

GOLD LAKE BOG RESEARCH NATURAL AREA¹

Subalpine bog communities and flora
and surrounding forest lands near the
crest of the Oregon Cascade Range.

The Gold Lake Bog Research Natural Area was established August 10, 1965, to preserve some prime subalpine bogs and several species of rare bog plants. The 188-ha. (463-acre) tract is located in Lane County, Oregon, and is administered by the Oak Ridge Ranger District (Oak Ridge, Oregon), Willamette National Forest. The natural area occupies most of the S1/2 S1/2 section 20 and N1/2 section 29, T. 22 S., R. 6 E., Willamette meridian. Legal lines provide most of the boundary except for the southeastern quarter, where the boundary follows Skyline Creek and Forest Trail 3681 (Maiden Peak Trail) for a portion of its length (fig. GL-1). The natural area lies at 43°39' N. latitude and 120°01' W. longitude.

ACCESS AND ACCOMMODATIONS

The natural area lies a short distance north of Willamette Summit on Oregon State Highway 58. There are several easy access routes into the tract. The Waldo Lake Road (Forest Road 204) bounds the northwestern corner of the natural area. The northwestern and southeastern corners of the tract can be reached by easy hikes from the end of the Gold Lake Road (Forest Road 223), via Forest

Trails 3677 or 3681, respectively. The southwestern corner of the tract can also be reached by boat travel across Gold Lake from the Gold Lake Forest Camp. Wet areas, ponds, and stream courses do make cross-country travel through the boggy portions of the natural area somewhat difficult at times.

The nearest commercial accommodations are found at Odell and Crescent Lake, along Oregon State Highway 58 east of Willamette Summit. There are numerous improved forest camps in the vicinity, including one at the outlet of Gold Lake, less than a mile from the natural area.

ENVIRONMENT

The bulk of the research natural area is located in a basin between two mountain slopes at the head of Gold Lake. The topography is essentially flat, except in the northwestern and southeastern corners, where lower mountain slopes have been incorporated within the tract. Three small ponds located within the bog are estimated to total about 1.5 ha. (4 acres). Three major streams (Ray, Salt, and Skyline Creeks) converge and flow through the tract. Elevations range from 1,463 to 1,646 m. (4,800 to 5,400 ft.).

Gold Lake Bog Research Natural Area is located in the volcanic High Cascades. Bedrock is composed of Pleocene-Pleistocene olivine basalt and basaltic andesite (Williams 1957). It is covered by aeolian deposits of volcanic ash and dacitic pumice, much of which came from the Mount Mazama eruption 6,600 years ago.

A cool, wet climate prevails. Most precipitation occurs during the winter months, and much of this accumulates in snow packs which probably attain maximum depths of 2 to 3 m. (6 to 9 ft.) on the average. Summers are relatively dry, and drought periods of 1 to 2 months are not uncommon. Climatic data from a weather station located about

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8 km. (5 miles) southeast of the natural area at 1,459-m. (4,788-ft.) elevation (Odell Lake Land Pan in U.S. Weather Bureau 1965) are as follows:

Mean annual temperature4.8°C. (40.6°F.)
Mean January temperature-3.6°C. (25.6°F.)
Mean July temperature14.6°C. (58.3°F.)
Mean January minimum
temperature-7.5°C. (18.5°F.)
Mean July maximum temperature ..23.7°C. (74.6°F.)
Mean annual precipitation1,533 mm. (60.37 in.)
June through August
precipitation86 mm. (3.39 in.)
Average annual snowfall834 cm. (329.00 in.)

Temperatures are somewhat cooler and precipitation higher on the natural area itself; isohyetal maps indicate 1,800 to 2,000 mm. (70 to 80 in.) of precipitation are to be expected on the tract.

Soils within the natural area have not been mapped or described. In upland areas they appear to be nondescript, Brown Podzolic forest soils developed in volcanic ash. Most of the ash is probably from the eruption of Mount Mazama 6,600 years ago. Organic soil profiles are encountered in the low-lying boggy areas.

BIOTA

Approximately 75.7 ha. (187 acres) of the Gold Lake Bog Research Natural Area are occupied by bogs and marshes, 1.6 ha. (4 acres) by ponds, and 117.2 ha. (272 acres) by subalpine forest. The forested acreage can arbitrarily be divided into 58.6 ha. (136 acres) of SAF cover type 206, Engelmann Spruce Subalpine Fir, and 58.6 ha. (136 acres) of type 205, Mountain Hemlock-Subalpine Fir (Society of American Foresters 1954). The Engelmann spruce (*Picea engelmannii*) subalpine fir (*Abies lasiocarpa*) forests tend to occur around the periphery of the bogs and marshes, and the mountain hemlock (*Tsuga mertensiana*) - subalpine fir forests are found in upland portions of the tract. Kuchler (1964) types represented would probably include Fir-Hemlock Forest (4) and Western Spruce Fir Forest (15). The natural area is at the boundary of the *Abies amabilis* and *Tsuga mertensiana* Zones described by Franklin and Dyrness (1969).

