BIOLOGICAL EVALUATION
FOR
SENSITIVE PLANTS

DIAMOND LAKE
RESTORATION PROJECT

UMPQUA NATIONAL FOREST
DIAMOND LAKE RANGER DISTRICT

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INTRODUCTION

Activities considered in this project require a Biological Evaluation to be completed (FSM 2672.4). The purpose of this Biological Evaluation process is to evaluate the impact of the proposed management actions on any plant species listed or proposed to be listed as Threatened or Endangered by the U.S. Fish & Wildlife Service, or classified as Sensitive by the U.S. Forest Service. The intent of this evaluation is to conduct and document activities necessary to ensure that the proposed management actions will not jeopardize the continued viability or cause adverse modification of habitat for any Threatened, Endangered, or Sensitive plant species, nor will cause a trend toward a Sensitive species becoming federally listed.

The Diamond Lake Restoration Project proposes four alternatives to deal with issues relating to water quality and recreational fishing within Diamond Lake. These alternatives are thoroughly discussed in chapter 2 of this Environmental Impact Statement (EIS).

EVALUATION PROCESS

I. Pre-Field Review

There are 35 Sensitive plant species currently documented or suspected to occur on the Umpqua National Forest. These are listed in Table 1. One species, *Lupinus oreganus* var. *kincaidii* C.P. Sm. (Kincaids Lupine) is listed as Threatened throughout its range. This plant occurs in oak savannah habitat in the Willamette valley and is known from one disjunct population on the Tiller Ranger District at Callahan meadows. There is no potential habitat for this plant within this planning area.

Table 1. Region 6 Sensitive Plant List for the Umpqua National Forest (1999)

Latin Name	Common Name	Potential Habitat
Arabis suffratescens var. horizontalis (Greene) Rollins	horizontal woody rock-cress	
Arnica viscosa Gray	Mt. Shasta *Arnica*	
*Asplenium septentrionale (*L.) Hoffman	grass fern	
Eucephalusr vialis Bradshaw	wayside aster	
Botrychium lanceolatum (Gmel.) Angstr.	lance-leaved grape-fern	
Botrychium minganense Victorin	Mingan moonwort	
Botrychium pumicola Coleville ex Underwood	Crater Lake grape-fern	
Calamagrostis breweri Thurb.	Brewer's reedgrass	**x**
Calochortus umpquaensis N. A. Fredericks	Umpqua mariposa lily	

Carex crawfordii Fern.	Crawford's sedge	**x**
Carex serratodens W. Boott	twotooth sedge	**x**
Cimicifuga elata Nutt.	tall bugbane	
Collomia mazama Colville	Mt. Mazama collomia	
Cypripedium fasciculatum Kellogg ex S. Wats.	clustered lady's-slipper	
Frasera umpquaensis M. E. Peck & Applegate	Umpqua *Frasera*	
Fritillaria glauca Greene	Siskiyou fritillaria	
Gentiana newberryi var. *newberryi* Gray	Newberry's gentian	
Hazardia whitneyi var. *discoidea* (J.T. Howell)W.D. Clark	Whitney's *Hazardia*	
Illiamna latibracteata Wiggins	California globe-mallow	
Isopyrum stipitatum (Gray) Drumm. & Hutchinson	dwarf *Isopyrum*	
Kalmiopsis fragrans sp. nov. Meinke & Kaye	Umpqua kalmiopsis	
Lewisia columbiana var. *columbiana* (T.J. Howell ex Gray) B.L. Robins.	Columbia *Lewisia*	
Lewisia leeana (Porter) B.L. Robbins	quill-leaved *Lewisia*	
Lupinus oreganus var. kincaidii C.P. Sm.	Kincaid's lupine	
Montia howellii S. Wats.	Howell's *Montia*	
Ophioglossum pusilum Raf.	adder's-tongue	
Pellaea andromedifolia (Kaulf.) Fee	coffee fern	
Perideridia erythrorhiza (Piper) Chang & Constance	red root yampah	
Polystichum californicum (D.C. Eaton) Diels.	California swordfern	
Romanzoffia thompsonii V.M. Martalla	Thompson's mistmaiden	
Schuezeria palustris ssp. americana L.	American Scheuzeria	**x**
Scirpus subtermanalis (Torr.) Sojak	water bulrush	**x**
Utricularia minor L.	lesser bladderwort	**x**
Wolffia columbiana Karst.	Columbian water-meal	**x**
Wolffia borealis (Engelm. Ex Hegelm.) Landolt ex Landolt &Wildi.	northern water-meal	**x**

II. Results of Field Reconnaissance

Potential habitats within the project area were surveyed by the Diamond Lake/North Umpqua district botany crew during June and July of 2003. Potential habitat was confined to wetlands along the south shore of Diamond Lake, along Lake Creek and along the south shore of Lemolo Lake. Three sensitive plants were found during field surveys.

