HABITATS AND DISTRIBUTIONS OF LAND VERTEBRATES ON THE CORVALLIS WATERSHED MARY'S PEAK, BENTON COUNTY, OREGON

by

FRANKLIN WRIGHT STURGES

A THESIS

submitted to

OREGON STATE COLLEGE

in partial fulfillment of
the requirements for the
degree of

MASTER OF ARTS

June 1955

APPROVED:

[redacted]

Professor of Zoology

In Charge of Major

[redacted]

Head of Department of Zoology

[redacted]

Chairman of School Graduate Committee

[redacted]

Dean of Graduate School

Date thesis is presented May 4, 1955

Typed by Patricia Sturges

Acknowledgements

There are many people to whom I am grateful for their assistance and encouragement throughout this study.

Dr. Kenneth Gordon, the major professor; Dr. Robert Storm, and Charles Hansen all visited the area and discussed the problem numerous times when difficulties arose.

David Gibney, H.M. Lilligren, and Rex Ressler, of the Siuslaw National Forest, were all very helpful at all times. They supplied maps and information gained from their experiences while working on the watershed.

Dr. Albert N. Steward helped with identification of some of the plants collected.

Dr. Chester Youngberg very kindly made available information about the soils as far as his study has progressed.

For my wife, Patricia Sturges, I feel the most appreciation of all for her continual encouragement, assistance in the field, helpful criticism of the thesis during preparation, and for typing it.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

HABITATS AND DISTRIBUTIONS OF LAND VERTEBRATES ON THE CORVALLIS WATERSHED MARY'S PEAK, BENTON COUNTY, OREGON

INTRODUCTION

The Corvallis Watershed on Mary's Peak offers a good situation for an ecological study of pristine conditions. It is large enough to contain the ranges of some of the larger animals and includes some vegetation variations due to elevation, exposure, and soil differences. The vegetation is dense forest characteristic of the Oregon Coast Range Mountains. There is not much known about the ecology of the land vertebrates in this type of forest. In 1952 it became necessary for the Forest Service to begin a program of development on the watershed to stop the spread of the Douglas fir bark beetle that was attacking the over mature trees. The possibility of field study in this area was brought to my attention while I was looking for a Master's thesis problem. The Forest Service and city officials enthusiastically encouraged any possible studies of the watershed.

The effects of man's activities and his impact on his environment have both academic and practical

importance. Useful information of this sort can result from observation of the primitive conditions and the subsequent changes that take place during and after disturbance. Because of my interest in problems of this nature I entered upon an investigation which took advantage of this situation.

It was hoped that a cursory description of the vegetation and a brief discussion of the land vertebrates in relation to their habitats might serve as a background for further study as the development program continues.

METHODS AND MATERIALS

The field work was done over a two year period. The equivalent of about 18 weeks was spent in the area, mostly during the two summers. Frequently camps were established just outside the boundary of the watershed or in the camp ground on top. The rest of the time it was necessary to commute from Corvallis. During the winters daytime excursions were made at infrequent intervals to get information of a seasonal nature. Unfortunately, the spring season is not well represented in my observations.

The time of day that observations were made varied a great deal. In the early summer of the first year I tried to be in the area as soon as possible after daylight. This was frequently as early as 4:30 a.m. It was found, however, that the birds did not become very active until it was warmer and the sun penetrated the canopy, which was seldom before 6:30 a.m. Observations were also made well after dark in attempts to locate owls but these were all unsuccessful with the exception of one spring evening to be mentioned later. The length of trapping periods varied from 18 hours to three days. The second day usually had a lower return and the third day was a failure in the few attempts made.

Where possible, the information was obtained by

direct observation. Small mammals were obtained with Museum Special snap traps, Oneida Victor gopher traps and 0 steel traps, Victor rat traps, and cans half filled with water were sunk in runways. The first mentioned was responsible for most of the individuals caught. Various baits were used. The one most frequently employed was a mixture of peanut butter, rolled oats and bacon fat. Birds that were difficult to identify were collected with a shotgun whenever possible. The reptiles and amphibians were preserved in alcohol. All of the animals that were collected were placed in the Oregon State College Museum of Natural History. Some plants were collected and now are in the Oregon State College Herbarium.

Several persons with a more intimate knowledge of the watershed supplied much valuable information. The personnel of the Siuslaw National Forest who worked in the area discussed the vegetation and their observations of the fauna and supplied maps and information of the terrain and history.

Mr. George Buckingham added much information from his experiences, particularly about the carnivores. He grew up while living near the lower boundary of the watershed. His father was employed there as caretaker from the early 1920's to late 1940's, consequently they both became very familiar with the region. The younger

Buckingham was interested in animals and even though he had no formal training his descriptions indicate he was very observant. He was kind enough to relate his observations to me and I present many of them here.

There were several difficulties encountered in the field work due to the dampness characteristic of this region. Frequently, the traps were sprung by a large slug as it took the bait from the treadle. On some nights as many as 15 to 20 percent of the traps were sprung in this manner. The slugs also would eat parts of animals caught. A few times this meant ruined skulls. Fog drip and rain also would set off a large percentage of traps. The large drops falling from the needles above were sufficient to spring them unless they were placed under a log or similar protection. Because the area is a watershed it is not possible to camp in it and this reduces the effectiveness of the field time considerably.

The authorities followed for nomenclature were as follows: plants, Peck (15); reptiles and amphibians, Schmidt (19); birds, the American Ornithologists' Union Checklist (1) and supplements; and mammals, Miller and Kellogg (14). The sources that were found useful in the field were Gabrielson and Jewett (8), Peterson (16), Hoffmann (9), Burt (4), Bailey (2), and Dalquest (5).

DESCRIPTION OF THE AREA

LOCATION

The Corvallis Watershed consists of the Rock Creek and Griffith Creek drainages on the east side of Mary's Peak. It is located near the western margin of Benton County in west-central Oregon. It is included within the western part of Range 6W and most of Range 7W in Township 12S Willamette Meridian. The area is about 2 miles south and 7-9 miles west of Philomath. Three Forest Service roads give easy access to the watershed. The road which enters at the northeast boundary is reached by Woods Creek Road which leaves U.S. Highway 20 west of Philomath. Easy entry at the southeast boundary is made by a road which follows Rock Creek from State Highway 34 into the middle of the watershed. The third road also leaves Highway 34 but farther west. It is the public road to the summit of the peak.

EXTENT AND BOUNDARIES

The limits of the area studied did not coincide exactly with the boundaries of the watershed (see map). A portion of the top of the mountain not in the watershed was included for its uniqueness. Most of the area north of Rock Creek and east of the confluence of Rock Creek and Stillson Creek was excluded. Otherwise the

