

Establishment Record Amendment

**Addition to the Gold Lake Bog Research
Natural Area**

Willamette National Forest

Lane County, Oregon

Gold Lake Bog Middle Fork Ranger District Willamette National Forest

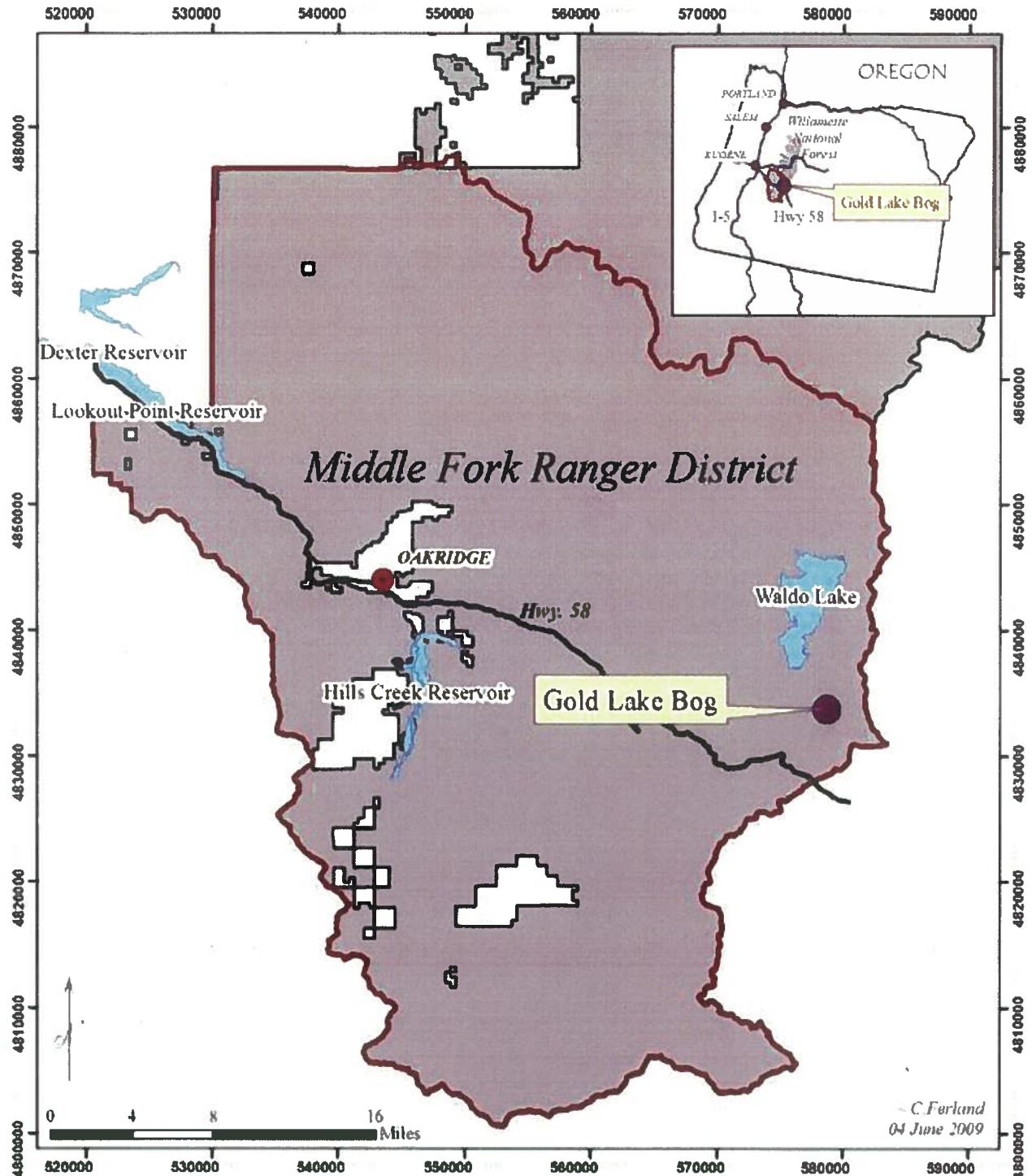


Figure 1. Location map – Gold Lake Bog RNA

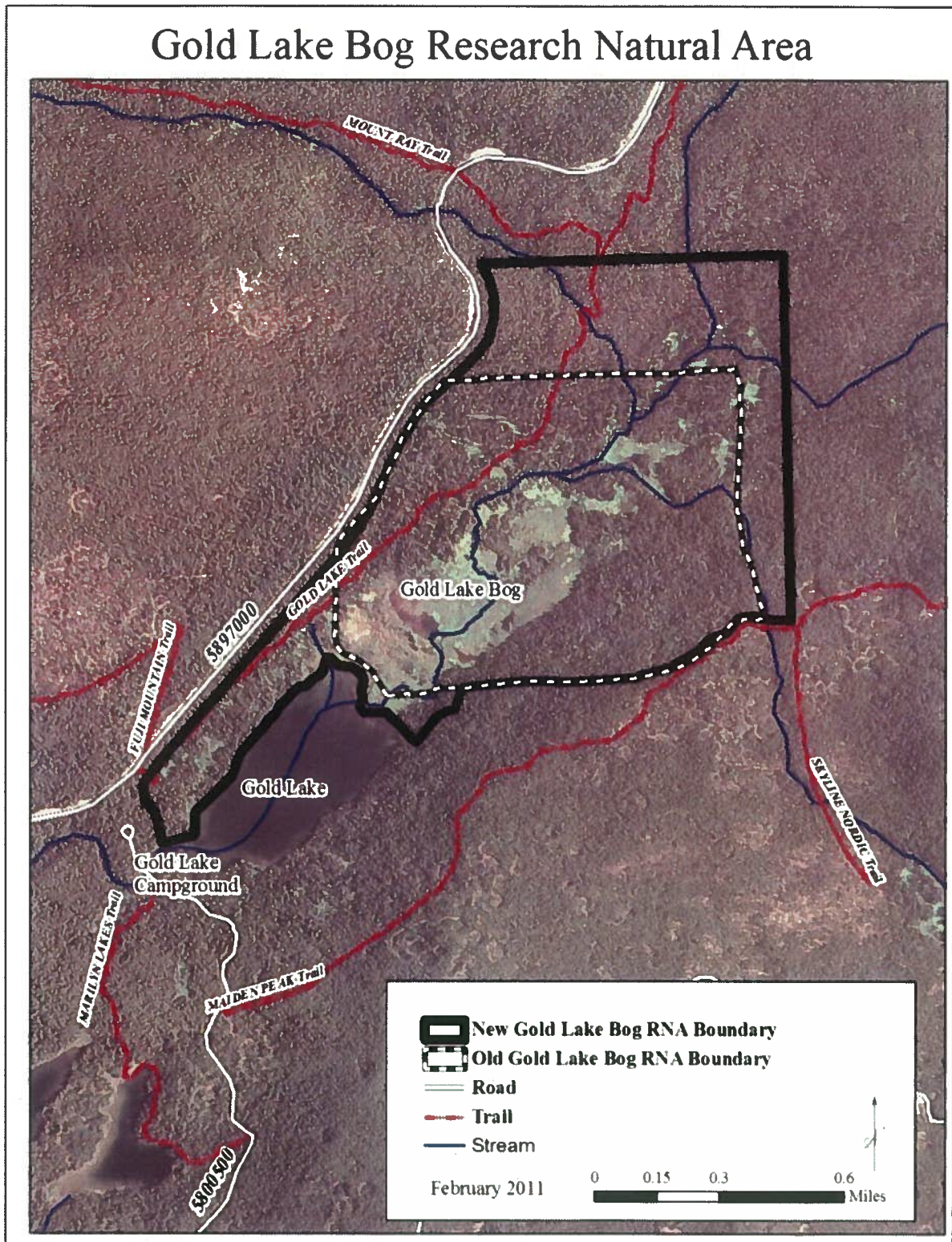


Figure 2. Boundary map – Gold Lake Bog RNA + RNA addition

Legal Description.

The RNA falls in portions of: Sections 20,21,28,29, & 30, T.22 S., R.6 E., Willamette Meridian.

The bearings and distances for the description are based on the Geodetic (Ground) measurements. Conversions shown are based on the UTM Grid Coordinate System, Zone 10, 1983 DATUM.

