

**CONSERVATION STRATEGY
FOR NORTHERN IDAHO WETLANDS**

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SUMMARY

The Idaho Conservation Data Center received a wetland protection grant from the Environmental Protection Agency under the authority of Section 104 (b)(3) of the Clean Water Act to enhance existing wetland information systems. The information summarized here can be applied to state biodiversity, conservation, and water quality enhancement projects on a watershed basis. The initial project area encompassed the Henrys Fork Basin including the Teton River drainage. Currently, work is continuing in the Big Wood River basin, southeastern Idaho watersheds, east-central basins, and Coeur d'Alene watershed. This document is a summary of information compiled for the Idaho Panhandle.

We used the United States Fish and Wildlife Service National Wetlands Inventory (NWI) to gain a broad perspective on the areal extent and types of wetlands in the survey area. Land ownership and management layers were overlaid on the NWI to determine ownership and the protected status of wetlands. Plant communities occurring in the survey area were placed into the hierarchical NWI classification and provide information relative to on-the-ground resource management.

Assessment of the quality and condition of plant communities and the occurrence of rare plant and animal species allowed us to categorize fifty-nine wetland sites based on conservation intent. Thirteen wetlands occur in a relatively natural condition and full protection is the priority. The biological significance of the surveyed wetland sites, abstracts for rare plant communities, and summaries of animal species are provided to guide management activities. Land managers can apply the process presented here to categorize wetlands which were not surveyed.

We identify conservation strategies for sites surveyed and for plant communities that are unprotected or under-protected. Less than 4% of the wetlands in the survey area have protection beyond regulatory provisions of the Clean Water Act. Most of the protected wetlands are in the emergent vegetation category. Deciduous forested wetlands, willow and alder dominated shrub wetlands, and peatlands are currently under-protected and should be of high priority for conservation activities.

Only portions of the information from the NWI maps and database records are summarized in this conservation strategy. All information contained in the databases is available for public use except a limited amount of threatened and endangered species information considered sensitive by the U.S. Fish and Wildlife Service. Contacts for accessing digital and analog data are included at the end of this manuscript.

ACKNOWLEDGMENTS

Many individuals within federal, state, and private agencies provided assistance with this project. Pat Cole of the Idaho Department of Fish and Game (IDFG) provided information on the wetland

resources of the survey area and helped with logistics including housing and access. Stacey Stovall of IDFG provided information on potential mitigation projects in the survey area, landownership information, and field tours. Mark Elsbree and Janice Hill of the North Idaho office of The Nature Conservancy helped prioritize sampling efforts. Mike Welling of Idaho Forest Industries provided access and field tours of corporate properties. The IDFG staff at the Sturgeon House in Bonners Ferry provided access to phones, faxes, and warm showers. Gretchen Kruse of IDFG provided boat access to islands on the Kootenai River.

The preparation of the manuscript and appendices would not have been possible without the assistance of headquarters staff at IDFG. Linda Williams and Andrew Pitner of the Conservation Data Center (CDC) are responsible for most of the data entry from which the appendices were generated. George Stephens assisted with database management, report generation, and exporting files for use in GIS. Steve Rust helped develop standards for the site and managed area databases and provided input on community database management. Rob Bursik's and Bob Moseley's previous work in wetlands in northern Idaho provided much of the information included in this report and a foundation upon which to add. Bob also provided technical assistance in the field and with administrative aspects of the project. Bart Butterfield and Lawrence Hartpence are responsible for the digital map products and data associated with this project.

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INTRODUCTION

The broad definition of wetlands describes land areas where water regimes determine the soil characteristics and distribution of plant and animal species. This definition includes not only jurisdictional wetlands, supporting wetland hydrology, hydric soils, and hydrophytic vegetation (Environmental Laboratory 1987), but a broader range of ecologically significant areas such as riparian corridors and vernal pools (World Wildlife Fund 1992, Cowardin et al. 1979). In spite of the significance of wetlands, these highly productive land areas have often been overlooked with studies focusing on aquatic or terrestrial ecosystems. However, in the past two decades it has become widely recognized that wetland functions, including water quality protection, storm water control, ground water protection, fish and wildlife habitat, and recreation, are disproportionate to their small areal extent.

Upon European settlement wetlands were regarded as areas with little economic value. Human settlements typically began and grew out from river channels and government programs were enacted which encouraged the development of wetlands. In Idaho an estimated 386,000 acres of wetland habitat (56%) were lost from 1780 to 1980 (Dahl 1990). Many remaining wetlands have been degraded by actions, such as hydrologic alteration and impacts to vegetation and soils, reducing wetland functions.

The recognition of the value of wetlands in the landscape has resulted in regulations, incentive programs, research, and protection of wetland habitat. Controversy over wetland definitions, the governments' authority, and the appropriateness of restrictions are ongoing. Wetland legislation during the Bush administration built on previous policy, such as the 1985 Food Security Act and Emergency Wetlands Resources Act of 1985, to achieve "no overall net loss of wetlands". Currently, the Clinton administration's review of the reauthorization of the Clean Water Act places an emphasis on the categorization of wetlands. This would serve to protect functionally and biologically significant wetlands and relax regulations for wetlands that are less significant.

The purpose of this plan is to enhance our ability to identify and classify wetlands to set priorities for wetland conservation. Wetlands related data are frequently retained by agencies in an analog format. Retrieval and application are cumbersome and wetland conservation opportunities have been lost due to the fragmented nature of specific protection, management, and restoration information. The United States Fish and Wildlife Service NWI provides a broad scale view of the types and areal extent of wetlands. Plant communities nest into the hierarchical NWI classification at the dominance level and provide fine scale information relative to on-the-ground management. The biological significance of specific wetland sites may be assessed using plant community information and rare plant and animal occurrence data.

It is our goal to make wetlands related information available to agencies and organizations involved in planning activities and the protection of wetlands and watersheds. The broad-scale data may be used to set basin-wide or county-wide goals for wetlands protection. Fine scale information on specific wetland sites can be used to identify proposed conservation sites, sites

with opportunities for restoration, and to comment on potential projects or permit activities within sites. The framework presented here, describing wetlands based on the plant community, can be applied by land managers to sites that were not surveyed as part of this project. Rare plant and animal data can be requested from the CDC and the site significance may be assessed.

Description, management, and status of rare plant communities and animal species summaries are included to guide management activities. Additional data including Geographic Information System (GIS) data layers, containing NWI maps and species distributions, and analog database records are available at the CDC. The methods for accessing this information are included at the end of this document (Table 8).

SURVEY AREA

The survey area is located in northern Idaho and contains most of Boundary and Bonner counties as well as a small portion of Kootenai county. The survey area is bounded on three sides by the Idaho state line and to the south by the divide separating the Pend Oreille from the Spokane River and Coeur d'Alene drainages.

The survey area is within the Flathead Valley (M333B) and Okanogan Highlands ecoregional sections (McNab and Avers 1994). Upland vegetation is dominated by douglas-fir at the lowest elevations, followed by grand fir, western hemlock, western redcedar and subalpine fir on an elevation gradient. Douglas-fir and grand fir occur on xeric soils and western hemlock and western redcedar are prominent on more mesic soils.