MARYS PEAK AREA

Study Area and Watershed Boundary

Deviation of Watershed from combined boundary

Surfaced Roads

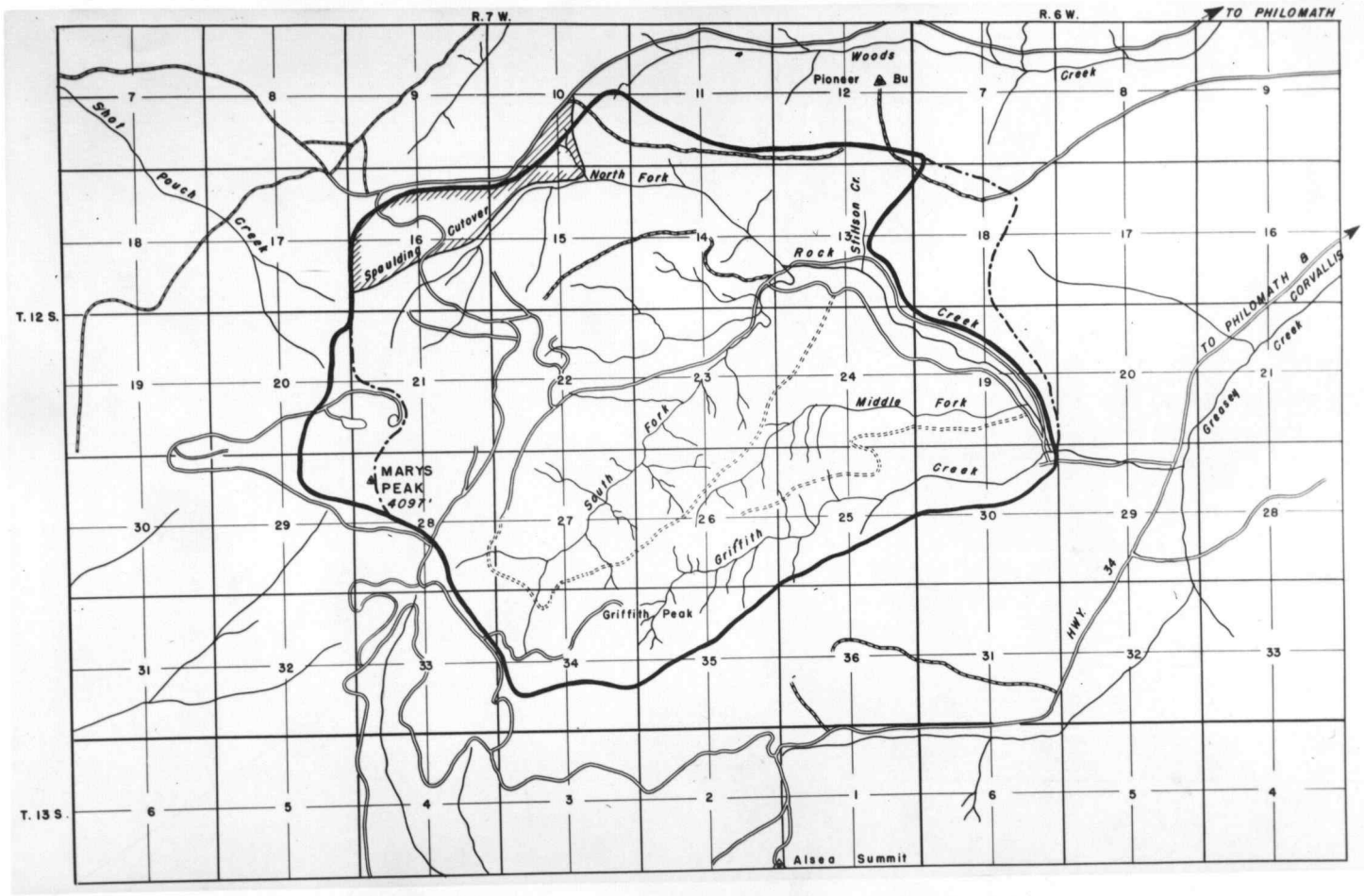
Unsurfaced Roads

Proposed Roads

Creek

Cutover

Lookout


R. 7 W.
R. 6 W.
TO PHILOMATH
T. 12 S.
T. 13 S.
Sheep
Pouch
Creek
Spaulding
Cutover
North Fork
Rock
Stillson Cr.
Woods
Pioneer
Bu
Creek
Middle Fork
Creek
South Fork
Griffith
Griffith Peak
MARYS PEAK
4097'
HWY 34
TO PHILOMATH & CORVALLIS
Greasey
Creek
Alsea Summit

marked boundaries of the watershed were used.

At its greatest dimensions the area is about five miles long east and west by four miles north and south. The elevation ranges from 4097 feet at the summit to about 450 feet where Griffith and Rock Creeks meet.

There are about 8500 acres within these boundaries. Approximately three-fourths of this is in Forest Service ownership. The rest is owned by the city of Corvallis except for a few acres in private ownership and in public domain (on the very top). The Forest Service recently made agreements with the city to manage the whole area as one unit.

GEOLOGY AND TOPOGRAPHY

The Oregon Coast Range is a dissected plateau or upraised peneplain and is structurally a low anticlinorium. The several peaks that rise above the general level of the crest of the range are monadnocks (7, p. 460). Mary's Peak is one of these and is the highest (4097 feet) north of the Umpqua River. It is the result of resistance of a sill of igneous rock intruded conformably into weak sedimentary rocks of the Burpee formation of Eocene age. The sandstones and siltstones of the Burpee formation lie unconformably on basalts of the Siletz River volcanic series. The igneous rock cap is thought to be a remnant of a once

more extensive body. There are only a few small areas of sedimentary rocks (mostly altered by heat) left on the granophyric gabbro that composes the bulk of the sill (18, pp.43-46).

From near the summit of the peak a ridge extends to the north. To the southeast of the body of the peak is Griffith Peak (3100 feet). A saddle is formed by a lower ridge which connects the two peaks. The western boundary of the watershed is along these ridges. The north boundary is situated on the ridge between the North Fork of Rock Creek and Wood's Creek. The south boundary is along Griffith Ridge south of Griffith Creek. Between these two ridges are five others of greater or lesser magnitude running parallel to them. The various ridges join the peak between 2000 feet and 2500 feet above sea level. In between all of these ridges are branches of Rock and Griffith Creeks. Most of the slopes are steep. On the south side of the peak there is a drop of 1500 feet from the summit in a half mile linear distance, while on the east side there is a drop of 2000 feet in one mile. The drop in elevation along the ridges is more gentle but their sides are also very steep.

SOILS

Study of the soils of the watershed is not completed at the present time. Information obtained so far indicates control by parent material over the soil type. Aiken clay loam, a rather heavy soil that has developed from basalt, occurs up to 1000 to 1300 feet in elevation. Above this is the Olympic clay loam which also developed from basalt. It extends to elevations varying from 1900 feet in sections 12 and 22 to 2600 feet in section 28. From the upper limit of the Olympic soil to about 3000 to 3200 feet are soils based on sedimentary rock that are not yet worked out but thought to be of the Melborne, Sites, and Astoria series. Above this zone is found an unclassified soil of loam texture that overlies the gabbro cap.(Youngberg, Oregon State College Soils Department, personal communication)

CLIMATE

Because of the proximity of the Pacific Ocean with the Japanese Current a short distance offshore, the Coast Range Mountains have a humid, temperate climate. East of these mountains is the Willamette Valley which is drier. Unfortunately, there are no weather stations which gather complete information situated near Mary's Peak. There is a rain gauge at the lower eastern limits

of the watershed. At Summit twelve miles north and west of the peak a similar station is maintained. Corvallis, in the Willamette Valley, is the closest station getting complete records. Table I shows the precipitation at these three stations.

Table I

Precipitation at Stations in Vicinity of Mary's Peak

	Elev.	Ave. Annual Rainfall	Ave. Annual Snowfall	Ave. Number of Days Receiving .01" Rain
Watershed	450'	67"	--------	----------
Summit	750'	60"	15.1"	160
Corvallis	220'	39"	7.4"	140

Corvallis temperature records are as follows: annual average 52°F., January average 39°F., July average 66°F., average number of days between freezing temperature 195, highest temperature recorded 107°F. in 1946, the lowest recorded -14°F. in 1919 (17, p. 2,5). The upper elevations of the peak are cooler and receive more precipitation than any of these stations. There is a moderate snowfall that generally leaves snow on the ground on the north facing slopes from about December to May. Drifts may accumulate up to a depth of fifteen feet or more in favorable places. Fog drip adds to the precipitation, especially on the windward slopes.

FORMER STUDIES OF OREGON COAST RANGE AND MARY'S PEAK VICINITY

There has been very little study made of the plants and animals in the Mary's Peak vicinity. A summary of the work that has been done will follow.

Two studies have been made on Saddle (or Saddleback) Mountain in northeastern Lincoln County about 25 miles north and a little west of Mary's Peak. The first of these, by Dr. Jane Dirks-Edmunds (6), is a comparison of the cedar-hemlock association of the Oregon Coast Range with the oak-hickory association found in Piatt County, Illinois. The area in Oregon was about 2 hectares in extent and was at 1400 feet in elevation. The floras and the common animals of both areas are described and discussed in relation to reaction, coaction and aspection.

The second study on the same plot on that mountain, by Dr. James MacNab (10), is a five year study of the plants and animals. He relates the seasons to plant and animal activities and the meteorological data gathered.

Dr. Robert Bratz made a study of the bird habitats found in the central section of the Oregon Coast Range Mountains (3). He presents a discussion of the several habitats frequented by birds in the area and the birds that are found in them. The study was made over an 18 month period. Mary's Peak was one of the areas visited

while the material was being gathered.

Dr. Vernon Bailey mentions briefly in Mammals and Life Zones of Oregon (2, pp.96, 269-270) having been on Mary's Peak (he called it Mt. Chintimini, as many other people have). Observations on two species, Lepus americanus and Lynx rufus are recorded.

