visible.

RESTORED

Set 1 $\frac{1}{2}$ " x 36" galvanized iron pipe with 3" bronze cap marked "OREGON
STATE BOARD OF FORESTRY T4N R10W S22 S23 S27 S26 1965 RS 401",
21 inches in ground, in mound of rock, and from which a:

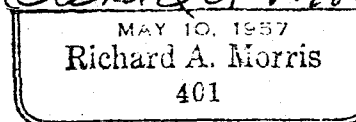
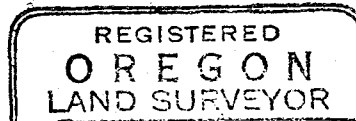
- 45" Cedar stump bears N1°E 33.9 ft.; scribed T4N R10W S23 BT.
- 27" Hemlock stump bears N38 $\frac{1}{2}$ °W 19.2 ft.; scribed T4N R10W S22 BT.
- 34" Cedar stump bears S70°W 54.2 ft.; scribed T4N R10W S27 BT.
- 17" Hemlock bears S45°E 26.0 ft.; scribed T4N R10W S26 BT RS 401.

Set 1" x 1" x 60" Alum. painted Cedar post 1.5 ft. NE of corner pipe.
Oregon State Forestry Department metal location poster on 17" Hemlock BT.

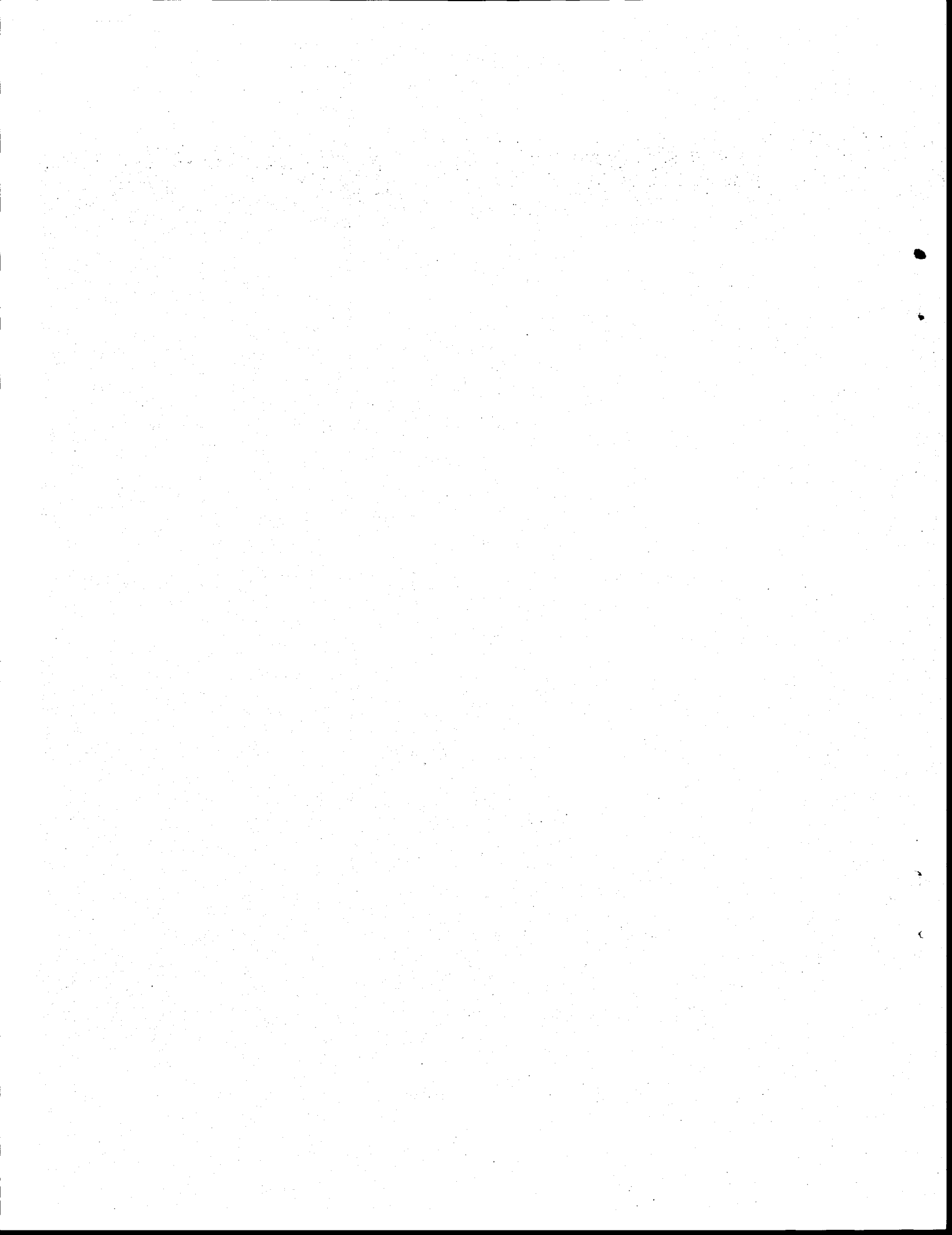
Dated September 29, 1965

Restored by /R. Ross, Transitman

 under my direction.



Present and witnessed by O. Olson	G. McKibbin
R. Martin	E. Davis
W. Bonsanti	



GOALS OF THE OREGON NATURAL AREA SYSTEM^{1/}

1. All public lands and waters within the state that constitute natural areas are subject to alteration by human activities unless such public lands and waters are preserved and protected for the use and benefit of the people of this state.
2. Natural areas are valuable to the people of this state for educational and scientific uses, for habitats for plant, animal and marine species, for the preservation of the paleontological resources and the natural historic features of such public lands and waters, for public benefits from the features of such public lands and waters and for the purpose of preserving such public lands and waters as living museums of the natural heritage of this state.
3. It is the public policy of the State of Oregon to secure for the people of this state the benefits of an enduring resource of natural areas by establishing a system of natural area preserves and by providing for the management and protection of such natural area preserves.

GOALS OF NATURAL AREA PRESERVES ADVISORY COMMITTEE

1. Cooperate in developing a coordinated program of preserving representative samples of Oregon's typical and unique ecosystem types or natural features by dedicating natural area preserves on public lands.
2. Provide educational and research opportunities in Oregon through access to natural area preserves as basic resources.
3. Compile and periodically update a comprehensive list of natural area locations in Oregon, and maintain a list of natural area preserves needs.
4. Assure perpetual protection to dedicated natural area preserves and maintain preserves in as nearly a natural condition as possible.
5. Encourage the establishment of natural area preserves on qualified areas that appropriate local governments, resource agencies or citizens recommend to the State Land Board and advisory committee.
6. Recommend natural area preserves in suitable locations throughout the state, including those within and near Oregon's population centers.
7. Publish and disseminate appropriate information about natural area preserves.

^{1/}Goals taken from Natural Area Statute, ORS 273.567.