Precambrian sedimentary formations and granitics of the Kaniksu batholith are the major rock types in northern Idaho. The Purcell trench separates the sedimentary Cabinet and Purcell Mountains to the east, the metamorphic/granitic Selkirk Mountains to the west and the Coeur d'Alene Mountains to the south. Glaciers that covered most of British Columbia in the late-Pleistocene extended south into northern Idaho and covered all but the highest mountains (Alt and Hyndman 1989). Many wetlands occur in glacially influenced landforms, such as kettle holes, glacial basins, cirques and outwash channels (Chadde et al.1996). Major rivers in the survey area include the Kootenai, Pend Oreille, and Priest river systems. Large river systems flow through glacial troughs. Many perennial streams are entrenched in narrow valleys and flow through glacial outwash and debris material.

Climate is cool temperate with a maritime influence. Air masses from the Pacific Ocean bring prolonged gentle rains, deep snow accumulations at upper elevations, cloudiness, and frequent fog. Outbreaks of arctic air occur frequently in the winter. Sandpoint (2,100 feet in elevation) averages 32 inches of precipitation annually with most of the precipitation occurring from November to March as snow, with rain on snow events common. Mean temperatures range from 18° F in December to 65° F in July. Higher elevations in the survey area have much higher accumulations of precipitation and lower mean temperatures. (Ross and Savage 1967).

STATUS OF WETLANDS

NATIONAL WETLANDS INVENTORY

The United States Fish and Wildlife Service (USFWS) has conducted inventories of the extent and types of our nation's wetlands and deepwater habitats. Wetland maps are being developed by the National Wetlands Inventory (NWI) which use a hierarchical classification scheme for map units. Systems and subsystems are at the most general level of the hierarchy and progress to class and subclass with optional modifiers. Systems and subsystems reflect hydrologic conditions. Classes describe the dominant life form or substrate. Modifiers are used to describe water regime, water chemistry, soils, and human or natural activities such as impoundments or beaver use (Cowardin et al. 1979). The five major systems characterizing wetland and deepwater habitats are summarized in Table 1. Palustrine systems describe wetland habitats only, the remaining systems include both wetland and deepwater habitat. The distribution of systems in the survey area is illustrated in Figure 1.

Table 1. Definition of wetland and deepwater habitat systems (Cowardin et al. 1979).

<u>System</u>	<u>Definition</u>
Marine	Open ocean and its associated high energy coastline.
Estuarine	Deepwater tidal habitats and adjacent tidal wetlands, generally enclosed by land with periodic access to the open ocean.
Riverine	Wetland and deepwater habitats contained within a channel.
Lacustrine	Lakes and ponds which exceed 2 meters in depth.
Palustrine	All nontidal wetlands dominated by trees, shrubs, persistent emergents and emergent mosses and lichens.

FIGURE 1 MAP (MAP NOT INCLUDED IN CDC HOMEPAGE VERSION)

WETLAND ACREAGE AND TYPES

The NWI maps wetlands at a scale of 1:24,000 as lines, points and polygons. The NWI data was digitized and entered into a Geographic Information System for most northern Idaho quadrangle maps. Total wetland acres were summarized for NWI wetland polygons within the survey area and for counties. Wetland acres were also estimated manually for maps which were not available in digital format. Wetlands, including deepwater habitat, represent approximately 11% of the 1.4 million acres of land area in northern Idaho (Figure 2(A)). Lacustrine systems, which include mostly deepwater habitat, make up over $\frac{2}{3}$ of this percentage (Figure 2(B)). The percentage of upland versus wetland habitat was also compared excluding deepwater habitat. Wetlands (excluding deepwater habitat) represent approximately 4% of the total land area in northern Idaho (Figure 3(A)). The dominant wetland types in the survey area include Palustrine emergent, Lacustrine littoral, Palustrine scrub-shrub, and Palustrine forested (Figure 3(B)). Wetland (including deepwater) habitat acreage is summarized for Bonner and Boundary counties in Figures 4 and 5. Appendix E summarizes the acres and frequency of occurrence of wetland and deepwater habitat by subclass for the survey area and counties.

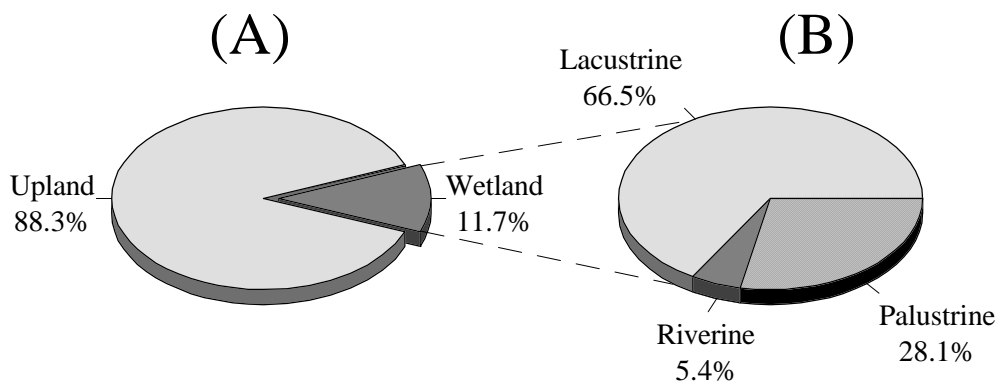


Figure 2. (A) Comparison of upland and wetland (including deepwater) habitat in northern Idaho. (B) Dominant wetland (including deepwater) systems in northern Idaho.

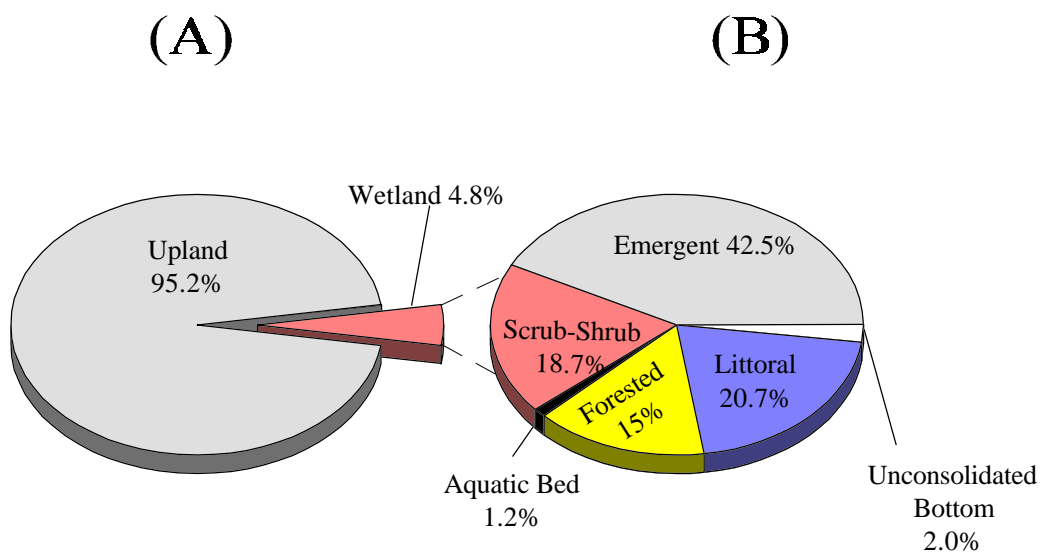


Figure 3. (A) Comparison of upland and wetland (excluding deepwater) habitat. (B) Dominant wetland (excluding deepwater) systems, subsystems, and classes in northern Idaho.