Average Mapping Angle for the RNA: + 0°40'00"

Average Grid Factor: 0.9994428

For conversion from feet to meters: 1 meter = 3.28084 feet

QUAD SHEET NAME	ANGLE POINT	BEARING	DISTANCE FEET (METERS)	DESCRIPTION
WALDO LAKE				1 POINT OF BEGINNING, is the ¼ corner between sections 20 & 21 as monumented by Fred Thomas. Approximate Latitude and Longitude: LATITUDE: 43°39'04.93" LONGITUDE: 122°01'17.83" thence,
		EAST	677.33 (206.45)	From the POB, go "DUE EAST" to a point that is "DUE NORTH" of a point that is N 30° W, 100 feet from the intersection of the Maiden Peak (#3681) & Skyline Nordic (#4383) Trails, to 2 Angle Point No. 2, thence,
		SOUTH	4,641.11 (1,414.61)	"DUE SOUTH" to a point that is N 30° W, 100 ft. from the intersection of Trails, Maiden Peak (#3681) & Skyline Nordic (#4383) to, 3 Angle Point No. 3, thence

SOUTHWESTERLY

2,000.00 (609.60) long a 100 ft.
buffer line north of
the centerline of the Maiden Peak
Trail for "2,000 feet", to
4 Angle Point No. 4. The
approximate Latitude and
Longitude:
Latitude: 43°38'12.00"
Longitude: 122°01'31.50"
thence,

WEST

2,000.00 (609.60)

Leaving the 100 foot buffer of the
trail, going "DUE WEST" to a
point that intersects the line that is
300 ft. from the easterly edge of
the Gold Lake Bog, to,
5 Angle Point No. 5,
thence,

SOUTHWESTERLY

1,580.00 (481.90) Along the 300
foot buffer of the
"Bog" to a point that is "S 33° E",
approx. 125 ft. from a point
where the shoreline of the lake
transitions from NE to NW, to,
6 Angle Point No. 6.
thence,

N 33° W

125.00 (38.10)

"N 33° W" to that point where the
shoreline of the lake transitions
from NE to NW, to,
7 Angle Point No. 7. The
approximate Latitude and
Longitude:
LATITUDE: 43°38'05.00"
LONGITUDE: 122°02'16.60"
thence,

NORTHWESTERLY &
SOUTHWESTERLY

5,150.00 (1,569.72) Along the
shoreline of the lake to a point
that is 375 ft. from the
centerline of Road No. 5800-500,
to, 8 Angle Point No. 8. thence,

NORTHEASTERLY

215.00 (65.53) Along the 375 ft. buffer line from Road No. 5800-500 for approx.

215 ft. to a point that is 200 ft. southeasterly from the centerline of the trail leading from the end of Rd. No. 5800-500, to, 9 Angle Point No. 9, thence,

NORTHEASTERLY

630.00 (192.02) Along the 200 ft. buffer line of the trail from the end Rd. 5800-500 to the intersection point that is 200 ft. from the centerline and junction of Trail No. 3674, to 10 Angle Point No. 10, thence,

NORTHERLY 300.00 (91.44)

Along the 200 ft. buffer line of Trail No. 3674 to the intersection point that is 200 ft. southerly from the centerline of Rd. No. 5897-000, to, 11 Angle Point No. 11, thence,

NORTHEASTERLY

8,000.00 (2,438.40) Along the 200 ft. buffer line from the centerline of Rd. No. 5897 to the intersection point that is "DUE WEST" of the ¼ corner between Sections 20 and 21, to 12 Angle Point No. 12, thence,

EAST

3,315.00 (1,010.41)

"DUE EAST" to the ¼ corner and the Point of Beginning.

Signature Page

For

ESTABLISHMENT RECORD AMENDMENT

Addition to Gold Lake Bog Research Natural Area.

Willamette National Forest

Lane County, Oregon

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation, and FSM 4063.41, Establishment Record Content, in arriving at this recommendation.

Recommended by Duane F. Bishop, District Ranger, Middle Fork
Ranger District, Willamette National Forest

Duane F Bishop

Date: 3/13/2013

Recommended by Meg Mitchell, Forest Supervisor, Willamette
National Forest

Meg Mitchell

Date: 3/26/13

Concurrence of

Robert Mangold
Robert D. Mangold, Station Director (acting),
USDA Forest Service, Pacific Northwest Research
Station

Date: 6/3/13

By virtue of the authority vested in me by CFR 2.60(a) and 36 CFR 251.23 of the Regulations of the Secretary of Agriculture, I hereby order that the lands described in this Establishment Record be designated as part of the Gold Lake Bog Research Natural Area.

Jeff Walter
Kent Connaughton
for Regional Forester, Region 6

Date: 6-3-13

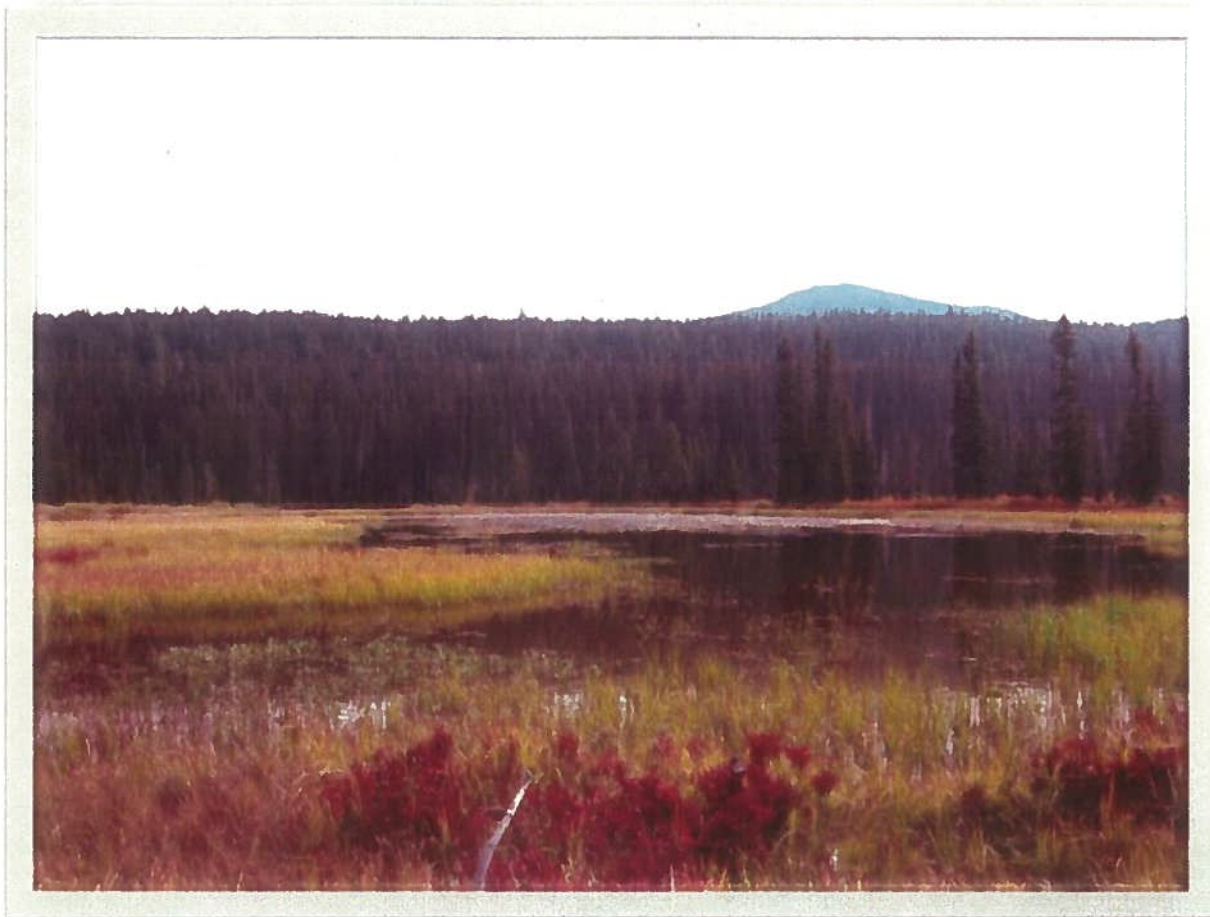


Figure 3. Fen vegetation within Gold Lake Bog Research Natural Area, including habitat for the Oregon spotted frog. View looking east towards Maiden Peak.

a. Introduction

The Gold Lake Bog Research Natural Area (RNA), was originally established on August 10, 1965 and included 415 acres (168 ha). The purpose of this establishment record amendment is to increase the size of the RNA by 241 ac (97 ha) for a total acreage of 656 ac (265 ha). The RNA is within the Salt Creek subwatershed of the Willamette River watershed, approximately 20 miles (32 km) east of the City of Oakridge, Oregon. The RNA and surrounding area are within the Willamette National Forest.

b. Justification section

(1) Justification Statement. A review by the Forest determined that the existing RNA did not fully incorporate the key wetlands features, especially the extensive complex of springs that support the bog ecosystem. In 2009 a preliminary proposal was developed by district specialists for a Forest Plan amendment to expand the RNA with minor boundary adjustments to fully include and better protect the wetland system. Gold Lake is located immediately downstream of the RNA (USDAWNF 2010). The recommended RNA changes were designed to include the key wetlands supporting the bog ecosystem and Oregon spotted frog breeding and overwintering sites (USDAWNF 2011).