George Cantwell in 1919 collected 55 mammals from a location 5 miles southwest of Philomath which is probably not far from the present eastern boundary of the watershed. Some of the species he obtained are usually found in a more open valley situation than is found on the watershed (letter from Viola Schantz, U.S. National Museum). The information of these two collectors that is possibly applicable to the present study is included in the species accounts.

Dr. Murray Johnson in 1952 collected 13 mammals at Connar's Camp and the camp ground on top.

Dr. John Merkle analysed the plant communities of Mary's Peak above the 2250 foot level (12, 13). The primary purpose was to ".....test the feasibility of employing quantitative methods combined with qualitative observations in order to define a plant community" (12, p.3). For my descriptions of these communities I draw heavily on this work. I incorporate a few changes of identification as found in the herbarium.

Reptiles and amphibians have received attention from several individuals. Drs. Robert Storm and Philip Dumas have done the most in this line. Their collecting was both on the lower parts of Rock Creek and up near the top on Parker Creek. Dr. Storm joined me in collecting along the upper parts of North Fork of Rock Creek.

HISTORY AND PROBABLE FUTURE USE

For many years the city of Corvallis has used the Rock Creek and Griffith Creek drainages as a source of water supply. In 1920, 1,720 acres of federal land, derived from an old Oregon and California Railroad land grant, were transferred from control of the Bureau of Land Management to the United States Forest Service for management as a watershed. This transfer stopped the logging operations of the Spaulding interests that were taking place in the area that is now the northwest corner of the watershed. In 1922 the Forest Service and the city entered into a cooperative management. Subsequent to this agreement the city began a program in which it purchased 1,938 acres below the Oregon and California lands to help protect the water source and intakes. In 1940 the Forest Service acquired 5,021 acres by purchase under the terms of the Weeks Law of 1911.

This completed government control over all but a very small area of the drainages of the two creeks.

In the early 1950's the over mature Douglas fir trees were attacked by the Douglas fir bark beetle (Dendroctonus pseudotsugae). Scattered throughout the old stand are spots of dead trees varying in extent from a few trees to 30 acres or more. In order to protect the watershed from fire and to keep the beetle damage from getting worse it was decided to begin a program of development which included the cutting of dead and infected trees and the establishment of a road system for fire patrol and log removal. In 1953 this plan was put into effect. Eventually there will be about 30 miles of surfaced road and 60 million board feet of timber will be salvaged. After that about five million board feet will be harvested annually. Cutting will be in small clear-cut patches and every effort will be made to speed regeneration.

VEGETATION AND HABITATS

The cover of almost all of the study area is dominated by large trees. The largest area of non-forest is found as a meadow on the top. This amounts to a little less than one square mile. On the south and southwest sides just below the meadow and to a lesser extent on the east side are patches of brush. Near Pioneer Butte are three meadows, the results of former homesteading activities. They are right on the eastern boundary of the watershed. There are some very small islands of bracken fern and some of brush in the old Spaulding cut-over which is mostly covered with young trees. On the north side there is a small part of an old burn (1908) that is included in the watershed. This was not visited but Merkle (12, p.20) reports its being covered with a dense stand of young Douglas fir. A few very small meadow areas in openings are scattered through the forest at lower elevations. The rest of the watershed is composed of stands of mature or mixed age trees.

MEADOW

The most common plants in the meadow on top of the mountain are red fescue (*Festuca rubra*), bent grass (*Agrostis hallii*), and sedge (*Carex californica*). They

are co-dominants, are very abundant, are evenly distributed throughout the community and grow in large groups or colonies. Other plants in decreasing abundance are: wind flower (Anemone lyallii), bracken fern (Pteridium aquilinum), violet (Viola glabella and adunca) wild rye (Elymus glaucus), Agrostis exarata, yarrow (Achillea lanulosa), lupine (Lupinus albicaulis), red sorrel (Rumex acetocella), Collinsia parviflora, Arenaria macrophylla, Senecio integerrimus, false Solomon seal (Smilacina sessilifolia) and others (12, pp.47-48).

In the period just after World War I this area was cultivated. The venture apparently was not successful and there is no evidence now of this past disturbance. Possibly the stock used in plowing introduced the Festuca idahoensis that was collected there in the 1920's.

On the southwest exposure of the peak above about 4000 feet is an area of thin soil and bare rock outcrops. This side feels the full impact of the prevailing southwest winds. The conditions here are very rigorous for plant life. Therefore, it is not as well covered by plants as the remainder of the meadow. There is an area on the south side of the western arm of the meadow with similar conditions, though not as severe or extensive.

Plants were not collected from the three "homestead" meadows. They are all grazed by sheep.

Conditions vary from very dry in the summer on the south facing slopes to more-or-less continually moist draws. The vegetation showed differences in these different situations. Rushes grow in the wettest soils. On the intermediate soils is a lush stand of grass and sedge with Rubus vitifolius widely spread. In the drier parts the grasses are not as luxuriant. A few apple trees and a black berry bramble remain as a reminder of the meadow's history.

The meadow as a habitat supplies the needs of several animals. The garter snake, Thamnophis ordinoides, is more abundant in the thick grass than elsewhere on the watershed. The meadow by itself is used by migrants, only, among the birds. The American pipit (Anthus spinoletta) is the most common of these. The white-crowned sparrow (Zonotrichia leucophrys) and the Oregon junco (Junco oreganus) are the most common of the birds which use the edge of the meadow--foraging in the grass but singing and seeking refuge in the trees nearby.

Among the mammals, the Oregon creeping mouse (Microtus oregoni) is the most frequently trapped. The rather obscure runways are very abundant. Moles (Scapanus orarius) and pocket gophers (Thomomys monticola) make their presence known by mounds of earth. The latter are not very common, at least if numbers trapped are an

indication.

The rocky outcrop and the thin soil are inhabited by the deer mouse (Peromyscus maniculatus, which was not caught in the denser grass) and the Beechey ground squirrel (Citellus beecheyi). This is the only place in the area studied that the ground squirrel was found. Alligator lizards (Elgaria coerulea) also are found associated with these rocks.

BRUSH

On the south and southwest sides of the peak is found a narrow band of brush of varying width. It reaches from the meadow to the trees found at a lower elevation. The most abundant species of shrubs in this community are vine maple (Acer circinatum), hazel (Corylus californica), and ocean spray (Holodiscus discolor). Species that are less abundant are rose (Rosa gymnocarpa), snowberry (Symphoricarpos albus), hawthorne (Crataegus douglasii) and willow (Salix scouleriana). Around the edge and scattered within the growth are blackberry vines (Rubus vitifolius).

Animals that are more or less restricted to the brush are mountain quail (Oreortyx picta) and golden-crowned sparrow (Zonotrichia atricapilla). Deer make heavy use of the area as evidenced by the paths and an occassional clubbed shrub. Deer mice were by far

more easily trapped in this stand than any other place where they were found.

NOBLE FIR

From about the lower limit of the gabbro cap in the vicinity of 3200 feet elevation up to the lower edge of the meadow the trees are predominantly noble fir (Abies nobilis). There are a few western hemlocks (Tsuga heterophylla) and Douglas firs (Pseudotsuga mucronata) scattered in among the true firs. Below the gabbro cap to about 1800 feet a few isolated noble firs can be seen.

The understory beneath the noble fir is sparse except in the more open stands on the west or south exposures. Young trees of both hemlock and noble fir are present, the fir being the more common. Oxalis oregana and Montia sibirica are the most frequently found herbs. Some of the other plants present are Luzula parviflora, Trisetum cernuum, Senecio triangularis, Coptis laciniata, Elymus glaucus, Scrophularia californica, Stellaria crispa, Viola glabella (12, pp.53-54).

The top of Mary's Peak above 3500 feet is the area discussed by Bratz (3, pp.35-39) for the noble fir forest habitat for birds.

There were no amphibians, reptiles or mammals found

to be more numerous in this community than in the others. Of the birds, the sooty grouse (Dendragopus obscurus) was found to be more abundant in this community than elsewhere.