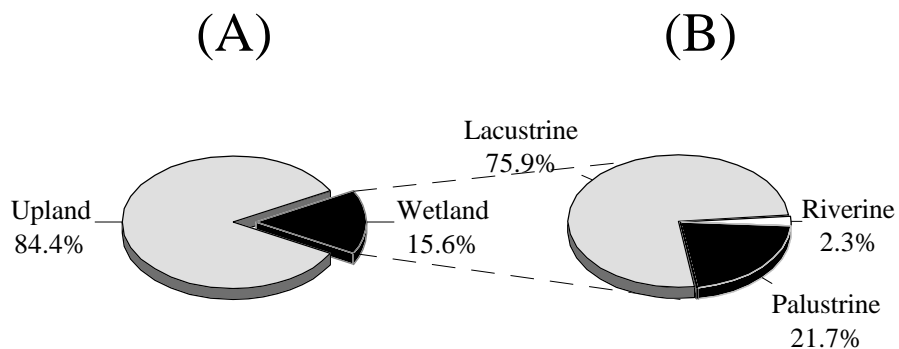


Figure 4. (A) Comparison of upland and wetland (including deepwater) habitat in Bonner County, Idaho. (B) Dominant wetland (including deepwater) systems in Bonner County, Idaho.

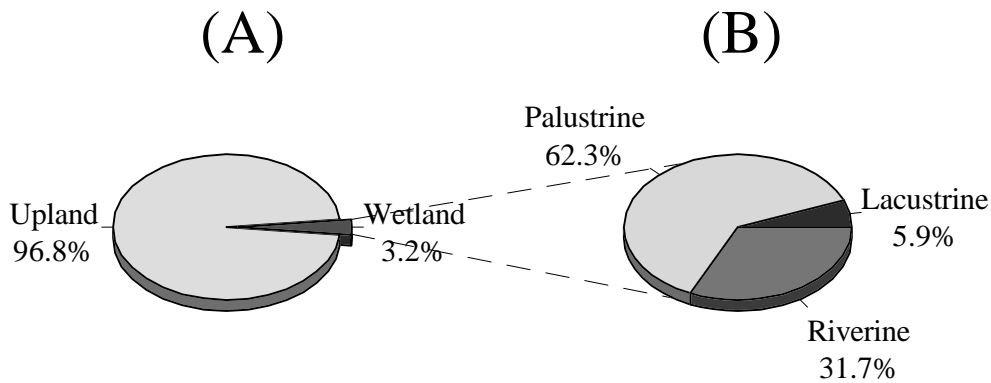


Figure 5. (A) Comparison of upland and wetland (including deepwater) habitat in Boundary County, Idaho. (B) Dominant wetland (including deepwater) systems in Boundary County, Idaho.

WETLAND OWNERSHIP

Land ownership was overlaid on the NWI to summarize the ownership of wetland (including deepwater habitat) acres in the survey area (Figure 6). Nearly ¼ of the wetlands in the survey area are in private ownership. Open water makes up 117,210 acres or 71% of the land area. The United States Forest Service is the largest public land manager of wetland habitats with lesser amounts being managed by the State of Idaho and the United States Fish and Wildlife Service. The Bureau of Land Management administrates less than 1% or 57 acres of wetlands in northern Idaho.

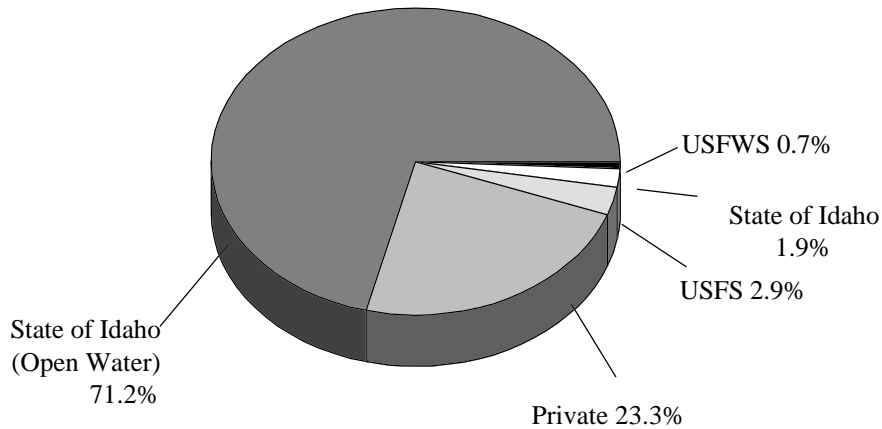


Figure 6. Land ownership of wetlands (including deepwater habitat) in northern Idaho.

WETLAND PROTECTION STATUS

The level of protection for wetlands in the survey area was determined by overlaying a management layer on the NWI. The management layer included land areas administered to maintain natural resource values such as Wildlife Management Areas, Research Natural Areas, and Wildlife Refuges. Approximately 5,362 acres of wetland and deepwater habitat are currently protected, representing less than 3.3% of the wetland and deepwater habitat in the survey area. This equates to approximately 0.2% of the total land base in the survey area. More than 1/3 of the wetlands which are protected are in the Lacustrine limnetic system. The acres of wetland and deepwater habitats protected are summarized in Table 2.

Table 2. Acres of wetland and deepwater habitat and protected status.

SYSTEM	Acres protected	Total acres	% of type protected
Subsystem			
PALUSTRINE			
Emergent	1,598	22,443	7.1%
Scrub-shrub	441	9,920	4.4%
Forested	471	8,011	5.8%

Table 2. Continued.

Aquatic bed	40	643	6.2%
Uncosolidated bottom	49	1099	4.4%
Uncosolidated shore	<u>0</u>	<u>11</u>	<u>0.0%</u>
TOTAL PALUSTRINE	2599	42,127	6.2%
LACUSTRINE			
Limnetic	2010	102,655	1.9%
Littoral	<u>414</u>	<u>11,430</u>	<u>3.6%</u>
TOTAL LACUSTRINE	2424	114,085	2.1%
RIVERINE			
Upper perennial	<u>339</u>	<u>8367</u>	<u>4.1%</u>
TOTAL RIVERINE	339	8367	4.1%
TOTAL ALL TYPES	5,362	164,579	3.2%

WETLAND CONDITION

The World Wildlife Fund (1992) developed a general framework for assessing wetland losses and gains that can be used to address the condition of and threats to wetlands. The basis for the framework are wetland functions. Wetland losses occur when functions are eliminated and an area no longer meets the definition of a wetland. Wetlands may also undergo functional shifts including impairments, type changes, or enhancements.