(2) Principal Distinguishing Features. Gold Lake Bog is a complex of wetland habitats including: ponds, sedge-dominated fens, sedge-dominated marshes, willow and birch swamps, and seasonally dry grasslands. The wetland complex contains several interesting, and unique (to the Willamette National Forest), vegetation types. These types are mostly linked, and considerably influenced by Salt Creek as it meanders through the RNA toward Gold Lake. An area in the upper portion of the bog contains a mosaic association of Engelmann spruce, lodgepole pine, and bog birch. Although the latter species has a broad geographic range, it is quite rare on the Middle Fork Ranger District. The main portion of the fen occurs adjacent to Gold Lake, where a scattered overstory of lodgepole pine combines with a low shrub layer of bog laurel and bog blueberry growing on hummocks that are slightly drier than the surrounding wetland.

On the west corner of the fen near the north corner of Gold Lake are several large springs. Some emerge at the lake or fen margins and others flow in short creeks before entering the lake or the fen. These springs and spring-fed streams support typical fen vegetation.

The fen complex is surrounded by Montane Mixed Conifer Forest habitat type. Forest floor vegetation in this area is typically dominated by several species of huckleberry, beargrass, and occasionally rhododendron.

Beaver are a keystone species affecting the ecological and hydrological processes throughout the entire wetland area. The fen area also supports several species of rare plants as well as the largest breeding population of Oregon spotted frog west of the crest of the Cascade Mountains (USDAWNF 2011). The Oregon spotted frog is a candidate species for listing under the Endangered Species Act. The U. S. Geological Survey has conducted long-term research on breeding abundance of the frog population at the Gold Lake site (USDAWNF 2011).

A detailed description of Gold Lake Bog can be found in the Site Management Plan for the Oregon Spotted Frog attached to the Establishment Report.

The Pacific Northwest Interagency Natural Areas Committee recognizes the importance of a multi-agency natural area program within Oregon. Over the past three decades, coordination between agencies and organizations has ensured selection of high quality sites representation a broad range of ecological situations across Oregon. The State of Oregon Natural Areas Plan documents the ecological communities, and rare plant and animal species present within Oregon (ONHAC 2010). The communities and rare species of statewide significance that are represented at Gold Lake Bog RNA include:

- 50. Mountain hemlock/big huckleberry.
- 54. Engelmann spruce-subalpine fir forest.
- 73. Upper montane to subalpine pond, with aquatic beds and marshy shore.
- 82. Few flowered spikerush/brown moss fen, with lodgepole pine.
- 85. Geyer willow shrub swamp.
- 88. Bog birch shrub swamp.
- 90. Bog blueberry shrub swamp, with Engelmann spruce, lodgepole pine, and tufted hairgrass.
- 78 Oregon spotted frog (*Rana pretiosa*).

c. Land Management Planning. The original boundary for Gold Lake Bog was recognized in the 1990 Willamette National Forest Land and Resource Management Plan (USDAWNF 1990). The expanded portion of the RNA was recognized in the Gold Lake Bog RNA Boundary Adjustment Decision Notice and Environmental Assessment (USDAWNF 2010).

Gold Lake Bog is classified as a Research Natural Area (RNA) land allocation under the Willamette National Forest Land and Resource Management Plan (1990). Research Natural Areas are set aside as areas where natural processes should be allowed to occur without human intervention. Their intent is to provide areas for non-manipulative environmental research, observation, and study. Specifically timber harvest is prohibited and access is limited to roads and trails that do not compromise the objectives of the RNA.

d. Management Prescription. The desired condition of the RNA is to provide for naturally occurring physical and biological processes without undue human intervention. The goals of the RNA are to provide protected areas that can be used to compare lands influenced by humans, provide educational and research areas for ecological and environmental studies, and preserve gene pools of rare and endangered plants and animals.

The RNA network within the Pacific Northwest encompasses a diverse assemblage of terrestrial and aquatic ecosystems represented in Oregon and Washington. Many RNA sites, such as Gold Lake Bog, serve as integral components of regional conservations strategies. Natural areas also provide a range of necessary ecological services for humans, including carbon sequestration, air and water filtration, water supply and regulation, erosion and sediment control, and local climate regulation. RNAs also hold aesthetic, cultural, and intrinsic values that contribute to an increase in the quality of life for humans (Wilson et al. 2009, Thompson and Starzomski 2007)

Recreation. Recreational use should be restricted or prohibited if such use threatens or interferes with the objectives or purposes for which the Research Natural Area is established (FSM 4063.35). Motorized recreation is prohibited at Gold Lake Bog RNA. There are established hiking trails on both sides of the bog, including Gold Lake Trail which passes through the RNA on the northwest side and Maiden Peak Trail on the southeast side. Although both trails are close to the bog, there appears to be an adequate buffer of upland forest between the trail and the bog that keeps most visitors from entering the bog. There is a developed campground (Gold Lake Campground) on the southern edge of Gold Lake. Most of the recreational use in the area is concentrated within the campground, the trails, and non-motorized boat and fly-fishing on Gold Lake. Forest Road 5897 runs parallel to the Research Natural Area along the northwest edge and facilitates travel by passenger vehicles in the summer and fall and snowmobiles in the winter and spring. This road is the main access to Waldo Lake, an important

recreational attraction on the Willamette National Forest. It is the second largest lake in Oregon and is revered for its pristine waters.

The existing developed campground southwest of the RNA is in a Management Area 12 Developed Recreation Site Prescription, which allows facilities and improvements, consistent with resource protections that support meaningful recreational experiences. The area surrounding Marilyn Lakes southwest of Gold Lake is in an Old Growth Grove Management Area Prescription 7, which preserves representative old-growth forests and provide opportunities for the public to enjoy the educational, aesthetic and spiritual values associated with such forests. Both of the developed campground and the old growth grove are outside the proposed management changes to Gold Lake and would not affect the RNA (USDAWNF 1990).

Existing Oregon Revised Statute 830.180 prohibits motors on Gold Lake, other than by Department of State Police and governmental agencies of Oregon and the federal government having jurisdiction on the described waters (USDAWNF 1990).

Timber management. No programmed timber harvest will be scheduled. Felled trees may be permitted for to ensure the safety of visitors Additional details can be found in the Willamette National Forest Land and Resource Management Plan (LRMP), Chapter IV.

e. Use or Control of Fire and Grazing. Fire should be natural and only for maintaining or promoting the ecological features for which the RNA is established. To control fire within Research Natural Areas, only methods that cause the least disturbance should be considered. No direct suppression activities, fire lines, fire retardant, or water dipping in Gold Lake should occur. Methods that employ ground machinery should also not be used. In developing a fire management plan, consider the role of natural fire in sustaining or managing the vegetation at the site. Any prescribed fire should mimic natural processes (USDA WNF 1990).

g. Physical Site Description and Climatic Conditions.

(1) Location: The RNA is located on the Willamette National Forest, Middle Fork Ranger District. The RNA falls in portions of: Sections 20,21,28,29, & 30, T.22 S., R.6 E., Willamette Meridian.

(2) Access: Beginning at the Middle Fork Ranger Station travel south-east on Highway 58 until Highway 58 intersects with road 5897 located in Township 22S, Range 5 ½E, Section 35. Proceed east on 5897 to the trailhead 3677 located in T22SR06E Section 30. This will take to the southeast corner of the RNA. From this point, proceed northeast into the RNA.

(3) Climate: The Salt Creek watershed where Gold Lake resides has a temperate climate with generally wet cool winters and dry warm summers. Average annual precipitation ranges from about 40 inches (102 cm) in the lower portion of the watershed to approximately 80 inches (203 cm) in the higher elevations. Above 4,000 feet (1219 m) in elevation, the majority of winter precipitation falls as snow. Yearly snow depths are variable but generally the snow period occurs from (September) November through March (May).

h. Ecological Description.

(1) Topography and hydrology: The topography is flat, except in the northwestern and southeastern corners where lower portions of adjoining slopes are included within the RNA boundary. Three small ponds occur within the central portion of the fen. 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.).

(2) Geology: Gold Lake Bog and surrounding mountains are located in the volcanic High Cascades. Bedrock is composed of Pliocene-Pleistocene olivine basalt and basaltic andesite. The area is covered by Aeolian deposits of volcanic ash and dacitic pumice, much of which came from the Mount Mazama eruption 6,600 years ago.

