VEGETATION SURVEY OF BISMARK MEADOWS, BONNER COUNTY, IDAHO

by

Juanita Lichthardt
Michael Mancuso
Karen Gray
Idaho Conservation Data Center

February 2004

Idaho Department of Fish and Game
Natural Resources Policy Bureau
600 South Walnut, P.O. Box 25
Boise, Idaho 83707
Steve Huffaker Director

Report prepared for
USDA Natural Resources Conservation Service

ABSTRACT

Bismark Meadows is one of 45 high priority peatland sites identified in a 1995 conservation strategy for Idaho valley peatlands. Continuous open wetland extends over 1,000+ acres and includes large expanses of rich fen. Most of the meadow was ditched and drained beginning in the early 1900s and until recently was used for hay production and pasture. In 2002, nearly the entire wetland became a conservation easement under the Wetlands Reserve Program (WRP). Under the program, agricultural use of the meadow has ceased and the Natural Resources Conservation Service has undertaken to disable drainage ditches in order to restore natural hydrology and wetland values. A vegetation survey of the meadow was conducted in 2002 and 2003 to document rare plants and describe the existing vegetation of Bismark Meadows. Eleven rare plant species of state conservation concern were found in the project area. Five plant communities were documented that are typical of peatland habitats, and a vegetation map comprised of 17 cover types was produced. This report details the findings of the vegetation survey and outlines a proposed vegetation monitoring plan for the easement.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

INTRODUCTION

Bismark Meadows is an extensive open wetland on the floodplain of Reeder Creek, on the west side of Priest Lake, in the Idaho panhandle. Much of the wetland has been drained for agriculture, but remnants of the natural vegetation are characteristic of peatland communities that are rare in Idaho.

Peatlands of northern Idaho, termed "valley peatlands" by Bursik (1990), are of high biodiversity value because of their rarity in the state and because of the numerous plant species restricted to such habitat. Peatlands are wetlands with waterlogged substrates of organic matter 12 inches (30 cm) or more thick (Chadde et al. 1998). Bismark Meadows is rare among Idaho's valley peatlands in that it formed along a stream rather than a pond or lake. In 1991, Rob Bursik, a wetland scientist working for the Idaho Conservation Data Center (IDCDC), surveyed two US Forest Service parcels that are minor parts of the peatland and found 13 plant species that are of conservation concern in Idaho and tracked by the IDCDC. He also documented seven community types associated with valley peatlands (Bursik and Moseley 1995). These are mainly communities associated with rich fens and paludified forest. Rich fens are minerotrophic peatlands dominated by sedges. Paludified forests form on the edges of peatlands where peat accumulation creates increasingly wetter conditions and *Sphagnum* spp. colonize the forest floor (Crum 1988). Based on the areas he surveyed, Bursik considered Bismark Meadows to be a high priority site for conservation. He recommended that ground disturbance within the site be minimized and the natural hydrology of the site be restored, allowing recolonization by natural vegetation to run its course. Bismark Meadows was included among 45 priority peatland sites identified in a conservation strategy for Idaho panhandle peatlands (Bursik and Moseley 1995).

Most of Bismark Meadows is privately owned and has been ditched and drained for use as pasture and hayfields. Approximately 85 percent (1,016 acres) of the contiguous, unforested meadow is now a conservation easement managed by the Natural Resources Conservation Service (NRCS) under the Wetland Reserve Program (WRP). The goal of the NRCS and its cooperators is to restore the natural hydrology of the area and thereby the original functions and values of the wetland. This will require filling-in of some of the drainage ditches that traverse the wetland and will result in a general raising of the water table. The NRCS is seeking to avoid direct impacts to rare plant species and communities and to obtain baseline vegetation data with which to compare future conditions.

In 2002 and 2003 a vegetation inventory was conducted in Bismark Meadows with the following objectives:

- Identify sensitive plant species and communities in need of protection from land-disturbing activities.
- Identify any federally protected plant species.
- Make a baseline vegetation map for the purpose of monitoring future changes in the ecosystem.
- Develop a vegetation monitoring plan.

SITE DESCRIPTION

Bismark Meadows is an extensive open wetland on the floodplain of Reeder Creek, a tributary of Priest Lake (Appendix A, Map 1). The main portion of the wetland is approximately 1200 acres (485 hectares) in size. The elevation is 2600 ft (792 m). The meadow is surrounded by young forest of mostly *Tsuga heterophylla* (western hemlock) and *Pinus contorta* (lodgepole pine). Several areas of wetland forest border the meadow. More than half of the open meadow area has been drained and is occupied by pasture grasses or a mixture of pasture grasses and native species. Peatland vegetation is found in areas that had not been drained, or where drainage was not as intensive, including USFS parcels, the northwestern lobe of the meadow, and at the eastern edge of the meadow where Reeder Creek crosses highway 57. Much of the eastern third of the meadow is inundated throughout the summer as a result of a beaver dam downstream. Beaver activity may have contributed to the development of peat soils in Bismark Meadows. The most extensive fen community is *Carex lasiocarpa* (slender sedge). Other rich fen habitat is characterized by a mixture of graminoids including *C. lasiocarpa, C. utriculata* (beaked sedge), *C. aquatilis* (water sedge), *C. cusickii* (Cusick sedge), *Scirpus microcarpus* (small-fruited bulrush), *Calamagrostis canadensis* (bluejoint reedgrass), and *Phalaris arundinacea* (reed canarygrass). There are limited areas of shrub carr (fen shrub communities) dominated variously by *Spiraea douglasii* (Douglas spiraea), *Alnus incana* (thin-leaf alder), *Betula glandulosa* (bog birch), *Salix geyeriana* (Geyer willow), and *Salix bebbiana* (Bebb willow).

Based on aerial photos, approximately 80 percent of the open meadow appears to have been plowed at some point, with the remaining area used for livestock grazing. Pasture grasses, including *Phalaris arundinacea*, were planted for forage or hay. Most of these former fields are dry during the summer and dominated by *Poa pratensis* (Kentucky bluegrass) or other pasture grasses. Others, although dry, support a sparse growth of native sedges with high moss cover.

Soils of Bismark Meadows are a mosaic of Pywell peat and Pywell-Hoodoo complex. The Hoodoo soil is a mineral soil derived primarily from alluvial volcanic ash (Weisel 1982).

The climate of northern Idaho is influenced by both maritime and continental weather patterns. Winters are primarily influenced by weather systems from the Pacific Ocean, with considerable cloudiness and precipitation. Mean annual precipitation for the area is about 32 inches (81 cm), most of which occurs between November and March. Snowfall accounts for more than 50 percent of the total precipitation. Summers are influenced by continental air masses and are often very dry. Its landscape position probably makes Bismark Meadows a cold-air sink.

VEGETATION SURVEY

Survey methods

A botanical reconnaissance of Bismark Meadows was conducted in September, 2002 and several rare plants[1] were found and mapped (Lichthardt and Mancuso 2003). In July of 2003 we returned to the area for a thorough survey of plant communities and rare plants. Drainage ditches were surveyed most intensively, as these will be the sites of disturbance associated with filling or placement of ditch blocks.

[1] Plants of conservation concern in Idaho and tracked by the Idaho Conservation Data Center (IDCDC).

Whenever a rare species was found we recorded information on population size and extent, associated species, and habitat. A navigation-grade GPS unit was used to obtain location coordinates. These data were entered into a element occurrence record (EOR) for each species, maintained by the IDCDC (Appendix B). Rare plants near ditches were staked and flagged.

We compiled a plant species list by cover type (Appendix C) and collected many unknown plants which were later identified. Voucher specimens collected during the survey will be deposited at the University of Idaho's Stillinger Herbarium. Weeds were noted along with their habitat and, when practical, their locations were mapped.

During our surveys we used the GPS to record breaks between different cover types. We used a combination of these points and aerial photos to delineate cover types for a vegetation map. Data on rare species and plant community types were used to update the site database record for Bismark Meadows maintained by the IDCDC (Appendix D).

Plant communities

Extensive draining of Bismark Meadows allowed the production of forage grasses. *Phalaris arundinacea* was planted for hay and is abundant over extensive areas. *Poa pratensis* may have been planted or have increased with grazing pressure. *Alopecurus pratensis* (meadow foxtail), *Agropyron* sp. (wheatgrass), *Bromus inermis* (smooth brome), and *Phleum pratense* (timothy) are other hay and pasture species present in the meadow. Areas that were not intensively cultivated support rich-fen communities of varying ecological condition. We documented five community types (c.t.) characteristic of peatlands. These are listed in Table 1, along with their global and state ranks (Table 2).

Table 1. Peatland community types identified at Bismark Meadows and their conservation ranks[1] (IDCDC 2003).

Community type (c.t.)	Rank
Betula glandulosa/Carex utriculata (bog birch/bladder sedge)	G4?S3
Carex lasiocarpa (slender sedge)	G4S2
Carex utriculata (bladder sedge)	G5S4
Spiraea douglasii (Douglas spiraea)	G5S4
Thuja plicata/Lysichiton americanus (western redcedar/skunk cabbage)	G4QS2

[1] See Table 2 for definitions of conservation ranks.

***Betula glandulosa/Carex utriculata* c.t.** This type occurs as small inclusions or stringers in other communities, and is very limited in extent within the project area. In addition to *B. glandulosa*, has some herbaceous species that distinguish it from the *Spiraea douglasii* type, e.g., *Menyanthes trifoliata* (bogbean). *Betula glandulosa* is over 6 ft (1.8 m) tall and *Crataegus douglasii* (Douglas hawthorn) is co-dominant. This community may also occur along Reeder Creek upstream of the project area.

Table 2. Definitions of selected state (S) and global (G) conservation ranks for plant taxa and plant communities. Where no distinction is made, definition is identical for species and communities (NatureServe 2003).

Rank	Definition
State ranks	
S1	Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. Typically 5 or fewer occurrences or very few remaining individuals (<1,000) or acres (<2,000), or linear miles (<10).
S2	Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. Typically 6 to 20 occurrences or few remaining individuals (1,000-3,000), or acres (2,000-10,000), or linear miles (10-50).
S3	Vulnerable in the state because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.
S4	Uncommon but not rare, and usually widespread in the state. Possible cause for long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.
S5	Secure–Common, widespread, and abundant in the state. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
Global ranks	
G4	Apparently secure globally–Uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery), and usually widespread. Apparently not vulnerable in most of its range, but possibly with cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.
G5	Secure–Common, widespread, and abundant (although it may be rare in parts of its range, particularly at the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences or more than 10,000 individuals.
Rank qualifiers	
Q	Distinctiveness of this entity is questionable.

***Carex lasiocarpa* c.t.** The *C. lasiocarpa* community type occurs on both mineral and peat soils. It forms nearly pure swards and thus lacks diversity. In Bismark Meadows it is indicative of very wet areas, with standing water often present. This community type is extensive in the eastern one-third of the meadow in deep standing water.

***Carex utriculata* c.t.** Areas dominated by *C. utriculata* are limited in the project area. It is most extensive north of the unchannelized stretch of Reeder Creek. These areas did not have standing water at the time of our survey. Some authorities lump *C. lasiocarpa* and *C. utriculata* as ecological equivalents and would call this a *C. lasiocarpa* c.t. (Boggs et al. 1990).

***Spiraea douglasii* c.t.** In the northern Rockies, any shrub community dominated by *Spiraea douglasii* is classified as a *Spiraea douglasii* community type (Boggs et al 1990; Jankovsky-Jones 1997). This is a very common wetland type in northern Idaho. It has not been broken down into specific associations and its seral status is unclear. *Spiraea* commonly forms

impenetrable thickets over 6 ft high. At Bismark Meadows two very different *Spiraea* communities occur. Dense, tall thickets occur along channels (*Spiraea* stringers), but elsewhere *Spiraea* occurs as a very open stand of small individuals occupying the same stratum with a diversity of forbs and graminoids. The dominant graminoids are *Carex aquatilis* (water sedge) and *Calamagrostis canadensis* (bluejoint reedgrass). To distinguish this community from *Spiraea* thicket we have called it *Spiraea douglasii/Calamagrostis canadensis*. This is a previously undescribed type. *Spiraea* does not occur as an inclusion, but is uniformly scattered. *Calamagrostis* seemed to be characteristic of the herb layer, and dominates in patches. The forb component is very diverse, with *Angelica arguta* (Lyall angelica) and *Ligusticum canbyi* (Canby ligusticum) prominent. Four rare plants are associated with this community.