WETLAND LOSSES

Wetland losses may be permanent or reversible. The distinction is made to identify those areas where restoration may be possible albeit costly. In northern Idaho agriculture and urbanization account for wetland losses. Historically drainage, land clearing, and conversion to cropland accounted for most wetland loss. Prior to settlement the Kootenai River spread across the wide valley bottom between the Purcell and Selkirk Mountains and supported forested and shrub wetlands, ponds, wet meadows, and marshes. In the 1920's dikes were created to contain spring floods. Cottonwood forests were removed and wetlands were filled for agriculture development. Cottonwoods forests and shrublands along the Kootenai River are currently restricted to streamside bands within the levees and to islands. Loss to road construction and home building has surpassed agricultural loss in recent years. This trend is likely to continue as population increases and economies switch from agricultural based to service based (Brown 1995) .

The National Resource Inventory estimates that Kootenai-Pend Oreille-Spokane sub-basin was stable in terms of wetland losses and gains on private land from 1982 to 1992 (Soil Conservation Service 1992). The estimates represent net gain versus net loss and do not evaluate the quality

of the wetland habitat. Nationally, losses of forested and scrub-shrub habitats have been offset by gains in open water and emergent habitat (Dahl 1990).

FUNCTIONAL SHIFTS

Most wetlands in the survey area are accessible and have been impacted by human influences resulting in shifts of wetland functions. **Impairments** are functional shifts that reduce wetland functions and include degradation and fragmentation. Degradation, the loss of one or more wetland functions, is indicated by shifts in species composition and may result in lowered water quality due to sediment input or increased water temperatures. Fragmentation occurs when functions are lost due to barriers restricting water or gene flow. **Type changes** occur when a wetland is converted from one type to another (e.g., scrub-shrub to emergent). Functional shifts improving wetland functions are considered **enhancements**.

Impairments

Shifts in species composition occur when native species such as shrubs and trees are removed, exotics invade or are introduced, or hydrology is altered. Lowered water quality often results due to loss of thermal cover along streams, loss of filtering functions, and decreased bank stability. The 1992 National Resource Inventory indicates that 30% and 29% of nonfederal wetlands in the Kootenai-Pend Oreille-Spokane sub-basin are used for cropland and pastureland respectively (Soil Conservation Service 1992). Pasture development has included placement of tile drains, ditching, reseeding or interseeding with pasture grasses, and removal of native tree and shrub species. The Soil Conservation Service estimated that less than a thousand acres of wetlands are used as rangelands. Grazing in northern Idaho typically occurs in meadows, hay pastures, or riparian bottomlands. Use of wetlands for rangeland affects species composition through the suppression of native woody species, removal and trampling of herbaceous species, introduction of exotic species, and compaction of soils. Extreme compaction of soils may create altered hydrology where water flows in rills rather than over the surface.

Human activities, including livestock grazing and ground disturbance, may introduce exotic plant species, create suitable conditions for the increase of less desirable native species, eliminate woody tree and shrub cover, and compact wetland soils. The noxious weeds *Euphorbia esula* (leafy spurge), *Cirsium arvense* (Canada thistle), *Cirsium vulgare* (bull thistle) *Centaurea* spp. (knapweeds), and *Linaria dalmatica* (dalmation toad-flax) may become established in more xeric wetlands and on the margins of mesic wetland sites. *Lythrum salicaria* (purple loosestrife) has been reported from Bonner and Kootenai Counties, but no populations were observed during 1996 field work.

Phalaris arundinacea (reed canary grass) is a grass species that has been planted for forage that invades wetlands. This species is well established in the survey area and creates dense monocultures in areas subject to water level manipulation. Attempts to control the distribution and spread of this species have been largely ineffective (Apfelbaum and Sams 1987). The USFWS is investigating the establishment of emergent vegetation with varying drawdown

regimes on moist soil management areas at the Kootenai National Wildlife Refuge. The goal is to discourage establishment of *Phalaris arundinacea*. The results of this study have application to wetlands throughout northern Idaho. While not as aggressive as *Phalaris arundinacea*, *Juncus effusus* (common rush) is another species occurring over large areas and establishing in areas subject to past grazing or water manipulation. It is unclear whether *Juncus effusus* is a native or introduced species. Less palatable native species, such as *Juncus balticus* (Baltic rush), *Carex nebraskensis* (Nebraska sedge), and *Rosa woodsii* (Wood's rose), may tend to increase in wetlands with grazing.

A number exotic graminoid species, including *Poa pratensis* (Kentucky bluegrass), *Dactylis glomerata* (orchardgrass), and *Poa palustris* (fowl bluegrass), are the dominant understory species in many riparian wetlands and lack the soil stabilizing characteristics of native species. These species have been planted as pasture grasses and are readily spread by livestock and water. Wetland vegetation along with soils on banks and islands of regulated rivers and lakes may be lost due to wind and wave action and daily and seasonal water fluctuations. Erosion is accelerated when banks are compacted or vegetation consists of shallow rooted graminoids such as Kentucky bluegrass.

Offsite activities which introduce nutrients or alter hydrology can impair wetlands. Sediment inputs from road building, logging, poor upstream channel conditions, and agriculture can change species composition. Changes can be rapid in peatlands resulting in the loss of numerous species over a short period of time. Research at Hager Lake Fen and Huff Lake Fen on the Priest River Ranger District documented that regulation of water levels, upland logging, and forest fires can result in water chemistry changes and extirpation of plant species (Bursik and Moseley 1992a and 1992b). Maintenance of roads adjacent to water courses can introduce sediments to streamside wetlands. Wetland plant communities and rare plant populations are threatened by accumulation of sand and other sediments from road maintenance along Fleming Creek.

Type changes

Type changes occur when a wetland is converted from one vegetation type to another and results in a shift in wetland functions. This is treated by the World Wildlife Fund (1992) as a gain when the change is to a wetter type and an impairment when the change is to a drier type. Water development projects account for the majority of type changes in the survey area. Most major rivers in northern Idaho are impacted by water development for hydroelectricity and recreation. Raised water levels replace wetlands with open water habitat. The delta systems of the Pack River and Pend Oreille River historically supported extensive emergent, scrub-shrub, and forested wetland habitat. During the summer months the deltas are primarily open water with islands. With winter drawdown barren mudflats, with limited habitat value, are exposed at these and other areas in the survey area (BPA 1996).

Beaver are a keystone species in wetlands with their activity resulting in natural type changes. The fur trade in the late 1800's nearly drove the species to extinction. In more recent times beaver have been suppressed for development of agricultural land. Complexes which once

extended across broad valley bottoms have been removed, channels straightened, and drainage ditches developed to create lands suitable for grazing and haying. Wetlands adjacent to a number of high quality peatlands identified in the study area could be enhanced by plugging periphery ditches and allowing beaver to return. Maintaining beaver populations is a critical element in sustaining natural wetland complexes.