(3) Soils: Soils in upland areas 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 soils predominate within the fen and along lake margins

(4) Vegetation: Gold Lake Bog RNA lies within the mountain hemlock zone and is dominated by coniferous forests. Mountain hemlock forest associations occupy 81% of the RNA. White fir/grand fir forest associations occur on roughly 12% of the area, and Pacific silver fir forests occur on 7.5% of the site. The mountain hemlock zone has the highest elevation and coldest temperatures of the potential natural vegetation zones within the central Cascade Mountains. Plant community types occurring within the RNA include herbaceous wetland dominated by sedges, rushes, and grasses.

Plant associations and plant communities (McCain and Diaz 2002, USNVC 2013) present within Gold Lake Bog RNA are:

<u>Vegetation type</u>	<u>Size</u>	<u>Percentage of total</u>
<i>Pseudotsuga menziesii</i> / <i>Arctostaphylos uva-ursi</i> - <i>Spirea betulifolia</i> var. <i>lucida</i> - <i>Paxistima myrsinites</i>	0.36 ha (0.89 ac)	0.14%
<i>Abies amabilis</i> / <i>Gaultheria shallon</i> - <i>Berberis nervosa</i>	0.27 ha (0.67 ac)	0.10%
<i>Abies amabilis</i> / <i>Acer circinatum</i> - <i>Achlys</i>	0.63 ha (1.56 ac)	0.24%

triphylla

<i>Tsuga mertensiana/ Vaccinium scoparium- Vaccinium membranaceum</i>	217.98 ha (538.6 ac)	82.63%
<i>Tsuga mertensiana/ Vaccinium membranaceum-Menziesia ferruginea</i>	44.46 ha (109.9 ac)	16.85%
Fen	0.09 ha (0.22 ac)	0.03%

Three sensitive plant species have been documented at Gold Lake Bog. Rannoch-rush (*Scheuchzeria palustris*) is a unique, rush-like plant found in fens, ponds, and lake margins at moderate to high elevations in the central western Cascade Mountains. It is found at four locations on the Willamette National Forest. *Scheuchzeria* grows with other fen-dependent plant species such as bladderworts (*Utricularia* spp.), sundews (*Drosera* spp.), and alpine laurel (*Kalmia microphylla*). Lesser bladderwort (*Utricularia minor*) and yellowishwhite bladderwort (*Utricularia ochroleuca*) are insectivorous fen plants. Each has bladders that act as insect-catching devices. Both species grow in water channels throughout the fen. Lesser bladderwort is known from three other locations on the Willamette National forest. Yellowishwhite bladderwort is known from only 1 other site on the Forest (USDAWNF 2010). In addition, a sensitive moss species, *Tomenthypnum nitens*, occurs at Gold Lake Bog and this is the only location known on the Willamette National Forest. In Oregon, this moss species is ranked as a G5S2 List 2.

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f. Appendices

Appendix 1 Updated plant list

Appendix 2 Updated amphibian, bird, reptile and mammal list

Appendix 3 Updated insect list

Appendix 4 Research since inception of original RNA establishment

Appendix 1 -- Updated plant list^{1 2 3}

Ferns & Allies

Blechnaceae

<i>Blechnum spicant</i>	Deer fern
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Dryopteridaceae

<i>Polystichum munitum</i>	Western swordfern
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Equisetaceae

<i>Equisetum arvense</i>	Field horsetail
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<i>Equisetum hyemale</i>	Scouringrush horsetail
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Ophioglossaceae

<i>Sceptridium multifidum</i>	Leathery grapefern
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Woodsiaceae

<i>Athyrium filix-femina</i>	Common ladyfern
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<i>Cystopteris fragilis</i>	Brittle bladderfern
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Trees & Shrubs: Conifers

Cupressaceae

<i>Juniperus communis</i>	Common juniper
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Pinaceae

<i>Abies amabilis</i>	Pacific silver fir
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<i>Abies concolor x grandis</i>	Grand fir – White fir hybrid
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<i>Abies grandis</i>	Grand fir
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<i>Abies lasiocarpa</i>	Sub alpine fir
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<i>Abies magnifica x procera</i>	California red fir – noble fir hybrid
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<i>Picea engelmannii</i>	Engelmann spruce
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Pinus contorta var. *latifolia*

Lodgepole pine

Pinus monticola

Western white pine

Pseudotsuga menziesii

Douglas-fir

Tsuga heterophylla

Western hemlock

Tsuga mertensiana

Mountain hemlock

Trees & Shrubs: Dicots

Adoxaceae

Sambucus racemosa

Red elderberry

Berberidaceae

Berberis nervosa

Cascade barberry

Betulaceae

Alnus rubra

Red alder

Alnus viridis ssp. *sinuata*

Sitka alder

Betula glandulosa

Resin birch

Caprifoliaceae

Lonicera caerulea

Sweetberry honeysuckle

Lonicera conjugialis

Purpleflower honeysuckle

Lonicera involucrata

Twinberry honeysuckle

Celastraceae

Paxistima myrsinites

Oregon boxleaf

Cornaceae

Cornus sericea

Redosier dogwood

Ericaceae

Arctostaphylos nevadensis

Pinemat manzanita

<i>Gaultheria humifusa</i>	Alpine spicewintergreen
<i>Gaultheria ovatifolia</i>	Western teaberry
<i>Kalmia macrophylla</i>	Alpine laurel
<i>Rhododendron macrophyllum</i>	Pacific rhododendron
<i>Vaccinium cespitosum</i>	Dwarf bilberry
<i>Vaccinium membranaceum</i>	Thinleaf huckleberry
<i>Vaccinium ovalifolium</i>	Oval-leaf blueberry
<i>Vaccinium scoparium</i>	Grouse whortleberry
<i>Vaccinium uliginosum</i>	Bog blueberry
Grossulariaceae	
<i>Ribes cereum</i>	Wax currant
<i>Ribes lacustre</i>	Prickly currant
<i>Ribes triste</i>	Red currant
Rosaceae	
<i>Amelanchier alnifolia</i>	Saskatoon serviceberry
<i>Rosa gymnocarpa</i>	Dwarf rose
<i>Rubus lasiococcus</i>	Roughfruit berry
<i>Sorbus sitchensis</i>	Western mountain ash
<i>Spiraea douglasii</i>	Rose spirea
Salicaceae	
<i>Salix commutata</i>	Undergreen willow
<i>Salix geyeriana</i>	Geyer willow
<i>Salix lucida</i> ssp. <i>lasiandra</i>	Pacific willow
<i>Salix sitchensis</i>	Sitka willow
<i>Salix</i> sp.	Willow

Sapindaceae

Acer circinatum

Vine maple

Herbaceous dicots

Apiaceae

Angelica arguta

Lyall's angelica

Angelica genuflexa

Knealing angelica

Cicuta douglasii

Western water hemlock

Heracleum maximum

Common cowparsnip

Ligusticum grayi

Gray's licorice-root

Osmorhiza berteroi

Sweetcicely

Perideridia gairdneri

Gardner's yampah

Sphenosciadium capitellatum

Woollyhead parsnip

Aristolochiaceae

Asarum caudatum

British Columbia wild ginger

Asteraceae

Achillea millefolium

Common yarrow

Adenocaulon bicolor

American trailplant

Agoseris aurantiaca

Orange agoseris

Anaphalis margaritacea

Pearly everlasting

Antennaria rosea

Rosy pussytoes

Arnica latifolia

Broadleaf arnica

Arnica mollis

Hairy arnica

Canadanthus modestus

Giant mountain aster

Cirsium remotifolium

Fewleaf thistle

<i>Erigeron aliceae</i>	Alice Eastwood's fleabane
<i>Hieracium albiflorum</i>	White hawkweed
* <i>Mycelis muralis</i> ³	Wall-lettuce
<i>Petasites frigidus</i> var. <i>palmatius</i>	Arctic sweet coltsfoot
<i>Rainiera stricta</i>	False silverback
<i>Rudbeckia occidentalis</i>	Western coneflower
<i>Senecio triangularis</i>	Arrowleaf ragwort
<i>Solidago canadensis</i>	Canada goldenrod
<i>Symphyotrichum spathulatum</i>	Western mountain aster
* <i>Taraxacum officinale</i>	Common dandelion
Berberidaceae	
<i>Achlys triphylla</i>	Sweet after death
<i>Vancouveria hexandra</i>	White inside out flower
Boraginaceae	
<i>Hackelia micrantha</i>	Jessica sticktight
<i>Hydrophyllum occidentale</i>	Western waterleaf
<i>Hydrophyllum tenuipes</i>	Pacific waterleaf
<i>Mertensia paniculata</i>	Tall bluebells
<i>Nemophila parviflora</i>	Smallflower nemophila
Brassicaceae	
<i>Arabis drummondii</i>	Drummond's rockcress
Caryophyllaceae	
<i>Cerastium nutans</i>	Nodding chickweed
<i>Sagina</i> sp.	Pearlwort
<i>Stellaria longipes</i>	Longstalk starwort