DOUGLAS FIR

Douglas fir is the most abundant tree below the belt of the noble fir. On favorable north and east exposures hemlock (Tsuga heterophylla) and western red cedar (Thuja plicata) will be found with the Douglas fir down to approximately 1500 feet. The cedar is not very abundant and is only on the moister soils. The hemlock is more common. It grows mixed with the fir or as a pure stand over small areas, usually on north exposures. Hemlock and cedar account for the young trees except in occasional openings where the Douglas fir can get established. On south exposures the fir grows mostly in pure stands. Most of the fir at these upper elevations are 250 to 400 years old.

From the lower limits of the study area decreasing in numbers upwards to 1500 or 1800 feet are some trees more frequently found in the valleys. Oregon maple (Acer macrophyllum) is the most abundant of these. Others are chinquapin (Castanopsis chrysophylla), ash (Fraxinus oregana) and yew (Taxus brevifolia) around seeps and along streams, and grand fir (Abies grandis), flowering dogwood (Cornus nuttallii), and oak (Quercus garryana) at lower

elevations. Most of the Douglas fir in this zone is even age from about 125 to 150 years old with a few, old, wolf trees scattered among them. The fir is now taller than most of the rest of the trees. Some of the maple and ash are beginning to die out. Occasional tall snags are seen. The presence of two distinct stands of different ages probably indicates the occurence of two different fires within the past 500 years. On the lower, south-facing slopes the presence of dying broad-leaved trees is evidence of a seral stage that is now passing into a stage of Douglas fir.

There are two types of understory beneath the Douglas fir. That characteristic of the upper zone is found on the Olympic and Melbourne, Sites, Astoria Series soils. The break between the upper and lower zones is not sharp but is at about the same elevation as the change from Olympic to Aiken soil.

Vine maple, salal (Gaultheria shallon), sword fern (Polystichum munitum), and Oregon grape (Berberis nervosa) are the most abundant species of the upper zone understory. In a few places they are all present in very dense tangles with the vine maple above the others. In other places under stands of hemlock the ground is almost barren of plants.

Elsewhere the relative abundance of shrubs varies

from place to place so that at one place the ground is covered with sword fern and a short distance away with salal.

Huckleberry (Vaccinium parvifolium) is present but not common. Among the herbs vanilla-leaf (Achlys triphylla) is abundant in patches and Oxalis oregana is common and widespread. Additional, less common species are Montia sibirica, western fescue (Festuca occidentalis), Trillium ovatum, Luzula parvifolia, Anemone deltoidea, bed straw (Galium triflorum), star flower (Trientalis latifolia), western gold-thread (Coptis laciniata), and others.

The understory of the lower zone is characterized by some of the same species but also has additions. The growth is not as dense. The main shrubs are hazel, vine maple and ocean spray. The hazel and ocean spray begin to appear with vine maple at about 1500 feet. The ocean spray is not abundant except in places where there is more light. The hazel becomes more abundant as one proceeds downward and away from the main peak. On the south facing slopes at low elevations it is the dominant shrub. Rose and snowberry are also found in this zone. Bracken fern comes into open areas and is sometimes present under trees. Herbs that can be found are California harebell (Campanula prenanthoides), twin flower (Linnaea borealis),

Tiarella trifoliata, and most of the others also found higher.

MacNab's (10) and Dirks-Edmunds' (6) descriptions and photographs of the area they studied on Saddle-back Mountain make me believe that that area was similar to Mary's Peak at the same elevation. It has been logged since their studies so I could not make observations of my own. The main difference seems to be in the shrub layer. On Saddle-back this layer was made up mostly of huckleberry (Vaccinium parvifolium) instead of the vine maple, ocean spray, and hazel found on Mary's Peak. The herbs and trees were about the same on both mountains.

There were no animals found to be restricted to the Douglas fir.

RIPARIAN

No extensive riparian vegetation was found. Either the stream-sides were without vegetation or plants previously mentioned occurred there. Some alder (Alnus oregana) was present in scattered places. Ash was common along the main stream but was also found in moist spots other than near streams. Probably a more careful search would reveal other species. Along the lower extremes of Rock Creek are two small areas that are the result of filled-up ponds behind old dams.

There are grasses, sedges, cattails and horsetails in both of these areas.

There were several mammals found only along streams or at least in definitely moist areas. These were beaver (Castor canadensis), muskrat (Ondatra zibethica), Phenacomys albipes, Microtus longicaudus, and raccoon (Procyon lotor).The water ouzel (Cinclus mexicanus), kingfisher (Megaceryle alcyon), and great blue heron (Ardea herodius) were the birds associated with streams. Of course many of the amphibians are found mainly near or in water. Some of these were the giant salamander (Dicamptodon ensatus), mountain salamander (Rhyacotriton olympicus), and the bell toad (Ascaphus truei).

SPAULDING CUT-OVER

The area in the northwest corner of the watershed that was logged clear by the Spaulding operation prior to 1920 amounts to less than a square mile. It is now covered by young trees, mostly Douglas fir, and patches of bracken fern, huckleberry, etc. Well up on the north fork of Rock Creek is an area of tall alders with grasses and sedges growing beneath in wet ground. In more open places there are a few cherry trees (Prunus emarginata) and blue elderberry (Sambucus glauca).

SPECIES ACCOUNTS

At the beginning of this study I had hoped to gather data in such a way that quantitative values could be presented for at least the more numerous species. It soon became apparent that this would demand too much time and would not be reliable with the methods I could use. Therefore, the comments on abundance in the following accounts were not arrived at systematically and are subjective impressions only.

There were reports of the occurrences of various species in the watershed in the past or present which I was unable to verify. These are included in the list of species accounts and are marked by an asterisk (*).

The seasonal status of bird species is shown by the following symbols: R., resident; S.V., summer visitor; and M, migrant. The designations are based on my observations and, therefore, are very tentative. If there was too little evidence I make no statement.

It was not considered advisable to consider identification to subspecific level in this study. The identification of birds was on sight alone or one or two skins which is not adequate for subspecies determination. According to the literature most of the breeding animals included are well within the range of their subspecies.

AMPHIBIANS

Dicamptodon ensatus Pacific giant salamander

The aquatic larvae of this species are common in the small pools of the streams from 450 feet to at least 3300 feet on Rock Creek and were found by Storm and others in Parker Creek at 3000 feet, just below the boundaries of this study on the southwest side of the peak. A few adults were taken near streams under bark, etc. on the east side of the mountain. One small adult was found devouring a slug 200 yards from a stream.

Rhyacotriton olympicus Mountain salamander

This salamander is abundant among the rocks of the small streams. They are found at all elevations in the watershed.

Taricha granulosa Rough-skinned newt

Only one specimen of this species was taken. It was found beside the middle fork of Rock Creek at 450 feet.

Plethodon dunni Dunn's salamander

This salamander is found under rocks and bark in moist situations. They were taken by Storm on Rock Creek at the lower limits of this study area. Others were collected by Dumas further up the same creek at about 700 feet. Storm and I found them up to about

2700 feet on a fork of Rock Creek.

Plethodon vehiculum Western red-backed salamander

This species is found very abundantly in the study area along creek banks or in the moist duff of the forest floor. They were taken by both Storm and Dumas low on Rock Creek and Storm and I found them up to about 3400 feet on a branch of the same stream.

Ensatina eschscholtzi Eschscholtz's salamander

Only one specimen of this species was taken. This was under bark in a moist location at 2000 feet near a fork of Rock Creek.

Ascaphus truei Tailed frog

The larvae of this frog can readily be found in rapidly moving water above about 1800 feet (also possibly lower). In the early summer adults were frequently found hopping about on the open forest floor on the east and north slopes. Later in the season they were only found near streams.

Hyla regilla Pacific tree frog

Only one specimen of this species was found. The adults were sometimes heard in spring and early summer. No larvae were found.

REPTILES

Sceloporus graciosus Sagebrush lizard

The only place these lizards were found was along a road cut overhung by dead fern fronds on a south facing slope at about 700 feet. In this situation they were common.

Gerrhonotus coeruleus Northern alligator lizard

Specimens of this species were taken by Vincent Roth in 1946 and Kenneth Walker in 1950 from the rock outcrops on the southwest slopes of the peak at 4000 feet. I saw a lizard, probably of this species, but it escaped before I could capture it. This was at about 700 feet in an old log near Rock Creek.

Thamnophis ordinoides Red-striped garter snake

This snake was found frequently in all habitats in the study area where there was grass. They appeared most abundantly in the thick grass on the meadow on top.