The key features of the natural area are the bogs and marshes, but complete descriptions of these communities are not available. Most of the common bog plants occur, including sphagnum moss, *Eriophorum* spp., *Menyanthes trifoliata*, and *Kalmia polifolia*. Five species of carnivorous plants occur within the natural area: *Drosera longifolia*, *Drosera rotundifolia*, *Utricularia intermedia*, *Utricularia minor*, and *Utricularia vulgaris*. Another relatively rare plant, *Scheuchzeria palustris*, is also found in the bogs. The area is believed to incorporate several of the best examples of the sphagnum bogs found in the central Oregon Cascade Range.

The timbered area includes Engelmann spruce, subalpine fir, mountain hemlock, Pacific silver fir (*Abies amabilis*), Shasta red fir (*Abies magnifica* var. *shastensis*), lodgepole pine (*Pinus contorta*), western white pine (*Pinus monticola*), and Douglas-fir (*Pseudotsuga menziesii*) as constituent species. As mentioned, there appear to be two major forest types present. Low-lying forests bordering marshes and bogs are typically dominated by Engelmann spruce and subalpine fir. Reproduction is composed primarily of mountain hemlock and subalpine fir. Engelmann spruce attains diameters of 110 cm. (45 in.) b.h. and heights of 50 m. (160 ft.). However, many of the stands have suffered recent mortality, with wind-throw being the most common agent killing the spruce and insects, the subalpine fir. Common understory species are *Viola sempervirens*, *Chimaphila umbellata*, *Pyrola secunda*, *Xerophyllum tenax*, *Clintonia uniflora*, *Rubus lasiococcus*, and *Tiarella unifoliata*.

The drier upland forests are very mixed in composition with mountain hemlock, Shasta red fir, Douglas-fir, and western white pine typically most conspicuous. The Shasta red fir and western white pine are usually largest, occasional specimens exceeding 100-cm. (40-in.) d.b.h. and 52 m. (175 ft.) in height. Mountain hemlock and Pacific silver fir often dominate the reproduction. The understory is typically sparse with species such as *Vaccinium membranaceum*, *V. scoparium*, and *Xerophyllum tenax* present.

Beaver (*Castor canadensis*) are probably the most important animals influencing natural processes within the natural area. They have developed dams and runways in some marshy areas (fig. GL-2). The natural area is used as summer range by elk (*Cervus canadensis*), blacktail deer (*Odocoileus hemionus columbianus*), and mule deer (*Odocoileus hemionus*). Badger (*Taxidea taxus neglecta*) have also been observed within the tract; their occurrence west of the summit of the Cascade Range is unusual. A complete list of mammals believed to utilize the natural area is provided in table GL-1. Birds commonly found within the natural area include blue grouse (*Dendragapus Obscurus*), mountain quail (*Oreortyx pictus*), mourning doves, (*Zenaidura macroura*), band-tailed pigeons (*Columbia fasciata*), mallard ducks (*Anas platyrhynchos*), and wood ducks (*Aix sponsa*). Gold Lake is stocked with rainbow trout which have moved up into the ponds and streams within the natural area.

Several species of amphibians are known to inhabit Gold Lake Bog. The Cascade frog (*Rana cascadae*) is found near the exterior of the bog, and the western spotted frog (*Rana pretrosa*) inhabits the interior of the bog. These two closely related species are probably genetically compatible in their ability to hybridize. The northwestern tree toad (*Hyla regilla*) is also found within the area.

HISTORY OF DISTURBANCE

The major human disturbance to the natural area has been the removal of beaver dams from the main stream channel by the Oregon State Game Commission to provide access for spawning rainbow trout from Gold Lake. Since the dams appear to be of major importance in maintaining high water levels in the marshes and bogs, this practice has been discontinued since establishment of the natural area. Beaver populations have reportedly decreased considerably in the last few years, a possible consequence of trapping which is not yet prohibited on the tract. Recreationists have caused some minor disturbances; these are confined primarily to trailside areas.

Open grasslands above the bog have been used as a base camp for hunters in the late fall, however. Such use is now prohibited, and public recreational use of the bogs and marshes is discouraged.

Wildfires have undoubtedly occurred over the natural area in past centuries; however, there is no evidence of recent wildfires.

RESEARCH

Some research on plant communities² and amphibian fauna³ have been carried out within the natural area.