***Thuja plicata/Lysichiton americanus* c.t**. An example of this bottomland forest community is found on the north edge of the western lobe of the meadow (cover type 4a, Map 1). It may border the meadow in several other places as well. The forest floor is undulating, probably with standing water in spring. *Lysichiton americanus* is the most prominent species in a diverse understory that also includes several wet-site ferns such as *Athyrium filix-femina* (ladyfern). All the major conifer species of the area are represented in the overstory. *T. heterophylla* (western hemlock) is currently the dominant conifer species, but *T. plicata* may eventually replace it on such a wet site. Early stages of paludification are indicated by patches of *Sphagnum* moss and three rare species associated with paludified forest. A total of five rare plant species were found in the one documented example of this type (Appendix 1, Map 2A).

The condition of native, unforested communities at Bismark Meadows is primarily a function of the amounts of *Phalaris* or *Poa pratensis* present. *Phalaris* dominates large areas of the meadow, sometimes in combination with other pasture grasses and elsewhere with native graminoids. Some old fields have primarily native species but the cover is sparse, due to the lowered water table, and there is often a high cover of non-*Sphagnum* mosses (so-called "brown mosses").

In the western lobe of the meadow (southwest of the Hawley ranch) we found the best examples of rich fen and paludified forest communities. This area also contains five rare plant species (Appendix A, Map 2A): *Carex buxbaumii* (Buxbaum sedge), *Carex leptalea* (bristle-stalked sedge), *Dryopteris cristata* (crested shield fern), *Epilobium palustre* (swamp willow-weed), and *Petasites sagittatus* (arrow-leaf coltsfoot). The north end of this area is in the best condition, although partially infested with reed canarygrass. There are pockets of *Sphagnum*. Community types include *Spiraea douglasii/Calamagrostis canadensis, Carex lasiocarpa,* and *Thuja plicata/Lysichiton americanus*. There is also a small area of *Betula glandulosa*/*Carex utriculata* c.t.

Much of the eastern one-third of the meadow was inundated with water in mid-summer, probably as a result of a beaver dam downstream on Reeder Creek, east of highway 57 (Jeff Stewart, pers. comm.). This area is dominated by *C. lasiocarpa* and dissected by stringers of willow and *Spiraea* on slightly higher ground (cover type 2a, Map 1). *Phalaris* dominates locally. A fenced area along Reeder Creek delineates a distinctive tall-willow/*Spiraea* carr (3c, Map 1). The fence-line contrast is indicative of a different land use history. Possibly the area of willow carr was not thoroughly drained. *Salix geyeriana* is represented, but deep water and dense brush precluded a thorough survey.

Vegetation map

The vegetation map for Bismark Meadows (Appendix A, Map 1) is based on cover types. The cover types used (Table 3) are organized within the following four general categories which are based on degree of disturbance and the dominant life form. The first category represents what we assume to be anthropogenic types resulting from some combination of drainage, cultivation, and seeding.. The other three are primarily natural communities in various ecological condition depending on the degree of artificial drainage and/or incursion by non-natives.

1) Hayfields and pastures. These areas are dominated by pasture grasses with variable amounts of native graminoids. These are areas that have been drained and used at one time used for livestock grazing or to grow hay.

2) Sedge wetland. This varies from nearly pure stands of *Carex lasiocarpa* or *C. utriculata*, to a mixture of sedges and *Poa pratensis* with an overstory of *Phalaris*. Included are old fields dominated by native graminoids.

3) Shrub carr. These areas include both tall shrub (*Salix* spp., *Betula glandulosa*, and *Crataegus douglasii*) and low shrub (*Spiraea douglasii*) types. This cover type is very patchy and limited in extent within Bismark Meadows

4) Forest. Both wetland and upland forest types adjoin the meadow. Forest patches within the open meadow are very small.

Rare plants

A total of 13 rare plant species are known from Bismark Meadows and adjoining uplands (Table 4) and their locations have been mapped (Appendix A, Maps 2-18). Eleven of these were recorded and mapped within the conservation easement in 2003. Population and habitat information for all rare plants are contained in an element occurrence record for each (Appendix B). All but two of the species (*Blechnum spicant* and *Hypericum majus*) are boreal peatland species that are peripheral or disjunct in Idaho, and restricted to peat substrates. Additional information and photos of some of the rare plant species occurring in Bismark Meadows are available on the IDCDC website: www2.state.id.us/fishgame/info/cdc/cdc.htm. Go to "Field guides"/"Idaho Panhandle National Forests."

***Blechnum spicant* (deerfern)** is a fern of wet sites in forests and has an interruptedly circumboreal distribution. It is unique among out forest ferns in having two distinctly different types of fronds, one vegetative and the other sporangia-bearing. We found two individuals along a shallow drainage ditch in the forest understory (Map 3).

Carex buxbaumii is a sedge with stiff, upright stems and bicolored spikes. Not being very abundant, it was difficult to pick out in the dense graminoid vegetation. We found it to be rare (three populations) and scattered (Map 5). It occurred in the *Spiraea douglasii/Calamagrostis canadensis* c.t. and also, somewhat surprisingly, in a hayfield planted to *Phalaris*.

Carex leptalea forms small dense clumps of fine leaves similar in aspect to a fine-leafed fescue. It was most abundant in the northwestern lobe of the meadow (Map 6) where it occurred in the *Spiraea douglasii/Calamagrostis canadensis* c.t. and an adjoining old field.

Table 3. Cover types used in the vegetation map of Bismark Meadows (see Appendix C for common names).

1	**Hayfields and pastures**	
1a	*Agrostis stolonifera*	Dominated in places by *Agrostis stolonifera* and elsewhere by a variety of forbs and graminoids. The tall forb, *Solidago canadensis* is abundant. Other common species that occur at lower cover include *Agrostis scabrella*, *Phalaris arundinacea*, *Poa pratensis*, *Poa palustris*, *Carex arcta, Carex bebbii*, and *Stachys pilosa*. The weeds *Chrysanthemum leucanthemum, Hypericum perforatum*, and *Potentilla norvegica* are present. Probably hayed at one time.
1b	*Poa pratensis–Carex* spp.	Dominated by *Poa pratensis* or a mix of *P. pratensis* and *Phleum pratense* with *Carex arcta*, *C. bebbii*, *Carex ovatus*, and other sedges. Other species commonly found in this cover type include: *Spiraea douglasii, Agrostis stolonifera, Epilobium glandulosum, Potentilla norvegica*, and *Solidago canadensis.*
1c	*Phalaris*–pasture grasses	Dominated by *Phalaris* with varying amounts of other pasture-grass species. (includes *Phalaris* hayfield).
1d	*Poa pratensis*	Summer-dry pasture areas dominated by *Poa pratensis*. Patches of *Spiraea douglasii* occur in places.
2	**Sedge wetland**	
2a	*Carex lasiocarpa*	Wet sedge wetland with large areas dominated by *C. lasiocarpa.* In the eastern half of the meadow interspersed with stringers of *Salix* spp. and *Spiraea douglasii*.
2b	*Carex utriculata*	Characterized by dense swards of *Carex utriculata*, sometimes in combination with *C. aquatilis*. Limited in extent; often occurs as a wet-site inclusion within drier community types.
2c	Mixed sedge meadow	Vegetation characterized by a mixture of *Carex aquatilis*, *C. bebbii, C. hoodii*, *C. lenticularis*, *C. arcta*, *C. utriculata,* and *Calamagrostis canadensis*. Forb diversity and abundance is low. Patches of *Phalaris* and *Agrostis stolonifera* may be intermixed.
2d	*Phalaris*–mixed sedge meadow	Generally dominated by *Phalaris*, but with a mixture of native sedges including *C. hoodii*, *C. lenticularis*, and *C. arcta*. Wet site inclusions support *C. vesicaria*, *C. utriculata,* or *C. lasiocarpa*.
2e	*Calamagrostis canadensis*	High cover of *C. canadensis* and no shrubs or only scattered shrubs. Other characteristic species include *Aster modestus*, *Carex buxbaumii, Petasites sagittatus*, *Senecio hydrophilus*, *Solidago canadensis*. *Carex aquatilis* codominates in places. Too limited to map.

Table 3. Continued.

	Cover type	**Description**
2f 2g	Sparse mixed graminoid	Artificially drained areas supporting predominantly native graminoids and a ground layer of brown mosses. A wide variety of graminoids are present, but growth is sparse and often stunted. Where *Phalaris* is present it was short and vegetative.
3	**Shrub carr**	
3a	*Spiraea douglasii*/ *Calamagrostis canadensis*	Short, scattered *S. douglasii* and a herbaceous layer dominated by *C. canadensis, Carex aquatilis*, and a diversity of forbs. *Carex leptalea* is locally abundant, as is *Solidago canadensis.* Common graminoids include: *Agrostis scabra, Agrostis stolonifera, Carex bebbii*, *Carex cusickii, Carex utriculata, Phalaris arundinacea*, *Poa palustris*, and *Poa pratensis*. *Angelica arguta* and *Ligusticum canbyi* are characteristic forbs.
3b	*Betula glandulosa/Carex utriculata*	Patches of tall (>6 ft) *Betula glandulosa* and *Crataegus douglasii* with Carex utriculata in the understory . Other characteristic species include *Rhamnus alnifolia*, *Spiraea douglasii*, *Athyrium filix-femina, Geum macrophyllum*, *Lysichiton americanus*, *Menyanthes trifoliata,* and *Sphagnum* spp. Limited to small inclusions.
3c	*Salix* spp.–*Spiraea douglasii*	A willow carr in undrained peatland remnants, consisting of tall willow-shrubs and dense, tall *Spiraea douglasii*. Willows include *Salix geyeriana, S. exigua* ssp. *exigua, S. bebbiana,* and *S. drummondiana.* Other woody species include *Populus trichocarpa, P. tremuloides, Rhamnus purshiana* and *Crataegus douglasii*.
3f	*Spiraea douglasii* stringers	Dense, tall *Spiraea* thicket along shallow channels.
3e	*Alnus sinuata* stringers	*Alnus sinuata* is widely scattered along Reeder Creek and a few ditches. (Not mapped.)
4	**Forest**	
4a	*Thuja plicata–Tsuga heterophylla/Lysichiton americanus*	Wetland forest with *Sphagnum* pockets. *Lysichiton americanus* is the most prominent species in a diverse understory that also includes wet-site ferns such as *Athyrium filix-femina* (ladyfern). There is a diverse conifer overstory with *T. heterophylla* usually dominant. Early stages of paludification are indicated by patches of *Sphagnum* moss.
4b	*Pinus contorta*	Small islands of *Pinus contorta*, and sometimes *Populus tremuloides*, on well-drained microsites in the meadow.

Table 4. Rare plants of Bismark Meadows and adjoining uplands.

Scientific name	Common name	Map #	Web page[1]	USFS status	Cons. Rank[2]
Carex buxbaumii	Buxbaum sedge	5	No	Sensitive	G5S3
Carex leptalea	Bristle-stalked sedge	6	Yes	Sensitive	G5S2
Carex magellanica ssp. *irrigua* (= *Carex paupercula*)	Boreal bog sedge	7	Yes	Sensitive	G5S2
Dryopteris cristata	Crested shieldfern	9	Yes	Sensitive	G5S2
Epilobium palustre	Swamp willow-herb	10	No	Sensitive	G5S3
Gaultheria hispidula	Creeping snowberry	11	Yes	Sensitive	G5S2
Hypericum majus	Canadian St. Johnswort	12	No	Sensitive	G5S3
Lycopodium dendroideum	Tree groundpine	13	Yes	Sensitive	G5S2
Petasites sagittatus	Arrow-leaf coltsfoot	14	No	Sensitive	G5S3
Sanicula marilandica	Black snake-root	15	No	Concern.	G5S3
Scheuchzeria palustris	Rannoch-rush	16	Yes	Sensitive	G5S2
Trientalis europaea var. *arctica* (=*T. arctica*)	Northern starflower	17	No	Sensitive	G5S3
Vaccinium oxycoccos	Bog cranberry	18	Yes	Sensitive	G5S2

[1] Indicates whether information is available on the IDCDC website.
[2] See Table 2.

Dryopteris cristata is a stiffly upright fern, with rather leathery, dark green leaves. It is associated with forest edges, tall-shrub inclusions in the open meadow, and ditchbanks (Map 9), where it occurs with *Spiraea douglasii*. Specimens were collected that appeared to be intermediate between *D. cristata* and *D. expansa*, possibly indicating hybridization.

Epilobium palustre is a delicate, rhizomatous perennial with very small white to pink flowers that have notched petals. It is rare in the project area; we found it only in the *Spiraea douglasii/Calamagrostis canadensis* c.t.