Thamnophis sirtalis Common garter snake

Only a few specimens of this species have been taken from the study area. One was by Vincent Roth in 1949 in the meadow on top. I found one in the thick grass along the north fork of Rock Creek in the Spaulding cut-over under the alder thicket.

BIRDS

*Ardea herodius — Great blue heron

This bird is reported by Buckingham to appear occasionally along lower Rock Creek.

Cathartes aura — Turkey vulture — S.V.

Occasionally individuals of this species were seen gliding among or over the trees or over the meadow on top.

Accipiter striatus — Sharp-shinned hawk — R.

Two pairs of sharp-shinned hawks were encountered frequently in the forest. One pair raised young on the ridge just west of Stillson Creek. The members of the other were seen several times near the fire road at 2200 feet.

Buteo jamaicensis — Red-tailed hawk — R.

These were seen sailing through the trees, or more frequently over the trees, numerous times. Possibly a pair nested on the watershed though no nest was found.

Circus cyaneus — Marsh hawk — M.

Marsh hawks were seen in both autumns (September) hunting over the meadow on top but at no other times.

Dendragapus obscurus R.

Anywhere on the watershed, but particularly in the firs around the meadow on top, one is likely to see or hear these grouse. They are quite common.

Bonasa umbellus Ruffed grouse R.

This bird is present in all habitats of the watershed but is not common. There were too few seen to determine habitat preference.

Oreortyx picta Mountain quail R.

When seen, this birds has always been in brush just outside the limits of this study area. They have been heard in the brush just below the meadow. Feathers of a mountain quail were found in the meadow on top near the brush on the south side.

Columba fasciata Band-tailed pigeon

These birds can sometimes be heard or seen in small bands or alone in the dense forest, usually high in the trees, but a few were caught by surprise on the ground. They immediately flew away.

Glaucidium gnoma Pigmy owl

Several little owls of this species inhabited the thick forest of the watershed. Two were seen active during the daytime. One early evening in May four birds responded to an imitating whistle. One came down

within a few feet of me until a movement frightened it away.

Chordeiles minor Night hawk S.V.

Occasionally these birds were seen darting about over the meadow on top in the late dusk of July evenings.

Chaetura vauxi Vaux's swift S.V.

Small flocks or individuals of this species were seen foraging a few times over the meadow on top or over the tops of the trees of the lower slopes.

Selasphorus rufus Rufous hummingbird S.V.

Individual hummingbirds were seen in all habitats in the study area but most frequently in the Douglas fir. They were among the first migrants to arrive in spring.

Megaceryle alcyon Belted kingfisher

One individual was seen at the confluence of Rock Creek and Stillson Creek in late October.

Colaptes cafer Red-shafted flicker R.

This species was seen occasionally in all habitats but most frequently around the south and east slopes of the meadow on top where there are old snags and the look-out telephone line.

Dryocopus pileatus Pileated woodpecker R.

This large woodpecker is found throughout the watershed wherever there are dead trees from which it can obtain food. In working on a tree it cuts large holes so that large piles of chips accumulate at the bases of old stumps. This evidence of activity is frequently seen.

Sphyrapicus varius Red-breasted sapsucker R.

These sapsuckers were found in the virgin Douglas fir forest up to about 1200 feet and in the Spaulding cut-over up to about 2000 feet. They frequently made use of roadways to fly from one point to another. Bratz (3, p.38) recorded it once in the Noble fir forest.

Dendrocopos villosus Hairy woodpecker R.

Dendrocopos pubescens Downy woodpecker R.

Both of these woodpeckers were found in the watershed in any of the habitats but most frequently in the old forest where there was an abundance of dead limbs and trees. Because of the slight differences in appearance of these two species it was not always possible to make positive identification. Of the times it was possible to make identification the downy was the more frequently seen.

Empidonax hammondii Hammond's flycatcher S.V.

This flycatcher was found quite common wherever there was a tree growth high enough so that there was a high canopy with exposed perches and room to fly beneath. From these perches they will sing and occasionally flit out to grab an insect and return to the same or a nearby perch. Two individuals were collected. The identification was confirmed by Dr. Alden H. Miller of the Museum of Vertebrate Zoology, Berkeley, California.

Empidonax difficilis Western flycatcher S.V.

The western flycatcher was seen even more frequently than Hammond's and contrary to it was found mostly in the brush. It sings and makes foraging sorties from the upper branches of vine maple or other shrub, usually underneath a canopy. Sometimes they were found in trees but not usually as high as the Hammond's.

Contopus richardsoni Wood peewee S.V.

The wood peewee was found only a very few times in the virgin forest but several were seen in the Spaulding cut-over.

Nuttallornis borealis Olive-sided flycatcher S.V.

Only two individuals were discovered--both singing from the tops of tall, isolated trees. One of these was in the old burn on the north side of the peak at about 2700 feet. The other was in the virgin forest at about 7000 feet.

Perisoreus canadensis Canada jay R.

This species is well represented in the watershed. It is found throughout the forested parts.

Cyanocitta stelleri Steller's jay R.

This jay, as with the previous one, is always present in the fir forest but not in large numbers.

Corvus corax Raven R.

The raven is found in limited numbers anywhere within the watershed. They were frequently seen flying in from the valley to the east and making circles to gain altitude in the late afternoon probably to roost high on the mountain. They appeared as much at home swooping through the dense forest as over the meadow on top or over the trees.

Nucifraga columbiana Clark's nutcracker M.

A few members of this species were seen flying about the meadow on top on a clear day, October 25, 1952. No others were seen.

Parus rufescens Chestnut-backed chickadee R.

This species is common in the forested parts of the watershed. It usually travels in flocks, often in the tops of the trees where they are hard to see.

Sitta canadensis Red-breasted nuthatch R.

These noisy birds are abundant throughout the year anywhere in the watershed where there are trees.

Certhia familiaris Creeper R.

Creepers can be found almost any time and any place within the watershed where there are trees.

Cinclus mexicanus Dipper

One individual was seen on Rock Creek at 700 feet. Another just outside the study boundary was seen at the falls on Parker Creek, 3000 feet.

Troglodytes troglodytes Winter wren R.

Any place in the watershed where there is an understory or debris on the ground this little wren is sure to be found. It is the most frequently seen bird throughout the year.

Turdus migratorius Robin S.V.

The robin was found in limited numbers on the meadow and in the noble fir trees surrounding it. Only rarely did it venture into the lower forests.

Ixoreus naevius Varied thrush R.

This bird was found commonly throughout the watershed any time during the year.

Hylocichla guttata Hermit thrush

Hylocichla ustulata Russet-backed thrush

During the spring and summer these birds can be heard in the early morning or evening singing from many points in the watershed. They were infrequently seen. The hermit thrush was not found below 1100 feet and occurred less frequently than the russet-backed thrush.

Sialia mexicana Western bluebird

This bluebird was seen only a few times in flocks in spring or fall on top of the peak. Bratz also records one observation from there.

Sialia currucoides Mountain bluebird

A pair of this species was seen once on the summit of the peak early in the morning of July 1, 1953. They sat in the top of a small fir tree and were watched for several minutes at 30 feet distance with 16 power binoculars. They were seen later by Dr. R.M. Storm and an ornithology class. Unfortunately, it was not possible to collect them.

Myadestes townsendi Townsend's solitaire R.

Solitaires were seen occasionally in any part of the virgin forest or on top of the mountain. One was collected at 900 feet on the south fork of Rock Creek.

Regulus satrapa Golden-crowned kinglet R.

This little bird of the tree tops was heard or seen regularly throughout the year anywhere within the watershed.

Regulus calendula Ruby-crowned kinglet W.V.

Members of this species were seen once only. However, they probably occur commonly with the flocks of chickadees and golden-crowned kinglets during the winter months.

Anthus spinoletta American pipit M.

Flocks of pipits were seen in the fall on the meadow. They remained quietly in the grass until disturbed and then would fly away and circle into the wind only to land again in the grass at some distance from the intruder.

Vireo solitarius Solitary vireo S.V.

Vireo gilvus Warbling vireo S.V.

The vireos were found only in the Spaulding cut-over,

the solitary vireo more often than the other. Bratz observed a solitary vireo in the noble fir.

Vermivora celata Orange-crowned warbler S.V.

This species was seen a very few times in the Spaulding cut-over.

*Vermivora ruficapilla Calaveras warbler

Bratz reported seeing this warbler twice on top of the peak.