The natural area is, of course, particularly valuable as a site for the study of the ecology of bog and marsh communities and the fauna associated with them. It provides a refugium for the protection of six uncommon species of bog plants and a site for studying the environmental (habitat) and breeding relationships of two species of frogs. The natural area is also well suited to studies of variation in composition, structure, and productivity of forest communities along an environmental gradient extending from wet, low-lying to dry, upland areas.

MAPS AND AERIAL PHOTOGRAPHS

Special maps applicable to the natural area include: *Topography* 15' Waldo Lake, Oregon quadrangle, scale 1: 62,500, issued by the U.S. Geological Survey in 1956; and *geology - Geologic Map of Oregon West of the 121st Meridian*, scale 1: 500,000 (Peck 1961), and *Geologic Map of the Central Part of the High Cascade Range, Oregon* (Williams 1957). Either the District Ranger (Oak Ridge Ranger District) or Forest Supervisor (Willamette National Forest, Eugene, Oregon) can provide details on the most recent aerial coverage and forest type maps for the area.

²Research by Dr. John Rumley, Montana State University, Bozeman.

³Research by Dr. James Kezar, Department of Biology, University of Oregon, Eugene.

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Table GL-1. — Tentative list of mammals for Gold Lake Bog Research Natural Area

Order	Scientific name	Common name
Insectivora	<i>Neurotrichus gibbsii</i>	shrew mole
	<i>Scapanus orarius</i>	coast mole
	<i>Sorex bendirii</i>	marsh shrew
	<i>Sorex palustris</i>	northern water shrew
	<i>Sorex trowbridgii</i>	Trowbridge shrew
	<i>Sorex vagrans</i>	wandering shrew
Chiroptera	<i>Antrozous pallidus</i>	pallid bat
	<i>Eptesicus fuscus</i>	big brown bat
	<i>Lasionycteris noctivagans</i>	silver-haired bat
	<i>Lasiurus borealis</i>	red bat
	<i>Lasiurus cinereus</i>	hoary bat
	<i>Myotis californicus</i>	California myotis
	<i>Myotis evotis</i>	long-eared myotis
	<i>Myotis lucifugus</i>	little brown myotis
	<i>Myotis thysanodes</i>	fringed myotis
	<i>Myotis volans</i>	long-legged myotis
	<i>Myotis yumanensis</i>	Yuma myotis
	<i>Plecotus townsendi</i>	Townsend big-eared bat
Lagomorpha	<i>Lepus americanus</i>	snowshoe hare
Rodentia	<i>Aplodontia rufa</i>	mountain beaver
	<i>Arborimus longicaudus</i>	white-footed vole
	<i>Castor canadensis</i>	beaver
	<i>Clethrionomys californicus</i>	California red-backed vole
	<i>Erethizon dorsatum</i>	porcupine
	<i>Eutamias amoenus</i>	yellow-pine chipmunk
	<i>Eutamias townsendi</i>	Townsend chipmunk
	<i>Glaucomys sabrinus</i>	northern flying squirrel
	<i>Microtus longicaudus</i>	long-tailed vole
	<i>Microtus oregoni</i>	Oregon or creeping vole
	<i>Microtus richardsoni</i>	Richardson vole
	<i>Microtus townsendi</i>	Townsend vole
	<i>Neotoma cinerea</i>	bushy-tailed wood rat
	<i>Peromyscus maniculatus</i>	deer mouse
	<i>Phenacomys intermedius</i>	heather vole
	<i>Spermophilus lateralis</i>	mantled ground squirrel
	<i>Tamiasciurus douglasi</i>	chickaree
	<i>Thomomys mazama</i>	Mazama pocket gopher
	<i>Zapus trinotatus</i>	Pacific jumping mouse
Carnivora	<i>Canis latrans</i>	coyote
	<i>Canis lupus</i>	wolf
	<i>Felis concolor</i>	mountain lion or cougar
	<i>Gulo luscus</i>	wolverine
	<i>Lynx rufus</i>	bobcat
	<i>Martes americana</i>	marten
	<i>Martes pennanti</i>	fisher
	<i>Mustela erminea</i>	short-tailed weasel or ermine
	<i>Mustela frenata</i>	long-tailed weasel
	<i>Mustela vison</i>	mink
	<i>Procyon lotor</i>	raccoon
	<i>Spilogale putorius</i>	spotted skunk or civet cat
	<i>Taxidea taxus</i>	badger
	<i>Urocyon cinereoargenteus</i>	gray fox
	<i>Ursus americanus</i>	black bear
	<i>Vulpes fulva</i>	red fox
Artiodactyla	<i>Cervus canadensis</i>	wapiti or elk
	<i>Odocoileus h. hemionus</i>	mule deer
	<i>Odocoileus h. columbianus</i>	blacktail deer