<i>Stellaria obtusa</i>	Rocky Mountain chickweed
Cornaceae	
<i>Cornus unalaschkensis</i>	Western cordilleran bunchberry
Crassulaceae	
<i>Sedum spathulifolium</i>	Broadleaf stonecrop
Droseraceae	
<i>Drosera anglica</i>	English sundew
<i>Drosera rotundifolia</i>	Roundleaf sundew
Ericaceae	
<i>Chimaphila menziesii</i>	Little prince's pine
<i>Chimaphila umbellata</i>	Pipsissewa
<i>Hemitomes congestum</i>	Coneplant
<i>Moneses uniflora</i>	Single delight
<i>Monotropa hypopithys</i>	Pinesap
<i>Orthilla secunda</i>	Sidebells wintergreen
<i>Pyrola asarifolia</i>	Liverleaf wintergreen
<i>Pyrola picta</i>	Whiteveined wintergreen
Fabaceae	
<i>Lathyrus nevadensis</i>	Sierra pea
<i>Lathyrus polyphyllus</i>	Leafy pea
* <i>Lotus corniculatus</i>	Bird's-foot trefoil
<i>Lupinus latifolius</i>	Broadleaf lupine
<i>Trifolium longipes</i>	Longstalk clover
Hypericaceae	
<i>Hypericum anagalloides</i>	Tinker's penny

<i>Hypericum formosum</i>	Western St. John's-wort
Lamiaceae	
<i>Agastache urticifolia</i>	Nettle leaved giant hyssop
<i>Prunella vulgaris</i>	Common selfheal
Lentibulariaceae	
<i>Utricularia intermedia</i>	Flatleaf bladderwort
<i>Utricularia macrorhiza</i>	Common bladderwort
<i>Utricularia minor</i>	Lesser bladderwort
<i>Utricularia ochroleuca</i>	Yellowishwhite bladderwort
Linnaeaceae	
<i>Linnaea borealis</i>	Twinflower
Menyanthaceae	
<i>Menyanthes trifoliata</i>	Buckbean
Montiaceae	
<i>Claytonia sibirica</i>	Siberian springbeauty
Nymphaeaceae	
<i>Nuphar lutea</i> ssp. <i>polysepala</i>	Rocky Mountain pond-lily
Onagraceae	
<i>Chamerion angustifolium</i>	Fireweed
<i>Circaea alpina</i>	Small enchanter's nightshade
<i>Epilobium ciliatum</i> ssp. <i>watsonii</i>	Fringed willowherb
<i>Epilobium glaberrimum</i>	Glaucous willowherb
<i>Epilobium oregonense</i>	Oregon willowherb
<i>Epilobium</i> sp.	Willowherb
Orobanchaceae	

<i>Castilleja miniata</i>	Giant red Indian paintbrush
<i>Pedicularis bracteosa</i> var. <i>flavida</i>	Towering lousewort
<i>Pedicularis groenlandica</i>	Elephanthead lousewort
<i>Pedicularis racemosa</i>	Sickle-top lousewort
Papaveraceae	
<i>Dicentra formosa</i>	Pacific bleeding heart
Phrymaceae	
<i>Mimulus guttatus</i>	Seep monkeyflower
<i>Mimulus primuloides</i>	Primrose monkeyflower
Plantaginaceae	
<i>Veronica americana</i>	American speedwell
<i>Veronica serpyllifolia</i> var. <i>humifusa</i>	Brightblue speedwell
<i>Veronica wormskjoldii</i>	American alpine speedwell
Polemoniaceae	
<i>Phlox adsurgens</i>	Northern phlox
<i>Polemonium californicum</i>	Moving polemonium
Polygonaceae	
<i>Bistorta bistortoides</i>	American bistort
* <i>Rumex acetosella</i>	Common sheep sorrel
Primulaceae	
<i>Dodecatheon jeffreyi</i>	Sierra shootingstar
Ranunculaceae	
<i>Aconitum columbianum</i>	Columbian monkshood
<i>Aquilegia formosa</i>	Western columbine
<i>Caltha leptosepala</i>	White marsh marigold

<i>Ranunculus aquatilis</i>	White water crowfoot
<i>Ranunculus flammula</i>	Greater creeping spearwort
<i>Ranunculus gormanii</i>	Gorman's buttercup
<i>Ranunculus uncinatus</i>	Woodland buttercup
<i>Ranunculus</i> sp.	Buttercup
Rosaceae	
<i>Comarum palustre</i>	Purple marshlocks
<i>Fragaria virginiana</i>	Virginia strawberry
<i>Geum macrophyllum</i>	Largeleaf avens
<i>Potentilla drummondii</i>	Drummond's cinquefoil
Rubiaceae	
<i>Galium trifidum</i> ssp. <i>columbianum</i>	Three-petal bedstraw
<i>Galium triflorum</i>	Fragrant bedstraw
Saxifragaceae	
<i>Micranthes odontoloma</i>	Brook saxifrage
<i>Micranthes oregana</i>	Oregon saxifrage
<i>Mitella breweri</i>	Brewer's miterwort
<i>Mitella caulescens</i>	Slightstemmed miterwort
<i>Tiarella trifoliata</i> var. <i>unifoliata</i>	Oneleaf foamflower
Valerianiaceae	
<i>Valeriana sitchensis</i>	Sitka valerian
Violaceae	
<i>Viola adunca</i>	Hookedspur violet
<i>Viola glabella</i>	Pioneer violet
<i>Viola macloskeyi</i>	Small white violet

Viola orbiculata

Darkwoods violet

Monocots

Amaryllidaceae

Allium validum

Pacific onion

Araceae

Lysichiton americanus

American skunkcabbage

Asparagaceae

Camassia quamash

Small camas

Maianthemum racemosum

Feathery false lily of the valley

Maianthemum stellatum

Starry false lily of the valley

Liliaceae

Calochortus tolmiei

Tolmie star-tulip

Clintonia uniflora

Bride's bonnet

Erythronium grandiflorum

Yellow avalanche-lily

Lilium columbianum

Columbia lily

Prosartes hookeri

Drops-of-gold

Streptopus amplexifolius

Claspleaf twistedstalk

Streptopus lanceolatus var. *curvipes*

Twistedstalk

Melanthiaceae

Trillium ovatum

Pacific trillium

Veratrum viride

Green false hellebore

Xerophyllum tenax

Common beargrass

Orchidaceae

Corallorhiza maculata

Summer coralroot

<i>Corallorhiza mertensiana</i>	Pacific coralroot
<i>Corallorhiza striata</i>	Hooded coralroot
<i>Corallorhiza</i> sp.	Coralroot
<i>Goodyera oblongifolia</i>	Western rattlesnake plantain
<i>Listera caurina</i>	Northwestern twayblade
<i>Listera convallarioides</i>	Broadlipped twayblade
<i>Listera cordata</i>	Heartleaf twayblade
<i>Listera</i> sp.	Twayblade
<i>Platanthera dilatata</i>	Scentbottle
<i>Platanthera sparsiflora</i>	Sparse-flowered bog orchid
<i>Platanthera stricta</i>	Slender bog orchid
<i>Platanthera</i> sp.	Fringed orchid
<i>Spiranthes romanzoffiana</i>	Hooded lady's tresses
<i>Spiranthes stellata</i>	Starry lady's tresses
Potamogetonaceae	
<i>Potamogeton alpinus</i>	Alpine pondweed
<i>Potamogeton foliosus</i>	Leafy pondweed
<i>Potamogeton natans</i>	Floating pondweed
Scheuchzeriaceae	
<i>Scheuchzeria palustris</i>	Rannoch-rush
Tofieldiaceae	
<i>Triantha occidentalis</i>	Western false asphodel
Typhaceae	
<i>Sparganium emersum</i>	European bur-reed

Graminoids

Cyperaceae

<i>Carex aquatilis</i> var. <i>dives</i>	Sitka sedge
<i>Carex echinata</i> ssp. <i>echinata</i>	Star sedge
<i>Carex limosa</i>	Mud sedge
<i>Carex simulata</i>	Analogue sedge
<i>Carex subfusca</i>	Brown sedge
<i>Carex utriculata</i>	Northwest Territory sedge
<i>Eleocharis palustris</i>	Common spikerush
<i>Eleocharis quinqueflora</i>	Fewflower spikerush
<i>Eriophorum gracile</i>	Slender cottongrass
<i>Scirpus microcarpus</i>	Panicled bulrush