Dendroica auduboni Audubon's warbler

I saw this bird once in the brush on top. Bratz also recorded it there.

Dendroica townsendi Townsend's warbler M.

Two individuals were seen on May 8, 1954, in the trees at the edge of a recently cleared area.

Dendroica occidentalis Hermit warbler S.V.

This warbler is very commonly heard singing in the early summer from the tops of trees in the watershed. They are difficult to see because of their habits but their singing indicated they are quite abundant.

Wilsonia pusilla Pileolated warbler S.V.

The pileolated warbler seems to prefer brush near streams. Wherever these conditions are found in

the watershed there will usually be a pair present

Piranga ludoviciana Western tanager S.V.

One family of this species was frequently seen along Rock Creek at 700 feet. Bratz reported one from the top.

Hesperiphona vespertina Evening grosbeak

Flocks of these birds are most likely to be seen during the spring high in the trees. Only once were they seen on the ground. This was in the noble fir forest in the early spring. Frequently, their presence could be detected only by their call as they flew overhead above the trees.

*Carpodacus purpureus California purple finch

This bird was reported by Bratz as present on the top of the peak. While with me on a "homestead" meadow C.G. Hansen saw one. They undoubtedly are fairly common but I did not see them myself.

Spinus pinus Pine siskin

This bird is probably fairly common in the high trees but I detected it only a few times.

Loxia curvirostra Red crossbill R.

Flocks of these birds are likely to be heard or seen anywhere, any time in the trees of the watershed.

Passerculus sandwichensis Savannah sparrow M.

One flock of individuals of this species was seen on the "homestead" meadow near Pioneer Butte in September 1954. This was the only time they were seen.

Junco oreganus Oregon junco R.

Common resident throughout the watershed but found most frequently around the fringe of the meadows.

Spizella passerina Chipping sparrow

Bratz reports seeing these birds four times on the top.

Zonotrichia leucophrys White-crowned sparrow S.V.

This is a very common bird around the meadow on top during the summer months.

Zonotrichia atricapilla Golden-crowned sparrow M.

This species is recorded on the basis of one individual caught in a mouse trap in the brush on top in September, 1954. Probably it occurs as a migrant fairly commonly.

Melospiza melodia Song sparrow

The song sparrow was seen only once. This was amongst the horsetails (Equisetum) beside a small rivulet at 1000 feet elevation.

MAMMALS

Scapanus townsendii — Townsend's mole

I collected one specimen of this species ¼ mile west of Rock Creek and Stillson Creek confluence. This was on a south facing grassy slope near the road. Cantwell collected two.

Scapanus orarius — Coast or Pacific mole

Five individuals of this species were collected. They came from all of the cover types described. Evidences of their presence were quite common in the form of burrows and/or mounds. Cantwell collected one.

Sorex trowbridgii — Trowbridge shrew

S. vagrans — Vagrant shrew

S. yaquinae — Yaquina shrew

Shrews of all of these species were trapped regularly during both summers. I believe they all occur in all of the habitats but the series I preserved were not adequate to be certain on this point. The S. vagrans was more frequently trapped than the others. Bailey (2, p.358) reports having seen a S. bendirii on a trail on the mountain. They may be present but I failed to catch any. Cantwell collected all three forms that I found.

*Myotis californicus California myotis

Two were collected by Cantwell. I saw no bats during this study.

Euarctos americanus Black bear

I didn't see any bears myself. The loggers see them occasionally. A crew of men working for the Oregon State Game Commission shot a cub on Griffith Ridge a few years ago. I found a scat, probably of a bear, in the trail on that same ridge.

Procyon lotor Raccoon

Raccoon sign is quite common along the lower creek banks. Buckingham says he has seen them frequently.

*Martes caurina Martin

Buckingham reported that martin were trapped years ago in the watershed. I have been unable to confirm this. The range of the animal includes Mary's Peak so it is highly possible it did or does occur there.

*Mustela frenata Longtail weasel

*M. erminea Shortail weasel

My efforts were in vain so I must rely on Buckingham again. He described two weasels. One was light cream colored and the other darker and with more red in it. They are becoming more numerous now.

*Mustela vison — Mink

Buckingham said he saw mink, usually where there were rabbits.

*Spilogale gracilis — Civet cat or spotted skunk

*Mephitis mephitis — Striped skunk

According to Buckingham both skunks are found in the watershed. Prior to 1940 the civet was the most numerous. About that time there was a reduction in numbers of skunks and deer. From then on the striped skunk has been the more numerous. The closest I came to verifying his account was smelling their presence.

*Vulpes fulva — Red fox

*Urocyon cinereoargenteus — Gray fox

Buckingham reports that he has seen both species of foxes on the watershed. The gray fox is seen fairly frequently. The red fox was seen mostly only in the early 1940's.

*Canis latrans — Coyote

Buckingham has seen coyotes in limited numbers only. One member of the Forest Service crew said he saw tracks in snow that he though were coyote.

*Canis lupus — Gray wolf

Buckingham described two animals he thought were

wolves as being taller, bluer and with a bushier tail than a coyote. He got a brief glance of them at close range while they stood on a log across a creek. He also got quick glimpses of them a few other times. He said his father found a den of young wolves in the rocks on top in the 1920's. The present caretakers report large animals they call wolves but also say there are feral dogs in the area much of the time so there is a chance of confusion on this point.

*Felis concolor Mountain lion

Buckingham said he saw cougers and also saw very large cat tracks.

*Lynx rufus Bobcat

Several times I found scats that were probably evidence of this species. A truck driver said he had seen one carrying a flying squirrel. Buckingham claims they are becoming more numerous since 1940 when "government trappers" ceased their operations in the area.

*Lynx canadensis Lynx

According to Buckingham there was a second kind of cat in the watershed that was larger and had longer ear tufts than the bobcat which was called lynx. He saw the two species both dead and alive.

Citellus beecheyi Beechey ground squirrel

There is a small colony of these squirrels in the rocks on the southwest side of the top of the peak. Cantwell collected two.

Eutamias townsendii Townsend's chipmunk

This chipmunk is very widely distributed within the watershed. When they are active it is hard to move about without being chattered at from some angle by one of these animals. Cantwell collected five.

Tamiasciurus douglasii Douglas squirrel or chickaree

This tree squirrel is found throughout the forest of the watershed but not as abundantly as I have seen them elsewhere. Six were collected by Cantwell.

Glaucomys sabrinus Northern flying squirrel

A specimen was obtained by Dr. Murray Johnson from near the camp ground on top. I have not seen any myself.

Thomomys monticola Sierra pocket gopher

I obtained only one gopher. Kenneth Walker trapped 23 specimens. All of these are from the meadow on top. There were mounds present in the "Homestead Meadows" that looked like gopher workings but could have been developed by moles. No animals were caught from these burrows.

Castor canadensis Beaver

Limited evidence of beaver activity was found along the lower portions of Rock Creek. According to Buckingham one occasionally will venture up to the higher reaches of the streams.

Peromyscus maniculatus Deer mouse

The ubiquitous deer mouse is found in all of the habitats present within the study area except for the very dense grass of the meadow on top. The habits and densities of this mouse vary considerably among the various situations. The greatest numbers occur in the brush on the south side of the top of the peak. It was interesting to note that in that area the mice responded very well to bait while in the timbered areas they seemed to pay little attention to any enticement to approach the traps. Eight representatives were preserved by Cantwell.

Neotoma cinerea Bushytail woodrat

Buckingham said woodrats are found throughout the watershed--particularly around any structures. Two young animals were obtained from Rudolph Ruprecht, the fire guard hired by the lumber company conducting salvage logging operations. They were the only ones I saw. Cantwell collected five.

Phenacomys albipes White-footed phenacomys

Two specimens of this mouse were collected. They were taken on the banks of very small streams in the near vicinity of tangles of debris or grass in dense forest at less than 1000 feet elevation. Murray Johnson collected one at Connar's Camp at 3000 feet elevation in a similar situation.

Clethrionomys occidentalis Western red-backed vole

These mice were found to be quite common in the dense forest. 40 individuals were trapped. All but a very few of these were taken by or under rotting logs or stumps. One mouse was seen out in a clear-cut area. It had a pile of green grass piled under a rock a short distance from a planted grass slope. When disturbed by my approach it immediately ran to cover under the roots of an uprooted tree nearby.