Gaultheria hispidula was found only in a small area of paludifying forest bordering the western lobe of the meadow, but could also occur in the bottomland forest in the northwest quarter of section 27 which was not surveyed. *Gaultheria hispidula* has tiny leathery leaves, white berries, and slender creeping stems that grow tightly appressed to moss or decaying wood. Distinctive, rust-colored hairs appressed to the stem distinguish it from *Vaccinium oxycoccos* when fruit are not present. It usually occurs with *Sphagnum* moss but can occur in a variety of peatland types from rich to poor fens.

Hypericum majus, a delicate perennial with small yellow flowers, was first collected in the Reeder Creek vicinity by John Leiberg in 1897. It is common in the wet bottoms of ditches and other depressions, especially where moist soil is exposed. Many plants were apparently seedlings.

Lycopodium dendroideum was found only in a small area of paludifying forest bordering the northwest lobe of the meadow, but could also occur in the bottomland forest in the northwest quarter of section 27 which was not surveyed. It is a distinctive clubmoss of paludified forest habitats.

Petasites sagittatus is a rhizomatous perennial with very broad, arrow-shaped leaves that have a whitish surface resembling flocking or felt. In mid-July only the leaves were present, arising singly, and forming very loose clusters. *Petasites sagittatus* is associated with the *Spiraea douglasii/Calamagrostis canadensis* and *C. canadensis* communities, forest edges, and occasionally well vegetated ditchbanks.

Trientalis europaea* var. *arctica is rhizomatous perennial in the primrose family that is common in a range of fen habitats, usually with *Sphagnum*. However, we found it only in the wetland forest (Maps 2A and 17).

Vaccinium oxycoccos was found only in a small area of paludifying forest bordering the western lobe of the meadow, but could also occur in the bottomland forest in the northwest quarter of section 27 which was not surveyed. Its habit is similar to *Gaultheria hispidula* (slender creeping stems that grow tightly appressed to moss or decaying wood, and tiny leathery leaves) but it lacks the coarse stem hairs and its berries are red. It is more highly restricted to *Sphagnum* substrates than *G. hispidula*. Only one small patch was observed, growing on *Sphagnum*.

Weeds

Much of Bismark Meadows is dominated by non-native grasses, particularly *Phalaris arundinacea* and *Poa pratensis*. Although *Phalaris* is native to northern North America, much of the material planted to pasture in northern Idaho is probably derived from cultivars introduced for agriculture (Apfelbaum and Sams 1987) which were selected for vegetative vigor, making them highly competitive.

Several broad-leaf weed species are present in Bismark Meadows (Table 5), the most extensive being *Cirsium arvense* (Canada thistle). The first three species in Table 5 have the greatest potential for disrupting natural succession following restoration of hydrology to the meadows. *Hieracium aurantiacum* (orange hawkweed) and *Linaria dalmatica* (Dalmatian toadflax) are currently rare in the project area and their precise locations have been mapped (Appendix A, Map 19). Some locations of *Leucanthemum vulgare* (= *Chrysanthemum leucanthemum*; oxeye daisy) were also mapped, but it turned out to be too common to document all patches observed. In addition to competing with native species, invasive weeds in the project area can affect the way adjacent landowners view the Wetlands Reserve Program. Under the WRP it is the responsibility of the respective landowners to control weeds. *Cirsium arvense*, *Hieracium aurantiacum,* and *Linaria dalmatica* are on the Idaho noxious weed list (Resources for Idaho 2003) and their control is mandated by state law.

Typha latifolia (broadleaf cattail) is a highly competitive native species that tends to form monocultures in perennially flooded areas. It can provide important refuge for waterfowl. It is currently rare in the study area; we found it in only one location. Seeds of *Typha* spp. are adapted to germinate on the bare mud of drawdown zones (Thompson 1992), so this species could benefit from occasional breaching of downstream beaver dams.

Table 5. Broadleaf weeds of concern in Bismark Meadows, ordered from highest to lowest level of concern.

Hieracium aurantiacum	Orange hawkweed	Rare in the study area, but an aggressive perennial.
Leucanthemum vulgare (= *Chrysanthemum leucanthemum*)	Oxeye daisy	Scattered in the project area but an aggressive spreader and possibly persistent where the surface soil is dry in summer.
Cirsium arvense	Canada thistle	Very abundant and possibly persistent where the surface is dry in summer.
Tanacetum vulgare	Common tansy	Locally abundant in disturbed sites.
Hypericum perforatum	Common St. Johnswort	Occasional in project area. Could increase with ground disturbance.
Potentilla norvegica	Norwegian cinquefoil	Common in the west end of the study area; does not appear very aggressive.
Linaria dalmatica	Dalmatian toadflax	Rare. Not a wetland species, but should be controlled while still possible.

MONITORING PLAN

The reinstatement of a more natural hydrology to Bismark Meadows represents a great opportunity to observe the response of a highly altered wetland to restoration efforts. The vegetation will provide one of the more salient aspects of this response. Vegetation monitoring is recommended both to describe existing plant communities, and to describe changes that take place after ditches are blocked and the water table raised. Changes may occur in 1) the composition of individual plant communities, 2) rare plant populations, and 3) in the pattern of cover types within the meadow. Hydrology is one of the most important factors determining the composition of peatland communities. As hydrologic conditions change, certain communities might expand, while others could diminish or be replaced. It is unknown if a return to more natural hydrologic conditions will result in expansion of native communities. Certain non-natives, most notably *Phalaris*, are well adapted to wetland habitats and can occur on peat substrates. Monitoring will be important to determining how management actions taken by the NRCS at Bismark Meadows affect the ecological condition of the vegetation.

We recommend that a monitoring plan include the following objectives:

1) to detect changes, if any, in the composition of several representative plant communities in Bismark Meadows,
2) to relate plant community changes, if any, to environmental factors, primarily depth to water,
3) to detect changes, if any, in the abundance and distribution rare plant populations, and
4) to detect changes, if any, in the distribution of cover types within the meadow over time.

Implementation of monitoring will depend on the specific objectives and monitoring questions developed by the project cooperators. Following are our recommendations for developing a vegetation monitoring program for Bismark Meadows.

Community composition

First, the sampling units need to be defined. The vegetation units shown in Map 1 could serve as sampling units, although they might be further refined before sampling. We propose selecting units that represent a range of conditions and moisture regimes (see below). Wetland vegetation is often sampled in 1-4 m^2 plots placed randomly or along transects (Wilcox 1995; Jeglum 1975). Permanent plots are more powerful in detecting change over time (Elzinga et al. 1998) and placing plots along transects simplifies monumenting.

Canopy cover and frequency are two parameters used to describe community composition. Canopy cover is difficult to estimate for individual species in meadow vegetation, at least for graminoids, and is subject to a large observer error, although it may be adequate for detecting dramatic changes. Frequency measurements eliminate the need to estimate cover and are highly repeatable (Elzinga et al. 1998). Depending on the specific monitoring objectives, you may not need to record every species present but target those that are indicative of vegetation condition (Lesica and Hanna 2002) or environmental factors (e.g., habitat type indicators). Because measurements of frequency are dependent on plot size it is usually necessary to use several plot sizes to coincide with different plant distribution patterns and scales.

At Bismark Meadows we recommend using 20- to 40-m transects along which nested plots are placed for recording rooted frequency. Plots should be separated by two or more meters. Transects should be placed parallel to the primary environmental gradient or to the direction of weed invasion, so that variation is captured within transects rather than partitioned between them (Elzinga et al. 1998). They can be placed randomly within the community or the community can be divided into equal segments with a random transect within each (stratified random sampling) to avoid over-sampling a small portion of the community. Transects should be marked as permanently as possible at each end with steel fenceposts. Frequency can then be measured in microplots placed along the transect at regular intervals. A point-quadrant or other methods (Elzinga et al. 1998) can be used to sample shrubs and trees. Photopoints should be established at each transect.

At the time baseline data are collected, each community should also be characterized using a 10 x 10 m plot in which canopy cover is estimated by species. This data will not be used for monitoring, but to help characterize the community type and add to the body of data supporting the type.

Vegetation transects should be accompanied by basic soil characterization to determine whether peat or mineral soil substrate is present. To help understand plant community changes, water table measurements should be made several times during the growing season. In addition, natural and human disturbance should be tracked, for example: extremes in water level, changes in management, weed treatments, disturbances in adjoining uplands, or breaching of downstream beaver dams.

Monitoring should be considered for sites or particular portions of the wetland that will be receiving specific management actions. For example, in areas receiving intensive herbicide application. In addition, the following are proposed monitoring sites that would provide a

gradient of both vegetation condition from relatively undisturbed to completely altered, and of moisture regime from summer-dry to perennially wet meadow sites.

1) The *Spiraea douglasii/Calamagrostis canadensis* community (cover type 3a) in the northwest lobe of the meadow (Map 1), where there is a concentration of rare plants.
2) The *Spiraea douglasii/Calamagrostis canadensis* community in the extreme southern tip of the project area.
3) Mapping units 1b and 1d where the diversity of native species is much lower.
4) North of Reeder Creek in mapping unit 2c, where wetland sedges and *Scirpus microcarpus* dominate to the south of an advancing front of *Phalaris.*
5) Mapping units 2f or 2g. These are some of the drier situations still dominated by native graminoids.

Rare plants

Some of the rare plants present in Bismark Meadows are sufficiently common in certain areas to be detected in community composition transects (Level 2, Table 6). For others, two different monitoring intensities might be used. A less intensive method (Level 1) would be to conduct a revisit using the GPS coordinates and information in the EOR. This can be an effective monitoring method if the method and intensity of the survey are documented and always repeated at a similar time of the year. Coordinates delineating the extent of survey must be recorded in addition to those of plant locations. For more intensive (Level 3) monitoring we recommend a 100 m^2 plot with two corners permanently marked. Plants (or stems of clonal plants) can then be enumerated and mapped within the plot. For large populations, several plots can be located along a transect. Most of the rare species found in Bismark Meadows are conducive to level 1 or 2 monitoring (Table 6). Most fall into one of two categories: 1) so rare that individual plants or clones can be marked (e.g., *Blechnum spicant* and *Vaccinium oxycoccos*) or 2) so widespread that changes will take place at coarser scale than can be detected by a permanent plot.

Table 6. Recommended monitoring levels for rare plants at Bismark Meadows.

Species	Level 1	Level 2	Level 3
Blechnum spicant	X		
Carex buxbaumii		X	
Carex leptalea		X	
Dryopteris cristata		X	
Epilobium palustre	X		
Gaultheria hispidula	X		
Hypericum majus	X		
Lycopodium dendroideum	X		
Petasites sagittatus		X	X
Trientalis europaea var. *arctica*		X	
Vaccinium oxycoccos	X		

Landscape-level monitoring

Low-level aerial photos may provide a means of mapping vegetation types and tracking changes in extent and pattern of these types. Ground-truthing should be done to determine the feasibility of this method as well as to verify the units mapped.

Monitoring schedule

All three monitoring levels (population, community, and landscape) should be initiated in 2004 to record conditions prior to restoration efforts. It seems reasonable to assume that different portions and different plant communities of the wetland may respond to management actions at different rates. Some places or communities may respond or change fairly quickly, while other may remain unchanged indefinitely. After 2004, we recommend monitoring be conducted every other year for four years. After five years, we should have a better idea of what an efficient monitoring interval will be. In addition, we recommend annual visits, at a specified time, to record water level information, management actions, and disturbances, and to check monument posts.

RECOMMENDATIONS

1. Populations of *Dryopteris cristata*, *Petasites sagittatus*, and *Carex buxbaumii* should be protected where they occur near ditch filling and other management activities. *Hypericum majus* appears to be very capable of colonizing ephemerally wet depressions and should thrive as long as such microsites are available along with seed sources.

2. *Epilobium palustre* and associated rare plants can be protected as part of a sensitive community (*Spiraea douglasii/Calamagrostis canadensis*). At a minimum, protection involves communicating the location of sensitive areas to people working in the meadow, restricting vehicle travel across certain areas, and controlling herbicide use. The two areas shown as cover type 3a (Appendix A, Map 1) are particularly sensitive because of their diversity and remnant native vegetation. Other units with a collection of rare plants should be considered sensitive.

3. Vegetation monitoring should be initiated in 2004 to capture baseline conditions prior to restoration and other management efforts.

REFERENCES CITED

Apfelbaum, S.I. and C.E. Sams. 1987. Ecology and control of reed canary grass. Natural Areas Journal 7:69-74.