Juncaceae

<i>Juncus balticus</i>	Mountain rush
<i>Juncus orthophyllus</i>	Straightleaf rush
<i>Juncus parryi</i>	Parry's rush
<i>Juncus</i> sp.	Rush

Poaceae

<i>Agrostis scabra</i>	Rough bentgrass
<i>Calamagrostis canadensis</i>	Bluejoint
<i>Calamagrostis stricta</i>	Slimstem reedgrass
* <i>Dactylis glomerata</i>	Orchardgrass
<i>Danthonia intermedia</i>	Timber oatgrass
<i>Deschampsia cespitosa</i>	Tufted hairgrass

<i>Dichanthelium acuminatum</i>	Tapered rosette grass
<i>Glyceria borealis</i>	Small floating mannagrass
<i>Glyceria leptostachya</i>	Davy mannagrass
<i>Hordeum brachyantherum</i>	Meadow barley
* <i>Hordeum murinum</i> ssp. <i>murinum</i>	Wall barley
<i>Muhlenbergia filiformis</i>	Pullup muhly
* <i>Phleum pratense</i>	Timothy
* <i>Poa pratensis</i>	Kentucky bluegrass
<i>Torreyochloa pallida</i>	Pale false mannagrass

¹ Taxa observed or reported to occur within the Research Natural Area.

² List developed by Tanya Harvey and the Eugene chapter of the Native Plant Society of Oregon in 2012

³ * = non-native species

Appendix 2 -- Updated amphibian, bird, reptile and mammal list'

Common Name	Scientific Name	Status	Source
AMPHIBIANS			
Northwestern Salamander	<i>Ambystoma gracile</i>	Known	USGS Observations
Long-toed Salamander	<i>Ambystoma macrodactylum</i>	Potential	
Pacific Giant Salamander	<i>Dicamptodon tenebrosus</i>	Potential	
Oregon Slender Salamander	<i>Batrachoseps wrightii</i>	Potential	
Ensatina	<i>Ensatina eschscholtzii</i>	Potential	
Dunn's Salamander	<i>Plethodon dunni</i>	Potential	
Rough-skinned Newt	<i>Taricha granulosa</i>	Known	USGS Observations
Western Toad	<i>Bufo boreas</i>	Known	USFS Observations
Pacific Chorus (Tree) Frog	<i>Pseudacris regilla</i>	Known	USFS Observations
Cascades Frog	<i>Rana cascadae</i>	Known	USGS Observations
Oregon Spotted Frog	<i>Rana pretiosa</i>	Known	USGS/USFS Observations
REPTILES			
Northern Alligator Lizard	<i>Elgaria coerulea</i>	Potential	
Rubber Boa	<i>Charina bottae</i>	Potential	
Common Garter Snake	<i>Thamnophis sirtalis</i>	Potential	

BIRDS

Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Known	Audubon Society Observations
Pied-billed Grebe	<i>Podilymbus podiceps</i>	Known	Audubon Society Observations
Great Blue Heron	<i>Ardea herodias</i>	Known	Audubon Society Observations
Wood Duck	<i>Aix sponsa</i>	Known	Audubon Society Observations
Mallard	<i>Anas platyrhynchos</i>	Known	USFS Observations
Cinnamon Teal	<i>Anas cyanoptera</i>	Known	Audubon Society Observations
Green-winged Teal	<i>Anas crecca</i>	Known	Audubon Society Observations
Northern Pintail	<i>Anas acuta</i>	Known	Audubon Society Observations
Gadwall	<i>Ana strepera</i>	Known	USFS Observations
American Wigeon	<i>Anas americana</i>	Known	Audubon Society Observations
Bufflehead	<i>Bucephala albeola</i>	Known	USFS Observations
Barrow's Goldeneye	<i>Bucephala islandica</i>	Known	Audubon Society Observations
Hooded Merganser	<i>Lophodytes cucullatus</i>	Potential	
Common Merganser	<i>Mergus merganser</i>	Potential	
Ring-necked Duck	<i>Aythya collaris</i>	Known	USFS Observations
Lesser Scaup	<i>Aythya affinis</i>	Known	Audubon Society Observations

Solitary Sandpiper	<i>Tringa solitaria</i>	Known	Audubon Society Observations
Spotted Sandpiper	<i>Actitis macularia</i>	Known	USFS Observations
Turkey Vulture	<i>Cathartes aura</i>	Known	USFS Observations
Osprey	<i>Pandion haliaetus</i>	Known	Audubon Society Observations
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Known	USFS Observations
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Known	USFS Observations
Cooper's Hawk	<i>Accipiter cooperii</i>	Known	USFS Observations
Northern Goshawk	<i>Accipiter gentilis</i>	Known	Audubon Society Observations
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Known	USFS Observations
Golden Eagle	<i>Aquila chrysaetos</i>	Potential	
American Kestrel	<i>Falco sparverius</i>	Potential	
Merlin	<i>Falco columbarius</i>	Potential	
Peregrine Falcon	<i>Falco peregrinus</i>	Potential	
Ruffed Grouse	<i>Bonasa umbellus</i>	Potential	
Sooty (Blue) Grouse	<i>Dendragapus fuliginosus</i>	Known	USFS Observations
Mountain Quail	<i>Oreortyx pictus</i>	Known	Audubon Society Observations
Sora	<i>Porzana carolina</i>	Known	Audubon Society Observations
American Coot	<i>Fulica americana</i>	Known	Audubon Society Observations
Killdeer	<i>Charadrius vociferus</i>	Potential	

Common Snipe	<i>Gallinago gallinago</i>	Known	USFS Observations
Western Screech-owl	<i>Otus kennicottii</i>	Potential	
Great Horned Owl	<i>Bubo virginianus</i>	Known	USFS Observations
Northern Pygmy-owl	<i>Glaucidium gnoma</i>	Known	Audubon Society Observations
Northern spotted owl	<i>Strix occidentalis caurina</i>	Known	USFS Observations
Barred Owl	<i>Strix varia</i>	Known	USFS Observations
Great Gray Owl	<i>Strix nebulosa</i>	Potential	
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	Potential	
Common Nighthawk	<i>Chordeillis minor</i>	Known	Audubon Society Observations
Black Swift	<i>Cypseloides niger</i>	Potential	
Vaux's Swift	<i>Chaetura vauxi</i>	Known	Audubon Society Observations
Calliope Hummingbird	<i>Stellula calliope</i>	Potential	
Rufous Hummingbird	<i>Selasphorus rufus</i>	Known	Audubon Society Observations
Belted Kingfisher	<i>Ceryle alcyon</i>	Known	USFS Observations
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	Known	USFS Observations
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	Known	USFS Observations
Downy Woodpecker	<i>Picoides villosus</i>	Potential	
Hairy Woodpecker	<i>Picoides pubescens</i>	Known	Audubon Society Observations
White-headed	<i>Picoides</i>	Potential	

Woodpecker	<i>albolarvatus</i>		
Three-toed Woodpecker	<i>Picoides tridactylus</i>	Known	USFS Observations
Black-backed Woodpecker	<i>Picoides arcticus</i>	Known	Audubon Society Observations
Northern Flicker	<i>Colaptes auratus</i>	Known	USFS Observations
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Known	USFS Observations
Lewis' Woodpecker	<i>Melanerpes lewis</i>	Known	Audubon Society Observations
Olive-sided Flycatcher	<i>Contopus borealis</i>	Known	Audubon Society Observations
Western Wood-Pewee	<i>Contopus sordidulus</i>	Known	Audubon Society Observations
Willow Flycatcher	<i>Empidonax traillii</i>	Known	USFS Observations
Hammond's Flycatcher	<i>Empidonax hammondii</i>	Known	Audubon Society Observations
Dusky Flycatcher	<i>Empidonax oberholseri</i>	Known	Audubon Society Observations
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	Known	Audubon Society Observations
Tree Swallow	<i>Tachycineta bicolor</i>	Known	USFS Observations
Violet-green Swallow	<i>Tachycineta thalassina</i>	Known	USFS Observations
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Known	Audubon Society Observations
Barn Swallow	<i>Hirundo rustica</i>	Known	Audubon Society Observations
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Known	Audubon Society Observations