Figure 1. American Scheuzeria

American Scheuzeria (*Scheuzeria palustris ssp. americana*) was found in a low nutrient fen along Lake Creek just south of highway 138. The population occurs over a three acre area within the fen. This is the first known location of this species in the Umpqua basin.

Water bulrush (*Scirpus subterminalis*) was found growing on the margins of Teal and Horse Lakes as well as on the margins of shallow pools within the south shore wetland complex adjacent to Diamond Lake. Juvenile forms of the plant were also found in Diamond Lake along shallow margins at the south end of the lake. The condition of water bulrush with regard to population size, vigor and overall health is questionable. This is thought, though no quantitative data exists, to be a result of the previous 1954 drawdown which likely affected this species' habitat negatively through drying of the wetland environment.

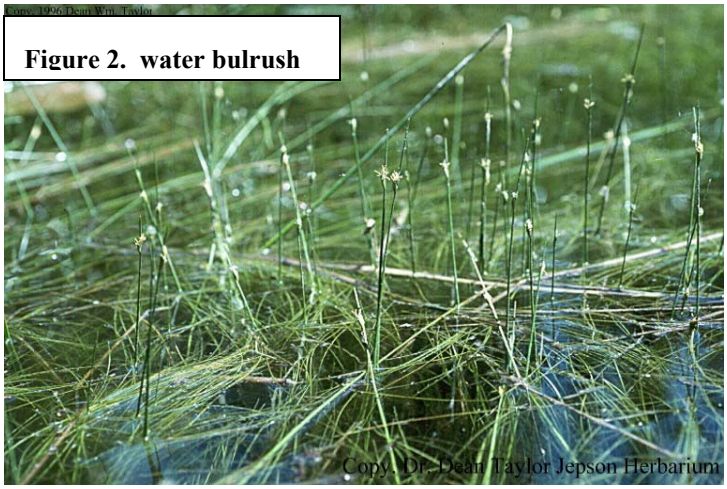

Figure 2. water bulrush

Lesser bladderwort (*Utricularia minor*) was found growing in the south shore Diamond Lake wetland complex as well as the south shore Lemolo Lake wetland. The sites are very similar as water bulrush sites, with plants occurring in areas with shallow standing water. The plant has small modified leaves that float on the surface of water and trap insects. Lesser bladderwort was found growing near the sites of water bulrush and likely suffered from the same negative effects due to the 1954 drawdown and rotenone treatment.

Figure 3. lesser bladderwort. It is the species that has very dissected leaves and almost looks like string in the water.

III. Determination of Effects

Introduction

This section discusses the direct, indirect and cumulative effects that may or may not occur to the Sensitive plants that were found during field surveys for this project. In addition to the main actions described under alternatives 2 and 3 there are also two connected actions that the Diamond Lake Resort would like to accomplish while the draw down is occurring. Neither of these connected actions will have any direct, indirect or cumulative effects on any Sensitive plant species.

American Schuezeria (*Schuezeria palustris ssp. americana*)

Alternative 1 (No Action) & 4

Direct & Indirect Effects

Neither of these alternatives propose activities that would jeopardize this population of American Sheuzeria. Alternative 4 responds to the issue of wetland ecology and conservation of the rare flora and fauna associated with them. This species is a wetland obligate species that is dependent on the fen ecosystem. These alternatives do not plan any alteration of that system. No direct or indirect effects would occur under these alternatives.

Cumulative Effects

The scale at which cumulative effects are addressed is the 5th field watershed level. The only past action that may have had affects on this population would be the 1954 Rotenone treatment which drew down Diamond Lake and subsequently dried Lake Creek. This is only speculative however and the population seems to be fully recovered if any negative effects did indeed occur (see table x. Past Management Activities in the Cumulative Effects Analysis Area for more detailed information). The only current ongoing activity that may be affecting this population is the water rights that change flow of Lake Creek from natural historic flows. The influence of this water manipulation has obviously not been enough to negatively impact this population to date (see table x Present Management Activities Within the Cumulative Effects Analysis Area for more detailed information). Under these two alternatives no future foreseeable projects would have any affects on this population of American Scheuzeria (see Table x. Reasonably Foreseeable Management Activities in the Cumulative Effects Analysis Area). When coupled with the aforementioned effects, implementing either of these alternatives is not likely to lead to any negative cumulative effects to this population of American Scheuzeria, which is the only known population within the entire Umpqua basin.