Enhancements

Enhancements increase or improve wetland functions. In the survey area enhancement projects have focussed on wetland reclamation, fencing, pond development, and weed control. The Kootenai National Wildlife Refuge is on the former floodplain of the Kootenai River and restoration has included creation of ponds and emergent wetland habitat. The IDFG, USFWS, and Natural Resources Conservation Service (NRCS) have been active in wetland enhancement on private lands in northern Idaho by, fencing, revegetation, and development of management plans. The Priest Lake Ranger District has done extensive surveys of noxious weeds and is implementing a weed control plan. The plan considers the impacts weed control may have on high quality wetlands, rare plant populations, water quality, and fisheries (USDA 1996).

WETLAND PLANT COMMUNITIES

The USFWS wetland classification system provides uniform terminology for defining the resource and has a variety of applications at higher levels for administrative, research, educational, and scientific purposes (Cowardin et al. 1979). The classification broadly organizes ecological units based on homogeneous natural attributes. The units, however, often include many dissimilar community types with wide-ranging biological significance and unique management implications. The plant community is a vegetation unit that nests into the USFWS classification at the dominance level of the classification hierarchy. Plant communities are used to guide management, as a coarse filter for preservation of biodiversity, and to assess biological significance (Bougeron and Engelking 1994, Hansen et al. 1995, Kovalchik 1993, Padgett et al. 1989 and Youngblood et al. 1985).

The plant community is a vegetation unit representing repeating assemblages of plant species that occur in response to complex environmental factors. The plant community is used as an indicator of difficult to measure or poorly understood environmental or site attributes such as hydrologic functions. This information can be used to make predictions about the effects of management decisions and expected trends on similar units of land. Additionally, plant community descriptions, stand tables, and on-the-ground reference sites provide a baseline for replicating plant communities in restoration efforts. Plant community descriptions and management information are summarized in many classifications and have been compiled for high ranking plant communities occurring in northern Idaho in Appendix B.

Our nation's biological resources are so great that management and protection of individual species is often impractical or ineffective. Community level conservation promotes protection of

a more thorough range of biotic elements including rare, little known, or cryptic species whose priority for conservation has not been documented. The plant community is considered a coarse filter where species and biotic processes are represented. Species falling through the coarse or community filter are often the rarest species where fine filter protection of viable occurrences is still necessary (Grossman et al. 1994).

Plant communities are ranked similarly to the system developed by The Nature Conservancy to rank plant and animal species. The ranking system is intended to allow managers to identify elements at risk and determine management and conservation priorities. Community ranks are based primarily on the total number of occurrences and area occupied by the community range wide. Secondly, trends in condition, threats, and fragility contribute to ranks when the information is known. The ranks are on a scale from 1 to 5 with a G1 indicating that the community is critically imperiled range wide and a G5 indicating no risk of extinction. Guidelines used to assign community ranks are included in Appendix C.

Review of existing classifications, gray literature, and previous survey work by the CDC were used to develop a preliminary list of wetland plant communities in Idaho. Previous survey work (Bursik and Moseley 1995, Cooper et al. 1991) was summarized along with data collected from field surveys to generate a list of plant communities occurring specifically in northern Idaho (Table 3). A key to the plant communities occurring in the survey area is included in Appendix A. The plant communities are within the Cowardin's Lacustrine littoral system and Palustrine system including the forested, scrub-shrub, emergent (herbaceous), aquatic bed, and moss-lichen classes reviewed below.

FORESTED VEGETATION

Broad-leaved deciduous forests occur on islands of major rivers such as the Kootenai, Clark Fork and Priest River. The forests are most commonly dominated by the cottonwood, *Populus trichocarpa* (black cottonwood) with lesser amounts of *P. deltoides* (plains cottonwood), and *P. acuminata* (Rydberg's cottonwood). Cottonwoods communities in the survey area are treated as *Populus trichocarpa* for describing community types. Stands of *P. tremuloides* (quaking aspen) are also present and associated with high gradient streams or seeps.

Needle-leaved riparian forests occur on tributaries to major rivers in the survey area and on the perimeter of emergent wetlands. *Thuja plicata* (western redcedar), *Abies lasiocarpa* (subalpine fir), *Picea engelmannii* (Engelman spruce) and less commonly *A. grandis* (grand fir) dominate needle-leaved forests. *Tsuga heterophylla* (western hemlock) may be codominant with *Thuja plicata* on wet bottomlands. The accumulation of peat in lake basins raises water levels and floods forested uplands. This process is termed paludification and results in colonization of the forest understory by *Sphagnum* and other peatland species. Paludified forests in northern Idaho have a mix of conifers including *Pinus contorta* (lodgepole pine), *Pinus monticola* (western white pine), in addition to the previously mentioned conifers. On high gradient streams in the survey area,

such as the Moyie River, riparian vegetation is frequently absent or poorly developed due to minimal floodplain development.

SCRUB-SHRUB VEGETATION

Shrublands dominated by willows and other shrubs occur in nearly impenetrable patches along low gradient channels, as stringers or on narrow floodplains along high gradient streams, as patches within riparian forests, and on margins of meadows and peatlands. At mid- to upper-elevations willow dominated shrublands associated with low gradient meandering channels are dominated by *Salix drummondiana* (Drummond's willow) with lesser amounts or codominance by *Salix geyeriana* (Geyer's willow), *S. sitchensis* (Sitka willow), and *S. bebbiana* var. *bebbiana* (Bebb's willow). Willows are frequently absent or a minor component of shrublands associated with high gradient streams. *Crataegus douglasii* (Douglas hawthorne), *Alnus incana* (mountain alder), *Alnus rubra* (red alder), *Cornus sericea* (red-osier dogwood) and *Rhamnus alnifolia* (alder buckthorn) occur as community dominants along high gradient streams. Patches of *Cornus sericea* (red-osier dogwood), *Salix bebbiana* var. *bebbiana*, are common in association with cottonwood forests on larger stream systems. Channel bars are frequently vegetated with *Salix exigua* (coyote willow).

Low willow vegetation was not encountered during surveys and can be considered infrequent in northern Idaho. Low shrublands dominated by *Betula glandulosa* (bog birch) and *Betula pumila* (dwarf birch), occur in the survey area in association with springs or seeps as rich to intermediate fens. Margins of many emergent wetlands commonly have a dense monoculture of *Spiraea douglasii* (hardhack) around the perimeter. *Alnus incana* or *Alnus rubra* is also frequently present on meadow margins.

EMERGENT (HERBACEOUS) VEGETATION

Herbaceous wetlands in the survey area usually occur as a complex of monocultures dominated by *Carex* spp., *Scirpus* spp, *Eleocharis palustris* (creeping spikerush), and *Typha latifolia* (common cattail). *Polygonum amphibium* (water ladysthumb) may occur on lake or pond shores. Grasslands and seasonally flooded wetlands are mostly dominated by *Phalaris arundinacea* with occasional *Deschampsia cespitosa* (Tufted hairgrass), *Calamagrostis canadensis* (Bluejoint reedgrass), or *Carex* spp. remnants. The grasslands are accessible and have largely been impacted by grazing, reseeding with pasture grasses, and hydrologic manipulation. Thick layers of sedge and moss peat accumulate where water tables are at or near the surface for most of the year.