Gray Jay	<i>Perisoreus canadensis</i>	Known	USFS Observations
Steller's Jay	<i>Cyanocitta stelleri</i>	Known	USFS Observations
Clark's Nutcracker	<i>Nucifraga columbiana</i>	Known	Audubon Society Observations
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	Potential	
Mourning Dove	<i>Zenaida macroura</i>	Potential	
American Crow	<i>Corvus brachyrhynchos</i>	Known	USFS Observations
Common Raven	<i>Corvus corax</i>	Known	USFS Observations
Mountain Chickadee	<i>Parus gambeli</i>	Known	Audubon Society Observations
Chestnut-backed Chickadee	<i>Parus rufescens</i>	Known	Audubon Society Observations
Red-breasted Nuthatch	<i>Sitta canadensis</i>	Known	USFS Observations
Brown Creeper	<i>Certhia americana</i>	Known	USFS Observations
Winter Wren	<i>Troglodytes troglodytes</i>	Known	USFS Observations
Rock Wren	<i>Salpinctes obsoletus</i>	Known	Audubon Society Observations
House Wren	<i>Troglodytes aedon</i>	Known	Audubon Society Observations
Marsh Wren	<i>Cistothorus palustris</i>	Potential	
American Dipper	<i>Cinclus mexicanus</i>	Known	USFS Observations
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Known	USFS Observations
Ruby-crowned Kinglet	<i>Regulus calendula</i>	Known	Audubon Society

			Observations
Western Bluebird	<i>Sialia mexicana</i>	Known	Audubon Society Observations
Mountain Bluebird	<i>Sialia currucoides</i>	Known	Audubon Society Observations
Townsend's Solitaire	<i>Myadestes townsendi</i>	Known	Audubon Society Observations
Swainson's Thrush	<i>Catharus ustulatus</i>	Known	USFS Observations
Hermit Thrush	<i>Catharus guttatus</i>	Known	Audubon Society Observations
American Robin	<i>Turdus migratorius</i>	Known	USFS Observations
Varied Thrush	<i>Ixoreus naevius</i>	Known	USFS Observations
Cedar Waxwing	<i>Bombycilla cedrorum</i>	Known	Audubon Society Observations
Hutton's Vireo	<i>Vireo huttoni</i>	Known	Audubon Society Observations
Warbling Vireo	<i>Vireo gilvus</i>	Known	Audubon Society Observations
Orange-crowned Warbler	<i>Vermivora celata</i>	Known	Audubon Society Observations
Nashville Warbler	<i>Vermivora ruficapilla</i>	Known	Audubon Society Observations
Yellow Warbler	<i>Dendroica petechia</i>	Known	Audubon Society Observations
Yellow-rumped Warbler	<i>Dendroica coronata</i>	Known	Audubon Society Observations
Townsend's Warbler	<i>Dendroica townsendii</i>	Known	Audubon Society Observations
Hermit Warbler	<i>Dendroica occidentalis</i>	Known	Audubon Society Observations

Northern Waterthrush	<i>Seiurus noveboracensis</i>	Known	Audubon Society Observations
Macgillivray's Warbler	<i>Oporornis tolmiei</i>	Known	Audubon Society Observations
Common Yellowthroat	<i>Geothlypis trichas</i>	Known	Audubon Society Observations
Wilson's Warbler	<i>Wilsonia pusilla</i>	Known	USFS Observations
Western Tanager	<i>Piranga rubra</i>	Known	USFS Observations
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	Known	Audubon Society Observations
Spotted Towhee	<i>Pipilo maculatus</i>	Known	Audubon Society Observations
Chipping Sparrow	<i>Spizella passerina</i>	Known	Audubon Society Observations
Fox Sparrow	<i>Passerella iliaca</i>	Known	Audubon Society Observations
Song Sparrow	<i>Melospiza melodia</i>	Known	Audubon Society Observations
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	Known	Audubon Society Observations
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	Known	Audubon Society Observations
Dark-eyed Junco	<i>Junco hyemalis</i>	Known	USFS Observations
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Known	Audubon Society Observations
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	Known	USFS Observations
Brown-headed Cowbird	<i>Molothrus ater</i>	Known	Audubon Society Observations
Bullock's Oriole	<i>Icterus bullockii</i>	Potential	

Pine Grosbeak	<i>Pinicola enucleator</i>	Potential	
Purple Finch	<i>Carpodacus purpureus</i>	Known	Audubon Society Observations
Cassin's Finch	<i>Carpodacus cassinii</i>	Known	Audubon Society Observations
Red Crossbill	<i>Loxia curvirostra</i>	Known	USFS Observations
White-winged Crossbill	<i>Loxia leucoptera</i>	Known	Audubon Society Observations
Pine Siskin	<i>Carduelis pinus</i>	Known	USFS Observations
American Goldfinch	<i>Carduelis tristis</i>	Known	Audubon Society Observations
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	Known	Audubon Society Observations

MAMMALS

Vagrant Shrew	<i>Sorex vagrans</i>	Potential
Baird's Shrew	<i>Sorex bairdi</i>	Potential
Fog Shrew	<i>Sorex sonomae</i>	Potential
Pacific Shrew	<i>Sorex pacificus</i>	Potential
Water Shrew	<i>Sorex palustris</i>	Potential
Pacific Marsh Shrew	<i>Sorex bendirii</i>	Potential
Trowbridge's Shrew	<i>Sorex trowbridgii</i>	Potential
Shrew-mole	<i>Neurotrichus gibbsii</i>	Potential
Coast Mole	<i>Scapanus orarius</i>	Potential
California Myotis	<i>Myotis californicus</i>	Potential
Yuma Myotis	<i>Myotis yumanensis</i>	Potential

Little Brown Myotis	<i>Myotis lucifugus</i>	Potential	
Long-legged Myotis	<i>Myotis volans</i>	Potential	
Long-eared Myotis	<i>Myotis evotis</i>	Potential	
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	Potential	
Big Brown Bat	<i>Eptesicus fuscus</i>	Potential	
Hoary Bat	<i>Lasiurus cinereus</i>	Potential	
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	Potential	
Snowshoe Hare	<i>Lepus americanus</i>	Known	USFS Observations
Mountain Beaver	<i>Aplodontia rufa</i>	Potential	
Townsend's Chipmunk	<i>Tamias townsendii</i>	Potential	
Belding's Ground Squirrel	<i>Spermophilus beldingi</i>	Potential	
California Ground Squirrel	<i>Spermophilus beecheyi</i>	Potential	
Golden-mantled Ground Squirrel	<i>Spermophilus lateralis</i>	Potential	
Douglas' Squirrel	<i>Tamiasciurus douglasii</i>	Known	USFS Observations
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	Potential	
Western Pocket Gopher	<i>Thomomys mazama</i>	Potential	
Badger	<i>Taxidea taxus</i>	Potential	
American Beaver	<i>Castor canadensis</i>	Known	USFS Observations
Deer Mouse	<i>Peromyscus maniculatus</i>	Potential	

Bushy-tailed Woodrat	<i>Neotoma cinerea</i>	Potential	
Western Red-backed Vole	<i>Clethrionomys californicus</i>	Potential	
Heather Vole	<i>Phenacomys intermedius</i>	Potential	
White-footed Vole	<i>Phenacomys albipes</i>	Potential	
Red Tree Vole	<i>Arborimus longicaudus</i>	Potential	
Montane Vole	<i>Microtus montanus</i>	Potential	
Long-tailed Vole	<i>Microtus longicaudus</i>	Potential	
Creeping Vole	<i>Microtus oregoni</i>	Potential	
Water Vole	<i>Microtus richardoni</i>	Potential	
Western Jumping Mouse	<i>Zapus princeps</i>	Potential	
Pacific Jumping Mouse	<i>Zapus trinotatus</i>	Potential	
Common Porcupine	<i>Erethizon dorsatum</i>	Potential	
Coyote	<i>Canis latrans</i>	Known	USFS Observations
Red Fox	<i>Vulpes vulpes</i>	Potential	
Black Bear	<i>Ursus americanus</i>	Known	USFS Observations
Common Raccoon	<i>Procyon lotor</i>	Potential	
American Marten	<i>Martes americana</i>	Known	USFS Observations
Fisher	<i>Martes pennanti</i>	Potential	
Ermine	<i>Mustela erminea</i>	Potential	
Long-tailed Weasel	<i>Mustela frenata</i>	Potential	
Mink	<i>Mustela vison</i>	Potential	

Wolverine	<i>Gulo gulo</i>	Potential	
Western Spotted Skunk	<i>Spilogale gracilis</i>	Potential	
Northern River Otter	<i>Lutra canadensis</i>	Known	USFS Observations
Mountain Lion	<i>Felix concolor</i>	Potential	
Bobcat	<i>Lynx rufus</i>	Potential	
Roosevelt Elk	<i>Cervus elaphus</i>	Known	USFS Observations
Black-tailed Deer	<i>Odocoileus hemionus</i>	Known	USFS Observations
Mule Deer	<i>Odocoileus hemionus</i>	Potential	