Alternative 2 & 3

Direct and Indirect Effects

None of the actions proposed in these alternatives would cause direct effects to this plant population. Indirect effects may occur if potential flooding and drying would occur in

Lake Creek. However it is likely that this fen is dependent upon springs and groundwater (Hofford pers. com., 2003). It is unknown how much this fen depends on water from Lake Creek to keep it wet year round. If significant flooding or drying does occur there is potential for individual plants to be uprooted and washed downstream as well as for individual plants to desiccate. Neither of these scenarios would necessarily lead to extirpation of this population. Flooding is a natural occurrence and may actually help distribute the plant to new locations. Drying is not likely to affect this species or the fen, which is raised a little above the stream terrace. No indirect effects are expected to occur due to these inferences. However there is minimal risk that negative effects could occur in a worse case scenario.

Cumulative Effects
The scale at which cumulative effects are addressed is the 5th field watershed level. The past, present and reasonably foreseeable actions contributing to cumulative effects are the same as those described under alternatives 1 and 4. Under these two alternatives there is minimal risk that this project would have any affects on this population of American Scheuzeria (see Table x. Reasonably Foreseeable Management Activities in the Cumulative Effects Analysis Area). When coupled with the aforementioned effects, implementing either of these alternatives is not likely to lead to any negative cumulative effects to this population of American Scheuzeria.

water bulrush (*Scirpus subterminalis*)

<u>Alternatives 1 & 4</u>

Direct and Indirect Effects
Neither of these alternatives propose activities that would jeopardize these populations of water bulrush. Alternative 4 responds to the issue of wetland ecology and conservation of the rare flora and fauna associated with them. This species is a wetland obligate species that is dependent on lake margins and fen ecosystems with areas of shallow water. These alternatives do not plan any alteration of these systems. No direct or indirect effects would occur under these alternatives.

Cumulative Effects
The scale at which cumulative effects are addressed is the 5th field watershed level. Past actions that may have had affects on this plant would be the 1954 Rotenone treatment which drew down Diamond Lake and water rights which affect the levels and margins of Diamond Lake (see table x. Past Management Activities in the Cumulative Effects Analysis Area for more detailed information). The only current ongoing activity that may be affecting this population is the water rights that continue to impact the lake margins of Diamond Lake. The influence of this water manipulation has possibly caused populations of water bulrush to stay in a juvenile state, potentially halting reproduction. By keeping the water at a steady high level the margin of Diamond Lake has not naturally receded, an event which would open habitat for this species (see table x Present Management Activities Within the Cumulative Effects Analysis Area for more detailed

information). Under these two alternatives the only future foreseeable action that would have affects on this plant would be maintaining the water rights (see Table x. Reasonably Foreseeable Management Activities in the Cumulative Effects Analysis Area). When coupled with the aforementioned effects, implementing either of these alternatives is not likely to lead to any negative cumulative effects to this population of water-bulrush.

Alternatives 2 and 3

Direct and Indirect Effects
No direct effects are expected to occur as a result of implementing either of these alternatives. Indirect effects are likely to occur as a result of lowering Diamond Lake and drying the margins of the lake, the Sedge Meadow/Fen systems along the south shore, and the potential drying of Teal lake (Breeden pers. com., 2003, Kemmers and Jansen, 1988, Beltman et. al. 2001). This will almost certainly lead to some desiccation of plants from the drying of their habitat. Whether these effects would be long term is unknown, but it is anticipated that the water bulrush will likely return within five years.

Cumulative Effects
The scale at which cumulative effects are addressed is the 5th field watershed level. The past, present and reasonably foreseeable actions contributing to cumulative effects are the same as those described under alternatives 1 and 4. When coupled with the aforementioned effects, implementing either of these alternatives is likely to lead to negative cumulative effects to this population of water-bulrush. This is because the extended drying of the plants habitat proposed with these alternatives, as well as the 1954 treatment and the manipulation of lake water levels are affects that have and would continue to negatively impact this Sensitive plant by drying its habitat. This effect would lead to some loss of individual plants and may compromise reproductive ability of the species. It is anticipated however, that these plant populations would recover relatively soon because the period of plant desiccation would not occur any longer than one season.