Boggs, K., P. Hansen, R. Pfister, and J. Joy. 1990. Classification and Management of Riparian and Wetland Sites in Northwestern Montana. Draft Version 1. Montana Riparian Association, Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula. 217 p.

Bursik, R.J. 1990. Floristic and phytogeographic analysis of northwestern Rocky Mountain peatlands, U.S.A. University of Idaho, Moscow, Idaho. 37 p. M.S. thesis.

Bursik, R.J. and R.K. Moseley. 1995. Ecosystem conservation strategy for Idaho Panhandle peatlands. Idaho Department of Fish and Game, Conservation Data Center. Boise, Idaho. 28 p. plus appendices.

Chadde, S.W., J.S. Shelly, R.J. Bursik, R.K. Moseley, A.G. Evenden, M. Mantas, F. Rabe, and B. Heidel. 1998. Peatlands on National Forests of the Northern Rocky Mountains: Ecology and Conservation. USDA Forest Service General Technical Report RMRS-GTR-11. Rocky Mountain Research Station. Ogden, UT. 75 p.

Crum, H. 1988. A focus on Peatlands and Peat Mosses. The University of Michigan Press, Ann Arbor. 306 p.

Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. Measuring and Monitoring Plant Populations. Bureau of Land Management Technical Reference 1730-1. 477 p.

Flora of North America Editorial Committee. 2003. Flora of North America North of Mexico. Oxford University Press, New York and Oxford. Multiple volumes and dates.

Jankovsky-Jones, M. 1997. Conservation strategy for northern Idaho wetlands. Idaho Department of Fish and Game, Idaho Conservation Data Center. Boise, Idaho. 35 p. plus appendices.

Jeglum, J.K. 1975. Vegetation-habitat change caused by damming a peatland drainageway in Northern Ontario. The Canadian Field-Naturalist 89:400.

Lesica, P. and D. Hanna. 2002. Monitoring composition of foothills grassland using frequency of indicator species. Natural Areas Journal 22:148-153.

Lichthardt, J. and M. Mancuso. 2003. Preliminary survey of the plant communities and rare plants of Bismark Meadows, Idaho. Idaho Department of Fish and Game, Idaho Conservation Data Center, Boise, Idaho. 5 p. plus appendices.

NatureServe. 2003. NatureServe Explorer: An online encyclopedia of life [web application]. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: http://www.natureserve.org/explorer.

Resources for Idaho. 2003. Resources for Idaho, Cals Publishing Catalog. Availability: info.ag.uidaho.edu.

Stewart, Jeff. District Conservationist, Natural Resources Conservation Service. Sandpoint, ID. Personal communication in September, 2002.

Thompson, K. 1992. The functional ecology of seed banks. In: M. Fenner, ed., Seeds, the Ecology of Regeneration in Plant Communities. CAB International. 373 p.

USDA-NRCS. 2001. The PLANTS database, version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weisel, C.J. 1982. Soil survey of the Bonner County area, Idaho. USDA-Soil Conservation Service. US Government Printing Office, Washington, DC. 202 p.

Wilcox, D.A. 1995. Wetland and aquatic macrophytes as indicators of anthropogenic hydrologic disturbance. Natural Areas Journal 15:240.

Appendix A

Maps

Appendix B

Element occurrence records (EOR) for rare plants in the
Bismark Meadows Wetlands Reserve Program easement

Blechnum spicant
Deer-fern
Occurrence Number: 69

Survey Site: BISMARK MEADOWS

County: Bonner

Quad name
Priest Lake SW

Latitude: 483718N **Longitude:** 1165913W

Town Range	Section	Meridian	Note
061N005W	21	BO	NE4SE4

Directions:
Take Forest Service Road # 2231 west from Highway 57 (intersection just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows. Enter forest west of Reeder Creek.

Survey Date: 2003-08-14 **First Observation Date:** 2003-07-15 **Last Observation Date:** 2003-08-14

EO Rank: Not ranked **EO Rank Date:**
EO Rank Comments:

EO Data:
2003: 2 crowns observed, 100% non-reproductive in 1 sq. ft. Population vigor poor. Thorough survey by Karen Gray, Juanita Lichthardt, and Michael Mancuso, IDCDC.

Monitoring Needs Comments:

Research Needs Comments:

General Description:
General habitat description is near creek bank in Thuja plicata-Tsuga heterophylla forest, with patches of Sphagnum moss perhaps paludifying the forest floor and creek banks in places. Aspect is slightly south. Slope is gently undulating. Light regime is Shady with small canopy gaps. Community type is Thuja plicata-Tsuga heterophylla/Athyrium filix-femina. Associated Species include Athyrium filix-femina, Dryopteris cristata, Rubus pedatus, Pinus monticola, Linnaea borealis, Gaultheria ovatifolia, and Sphagnum sp.

Min. Elevation:	2,660.00	**feet**	810.77	**meters**
Max. Elevation:		**feet**		**meters**

Size of EO: 1 sq. ft.
Protection Comments:
No imminent threat: Meadow hawkweed (Hieracium pratense), oxeye daisy, Canada thistle, and orange hawkweed (Hieracium aurantiacum) occur in the area.

Management Comments:
Owner no longer runs cows on his property. Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS.
Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and private land.
General Comments:

Specimens:

Best Source for Information
Idaho Conservation Data Center.

Carex buxbaumii
Buxbaum's Sedge
Occurrence Number: 18

Survey Site: BISMARK MEADOWS

County: Bonner

Quad name
Priest Lake SW
Priest Lake NW

Latitude: 483747N **Longitude:** 1165823W

Town Range	Section	Meridian	Note
061N005W	22	BO	N2
061N005W	23	BO	SW4NW4
061N005W	21	BO	SE4SE4

Directions:
Take Forest Service Road # 2231 west from Highway 57 (intersection just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows (to subpop. #4). To get to subpops. #2 and #3, approach from Barne's Ranch, from Road # 2231.
Survey Date: 2003-07-17 **First Observation Date:** 1991-07-01 **Last Observation Date:** 2003-07-17

EO Rank: Possibly fair estimated viability **EO Rank Date:** 07/01/1991
EO Rank Comments:

EO Data:
1991: 101-1000 genets, 1001-10,000 ramets; plants are mature, 50% in leaf, 50% in flower. Area surveyed by Rob Bursik, Idaho CDC. 2003: An unknown number of individuals observed with fair vigor. 50% reproductive, 50% non-reproductive. Plants were in seed. Culms scattered (20-50 over 1/4 acre).
Monitoring Needs Comments:
1) Avoid fill or scraping for fill near Carex buxbaumii sites. 2) Treat weeds. 3) Use vegetation map to assess vegetation changes after management actions.
Research Needs Comments:

General Description:
Saturated (wet); bottom; flat aspect; 0-3% slope; on alluvium with histic epipedon; open sedge/grass meadow/shrub carr mosaic; prominent over a ca 0.25 acre area with Calamagrostis canadensis, Carex rostrata, Lupinus sp., Petasites sagittatus, Fragaria virginiana, and Geum macrophyllum. 2003: Subpopulations 3 and 4 are in remnant fen vegetation (Spiraea douglasii/Calamagrostis canadensis). Subpopulation 2 habitat is sedge dominated with scattered reed canary grass. Aspect is flat or gently undulating. Slope is flat or gently rolling. Soil/Substrate is peat. Light regime is open. Community type is sedge-reed canarygrass, and Spiraea douglasii/Calamagrostis canadensis. Associated species include Pedicularis groenlandica, Poa pratensis, rather short Phalaris arundinacea, Carex ovalis, Carex arcta, Carex vesicaria, Carex lenticularis, Agrostis scabra, Potentilla gracilis, short, scattered Spiraea douglasii, Calamagrostis canadensis.

Min. Elevation:	2,620.00	**feet**	799.00	**meters**
Max. Elevation:	2,660.00	**feet**	810.77	**meters**

Size of EO: 1/4 acre.
Protection Comments:
1991: The only disturbance is an old drainage ditch that no longer seems to affect local hydrology. No current threats. 2003: Phalaris arundinacea is the primary threat. Chrysanthemum leucanthemum and Poa pratensis are also present.

Management Comments:
Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations.

Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and private land.
General comments: Approximately 20 acres of potential habitat in the immediate area.

Specimens: Rob Bursik 1734 (ID).

Best Source for Information: Idaho Conservation Data Center.

Carex leptalea
Bristle-stalked Sedge
Occurrence Number: 8

Survey Site: REEDER CREEK/BISMARK MEADOWS

County: Bonner

Quad Name
Priest Lake SW
Priest Lake NW

Latitude: 483707N **Longitude:** 1165917W

Town Range	Section	Meridian	Note
061N005W	21	BO	E2

Directions:
Take Forest Service Road # 2231 west from Highway 57 (intersection just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows.

Survey Date: 2003-07-15 **First Observation Date:** 1991-07-01 **Last Observation Date:** 2003-07-15

EO Rank: Good estimated viability **EO Rank Date:** 07/01/1991
EO Rank Comments:

EO Data:
1991: 101-1000 genets, 1001-10,000 ramets; plants are vigorous, 100% in immature fruit. Area surveyed by Rob Bursik, Idaho CDC. 2003: 500 estimated genets observed within 3 groupings (middle (eastern), middle (western), and southern). 95% reproductive, 5% non-reproductive. Population size is 2 acres scattered over 15 acres. Population vigor assessed as fair to good. Somewhat thorough survey by Karen Gray and Juanita Lichthardt, IDCDC.

Monitoring Needs Comments:
The area west of the north-south drainage ditch south of the Joe Hawley place supports several rare plant species and native plant communities. Ditch-filling activities should minimize impacts to the native vegetation and rare plants. Monitor plants.
Research Needs Comments:

General Description:
Inundated (hydric) and saturated (wet-mesic); bottom; flat aspect; 0-3% slope; open light; growing on a small area in a sedge meadow which is covered by Sphagnum hummocks and in an adjacent shallow depression in standing water and beneath Spiraea hummocks; with Carex paupercula, Carex canescens, and Carex rostrata. 2003: General habitat is sedge/grass meadow, with short, scattered Spiraea douglasii and abundant forbs. Aspect is flat or gently undulating. Slope is flat, or gently rolling. Substrate/soil is peat (organic). Light regime is open. Associated Species include Ligusticum canbyi, Solidago canadensis, Senecio sp., Viola sp. Agrostis scabra, Spiraea douglasii, Carex utriculata, Carex aquatilis, Aster sp., Calamagrostis canadensis, Petasites sagittatus, Hypericum majus and Poa pratensis.

Min. Elevation:	2,650.00	**feet**	807.72	**meters**
Max. Elevation:	2,670.00	**feet**	813.82	**meters**

Size of EO: 2 acres scattered over 15 acres.
Protection Comments:
An old road was built through the meadow, but the culvert has been removed. There are no current threats to the population.

Phalaris arundinacea, Poa pratensis, and Chrysanthemum leucanthemum are all present and present threats.

Management Comments:
Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations.
Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and private land.
General comments: There are ca 5 acres of potential habitat in the immediate area.

Specimens:
Rob Bursik 1727A (ID), Gray 4253 (ID).

Best Source for Information
Idaho Conservation Data Center.

Dryopteris cristata
Crested Shield-fern
Occurrence Number: 6

Survey Site: BISMARK MEADOWS

County: Bonner

Quad name
Priest Lake SW
Priest Lake NW

Latitude: 483703N **Longitude:** 1165808W

Town Range	Section	Meridian	Note
061N005W	21	BO	
061N005W	22	BO	
061N005W	27	BO	
061N005W	28	BO	

Directions:
Bismark Meadows lies west of Highway 57, from about 0.5 mile to 2 miles SW of Nordman (access from Highway 57) Or take Forest Service Road # 2231 west from Highway 57 (intersection just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows. Also, one population lies N along Reeder Creek.

Survey Date: 2003-08-14 **First Observation Date:** 1948-07-23 **Last Observation Date:** 2003-08-14

EO Rank: Good or fair estimated viability **EO Rank Date:** 08/14/2003
EO Rank Comments:
EO Rank changed from D to BC in 8/03 due to location of more subpopulations.
EO Data:
1987: Nice sized population in meadows and in forest margin at southwest corner of open meadows. Observation by Norm Trigoboff. 1991: Population relocated by Bursik. Population area estimated to be ca 5 acres. 2002: Two new subpopulations observed with 6-10 estimated genets. Population size of subpopulation 1 is ca 2.5 acres and subpopulation 3 is ca .05 acre. Population vigor assessed as fair. Fairly thorough survey by Karen Gray and Juanita Lichthardt, IDCDC. 2003: Total # of individuals in the population is 200-300 estimated genets (scattered throughout 3 subpopulations). The size of the population area is 1 acre scattered over 300 acres . Population vigor is good. There is probably additional unsurveyed habitat. Somewhat thorough survey by Karen Gray, Juanita Lichthardt, and Michael Mancuso, IDCDC.