Microtus longicaudus Longtail vole

Two adults and two young of this species were collected. All were in moist to wet situations. One adult was taken on the bank of a stream at some distance away from any grass cover and several feet from cover of any kind. The other adult was from a marshy grass area in the Spaulding cut-over under the thicket of large alders at the head of the North Fork of Rock

Creek. Identification was made by Syd Anderson of the University of Kansas.

Microtus oregoni — Oregon vole or creeping mouse

This mouse is very abundant in the meadow on top of the peak. It was also found in small areas of grass at lower elevations. Cantwell collected four of this species.

Aplodontia rufa — Mountain beaver

This unique animal was never seen but its burrows were ample evidence of their presence. In the virgin forest it was found only at one place, beside a stream at 2000 feet elevation. In the Spaulding cut-over several burrow systems were found. Forest Service personnel have found burrows at other places in the virgin forest at lower elevations.

Zapus princeps — Big jumping mouse

Four of these were collected. Two were by the head of Parker Creek in grass and the other two were in grass by Rock Creek at 700 feet.

Lepus americanus — Snow-shoe hare

Bailey obtained a specimen of this species from "the upper slopes" of the mountain. I saw a young one in June of 1953 and tracks in March of 1954 in the noble fir near the camp ground on top. One adult was

seen near a fork of Rock Creek at 2000 feet.

Sylvilagus bachmani Brush rabbit

I found four young under a slab of bark near the same place by Rock Creek where the snowshoe rabbit was seen but they were too quick and got away. Buckingham states he found them frequently in the watershed. Cantwell collected two brush rabbits.

*Cervus canadensis Elk

Persistant rumors were substantiated by Buckingham that elk were occasionally present in the watershed. At various times he saw individuals or bands up to a dozen in number at various places in the area.

Odocoileus hemionus Blacktail deer

Deer are quite common in the watershed. Evidence of their presence is found anywhere in the area. A favored congregating spot in summer evenings is the meadow on top.

ANIMALS FOUND THAT ARE INFREQUENTLY OBSERVED IN THE COAST RANGE

The virgin forest and meadow included in the area studied apparently contain conditions enough different from the majority of the Oregon Coast Range to enable several animals to live there that are not recorded as being common throughout those mountains. Townsend's solitaire, Hammond's flycatcher and hermit thrush are three of the birds common during the summer (assumed to breed) which are listed by Gabrielson and Jewett (8, pp.480, 396, 469-473) as being stragglers or only occasional in the coast mountains. The red-backed mouse (Clethrionomys occidentalis) was caught frequently. It was reported by MacNab and Dirks (11) as not being well known in this area. Phenacomys albipes is not well known either, but three were taken on Mary's Peak.

Four possible factors to explain the presence of these forms are: 1) higher elevation than most of the range, 2) the edge effect between forest and meadow near the top of the mountain, 3) it was a fairly large area which had not felt the influence of man's activities, and 4) the Coast Range has not been well enough studied yet. Further study of the other peaks that approach Mary's Peak in height and that have meadows on top would

probably shed light on these possibilities. Continued observation on the Mary's Peak area would possibly indicate the effect of disturbance on these few species.

SOME EFFECTS OF MAN'S ACTIVITIES

The watershed on Mary's Peak presented a very attractive situation for an ecological study. It was an area of virgin conditions about to come under a plan of controlled use. An opportunity was presented for study of effects of disturbance on the vertebrate fauna. The present study was an attempt to assess the pristine conditions and note any changes that might appear. Unfortunately, time did not permit enough study to come to any sound conclusions on the latter aspect. However, some observations can be recorded.

A stand of Douglas fir trees on the south slope at 2800 feet elevation that covered an area about 14 acres in size was killed in 1952 by beetles. In the summer of 1953 I attempted to determine what small mammals were present. On the fringes of this area I succeeded in catching animals in the usual five to ten percent of the traps with sixty traps out. On the other hand, the traps, when set in the center of this area, failed to produce any return. It was noticed that the duff was very dry and lacking in evidence of invertebrate life. If all of the small mammals in a virgin fir forest of this type were dependant primarily on invertebrates as a food source this lack would explain the apparent

absence of mammals in this dry area. Time did not allow further pursuit of this problem.

Another area of beetle kill on a northeast facing slope about 3 acres in size was set with 60 traps in July and yielded the usual number of animals. In September, after the area had been logged and the ground much disturbed, 30 traps were set. They produced a return of seven animals--over twice the normal catch. Five of the seven were Peromyscus, a larger proportion of that species than usual. An adjacent undisturbed area produced the usual percentage--two animals from the 30 traps. In September 1954 the same areas were covered with 30 traps apiece and yielded six and four respectively. These data are too scanty to draw definite conclusions from but possibly indicate increased population in an area immediately after cutting. However, it might also indicate an increased response to use of bait on traps. Apparently, bait is not very effective in attracting animals in the dense forest as they were caught facing out of the trap just as often as facing into the trap.

Some birds and larger mammals seem to respond to cleared areas also. Varied, russet-backed, and hermit thrushes, Townsend's solitaires, and juncos all used roadways (mainly those that were unsurfaced) and clear-cut areas in searching for food on the ground and as

flyways. Deer use the roads for their own travel. This is true also of many of the carnivores, notably the coyote, bob-cat, and bear.

The area that has been allowed to regenerate since it was cut 35 years ago (Spaulding cut-over) attracts several species that were not seen in the older forest. The warbling and solitary vireos and the orange-crowned warbler fit into this category. The wood peewee might be placed in the same rank, though it occasionally gets into the older forest. The mountain beaver is also much more common in the young stand than the old. Hammond's flycatcher was one of the species not found in this young growth.

The practice of the Forest Service of planting grass on all disturbed soil near roads will probably induce increased populations of mice, especially microtines, to develop. A red-backed mouse was seen beside a small stack of short pieces of cut grass under a rock. It probably had gathered it from a planted grass patch 15 feet away.

Plate 1

WATERSHED FROM SUMMIT

A view eastward from the parking lot near the summit which shows noble fir in the right foreground, a clear-cut area in the lower left corner, the ridges of the watershed in the center and the Willamette Valley in the background. A few beetle killed trees show up as light spots in the forest. The watershed extends from the point where the picture was taken to the ridge with the large rectangular clear-cut on it. Rock Creek is just this side of that patch.

Plate 1

Plate 2

SUMMIT AT MARY'S PEAK

This picture illustrates the features of the summit of Mary's Peak. In the foreground to the right is a portion of the brush, at this point mostly hazel, and to the left is meadow. The trees visible are noble fir. The meadow in the distance has a band of bracken fern across it. The Forest Service look-out is on the skyline.

Plate 2

Plate 3

NOBLE FIR FOREST

The winter scene in the interior of the noble fir forest shows one to three feet of snow on the ground. There are few shrubs present. This is near the area of the campground at 3900 feet.

Plate 3

Plate 4

UPPER ZONE DOUGLAS FIR FOREST
AND VANILLA-LEAF

The interior of the upper zone Douglas fir forest shows the density of trees and an area with herbs but no shrubs. This is on a bench at 2700 feet elevation. The prominent herb is vanilla leaf.

Plate 4

Plate 5

UPPER ZONE DOUGLAS FIR FOREST
AND VINE MAPLE

This is another view of the interior of the upper zone Douglas fir forest. Here the vine maple is quite dense. There is also a layer of herbs and grasses beneath the shrub. The elevation is about 2300 feet.

Plate 5

Plate 6

CLOSE-UP IN UPPER ZONE DOUGLAS FIR FOREST

The denseness of the trees, shrubs, and debris can be seen in this close-up in the upper zone Douglas fir forest. Down logs as shown here were numerous in many areas. Trapping for small mammals was most successful along these logs. The elevation is about 2500 feet.

Plate 6

Plate 7

GRIFFITH RIDGE

In many areas where the upper layer of shrubs (hazel, vine maple) is sparse or absent the small woody perrenials may be very dense as is shown here. Salal, Oregon grape and sword fern are the most common. Western fescue is present in small openings. The trees are also very dense on Griffith Ridge at 1400 feet elevation where this picture was taken.