Lesser bladderwort (*Utricularia minor*)

Alternatives 1 & 4

Direct and Indirect Effects
Neither of these alternatives propose activities that would jeopardize these populations of lesser bladderwort. Alternative 4 responds to the issue of wetland ecology and conservation of the rare flora and fauna associated with them. This species is a wetland obligate species that is dependent on sedge meadow/fen ecosystems with areas of shallow water. These alternatives do not plan any alteration of these systems. No direct or indirect effects would occur under these alternatives.

Cumulative Effects
The scale at which cumulative effects are addressed is the 5th field watershed level. Past actions that may have had affects on this plant would be the 1954 Rotenone treatment which drew down Diamond Lake and the implementation of Lemolo 1 hydropower

projects (see table x. Past Management Activities in the Cumulative Effects Analysis Area for more detailed information). The only current ongoing activity that may be affecting this population is the Lemolo 1 hydropower projects which fluctuate water at Lemolo Lake. These actions have not resulted in the complete extirpation of this species from the area, but they have likely significantly reduced the amount of habitat (see table x Present Management Activities Within the Cumulative Effects Analysis Area for more detailed information). Under these two alternatives the only future foreseeable action that would have affects on this plant would be the continued operation of the Lemolo 1 hydro project (see Table x. Reasonably Foreseeable Management Activities in the Cumulative Effects Analysis Area). When coupled with the aforementioned effects, implementing either of these alternatives is not likely to lead to any negative cumulative effects to these populations of lesser-bladderwort.

Alternatives 2 & 3

Direct and Indirect Effects
No direct effects are expected to occur as a result of implementing either of these alternatives. Indirect effects are likely to occur as a result of lowering Diamond Lake and drying the sedge meadow/fen ecosystems along the south shore of Diamond Lake (Breeden, 2003, Kemmers and Jansen, 1988, Beltman et. al. 2001). Desiccation is expected in some plants as a result of prolonged drying of the habitat. Whether these effects will be long term is unknown, but it is anticipated that the lesser bladderwort would likely return in a relatively short amount of time.

Cumulative Effects
The past, present and reasonably foreseeable actions contributing to cumulative effects are the same as those described under alternatives 1 and 4. When combined with the past, present, and reasonably foreseeable actions, implementing either of these alternatives is likely to lead to negative cumulative effects to some of the populations of lesser bladderwort due to the potential of prolonged drying of their habitat. It is likely that the 1954 draw down combined with the proposed draw down would cause drying and desiccation to lesser bladderwort populations on the south shore of Diamond Lake. A loss of individual plants is expected and their may be a loss of vigor within the entire population which already seems to be only barely holding on. The populations at the south end of Lemolo Lake would likely not be impacted by these alternatives.

REFERENCES

Abrams, Leroy. 1923-1960. Illustrated Flora of the Pacific States, vol. 1-4. Stanford University Press, Stanford, California.

Hickman, James C., Ed. 1993. The Jepson Manual, Higher Plants of California. University of California Press, Berkeley, California.

Hitchcock, C. L., and A. Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle, Washington.

Hitchcock, C. L., A. Cronquist, M. Ownbey, and J. W. Thompson. 1955-1969. Vascular Plants of the Pacific Northwest, parts 1-5. University of Washington Press, Seattle, Washington.

Kemmers, R. H. and P. C. Jansen. 1988. Hydrochemistry of Rich Fen and Water Management. Agricultural Water Management, 14, 399-412. Elsevier Science Publishers, Amsterdam.

Oregon Natural Heritage Program. 1993. Rare, Threatened, and Endangered Plants and Animals of Oregon. Oregon Natural Heritage Program, Portland, Oregon.

Peck, Morton E. 1941. A Manual of the Higher Plants of Oregon. Binford & Mort, Portland, Oregon.

Peck, Morton E. 1934. New Plants from Oregon. Proceedings of the Biological Society of Washington 47:185.

USDA Forest Service. 1990. Sensitive Plants of the Umpqua National Forest. Pacific Northwest Region, Umpqua National Forest.

USDA Forest Service. 2000. PLANTS database from: USDA/Natural Resources Conservation Service

Wagner, David D. 1992. Guide to the Species of Botrychium in Oregon. USDA Forest Service Report. Mt. Hood National Forest. 50 pp.

Wagner, Warren H. Jr. and Florence S. 1990. Notes on the Fan-leaflet Group of Moonworts in North America with Descriptions of Two New Members. American Fern J. 80(3):73-81.