Monitoring Needs Comments:
Population should be monitored to detect changes related to restoration of hydrologic regime in Bismark Meadows. Activities related to filling the ditches (such as scraping fill material) should be conducted so as not to disturb fern locations.
Population should be monitored to detect changes related to restoration of hydrologic regime in Bismark Meadows.

Research Needs Comments:

General Description:
Sphagnum hummocks; bottom; flat aspect; open light. Sphagnum hummocks; bottom; flat aspect; open light. 2002: Rich fen with patchy shrub and sedge meadow. Mostly at edges of shrub cover. Level slope. Area is saturated much of the year. Open light regime. Substrate/soil is organic (peat). Associated species include Carex utriculata, Phalaris arundinacea, Calamagrostis canadensis, Betula glandulosa, Spiraea douglasii, Carex lasiocarpa, Potentilla palustris, Petasites sagittata, and Sphagnum. 2003: General habitat description is Thuja plicata-Tsuga heterophylla forest, with patches of Sphagnum moss perhaps paludifying the forest floor. Also, along drainage ditches and creek, both shaded and open, in shrub carr, and in some low Spiraea douglasii patches. No aspect. Slope is gently undulating. Substrate/soil is peat (organic). Light regime is variable: occurs both in shaded and relatively open conditions. Community type is Thuja plicata-Tsuga heterophylla forest, alder-shaded creek and ditches, open ditches, shrub carr (Betula glandulosa) and patches of short Spiraea douglasii. Associated Species include Lyshiciton americanum, Trientalis europaea ssp. arctica, Lycopodium dendroides, Vaccinium oxycoccos (in forest), Alnus, Spiraea douglasii and Athyrium filix-femina on shady stream banks, and Betula glandulosa in shrub carr.

Min. Elevation:	2,620.00	**feet**	798.58	**meters**
Max. Elevation:	2,680.00	**feet**	816.86	**meters**

Size of EO: 7.5 acres.
Protection Comments:
Phalaris arundinacea abundant in area. Meadow hawkweed (Hieracium pratense), oxeye daisy, Canada thistle, Poa pratensis and other pasture grasses, and orange hawkweed (Hieracium aurantiacum) occur in the area.

Management Comments:
Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations.

Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and private land.

General comments: Fronds tended to be loosely clustered and we counted clusters. Probably the densest aggregation of clusters (>130 in 230 sq meters) is along the drainage ditch that follows the section line between Sections 22 & 27 (Subpopulation 3).

Specimens:
J. H. and C. B. Christ 18035 (ID) - collection label reads "near Lambert Ranch".
Rob Bursik 1728 (ID).
J. H. Christ 18036 (NY) - collection label reads "2-3 miles west of Nordman, on the Reeder Creek Road; Lambert Ranch".
Gray 4270 (ID).

Best Source for Information
Idaho Conservation Data Center.

Epilobium palustre
Swamp Willow-weed
Occurrence Number: 11

Survey Site: BISMARK MEADOWS

County: Bonner

Quad name:
Priest Lake SW
Priest Lake NW

Latitude: 483712N **Longitude:** 1165913W

Town Range	Section	Meridian	Note
061N005W	22	BO	NE4NE4
061N005W	21	BO	SE4SE4

Directions:
Take Forest Service Road # 2231 west from from Highway 57 north of Nordman. After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows. Epilobium palustre is just south of shrub carr, west of Reeder Creek, and west of north-south drainage ditch.

Survey Date: 2003-07-15 **First Observation Date:** 1991-07-01 **Last Observation Date:** 2003-07-15

EO Rank: Poor estimated viability **EO Rank Date:** 07/15/2003

EO Rank Comments:
EO Rank changed from C to D in 2003.

EO Data:
1991: 11-50 genets, 11-50 ramets; plants are feeble-looking, 100% in bud. Small population, did not seem to be doing well despite available habitat. Area surveyed by Rob Bursik, Idaho CDC. 2003: 25 estimated genets observed in 2 sites. 20% non-reproductive, 80% reproductive. Population size 3 sq. meters. Population vigor is fair to poor. Cursory survey by Karen Gray and Juanita Lichthardt, IDCDC.

Monitoring Needs Comments:
Vegetation monitoring should be undertaken to assess the effects of management (filling drainage ditches to restore flooding).

Research Needs Comments:

General Description:
Wet sedge-Calamagrostis canadensis meadow, often with scattered, short Spiraea douglasii and forbs. Flat aspect; 0-3% slope; open light; open sedge/graminoid fen; growing with Carex rostrata, C. buxbaumii, Lupinus polyphyllus, Calamagrostis canadensis, Carex leptalea, Carex aquatilis, Ligusticum canbyi, Solidago canadensis, Viola sp., Agrostis scabra, Spiraea douglasii, and Geum macrophyllum on scattered peat.

Min. Elevation:	2,620.00	**feet**	799.00	**meters**
Max. Elevation:	2,660.00	**feet**	810.77	**meters**

Size of EO: 10 - 100 SQ YD

Protection Comments:
There is an old drainage ditch through the fen. Possible cattle grazing. Canada thistle and Poa pratensis present threats.

Management Comments:
Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations.

Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and private land.
General Comments: There are approximately 5 acres of potential habitat in the immediate area.

Specimens:
Rob Bursik 1742 (ID).

Best Source for Information
Idaho Conservation Data Center.

Gaultheria hispidula
Creeping Snowberry
Occurrence Number: 4

Survey Site: REEDER CREEK/BISMARK MEADOWS

County: Bonner

Quad name
Priest Lake SW
Priest Lake NW

Latitude: 483719N **Longitude:** 1165913W

Town Range	Section	Meridian	Note
061N005W	21	BO	NE4NE4, NW4SE4, NE4SE4

Directions:
Along Reeder Creek, ca 2.5 miles west of Nordman; access is via FS road 2231 and Bismark Meadows: Take Forest Service Road # 2231 west from Highway 57 (intersection just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows. Enter forest west of Reeder Creek.

Survey Date: 2003-08-14 **First Observation Date:** 1948-07-23 **Last Observation Date:** 2003-08-14

EO Rank: Excellent or good estimated viability **EO Rank Date:** 08/14/2003
EO Rank Comments:

EO Data:
1948: No data. Collected by J. H. Christ. 1987: Good sized population in woods at SW corner of meadow, sometimes dense. Observation by Norm Trigoboff. 1991: Population relocated by Bursik. 2003: New subpopulation observed south of original population. 5 - 10 estimated patches observed over 1/10 acre. 98% non-reproductive, 2% reproductive. Population vigor estimated as good. Somewhat thorough survey by Karen Gray, Juanita Lichthardt and Michael Mancuso, IDCDC.
Monitoring Needs Comments:
Area should be monitored periodically to see if weeds are invading.
Research Needs Comments:

General Description:
General habitat is Thuja plicata, Tsuga heterophylla forest, with patches of sphagnum moss perhaps paludifying the forest floor. Aspect is slightly south and slope is gently undulating. Substrate/soil is rotten wood or duff overlain by sphagnum moss. Light regime is Shady with small canopy gaps. Community type is Tsuga heterophylla/Lysichiton americanum. Associated Species include Lysichiton americanum, Dryopteris cristata, Cornus canadensis, Rubus pedatus, Pinus monticola, Linnaea borealis, Trientalis europaea ssp. arctica, Lycopodium annotinum, Lycopodium clavatum, Lycopodium dendroidea, and Vaccinium oxycoccos.

Min. Elevation:	2,660.00	**feet**	811.00	**meters**
Max. Elevation:	2,660.00	**feet**	810.77	**meters**

Size of EO: Scattered patches over 1-2 acres.
Protection Comments:
No imminent threat: meadow hawkweed (Hieracium pratense), oxeye daisy, Canada thistle, and orange hawkweed (Hieracium aurantiacum) occur in the area.

Management Comments:
Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations. Owner no longer runs cows on his property.
Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and private land.
General comments:

Specimens:
Rob Bursik 1733 (ID).
J. H. Christ 18040 (NY) - collection label reads "2-3 miles W of Nordman, on Reeder Creek road at Lambert Ranch; west side of peat bog, under spruce on old logs, on hummocks, and at base of trees in sphagnum". Determined by S. J. Smith in 1965.
Gray 4260 (ID).

Best Source for Information
Idaho Conservation Data Center.

Hypericum majus
Canadian St. John's-wort
Occurrence Number: 15

Survey Site: REEDER CREEK

County: Bonner

Quad name
Priest Lake SW
Priest Lake NW

Latitude: 483743N **Longitude:** 1165808W

Town Range	Section	Meridian	Note
061N005W	22	BO	
061N005W	23	BO	
061N005W	21	BO	
061N005W	27	BO	

Directions:
Along Reeder Creek, which is located near Nordman, west of Priest Lake. Take a left of Hwy 57, about 0.5 mile before Nordman, onto FS road 238. Take 238 to end (old Bismark Work Center). Walk about 2/3 mile SW to footbridge that crosses channelized portion of Reeder Creek. Also Bismark Meadows. Bismark Meadows lies west of Highway 57, from about 0.5 mile to 2 miles SW of Nordman (access from Highway 57) Or take Forest Service Road # 2231 west from Highway 57 (intersection just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows.

Survey Date: 2003-07-17 **First Observation Date:** 1897-07-23 **Last Observation Date:** 2003-07-17

EO Rank: Fair estimated viability **EO Rank Date:** 09/11/2002
EO Rank Comments:
Small population in area impacted by human activities and nearby vegetation dominated by Phalaris arundinacea.
EO Data:
1897: No data. Collected by Leiberg. 2002: Less than 100 plants observed in a small area during a cursory survey by Michael Mancuso. 2003: 500 genets observed throughout entire population. 50% non-reproductive, 50% reproductive. Population area is 1 acre, mostly linear, in ditches. Population vigor assessed as fair to good. Somewhat thorough survey by Juanita Lichthardt, Karen Gray and Michael Mancuso, IDCDC.
Monitoring Needs Comments:
Activities related to filling the ditches (such as scraping fill material) should be conducted so as not to disturb Hypericum majus locations.
Research Needs Comments:

General Description:
"Sphagnum swamps." 2002: Near creek channel; wet muddy soil that is probably covered by standing water part of the year. Opening is surrounded by dense graminoid-dominated vegetation. 2003: General habitat is in mud of ditch bottoms, but also in depressions in sedge meadows, and among sedges in meadows. No aspect. Slope is gently undulating. Substrate/soil is peat (organic). Light regime is in shade of other vegetation. Community type is seasonally inundated sedge meadows. Associated Species include Carex leptalea, Solidago canadensis, Potentilla norvegica, Agrostis scabra, Agrostis stolonifera, Galeopsis tetrahit, scattered Phalaris arundinacea, scattered Spiraea douglasii, Aster sp., Carex utriculata, Viola spp., and tall sedges.

Min. Elevation:	2,620.00	**feet**	798.58	**meters**
Max. Elevation:	2,660.00	**feet**	810.77	**meters**

Size of EO:
Protection Comments:
2002: a) Vehicle tracks nearby. b) Old cattle hoof prints in mud. c) High cover of reed canary grass in general area. 2003: Phalaris arundinacea is abundant in ditches and may consume habitat as drainage ditches fill in. Canada thistle, Poa pratensis and other pasture grasses, and oxeye daisy occur in the area.

Management Comments:
Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations.
Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and Private land.
General comments: Leiberg's 1897 collection from "near Reeder Creek" is included in this occurrence.

Specimens:
Leiberg 2749 (herbarium unknown, possibly US) - elevation given in notes is 900 m (ca 2950 ft.), which is slightly high for the swampy areas near Reeder Creek.
Mancuso 2410 (ID).; Gray 4274 (ID).; Lichthardt 171 (ID).

Best Source for Information
Idaho Conservation Data Center.