FISH

Brook Trout	<i>Salvelinus fontinalis</i>	Known	ODFW Observations
Rainbow Trout	<i>Oncorhynchus mykiss</i>	Known	ODFW Observations
Cutthroat Trout	<i>Oncorhynchus clarki</i>	Potential	

¹ Species documented and suspected to occur

Appendix 3 – Updated insect list - Dragonflies and damselflies¹

<u>Common name</u>	<u>Scientific name</u>
American emerald	<i>Cordulia shurtleffii</i>
Black meadowhawk	<i>Sympetrum danae</i>
Blue-eyed darner	<i>Rhionaeschna multicolor</i>
Boreal bluet	<i>Enallagma boreale</i>
Brush-tipped emerald	<i>Somatochlora walshii</i>
California darner	<i>Rhionaeschna californica</i>
Canada darner	<i>Aeshna canadensis</i>
Chalk-fronted corporal	<i>Ladona julia</i>
Common Green darner	<i>Anax junius</i>
Pacific spiketail	<i>Cordulegaster dorsalis</i>
Common whitetail	<i>Plathemis lydia</i>
Crimson-ringed whiteface	<i>Leucorrhinia glacialis</i>
Dot-tailed whiteface	<i>Leucorrhinia intacta</i>
Eight-spotted skimmer	<i>Libellula forensis</i>
Emerald spreadwing	<i>Lestes dryas</i>
Four-spotted skimmer	<i>Libellula quadrimaculata</i>
Great Basin snaketail	<i>Ophiogomphus morrisoni</i>
Hudsonian whiteface	<i>Leucorrhinia hudsonica</i>
Lyre-tipped spreadwing	<i>Lestes unguiculatus</i>
Mountain emerald	<i>Somatochlora semicircularis</i>
Northern bluet	<i>Enallagma annexum</i>

<u>Common name</u>	<u>Scientific name</u>
Northern spreadwing	<i>Lestes disjunctus</i>
Pacific forktail	<i>Ischnura cervula</i>
Paddle-tailed darner	<i>Aeshna palmata</i>
Ringed emerald	<i>Somatochlora albicincta</i>
Sedge darner	<i>Aeshna juncea</i>
Sedge sprite	<i>Nehalennia irene</i>
Shadow darner	<i>Aeshna umbrosa</i>
Spotted spreadwing	<i>Lestes congener</i>
Tiaga bluet	<i>Coenagrion resolutum</i>
Twelve-spotted Skimmer	<i>Libellula pulchella</i>
Variable Darner	<i>Aeshna interrupta</i>
Vivid Dancer	<i>Argia vivida</i>
Western forktail	<i>Ischnura perparva</i>
Western Pondhawk	<i>Erythemis collocata</i>
Western red damsel	<i>Amphiagrion abbreviatum</i>
White-faced meadowhawk	<i>Sympetrum obtrusum</i>
Zig-zag darner	<i>Aeshna sitchensis</i>

¹ Compiled by Cary Kerst, 2011.

Appendix 4 – Research since initial RNA designation

Oregon spotted frog (*Rana pretiosa*) Gold Lake Bog site management plan (excerpts)¹

This is one of the largest breeding populations of *R. pretiosa* in Oregon and is one of only three known populations west of the Cascade Crest in Oregon.

The primary habitat for the Oregon spotted frog occurs on the northeast side of Gold Lake within Gold Lake Bog Research Natural Area. This area is a complex of wetland habitats including: ponds, *Carex*-dominated marshes, sphagnum “bogs” (fens), and willow and birch swamps. This area is currently being occupied by lodgepole pine (*Pinus contorta*). Whether forest development in this area poses a longer-term indirect effect to *R. pretiosa* is speculative, but warrants monitoring for habitat changes.

Key sites selected for tree and shrub encroachment monitoring included Gold Lake Bog and the marsh area surrounding a pond northeast of Gold Lake (referred in this study as Gold Pond or Gold Pond Marsh). Gold Lake Bog was monitored because it is the primary area containing rare and sensitive floral bog species and conversion to forest cover would likely mean loss of these species. Gold Pond Marsh contains some of the most important egg-laying and overwintering habitat for this *R. pretiosa* population. Hydrological regimes could be altered if beaver populations are reduced or their activity and habitat use patterns shift. Beavers impact the distribution and availability of aquatic habitat in several ways that are relevant to *R. pretiosa*.

Monitoring transects were also established at several other smaller wetland openings near these two major sites. No immediate threats to documented *R. pretiosa* overwintering and egg-laying sites from conifer development were observed. Gold Pond Marsh and wetlands to the west of the pond appeared relatively stable with evidence of increased tree mortality at some sites. Recent lodgepole pine establishment adjacent to the north shore of Gold Lake and at one site along the northwest corner of Gold Pond Marsh are not directly in known breeding and wintering habitat. A survey of beaver activity and habitat structures determined that beavers are currently using the site. Moreover, as beavers are a keystone species, continued monitoring of water levels, temperatures, and beaver presence is warranted.

Interactions with non-native fishes and American bullfrogs were also examined and introduced fish predators are implicated in the declines of several ranid frogs elsewhere in the western U.S., but there is little data on the details of interactions with *R. pretiosa* at Gold Lake Bog. Because of this, Maintaining the broad array of habitats in the area that allow vulnerable life stages of *R. pretiosa* cover and habitat segregation from fish predators probably benefits frog populations. A largely unknown but potentially important interaction is the potential for both frogs and fish to use springs and inflow streams in winter. Non-native fish are likely impacting this *R. pretiosa* population.

However removal of these fish from the lake and bog is not a feasible alternative. Thus, monitoring of frog numbers and careful coordination with ODFW fisheries management is essential.

Vegetation changes such as conifer encroachment into the fen ("bog") and adjacent marsh area were examined to determine whether conifer invasion has become a limited threat to the *R. pretiosa* population on the premise that hydrologic regimes are maintained by beavers and climatic changes do not reduce water inputs to the system. Continued monitoring of changes in conifer encroachment and water levels is warranted.

Invasive flora and fauna should be limited and not expand beyond existing non-native species (i.e. brook and rainbow trout). Key biological elements such as beaver should remain an active resident of the bog; unrestricted by trapping or dam removal.

Researchers concluded that the desired site condition at Gold Lake Bog would be one that includes a spring-fed, wetland system with active beavers and a healthy, stable or increasing population of *R. pretiosa*. This system should remain fen habitat with abundant open water interspersed with willow and alder clumps. Conifers are a natural part of this system, but they should be regulated by the natural hydrologic and fire regimes so that open wetland areas including shallow ponds, sedge marshes, and sphagnum bogs are maintained.

Naturally ignited fires would benefit the ecology of the fen and surrounding wetland within in the areas referred to as Gold Pond and Gold Pond Marsh on the northeast side of Gold Lake. Fire suppression is not encouraged anywhere within the boundaries of the bog/Research Natural Area. Specifically, direct attack via constructed firelines and/or fire retardant should be prohibited. Additionally, a restriction on dipping out of Gold Lake is advised.

Monitoring should continue indefinitely to assess hydrologic and habitat conditions for *R. pretiosa* and other sensitive vascular plant species and mosses.

¹ adapted from: **U.S. Department of Agriculture, Forest Service, Willamette National Forest (USDA WNF). 2011.** Gold Lake Bog, Oregon spotted frog (*Rana pretiosa*), site management plan. On file with Middle Fork Ranger District, Willamette National Forest, 46375 Highway 58, Westfir, OR 97492. 53 p.

Vegetation studies 1980-2002 (excerpts)

Christy (2003) mapped plant associations at Gold Lake Bog in 1980, compiled species lists for each association, and established four transects in ecotones to monitor vegetation change over time by use of repeat photography. These transects were rephotographed in 1988 and 2002, and remeasured in 2002.

Vegetation and hydrology changes documented for the 1980-2002 time period include:

- In 2002, invasion by lodgepole pine was evident around the margins of the fen mat;
- In some areas, Geyer willow (*Salix geyeriana*) showed heavy cropping by elk or deer, and elk bedding is common throughout this area;
- Abundant forage in the fen makes this prime elk habitat;
- In some areas, flooding appears to be killing bog blueberry (*Vaccinium uliginosum*); and
- What was nearly dry in September 1980 is completely flooded, full of *Carex utriculata*, *Menyanthes trifoliata*, and *Potamogeton natans* in 2002.

² adapted from: Christy, J.A. 2003. Summary of vegetation studies, 1980-2002, Gold Lake Bog Research Natural Area. On file with: Middle Fork Ranger District, Willamette National Forest, 46375 Highway 58, Westfir, OR 97492.