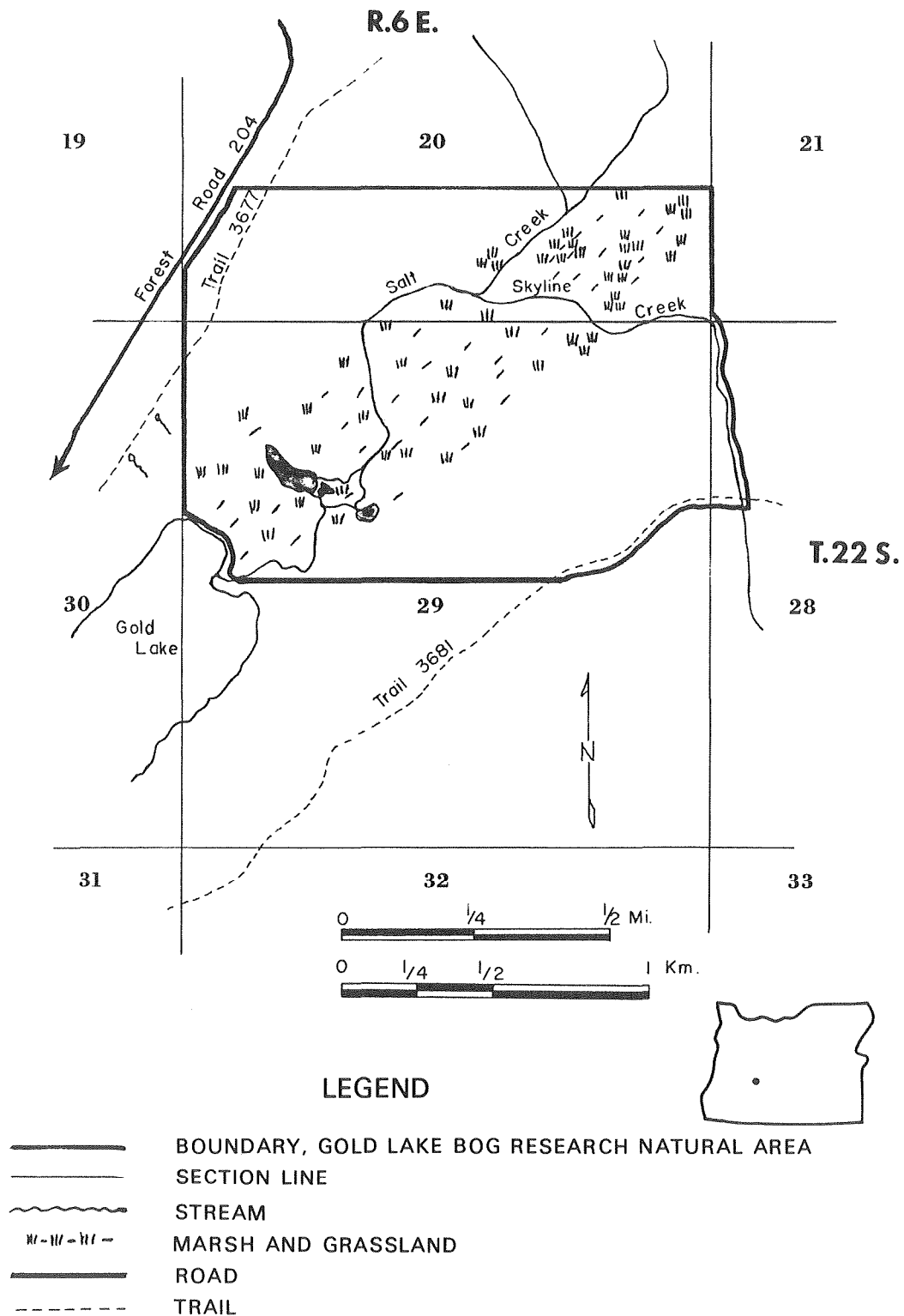


Figure GL-1.- Gold Lake Bog Research Natural Area,
Lane County, Oregon.

Figure GL-2. -Natural features of Gold Lake Bog Research Natural Area. Upper left: Typical bog community in which two species of *Drosera* and three of *Utricularia* are found. Upper right: Open forest association of Engelmann spruce and lodgepole pine typical of areas in and around the bogs and ponds. Center left and right: Ponds within the natural area showing typical subalpine mixed-conifer forests on surrounding slopes; note abundant water lilies. Lower left: Beaver dam within the Gold Lake Natural Area; the Oregon State Game Commission no longer removes such dams. Lower right: Beaver runways are common in some marshy areas.