Lycopodium dendroideum
Groundpine
Occurrence Number: 4

Survey Site: BISMARK MEADOWS

County: Bonner

Quad name
Priest Lake SW
Priest Lake NW

Latitude: 483724N **Longitude:** 1165649W

Town Range	Section	Meridian	Note
061N005W	23	BO	N2
061N005W	21	BO	SE4

Directions:
Subpopulation 1: Just south of FS Road 238, 0.25 mile west of the junction with State Route 57, 0.2 mile ESE of Bismark Work Center. Also ca 1000 feet E of SR 57 along a powerline right-of-way and on the S side of Reeder Creek. Subpopulation 2: Take Forest Service Road # 2231 west from Highway 57 (intersection is just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows. Enter forest west of Reeder Creek.
Survey Date: 2003-08-14 **First Observation Date:** 1992-09-11 **Last Observation Date:** 2003-08-14

EO Rank: Fair estimated viability **EO Rank Date:** 08/15/2003
EO Rank Comments:
EO Rank changed from B to C in 2003.
EO Data:
1992: Ca 300 genets, 75% vegetative, 25% in fruit. Population vigor assessed as good. Observation by Diane Penny and Heidi Dorman, Priest Lake RD. 1995: Penny and Tim Layser located an additional population E of the highway with ca 150 plants, 80% vegetative and 20% in fruit. Population age class structure is 30% immature, 60% mature, and 10% senescent. Plant vigor assessed as good. 2003: Also observed on 7/15. Two patches observed. 98% non-reproductive, 2% reproductive. Population vigor assessed as fair to good. Somewhat thorough survey, although more potential habitat exists in the area.

Monitoring Needs Comments:
Area should be monitored periodically to see if weeds are invading.
Research Needs Comments:

General Description:
Mixed species stand of second growth (selectively cut). Flat area, probably a frost pocket with moist to mesic site conditions. Also on ecotone of a small peatland and timber; Tsuga heterophylla/Clintonia uniflora habitat type. Near the work center plants are scattered throughout the area, including old skids. They area often clustered around downed logs and stumps, in the duffy needle layer. Associated species include Lycopodium complanatum, Linnaea Borealis, Vaccinium membranaceum, Pachistima myrsinites, Cornus canadensis, Populus trichocarpa, Pinus contorta, Thuja plicata, Tsuga heterophylla, Picea engelmannii, Abies lasiocarpa, Alnus incana, Vaccinium caespitosum, Rosa gymnocarpa, Spiraea densiflora, Amelanchier alnifolia, Pyrola asarifolia, Smilacina stellata, Aralia nudicaulis, Comandra livida, Osmorhiza chilensis, Pteridium aquilinum, Equisetum arvense, Dryopteris cristata, Rubus pedatus, Lysichiton americanum, Pinus monticola, Linnaea borealis, Trientalis europaea ssp. arctica, Lycopodium annotinum, Lycopodium clavatum, Gaultheria hispidula, Vaccinium oxycoccos and Polytrichum spp.

Min. Elevation:	2,610.00	**feet**	796.00	**meters**
Max. Elevation:	2,660.00	**feet**	810.77	**meters**

Size of EO: Small.
Protection Comments:
1992: This location is scheduled to be winter logged in 1993 (salvage sale). Some plants are located outside the sale boundaries. 1995: Population E of the highway is near a powerline right-of-way. No visible threats if the area is buffered from proposed salvage activities. 1992: This location is scheduled to be winter logged in 1993 (salvage sale). Some plants are located outside the sale boundaries. 1995: Population E of the highway is near a powerline right-of-way. No visible threats if the area is buffered from proposed salvage activities. 2003: No imminent threat. Meadow hawkweed (Hieracium

pratense), oxeye daisy, Canada thistle, and orange hawkweed (Hieracium aurantiacum) occur in the area.

Management Comments:
Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations. Owner no longer runs cows on his property.
Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and private land.
General comments: Photographs were taken, but are not in the possession of the Idaho CDC. Stand id: 840-02-024, 044, 045.

Specimens:
Norm Trigoboff s.n. (Priest Lake RD) - collected in the SE4 of Section 23 on the S side of Reeder Creek.
Gray 4272 (ID).

Best Source for Information
Idaho Conservation Data Center.

Petasites sagittatus
Arrowleaf Coltsfoot
Occurrence Number: 18

Survey Site: BISMARK MEADOWS

County: Bonner

Quad name
Priest Lake SW
Priest Lake NW

Latitude: 483710N **Longitude:** 1165920W

Town Range	Section	Meridian	Note
061N005W	21	BO	
061N005W	27	BO	
061N005W	22	BO	
061N005W	23	BO	
061N005W	28	BO	

Directions:
Bismark Meadows lies west of Highway 57, from about 0.5 mile to 2 miles SW of Nordman (access from Highway 57), or take Forest Service Road # 2231 west from Highway 57 (intersection just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows.

Survey Date: 2003-07-17 **First Observation Date:** 1991-07-01 **Last Observation Date:** 2003-07-17

EO Rank: Good estimated viability **EO Rank Date:** 07/01/1991
EO Rank Comments:

EO Data:
1991: Subpopulation one is a small but vigorous population consisting on 1-10 genets; plants are mature but not flowering. Survey may have been conducted too late to find flowering stems. Subpopulation 2 contains 101-1000 normal genets in leaf; plants are 25% immature, 75% mature; may be too late to detect flowers. A few scattered, rhizomatous patches found in depressions with shallow standing water in meadow/shrub carr mosaic. There is likely more P. sagittatus in the meadow. Area surveyed by Rob Bursik, Idaho CDC. 2002: A third subpopulation discovered consisting of 2 non-reproductive genets observed with poor vigor. Cursory visit by Juanita Lichthardt and Michael Mancuso, IDCDC. 2003: 100-200 estimated ramets observed over a 1.5 sq. mile area, mostly in SE4 Section 21. Population size estimated ca 5 acres. Plants were 100% non-reproductive. Population vigor assessed as good. Fairly thorough survey by Karen Gray and Juanita Lichthardt, IDCDC.

Monitoring Needs Comments: Monitor effects of restored hydrologic regime.

Research Needs Comments:

General Description:
Saturated (wet-mesic); flat; 0-3% slope; partial light; sedge meadow/shrub carr mosaic; growing on meadow margin on moist peat with Spiraea douglasii, Alnus incana, Phalaris arundinacea, Cirsium arvense, and Scirpus microcarpus. 2003: Occurs in sedge meadows with short Spiraea douglasii, also in forest openings in wet depressions, on ditchbanks and along creeks. Plants are restricted to fen remnants and edges of wet forests primarily, and, rarely, occur on banks of nearby ditches. No aspect. Slope is gently undulating. Substrate/soil is peat (organic). Light regime is mostly open. Community type is seasonally inundated sedge meadows, or moist forests. Associated Species include Carex leptalea, Solidago canadensis, Potentilla norvegica, Agrostis scabra, Agrostis stolonifera, scattered Phalaris arundinacea, scattered Spiraea douglasii, Aster sp., Carex utriculata, Calamagrostis canadensis and other tall sedges.

Min. Elevation:	2,610.00	**feet**	795.53	**meters**
Max. Elevation:	2,660.00	**feet**	810.77	**meters**

Size of EO: 5 acres.
Protection Comments: Phalaris arundinacea, Canada thistle, Poa pratensis and other pasture grasses, and oxeye daisy pose threats.

Management Comments:
Activities related to filling the ditches should be conducted so as not to disturb Petasites sagittatus locations. Portions of the population should be monitored to detect changes related to restoration of the hydrological regime. Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations.

Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and private land.
General comments: Approximately 5 acres of potential habitat in the immediate area.

Specimens:

Best Source for Information
Idaho Conservation Data Center.

Trientaliseuropaea* var. *arctica
Northern Starflower
Occurrence Number: 6

Survey Site: REEDER CREEK

County: Bonner

Quad name:
Priest Lake SW
Priest Lake NW

Latitude: 483757N **Longitude:** 1165913W

Town Range	Section	Meridian	Note
061N005W	16	BO	SE4
061N005W	21	BO	NW4SE4

Directions:
Subpopulation 1: Meadow along the west side of Reeder Creek, ca 2.5 miles west of Nordman. Access is by FS Road 2231 from Nordman. Subpopulation 2: Take Forest Service Road # 2231 west from Highway 57 (intersection is just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows. Enter forest west of Reeder Creek.
Survey Date: 2003-08-14 **First Observation Date:** 1987-08-25 **Last Observation Date:** 2003-08-14

EO Rank: Good estimated viability **EO Rank Date:** 07/01/1991
EO Rank Comments:

EO Data:
1987: Not common; in meadow-woods border at SW corner of open meadow. Observation by Norm Trigoboff. 1991: Small population of 51-100 genets and 101-1000 ramets, growing mostly on raised sphagnum hummocks; plants are of normal vigor, 75% in leaf, 5% in flower, and 20% in immature fruit; age structure of population is 75% mature and 25% immature. Area surveyed by Rob Bursik, Idaho CDC. 2003: Also observed on 7/15. 100+ estimated genets observed. 50% non-reproductive, 50% reproductive. Population size is 1/100th acre scattered over 1-2 acres. Population vigor assessed as fair. Cursory to somewhat thorough survey by Karen Gray, Juanita Lichthardt and Michael Mancuso, IDCDC. More potential habitat exists north of the surveyed area.

Monitoring Needs Comments:

Research Needs Comments:

General Description:
1991: Saturated (wet-mesic); bottom; flat aspect; 0-3% slope; open light; on raised sphagnum hummock; peat substrate; associated with Spiraea douglasii, Dryopteris cristata, Carex rostrata, Lycopus uniflorus, and Carex canescens. 2003: General habitat description is Thuja plicata, Tsuga heterophylla forest, with patches of sphagnum moss perhaps paludifying the forest floor. Aspect is slightly south. Slope is gently undulating. Substrate/soil is duff overlain by sphagnum moss. Light regime is shady with small canopy gaps. Community type is Tsuga heterophylla/Lysichiton americanum. Associated species include Dryopteris cristata, Cornus canadensis, Rubus pedatus, Lysichiton americanum, Pinus monticola, Linnaea borealis, Trientalis europaea ssp. arctica, Lycopodium annotinum, Lycopodium clavatum, Gaultheria hispidula, Lycopodium dendroides

Min. Elevation:	2,660.00	**feet**	810.77	**meters**
Max. Elevation:		**feet**		**meters**

Size of EO: 1-2 acres.
Protection Comments:
No imminent threat: meadow hawkweed (Hieracium pratense), oxeye daisy, Canada thistle, and orange hawkweed (Hieracium aurantiacum) occur in the area.

Management Comments:
Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations. Owner no longer runs cows on his property.
Owner Comments: Idaho Panhandle NFs, Priest Lake RD; and private land.
General
Comments: Approximately 1 acre of potential habitat in the immediate area.

Specimens:
Rob Bursik 1732 (ID). Gray 4258 (ID).

Best Source for Information
Idaho Conservation Data Center.

Vaccinium oxycoccos
Bog Cranberry
Occurrence Number: 9

Survey Site: BISMARK MEADOWS

County: Bonner

Quad name:
Priest Lake SW

Latitude: 483719N **Longitude:** 1165917W

Town Range	Section	Meridian	Note
061N005W	21	BO	NW4SE4, NE4SE4

Directions:
Take Forest Service Road # 2231 west from Highway 57 (intersection is just north of Nordman). After ~ 2 miles, veer left at sharp bend to south. At the end of the road (about 3/4 mile), park at Joe Hawley's farm. Cross creek on footbridge south of farmhouse to enter Bismark Meadows. Enter forest west of Reeder Creek.
Survey Date: 2003-08-14 **First Observation Date:** 1897-07-23 **Last Observation Date:** 2003-08-14

EO Rank: Poor estimated viability **EO Rank Date:** 08/14/2003
EO Rank Comments:
EO Rank changed from Historical to D when population was relocated in 2003.
EO Data:
1897: Collection by Leiberg. 1932: Collection by Christ. 1991: Rob Bursik, Idaho CDC, was unable to relocate, but his survey was limited to only a small portion of Bismark Meadows and Reeder Creek. The extensive meadows may support V. oxycoccos in intermediate or poor fen habitats, but, much of the area has been drained, hayed, and grazed. 2003: Area also surveyed on 7/15. One patch consisting of a few non-reproductive strands with poor vigor observed in a 1 x 2 ft. area during a cursory to somewhat thorough survey by Karen Gray, Juanita Lichthardt and Michael Mancuso, IDCDC.