Plate 7

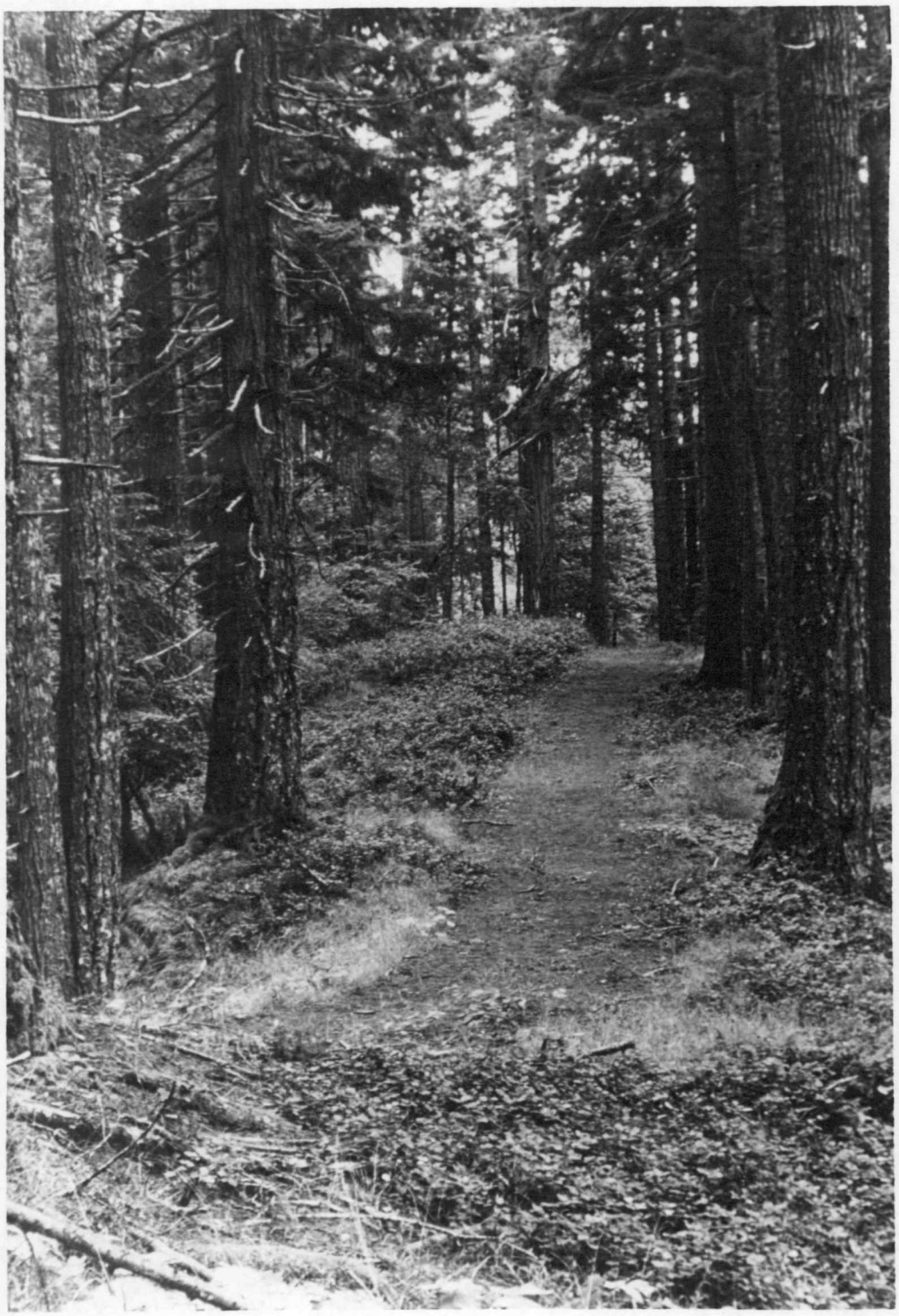


Plate 8

PHENACOMYS HABITAT

This steep sided ravine with the tangle of debris is a location where I caught a *Phenacomys albipes*. The trap was set beside the water just upstream from the largest log which is about three feet in diameter. The surrounding vegetation is western red cedar, Douglas fir, vine maple, hazel and sword fern.

Plate 8

Plate 9

LOWER ZONE DOUGLAS FIR FOREST

The typical lower zone Douglas fir forest has Oregon maple and Garry oak with the Douglas fir, grand fir and other conifers. The conspicuous shrubs are hazel and rose in the picture. There are several grasses present, fern and various herbs. There is debris scattered about on the ground.

Plate 9

BIBLIOGRAPHY

1. American ornithologists' union. Check-list of North American birds. Fourth ed. Lancaster, Pa., American ornithologists' union, 1931. 526p.

2. Bailey, Vernon. The mammals and life zones of Oregon. Washington, government printing office, 1936. 416p. (North American fauna no. 55)

3. Bratz, Robert Davis. Avifaunal habitats in the central coast mountains of western Oregon. M.S. thesis. Oregon state college, 1950. 119p.

4. Burt, William Henry and Richard Phillip Grossenheider. A field guide to the mammals. Boston, Houghton, 1952. 200p.

5. Dalquest, W.W. Mammals of Washington. University of Kansas publications museum of natural history 2:1-444. 1948.

6. Dirks-Edmunds, Jane Claire. A comparison of biotic communities of the cedar-hemlock and oak-hickory associations. Ecological monographs 17:235-260.

7. Fenneman, Nevin M. Physiography of western United States. New York, McGraw-Hill, 1931. 534p.

8. Gabrielson, Ira N. and Stanley G. Jewett. Birds of Oregon. Corvallis, Oregon state college, 1940. 650p. (Oregon state monographs, studies in zoology no. 2)

9. Hoffman, Ralph. Birds of the Pacific states. Boston, Houghton, 1927. 353p.

10. McNab, James A. Faunal aspection in the coast range mountains of northwestern Oregon. Ph.D. diss. University of Nebraska, 1944.

11. McNab, James A. and Jane Claire Dirks. The California red-backed mouse in the Oregon coast range. Journal of mammology 22:174-180.

12. Merkle, John. An analysis of the plant communities of Mary's Peak, western Oregon. Oregon state college, 1948. 95p. Ph.D. diss.

13. ———— An analysis of the plant communities of Mary's Peak, western Oregon. Ecology 32:618-640.

14. Miller, Gerrit S., Jr. and Remington Kellogg. List of North American mammals. Washington, Smithsonian institute, 1955. 954p. United States national museum bulletin 205.

15. Peck, Morton Eaton. A manual of the higher plants of Oregon. Portland, Binfords and Mort, 1941. 866p.

16. Peterson, Roger Tory. A field guide to western birds. Boston, Houghton, 1941. 240p.

17. Powers, W.L. Climate and its relation to agriculture. Corvallis, Oregon, area--1889-1950. 1950. (Oregon state college. Agricultural experiment station. Circular of information 487.)

18. Roberts, Albert E. A petrographic study of the intrusive at Mary's Peak, Benton co., Oregon. Northwest Science 27:43-60. 1953.

19. Schmidt, Karl P. A checklist of North American amphibians and reptiles. Sixth ed. American society of ichthyologists and herpetologists, Chicago, 1953.

SUMMARY

1. An attempt was made to describe the habitats of the Corvallis Watershed and determine the use by the terrestrial vertebrates through direct observation and by trapping.

2. The watershed is situated on the northeast slopes of Mary's Peak, west-central Oregon. There are about 8,500 acres included most of which were covered by virgin Douglas fir forest at the time this study began. Because of a resistant gabbro cap over weak sedimentary rock the slopes of the peak are very steep. The three types of parent material have given rise to four types of soil. The climate is humid and temperate because of the ocean a few miles distant.

3. Because of an infestation of bark beetles a program of road development and logging was begun in 1953. The logging will continue on a 100 year cycle. This study was made to determine the conditions before disturbance to serve as background for future investigations.

4. There are six habitats described. There is an extensive meadow on the summit of the peak. On the southwest side of the top there is a smaller area of brush. Below this is a zone of noble fir. The rest

of the forest is Douglas fir in which two zones are recognized. Another habitat is a small area that was logged about 35 years ago. The streams add a weak element of riparian conditions.

5. There were 112 species of animals listed. Of these eight are amphibians, four reptiles, 61 birds, and 39 mammals of which 15 were unconfirmed.
6. A few animals were found commonly that have not been frequently found in the Coast Range Mountains.
7. The logging carried on in the past and in progress at present has apparently produced a few changes in the fauna present.