AQUATIC BED AND LACUSTRINE LITTORAL VEGETATION

Palustrine and Lacustrine aquatic bed vegetation occurs in littoral (< 2 meters) and limnetic (> 2 meters) zones of ponds and lakes in the survey area. Vegetation types correspond to water depth to form somewhat concentric rings. *Potamogeton natans* (floating-leaved pondweed),

Myriophyllum spp. (water-milfoil), *Utricularia* spp. (bladderwort), and other *Potamogeton* spp. occur alone or in combination in shallow littoral zones. *Nuphar polysepalum* (yellow pond lily) and *Brasenia schreberi* (water-shield) are frequently present as monocultures in deep littoral zones. *Potamogeton amplifolius* (large-leaved pondweed), *Potamogeton praelongus* (white-stalked pondweed), and *Potamogeton richardsonii* (Richardson's pondweed) are common in limnetic zones. Our current classification of aquatic vegetation types is incomplete. Aquatic plant species lists are available for most of the ponds and lakes in northern Idaho, however cover and environmental data is insufficient to develop an aquatic classification.

MOSS-LICHEN VEGETATION

Palustrine moss-lichen wetlands are defined as areas where mosses or lichens cover surface substrates and vascular plants make up less than 30% of the areal cover (Cowardin et al. 1979). Moss species are frequently present in the vegetation types discussed previously, but vascular species are prominent. Moss-lichen wetlands, as defined by Cowardin et al. (1979), are present in northern Idaho and include the *Sphagnum*-rich Poor Fen and Ombrotrophic Bog community types. Poor fens are characterized by continuous cover of *Sphagnum* and scattered vascular species. Poor fens may cover several acres. Ombrotrophic bogs are an uncommon wetland feature which occur in isolated microsites (10 to 100 m²). Ombrotrophic means "from the sky" and these bogs have raised topography where peat has accumulated to create a surface that may be isolated from influence by ground water and reliant upon precipitation. In northern Idaho, Moss-Lichen wetlands are mapped by NWI with emergent wetland map units due to the resolution at which the maps were developed.

PEATLANDS

The forested, scrub-shrub, and emergent vegetation types discussed previously may occur, and moss-lichen vegetation types always occur as peatlands where accumulation of organic matter exceeds decomposition. Peatlands in the survey area can be further divided into paludified forests, ombrotrophic bogs, poor fens, intermediate fens, and rich fens (Bursik and Moseley 1995). The first three types of peatlands have been discussed in previous sections and discussion here will focus on intermediate and rich fens. Intermediate fens and rich fens are *Sphagnum*-poor peatlands with vascular plants contributing significant cover. Intermediate fens have equal dominance by bryophyte and vascular species. *Carex cusickii* (Cusick's sedge), *Carex lasiocarpa* (slender sedge), and *Dulichium arundinaceum* (dulichium) community types usually occur in intermediate fens. Organic soils of rich fens are formed by accumulation of sedge, grass, and brown moss (*Aulacomnium* spp. and *Calliergon* spp.) peat. *Carex utriculata* (beaked sedge), *Carex aquatilis* (water sedge), *Typha latifolia*, *Calamagrostis canadensis*, *Deschampsia cespitosa*, *Betula glandulosa*, and *Salix* spp. dominated community types may occur as rich fens. Peatlands are among the most floristically significant wetlands providing habitat for over half of the rare wetland plant species in the survey area.

Table 3. Plant communities and ranks in northern Idaho wetlands arranged by Cowardin system, class and subclass.

Scientific Name	Common name	Rank	
Palustrine Forested Communities			
Needle-leaved evergreen			
<i>Abies grandis</i> / <i>Clintonia uniflora</i>	Grand fir/Queencup beadlily	G5	S3
<i>Clintonia uniflora</i> phase	Queencup beadlily phase	G4	S3
<i>Abies lasiocarpa</i> / <i>Calamagrostis canadensis</i>	Subalpine fir/Bluejoint reed grass	G5	S3
<i>Calamagrostis canadensis</i> phase	Bluejoint reed grass phase	G5	S5
<i>Ligusticum canbyi</i> phase	Canby's licorice-root phase	G5	S5
<i>Vaccinium caespitosum</i> phase	Dwarf huckleberry phase	G5	S5
<i>Abies lasiocarpa</i> / <i>Oplopanax horridum</i>	Subalpine fir/Devil's club	G2	S2
<i>Abies lasiocarpa</i> / <i>Rhododendron albiflorum</i>	Subalpine fir/Cascades azalea	G5	S5
<i>Abies lasiocarpa</i> / <i>Streptopus amplexifolius</i>	Subalpine fir/Claspleaf twistedstalk	G4	S4
<i>Ligusticum canbyi</i> phase	Canby's licoroce-root phase	G4	S4
<i>Menziesia ferruginea</i> phase	Fools huckleberry phase	G4	S4
<i>Streptopus amplexifolius</i> phase	Claspleaf twistedstalk phase	G4	S4
<i>Pseudotsuga menziesii</i> / <i>Physocarpus malveceus</i> , <i>Smilacina stellata</i> phase	Douglas fir/Mountain ninebark Claspleaf twistedstalk phase	G5	S5
<i>Thuja plicata</i> / <i>Asarum caudatum</i>	Western redcedar/Wild ginger		
<i>Asarum caudatum</i> phase	Wild ginger phase	G4	S4
<i>Thuja plicata</i> / <i>Athyrium filix-femina</i>	Western redcedar/Ladyfern	G4	S3
<i>Adiantum pedatum</i> phase	Maidenhair fern phase	G3	S2
<i>Athyrium filix-femina</i> phase	Ladyfern phase	G3	S2
<i>Clintonia uniflora</i> phase	Queencup beadlily phase	G5	S4
<i>Thuja plicata</i> / <i>Gymnocarpium dryopteris</i>	Western redcedar/Oak-fern	G3	S2
<i>Thuja plicata</i> / <i>Lysichitum americanum</i>	Western redcedar/Skunk cabbage	G4Q	S2
<i>Thuja plicata</i> / <i>Oplopanax horridum</i>	Western redcedar/Devil's club	G3	S3
<i>Tsuga heterophylla</i> / <i>Asarum caudatum</i>	Western hemlock/Wild ginger		
<i>Aralia nudicaulis</i> phase	Wild sarsaparilla phase	G3	S3
<i>Asarum caudatum</i> phase	Wild ginger phase	G3	S3
<i>Menziesia ferruginea</i> phase	Fools huckleberry phase		
<i>Tsuga heterophylla</i> / <i>Clintonia uniflora</i>	Western hemlock/Queencup beadlily	G4	S5
<i>Aralia nudicaulis</i> phase	Wild sarsaparilla phase	G5	S2?
<i>Tsuga heterophylla</i> / <i>Gymnocarpium dryopteris</i>	Western hemlock/Oak-fern	G3	S3
Paludified forest	Paludified forest	G5	S1
Broad-leaved deciduous			
<i>Populus tremuloides</i> / <i>Calamagrostis canadensis</i>	Quaking aspen/Bluejoint reedgrass	G3	S4
<i>Populus tremuloides</i> / <i>Cornus sericea</i>	Quaking aspen/Red-osier dogwood	G3	S4
<i>Populus trichocarpa</i> / <i>Symphoricarpos albus</i>	Black cottonwood/Common snowberry	G3	S3
<i>Populus trichocarpa</i> / <i>Cornus sericea</i>	Black cottonwood/Red-osier dogwood	G4	S1
<i>Populus trichocarpa</i> / <i>Poa pratensis</i>	Black cottonwood/Kentucky bluegrass	GE	SE
<i>Populus trichocarpa</i> /Recent alluvial bar	Black cottonwood/Recent alluvial bar	G?	S?