Monitoring Needs Comments:
Area should be monitored periodically to see if weeds are invading. Further surveys are warranted to see if there are other occurrences in the area.
Research Needs Comments:

General Description:
"In sphagnum bog" (Christ). "Sphagnum swamps" (Leiberg). 2003: General habitat description is Thuja plicata, Tsuga heterophylla forest, with patches of sphagnum moss perhaps paludifying the forest floor. Aspect is slightly south. Slope is gently undulating. Substrate/soil is duff overlain by sphagnum moss. Light regime is shady with small canopy gaps. Community type is Tsuga heterophylla/Lysichiton americanum. Associated species include Dryopteris cristata, Cornus canadensis, Rubus pedatus, Lysichiton americanum, Pinus monticola, Linnaea borealis, Trientalis europaea ssp. arctica, Lycopodium annotinum, Lycopodium clavatum, Gaultheria hispidula, Lycopodium dendroides

Min. Elevation: 2,660.00 **feet** 810.77 **meters**
Max. Elevation: **feet** **meters**
Size of EO: Very small population (a few strands) observed over 2 sq. ft.
Protection Comments:
No imminent threat: meadow hawkweed (Hieracium pratense), oxeye daisy, Canada thistle, and orange hawkweed (Hieracium aurantiacum) occur in the area.

Management Comments:
Land is in Wetlands Reserve Program, in a permanent conservation easement managed by the USDA-NRCS. The drainage ditches are slated to be filled with help from Natural Resource Conservation Service in order to return the meadows to a more natural hydrological regime. Owners have responsibility to treat weed infestations. Owner no longer runs cows on his property.

Owner Comments: Private land.
General comments:

Specimens:
Leiberg 2744 (herbarium unknown, possibly US) - elevation given in notes is 900 m (ca 2950 ft) which is too high for the swampy areas near Reeder Creek.
J. H. Christ 2117 (CIC, ID) - collected 11/16/32 at "Nordman."

Best Source for Information
Idaho Conservation Data Center.

Appendix C

Bismark Meadows plant list

Appendix C

Bismark Meadows plant list[1]

Scientific name	Common name	LF[2]	I[3]	Habitat[4]
Abies grandis	Grand fir	T		F
Abies lasiocarpa	Subalpine fir	T		F
Achillea millefolium	Yarrow	PF		M
Agropyron sp.	Wheatgrass	G	I	OF
Agrostis scabra	Rough bentgrass	G		M
Agrostis stolonifera	Redtop bentgrass	G	I	M
Alnus incana	Thin-leaf alder	S		Rip
Alopecurus geniculatus	Water foxtail	G		Ditches
Alopecurus pratensis	Little foxtail	G	I	OF
Anaphalis margaritacea	Pearly everlasting	PF		M
Angelica arguta	Lyall angelica	PF		M
Aralia nudicaulis	Wild sarsaparilla	PF		F
Asarum caudatum	Wild ginger	PF		F
Aster modestus	Few-flowered aster	PF		Spdo
Aster occidentalis	Western aster	PF		Spdo
Athyrium filix-femina	Ladyfern	FE		TS,F
Betula glandulosa	Bog birch	S		TS
Bidens cernua	Nodding beggar-ticks	AF		Ditches
Blechnum spicant[6]	Deerfern	FE		F
Botrychium multifidum	Leathery grape-fern	FE		M, Spdo
Botrychium virginianum	Rattlesnake fern	FE		F
Bromus inermis	Smooth brome	G	I	M
Calamagrostis canadensis	Bluejoint reedgrass	G		M
Camassia quamash	Small camas	PF		M
Carex aperta	Columbia sedge	G		M
Carex aquatilis	Water sedge	G		M
Carex arcta	Northern clustered sedge	G		M
Carex athrostachya	Slender-beaked sedge	G		M
Carex bebbii	Bebb sedge	G		M, OF
Carex brunnescens	Brownish sedge	G		M
Carex buxbaumii	Buxbaum sedge	G		M
Carex canescens	Gray sedge	G		Ditches
Carex crawfordii	Crawford sedge	G		M
Carex cusickii	Cusick sedge	G		M
Carex deweyana	Dewey sedge	G		F
Carex echinata	Spiny star sedge	G		F
Carex hoodii	Hood sedge	G		M
Carex interior	Inland sedge	G		M
Carex lasiocarpa	Slender sedge	G		M
Carex lenticularis	Lentil-fruit sedge	G		M, Ditches
Carex leptalea	Bristlestalk sedge	G		M
Carex nebrascensis	Nebraska sedge	G		M

Scientific name	Common name	LF[2]	I[3]	Habitat[4]
Carex ovatus	Hare sedge	G		M
Carex pachystachya	Thick-headed sedge	G		OF
Carex praegracilis	Clustered field sedge	G		
Carex retrorsa	Retrorse sedge	G		M
Carex stipata	Sawbeak sedge	G		Ditches
Carex utriculata	Bladder sedge	G		
Carex vesicaria	Blister sedge	G		Ditches
Castilleja miniata	Red paintbrush	PF		M
Chamerion angustifolium [=*Epilobium angustifolium*]	Fireweed	PF		F
Chrysanthemum leucanthemum	See *Leucanthemum*			
Circaea alpina	Enchanter's nightshade	PF		F
Cirsium arvense	Canada thistle	PF	I	OF, M
Crataegus douglasii	Black hawthorn	S		TS
Deschampsia cespitosa	Tufted hairgrass	G		M
Dryopteris cristata[5]	Crested woodfern	FE		TS, F
Dryopteris carthusiana	Spinulose woodfern	FE		F
Dryopteris filix-mas	Male fern	FE		F
Echinochloa crusgalli	Barnyard-grass	G	I	OF
Eleocharis palustris	Common spikerush	G		SC
Elymus glaucus	Blue wildrye	G		Ditches
Epilobium angustifolium	(see *Chamerion*)			
Epilobium glandulosum	Common willow-herb	PF		Ditches
Epilobium palustre	Swamp willow-herb	PF		Spdo
Equisetum arvense	Common horsetail	FE		
Equisetum fluviatile	Water horsetail	FE		
Equisetum palustre	Marsh horsetail	FE		
Equisetum sylvaticum	Woodland horsetail	FA		F
Fragaria vesca	Woodland strawberry	PF		
Fragaria virginiana	Virginia strawberry	PF		
Galeopsis tetrahit	Common hemp nettle	PF	I	
Galium trifidum	Small bedstraw	PF		TS
Gaultheria hispidula	Creeping snowberry	S		F
Gaultheria ovatifolia	Western teaberry	S		F
Geum macrophyllum	Big-leaf geum	PF		Ditches
Glyceria borealis	Northern mannagrass	G		
Glyceria grandis	Reed mannagrass	G		Rip
Gnaphalium palustre	Lowland cudweed	AF		
Gratiola neglecta	Common hedge-hyssop	AF		Ditches
Hieracium aurantiacum	Orange hawkweed	PF	I	
Hypericum majus[3]	Canadian St. Johnswort	PF		Ditches
Hypericum perforatum	Common St. Johnswort	AF	I	
Impatiens noli-tangere	Touch-me-not	PF	I	Ditches
Juncus balticus	Baltic rush	G		
Juncus bufonius	Toad rush	G		
Juncus ensifolius	Swordleaf rush	G		Ditches
Juncus filiformis	Thread rush	G		OF

Scientific name	Common name	LF[2]	I[3]	Habitat[4]
Juncus tenuis	Wire rush	G		Ditches
Juncus vaseyi	Vasey rush	G		OF
Lactuca biennis	Tall blue lettuce	PF		F
Leucanthemum vulgare [= *Chrysanthemum leucanthemum*]	Oxeye daisy	PF	I	Ditches
Ligusticum canbyi	Canby ligusticum	PF		Spdo
Linaria dalmatica	Toadflax	PF	I	M
Lotus corniculatus	Birdfoot trefoil	PF	I	Ditches
Luzula campestris	Woodrush	G		M
Lycopodium dendroideum[5]	Tree groundpine	CM		F
Lysichiton americanus	Skunk cabbage	PF		TS,F
Lysimachia thyrsiflora	Tufted loosestrife	PF	I	
Madia glomerata	Tarweed	AF		OF
Medicago sativa	Alfalfa	PF	I	OF
Menyanthes trifoliata	Bogbean	PF		TS
Menziesia ferruginea	Fool huckleberry	S		F
Mimulus guttatus	Yellow monkey-flower	PF		Ditches
Mimulus moschatus	Muskflower	PF		Ditches
Muhlenbergia filiformis	Slender muhly	G		
Myosotis laxa	Sm-flowered myosotis	PF		Ditches
Osmorhiza chilensis	Sweet cicely	PF		F
Packera indecora [=*Senecio indecorus*]	Elegant groundsel	PF		BC
Pedicularis groenlandica	Elephant-head	PF		M
Petasites sagittatus[6]	Arrow-leaf coltsfoot	PF		F, Spdo, Ditches
Phalaris arundinacea	Reed canarygrass	G	I	M
Phleum pratense	Timothy	G	I	OF
Pinus contorta	Lodgepole pine	T		F
Pinus monticola	Western white pine	T		F
Plantago lanceolata	Buckhorn plantain	PF	I	OF
Poa palustris	Fowl bluegrass	G	I	OF
Poa pratensis	Kentucky bluegrass	G	I	OF
Populus tremuloides	Aspen	T		F
Populus trichocarpa	Black cottonwood	T		Ditches
Polygonum amphibium	Water smartweed	PF		Ditches
Polygonum aviculare	Prostrate knotweed	AF		OF
Polygonum hydropiperoides	Swamp smartweed	PF		Ditches
Potentilla gracilis	cinquefoil	PF		M
Potentilla norvegica	Norwegian cinquefoil	AF	I	M,OF
Potentilla palustris	Purple cinquefoil	PF		M
Pteridium aquilinum	Bracken fern	FE		OF
Ranunculus flammula	Creeping buttercup	PF		Ditches
Ranunculus orthorhynchus	Straight-beak buttercup	PF		Ditches
Ranunculus uncinatus	Little buttercup	PF		F
Rhamnus alnifolia	Alder-leaf buckthorn	S		TS
Rhamnus purshiana	Cascara	S		F
Rubus idaeus	American raspberry	S		TS

Scientific name	Common name	LF[2]	I[3]	Habitat[4]
Rubus leucodermis	Blackcap	S		F
Rubus parviflorus	Thimbleberry	S		F
Rubus pedatus	Strawberryleaf	S		F
Rumex acetosella	Sheep sorrel	PF	I	M, OF
Rumex occidentalis	Western dock	PF		Ditches
Salix bebbiana	Bebb willow	S		TS
Salix drummondiana	Drummond willow	S		TS
Salix exigua ssp. *exigua*	Sandbar willow	S		TS
Salix geyeriana	Geyer willow	S		TS
Sambucus racemosa	Black elderberry	S		Ditches
Scirpus microcarpus	Small-fruited bulrush	G		M, Ditches
Scutellaria galericulata	Marsh skullcap	PF		Spdo
Senecio hydrophilus	Alkali-marsh butterweed	PF		M
Solidago canadensis	Canada goldenrod	PF		Spdo, M
Sparganium angustifolium	Narrow-leaf bur-reed	G		Ditches
Spiraea douglasii	Douglas spiraea	S		Spdo
Stachys pilosa	Hairy hedgenettle	PF		M
Stellaria graminea	Grass-like starwort	AF	I	Spdo, Rip
Streptopus amplexifolius	Twisted stalk	PF		F
Tanacetum vulgare	Common tansy	PF	I	M
Thuja plicata	Western redcedar	T		F
Trientalis europaea var. *arctica* [=*T. arctica*]	Northern starflower	PF		M
Tsuga heterophylla	Western hemlock	T		F
Typha latifolia	Broadleaf cattail	PF		Ditches
Urtica dioica	Stinging nettles	PF		Ditches
Vaccinium oxycoccos	Bog cranberry	S		F
Vaccinium sp.	Huckleberry	S		F
Veronica americana	American speedwell	PF		Ditches
Veronica peregrina var. *xalapensis*	Purslane speedwell	AF		
Viola glabella	Heart-leafed violet	PF		F

[1] Nomenclature follows Flora of North America Editorial Committee (2003), or USDA-NRCS (2001) for groups not covered by *Flora of North America*.

[2] Life form (LF): G = graminoid, PF = perennial forb, AF = annual forb, FE = ferns and allies, S = shrub, T = tree, CM = clubmoss.

[3] I = introduced to North America.

[4] M = graminoid meadow; Rip = riparian; TS = tall shrub; Spdo = *Spiraea douglasii* community type; OF = old fields; F = forest.

Appendix D

Idaho Conservation Data Center
database record for Bismark Meadows

SITE BASIC REPORT
BISMARK MEADOWS
#291

COUNTY: Bonner

QUAD NAME:	QUAD CODE:
PRIEST LAKE SW	4811658
PRIEST LAKE NW	4811668

DIRECTIONS: From the Priest Lake Ranger Station off of Highway 57, head north on 57 four miles. Just south of Nordman, ID, FS Rd 238 heads to the west. Take it to the gate which is no more than 1/4 mile down the road. Walk up to the old, abandoned USFS Bismark Work Center. Head south from the buildings into Bismark Meadows along Reeder Creek. A northwestern lobe also extends up Reeder Creek. The northwestern lobe of Bismark Meadows can be accessed by going another 1/4 mile north on Hwy 57, through Nordman and taking FS Rd 2231 to the west. An unnumbered road heads south about two miles down 2231. It runs parallel to Reeder Creek and offers easy access to the meadows. This is an area Bursik formerly referred to as Reeder Creek Meadows, but it is effectively just another part of the larger Bismark Meadows.

Site Description: Bismark Meadows is an extensive open wetland associated with a low-gradient, meandering section of Reeder Creek, a tributary of Priest Lake. More than half of the open meadow area has been drained and is occupied by pasture grasses or a mixture of pasture grasses and native species. The remainder is a mosaic of peat fen communities. The most extensive community within the mosaic is a shrub carr dominated variously by *Spiraea douglasii, Alnus incana, Betula glandulosa, Salix geyeriana*, and *Salix bebbiana*. Interspersed among the shrub carr habitats are sedge-dominated rich fens characterized by *Carex utriculata*, *C. lasiocarpa, C. leptalea, C. aquatilis, C. canescens, C. vesicaria, C. buxbaumii* (a rare species), *C. cusickii, Juncus balticus, Scirpus microcarpus, Calamagrostis canadensis, Potentilla palustris*, and *Phalaris arundinacea*. *Carex lasiocarpa* is particularly extensive. Fen communities are found in areas that had not been drained, or where drainage was not as intensive: on USFS parcels: in the northwestern lobe of the meadow, to the north of the non-channelized stretch of Reeder Creek, and at the eastern edge of the meadow where Reeder Creek crosses the highway. On the west side of Reeder Creek just before it flows into the meadow, are scattered patches of *Sphagnum centrale* and *S. angustifolium* growing beneath shrubs and around the bases of *Picea engelmannii, Tsuga heterophylla, Thuja plicata*, and *Abies lasiocarpa* trees in a paludified forest area. These small habitats support six rare species: *Carex leptalea* (bristle-stalk sedge), *Dryopteris cristata* (crested shield fern), *Gaultheria hispidula* (creeping snowberry), *Vaccinium oxycoccos* (bog cranberry), *Lycopodium dendroideum* (groundpine), and *Trientalis europaea* var. *arctica* (northern starflower).

KEY ENVIRONMENTAL FACTORS: Bismark Meadows occur in the broad valley of the low-gradient, meandering Reeder Creek. The broad flats along the creek, perhaps coupled with beaver activity were apparently ideal for the accumulation of peat deposits. Beaver activity continues to affect hydrology of the meadows.

ELEVATION 2600 - 2720 ft

CLIMATE DESCRIPTION: The climate of northern Idaho is influenced by both maritime and continental weather patterns. Winters are primarily influenced by weather systems from the Pacific Ocean, with considerable cloudiness and precipitation. Mean annual precipitation for the area is about 32 inches (81 cm), most of which occurs between November and March. Snowfall accounts for more than 50 percent of the total precipitation. Summers are influenced by continental air masses and are often very dry.

LAND USE HISTORY: Bismark Meadows was historically heavily grazed and much of the area was grazed or hayed until recently. Even the portion of Bismark Meadows managed by the USFS was grazed by the stock kept at the Work Center. Drainage ditches in the meadows near the site of the former Work Center are evidence of the efforts made by the Forest Service to improve forage by draining part of the meadows. Major attempts were made to drain the privately owned portion of the meadows in the past and much of the attempt has been successful. In 2002, nearly all of the private lands within the meadow (1016 acres) were placed in a conservation easement under the Wetlands Reserve Program (WRP) and agricultural activities other than weed control were terminated. The conservation easement will by managed by the USDA-Natural Resources Conservation Service (NRCS) and cooperators.

BOUNDARY JUSTIFICATION: The site boundaries encompass the continuous, forested and open wetland that comprises Bismark Meadows. The entire Wetlands Reserve Program Conservation Easement is included, as well as parcels managed by the Forest Service. Hwy 57 bounds the site to the east.

PRIMARY.ACRES: 1,277

SITE COMMENT: This site is one of 45 high-priority peatland sites in the Idaho Panhandle, which should be recognized as an important representative peatland, and should be protected in the interests of preserving the range of conditions and species known to occur in these rare habitats in the region (Bursik and Moseley 1996). In the January 17, 1996, meeting between S. Rust and M. Mousseaux this site was identified as a low priority site for Forest Service involvement.

Site Significance:

BIODIVERSITY COMMENTS: Bismark is one of the few valley peatlands that formed along low gradient streams and not around a pond or lake. It contains only pockets of peat, while much of the area occurs on largely mineral substrate. Although it has been heavily and directly impacted by human activities, portions remain in good condition. In spite of the impacts, the area still supports at least twelve rare plant populations: *Carex buxbaumii* (Buxbaum's sedge), *Carex leptalea* (bristle-stalk sedge), *Carex paupercula* (poor sedge), *Dryopteris cristata* (crested shield fern), *Epilobium palustre* (swamp willow-weed), *Gaultheria hispidula* (creeping snowberry), *Hypericum majus* (Canadian St. Johnswort), *Lycopodium dendroidium* (groundpine), *Petasites sagittatus* (arrowleaf colt's foot), *Sanicula marilandica* (black snake-root), *Trientalis europaea* var. *arctica* (northern starflower), and *Vaccinium oxycoccos* (bog cranberry). More, including*, Salix pedicellaris*, *Scheuchzeria palustris* (rannoch-rush), and *Carex chordorrhiza* could potentially be found in the area. *Scheuchzeria palustris* was collected in the vicinity in 1897. The site is very diverse floristically due to the habitat diversity.

OTHER VALUES COMMENTS: Historically, the drained portions of Bismark Meadows provided high yields of forage and hay. It is surely important habitat for big and small game, especially waterfowl, throughout the year due to the abundant water and forage available. For several years in the late 1980's it was the summer haunt of a grizzly sow and her cubs. Six grizzlies were observed in the meadow in spring of 2003. Reeder Creek is one of the big tributaries feeding Priest Lake. Native cutthroat trout were reported as recently as 1991.

PROTECTION URGENCY COMMENT:

MANAGEMENT URGENCY COMMENTS: Management recommendations made in 1991 (cessation of grazing and the removal of hydrology-modifying ditches) began being implemented with the completion of the conservation easement (2002).

Real Estate and Protection:

CONSERVATION INTENT: In a January 17, 1996, meeting between S. Rust and M. Mousseaux this site was identified as a low priority site for Forest Service involvement. However, the sensitive communities and plant populations occurring there should be protected from the effects of off-site logging, road building, and other land-disturbing activities. As part of the Wetlands Reserve Program administered by NRCS, more natural hydrological conditions will gradually be restored, with the intent of enhancing peatland vegetation and reducing weedy wetland species.

DESIGNATION: Private land - protected

PROTECTION COMMENTS: Virtually all of the privately-owned wetland making up Bismark Meadows is now in a conservation easement under the Wetland Reserve Program (WRP) administered by the USDA-NRCS. The management goal is to restore the natural hydrology of the wetland complex.

Stewardship:

LAND USE COMMENTS: Much of Bismark Meadows has been ditched and drained to some degree to allow livestock grazing and haying. In these areas, wet meadow and fen communities have been converted to dominance by Kentucky bluegrass (*Poa pratensis*), reed canarygrass (*Phalaris arundinacea*), and other pasture grasses.

EXOTIC SPECIES COMMENTS: Bursik did not note any aggressive exotic species in USFS parcels. In 2003 surveys of the conservation easement, extensive areas of aggressive exotics were observed including Kentucky bluegrass (*Poa pratensis*), reed canarygrass (*Phalaris arundinacea*), and Canada thistle (*Cirsium arvense*). One small colony of *Linaria dalmatica* (Dalmatian toadflax) was observed near hwy. 57. Orange hawkweed (*Hieracium aurantiacum*) was observed in two locations. *Potentilla norvegica* (Norwegian cinquefoil) was common in the western end of the meadow, but did not seem to be achieving dominance anywhere.

OFF SITE: Logging, road construction and maintenance, and grazing in uplands surrounding Bismark Meadows may threaten the plant communities and rare plant populations with enhanced eutrophication.

INFORMATION NEEDS: Water chemistry monitoring should be initiated at this site. Terrestrial invertebrate populations should also be surveyed in the future. We also recommend the establishment of permanent vegetation monitoring plots and photopoints in major plant communities to document changes that take place as a more natural hydrological regime is achieved.

MANAGED AREA RELATIONS: Approximately one-quarter of Bismark Meadows is found in several scattered USFS tracts managed by the Priest Lake RD. The remainder of the site is owned by private individuals who, previous to 2002, managed the site intensively for cattle and hay production. Since 2002 most of the privately owned land is in the Wetland Reserve Program.

Element Occurrence Information:

COMMUNITY NAME:	EO NO.:	COMMON NAME:
Betula glandulosa/Carex utriculata		Bog birch/bladder sedge
Spiraea douglasii		Pink spiraea
Alnus incana/Carex utriculata		Mountain alder/bladder sedge
Carex utriculata		Bladder sedge
Carex buxbaumii		Buxbaum sedge
Carex lasiocarpa		Slender sedge
Valley peatland pond		Valley peatland pond
Paludified forest		Paludified forest
Carex cusickii		Cusick's sedge
Salix geyeriana		Geyer’s willow
Thuja plicata-Tsuga heterophylla/Lysichiton		Western redcedar/western hemlock/skunkcabbage

SPECIES NAME:		
Strix varia		Barred owl
*Sanicula marilandica**	011	Black snake-root
Petasites sagittatus	018, 020, 031	Arrowleaf coltsfoot
Hypericum majus	015	Canadian St. Johnswort
Gaultheria hispidula	004	Creeping snowberry
Vaccinium oxycoccos	009	Bog cranberry
Epilobium palustre	011	Swamp willow-weed
Trientalis europaea arctica	013	Northern starflower
Carex buxbaumii	018	Buxbaum sedge
Carex leptalea	008	Bristle-stalked sedge
Carex paupercula	007	Poor sedge
*Scheuchzeria palustris**	002	Pod grass
Dryopteris cristata	006	Crested shield-fern
Lycopodium dendroideum	004	Groundpine
*Botrychium lanceolatum**	028	Lanceleaf moonwort
*Cetraria sepincola**	002	Lichen

* Known locations are outside the current site boundaries.

References:

SOURCECODE:	CITATION:
A95BUR01IDUS	Bursik, R. J., and D. M. Henderson. 1995. Valley peatland flora of Idaho. Madrono 42(3): 366-395.
U95BUR01IDUS	Bursik, R. J., and R. K. Moseley. 1995. Ecosystem conservation strategy for Idaho Panhandle peatlands. Cooperative project between Idaho Panhandle National Forests and Idaho Department of Fish and Game, Conservation Data Center, Boise. 28 pp. plus appendix.
U92BUR01IDUS	Bursik, R. J. 1992. Field investigations of sensitive plant taxa occurring on the Priest Lake Ranger District, Kanisku National Forest, Idaho Panhandle National Forests. Idaho Department of Fish and Game, Conservation Data Center, Boise. 141 pp. plus appendices.
U90BUR01IDUS	Bursik, R. 1990. Floristic and phytogeographic analysis of northwestern Rocky Mountain peatlands, U.S.A. Unpublished thesis, University of Idaho, Moscow. 37 pp.
U87CAI05IDUS	Caicco, S. L. 1987. Field investigations of selected sensitive plant species on the Idaho Panhandle National Forest. Conservation Data Center, Idaho Department of Fish and Game, Boise. 44 pp. plus appendices.
U97JAN02IDUS	Jankovsky-Jones, M. 1997. Conservation strategy for Northern Idaho wetlands. Conservation Data Center, Idaho Department of Fish and Game. 35 pp. plus appendices.
B98CHA01IDUS	Chadde, S. W., et al. 1998. Peatlands on national forests of the northern Rocky Mountains: ecology and conservation. USDA Forest Service General Technical Report RMRS-GTR-11. Rocky Mountain Research Station. Ogden, UT. 75 pp.