Table 3. Continued.

Palustrine Scrub-Shrub Communities			
Broad-leaved deciduous			
<i>Cornus sericea</i>	Red-osier dogwood	G4	S3
<i>Cornus sericea/Heracleum lanatum</i>	Red-osier dogwood/Common cowparsnip	G3	S2
<i>Crataegus douglasii/Heracleum lanatum</i>	Black hawthorne/Common cowparsnip	G2	S1
<i>Alnus incana/Athyrium felix-femina</i>	Mountain alder/Ladyfern	G3	S3
<i>Alnus incana/Calamagrostis canadensis</i>	Mountain alder/Bluejoint reedgrass	G3	S3
<i>Alnus incana/Carex utriculata</i>	Mountain alder/Beaked sedge	G4	S3
<i>Alnus incana/Cornus sericea</i>	Mountain alder/Red-osier dogwood	G4	S3
<i>Alnus incana/Equisetum arvense</i>	Mountain alder/Field horsetail	G3	SP
<i>Alnus incana/Lysichiton americanum</i>	Mountain alder/Skunk cabbage	G3	S3
<i>Alnus incana/Mesic forb</i>	Mountain alder/Mesic forb	G2G3	S1
<i>Alnus incana/Mesic graminoid</i>	Mountain alder/Mesic graminoid	G2G3?	SE
<i>Alnus incana/Spiraea douglasii</i>	Mountain alder/Pink spiraea	GU	SP
<i>Betula glandulosa/Carex lasiocarpa</i>	Bog birch/Slender sedge	G4	S2
<i>Betula glandulosa/Carex utriculata</i>	Bog birch/Beaked sedge	G4	S3
<i>Salix exigua/Barren</i>	Sandbar willow/Barren	G3?	S4
<i>Salix exigua/Mesic forb</i>	Sandbar willow/Mesic forb	G2?	S3
<i>Salix exigua/Mesic graminoid</i>	Sandbar willow/Mesic graminoid	G3?	S3?
<i>Salix bebbiana</i>	Bebb's willow	G3	S3
<i>Salix bebbiana/Mesic graminoid</i>	Bebb's willow/Mesic graminoid	G2G3	S3
<i>Salix boothii/Mesic forb</i>	Booth's willow/Mesic forb	G3	S3?
<i>Salix drummondiana/Calamagrostis canadensis</i>	Drummond's willow/Bluejoint reedgrass		
		G2	S3
<i>Salix drummondiana/Carex utriculata</i>	Drummond's willow/Beaked sedge	G3	S3
<i>Rhamnus alnifolia</i>	Alder buckthorn	G3	S3
<i>Spiraea douglasii</i>	Hardhack	G5	S4

Palustrine Emergent Communities

Persistent

<i>Carex aquatilis</i>	Water sedge	G5	S4
<i>Carex buxbaumii</i>	Buxbaum's sedge	G3	S1
<i>Carex cusickii</i>	Cusick's sedge	GQ	S3
<i>Carex lanuginosa</i>	Woolly sedge	G4	S2
<i>Carex lasiocarpa</i>	Woolly fruit sedge	G4	S2
<i>Carex limosa</i>	Mud sedge	G3	S1
<i>Carex livida</i>	Livid sedge	GQ	S2
<i>Carex microptera</i>	Smallwing sedge	G4	S3
<i>Carex nebraskensis</i>	Nebraska sedge	G4	S3
<i>Carex scopulorum</i>	Holm's mountain sedge	G4	S3
<i>Carex simulata</i>	Soft-leaved sedge	G3	S2
<i>Carex utriculata (rostrata)</i>	Beaked sedge	G5	S4
<i>Carex vesicaria</i>	Inflated sedge	GU	S3
<i>Eriophorum polystachion</i>	Many-spiked cottongrass	G3?	S3
<i>Phalaris arundinacea</i>	Reed canarygrass	G4	S5
<i>Agropyron smithii</i>	Bluestem wheatgrass	G3G5	S1
<i>Agrostis stolonifera</i>	Creeping bentgrass	GE	SE

Table 3. Continued.

<i>Calamagrostis canadensis</i>	Bluejoint reedgrass	G4Q	S4
<i>Glyceria borealis</i>	Northern mannagrass	G4	S1
<i>Deschampsia cespitosa</i>	Tufted hairgrass	G4	S3
<i>Deschampsia cespitosa/Danthonia intermedia/Bluejoint reedgrass</i>	Tufted hairgrass/Intermediate oatgrass/ Calamagrostis canadensis	GQ	S?
<i>Eleocharis palustris</i>	Common spikerush	G5	S3
<i>Juncus effusus/compactus</i>	Common rush	GU	SU
<i>Scirpus acutus</i>	Hardstem bulrush	G5	S4
<i>Scirpus microcarpus</i>	Small-fruit bulrush	GU	SU
<i>Scirpus validus</i>	Soft stem bulrush	G4	S2
<i>Dulichium arundinaceum</i>	Dulichium	G3?	S2
<i>Equisetum fluviatile</i>	Water horsetail	G4	S3
<i>Polygonum amphibium</i>	Water ladysthumb	G2	S4
<i>Typha latifolia</i>	Broadleaf cattail	G5	S4

Palustrine Aquatic Bed and Lacustrine Littoral Communities

<i>Brasenia shreberi</i>	Water-shield	GU	SU
<i>Nuphar polysepalum</i>	Rocky mountain pond lily	G4	S4

Palustrine Moss-Lichen Communities

Moss

Ombrotrophic bog	Ombrotrophic bog	G5	S1
Poor Fen	Poor Fen	G4	S1

RARE FLORA

Forty-nine rare plant species are known to occur in northern Idaho wetlands (Table 4). *Andromeda polifolia* and *Maianthemum dilatatum* are known from single populations in the state. Twenty species are only known in Idaho from occurrences in the northern part of the state and are indicated in Table 4 by an * following the species name. *Blechnum spicant*, *Maianthemum dilatatum*, *Polystichum braunii*, *Tellima grandiflora*, and *Triantha occidentalis* ssp. *brevistyla* are coastal disjunct species. The remaining species are widespread boreal and circumboreal species with specialized habitat requirements.

Table 4. Rare flora of northern Idaho wetlands, conservation rank, and Idaho Native Plant Society (INPS) category (G=Globally Rare, 1=State Priority 1, 2=State Priority 2, S=Sensitive, M=Monitor, R=Review). Definitions of INPS categories are available in Rare, Threatened, and Endangered Plants and Animals of Idaho (CDC 1994). Species marked with an * are only known in Idaho from populations in the northern part of the state.

Scientific name	Common Name	Rank		INPS Category
<i>Andromeda polifolia</i>	Bog-rosemary	G5	S1	1
<i>Aster junciformis</i>	Rush aster	G5	S1	S
<i>Betula pumila</i> var. <i>glandulifera</i> *	Dwarf birch	G5T5	S2	S
<i>Blechnum spicant</i>	Deer-fern	G5	S3	S
<i>Botrychium ascendens</i> *	Triangular-lobed moonwort	G3?	S1	G
<i>Botrychium minganense</i>	Mingan moonwort	G4	S3	2
<i>Botrychium pinnatum</i>	Northern moonwort	G4?	S2	2
<i>Botrychium lanceolatum</i> var. <i>lanceolatum</i>	Lance-leaved moonwort	G5T4	S3	2
<i>Carex buxbaumii</i>	Buxbaum's sedge	G5	S3	S
<i>Carex chordorrhiza</i> *	String-root sedge	G5	S2	1
<i>Carex comosa</i> *	Bristly sedge	G5	S1	1
<i>Carex flava</i>	Yellow sedge	G5	S3	M
<i>Carex leptalea</i>	Bristle-stalked sedge	G5	S2	S
<i>Carex livida</i>	Livid sedge	G5	S2	S
<i>Carex paupercula</i> *	Poor sedge	G5	S2	2
<i>Carex rostrata</i> *	Beaked sedge	G5	S2	S
<i>Cicuta bulbifera</i>	Bulb-bearing water hemlock	G5	S2	S
<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Small yellow lady's slipper	G5T5	S1	1
<i>Diphasiastrum sitchense</i> *	Sitka clubmoss	G5	S2	S
<i>Drosera intermedia</i>	Spoon-leaved sundew	G5	S1	1
<i>Dryopteris cristata</i> *	Crested-shield fern	G5	S2	S
<i>Epilobium palustre</i>	Swamp willow-weed	G5	S3	M
<i>Epipactis gigantea</i>	Giant helleborine	G4	S3	1
<i>Eriophorum viridicarinum</i>	Green-keeled cotton-grass	G4	S1	1
<i>Gaultheria hispidula</i> *	Creeping snowberry	G5	S2	2
<i>Hypericum majus</i> *	Large Canadian St. John's-wort	G5	S3	2
<i>Lycopodiella inundata</i>	Northern bog clubmoss	G5	S2	1
<i>Lycopodium dendroideum</i> *	Groundpine	G5	S2	S
<i>Maianthemum dilatatum</i>	False lily-of-the-valley	G5	S1	1
<i>Muhlenbergia racemosa</i>	Green muhly	G5	S2	1
<i>Petasites sagittatus</i> *	Arrowleaf coltsfoot	G4	S3	M
<i>Phegopteris connectilis</i> *	Northern beechfern	G5	S2	2
<i>Polystichum braunii</i> *	Braun's sword fern	G5	S1	2
<i>Rhynchospora alba</i>	White beakrush	G5	S2	1
<i>Salix candida</i>	Hoary willow	G5	S2	S
<i>Salix pedicellaris</i> *	Bog willow	G5	S1	2
<i>Sanicula marilandica</i> *	Black snake-root	G5	S2	S
<i>Scheuchzeria palustris</i>	Pod grass	G5	S2	2
<i>Scirpus fluviatilis</i> *	River bulrush	G5	S1	R
<i>Scirpus hudsonianus</i>	Hudson's bay bulrush	G5	S1	1
<i>Scirpus subterminalis</i>	Water clubrush	G4G5	S3	S
<i>Streptopus streptopoides</i> var. <i>brevipes</i> *	Kruhsea	G5T4	S1	S
<i>Tellima grandiflora</i>	Fringecup	G5	S2	S

Table 4. Continued.

<i>Thalitrum dasycarpum</i>	Purple meadowrue	G5	S1	R
<i>Triantha occidentalis</i> ssp. <i>brevistyla</i>	Short-style sticky tofielda	G5T4	S1	1
<i>Trientalis arctica</i> *	Northern starflower	G5	S3	S
<i>Trientalis latifolia</i>	Western starflower	G5	S3	M
<i>Vaccinium oxycoccos</i> *	Bog cranberry	G5	S2	2
<i>Vallisneria americana</i>	Wild celery	G5	S1	S

RARE ANIMALS

Northern Idaho provides breeding habitat for 29 wetland and riparian associated vertebrate species of concern. River corridors and forested lake margins provide breeding habitat for bald eagles and American peregrine falcons. The Kootenai River, Pend Oreille River, and Lake Pend Oreille are bald eagle wintering areas. Northern pygmy owls, great gray owls, and barred owls prefer dense forests or open woodlands and frequent open meadows for foraging. Large open water bodies of lakes and rivers with shallow water areas supporting emergent vegetation are habitat for red-necked grebes, western grebes, common loon (infrequent in northern Idaho), common goldeneye, Barrow's goldeneye, and hooded mergansers. Harlequin ducks breed on relatively low gradient, disturbance free mountain streams. The majority of the Idaho breeding population of Harlequin ducks is concentrated on approximately 30 streams in north Idaho. Long-billed curlews prefer prairies and grassy meadows and are of infrequent occurrence in northern Idaho. Three-toed woodpeckers are found in coniferous forests and occasionally in willow thickets along streams. Conifer forests with windthrow and burned areas with standing dead are habitat for black backed woodpeckers. Boreal chickadees are found in subalpine forests as well as dense montane forests.

Five amphibian species of concern occur in northern Idaho wetlands; Coeur d'Alene salamander, western toad, northern leopard frog, spotted frog, and wood frog. The wood frog was found in the vicinity of Priest Lake in the 1950's and has not been collected in the state of Idaho since the 1980's. The remaining species may be secure in northern Idaho, however information supporting this is limited (Peterson pers. conv. 1997). Coeur d'Alene salamanders are known from two locations in the survey area and occur in association with springs or seeps, spray zones of waterfalls, and edges of streams. The Coeur d'Alene salamander is more common in the Coeur d'Alene drainage, south of the survey area (Groves et al. 1997).

The Kootenai River provides habitat for the Kootenai River white sturgeon and burbot, both state species of special concern. Sturgeon and burbot numbers have declined due to habitat loss associated with the construction of Libby Dam. Bull trout are present in the Kootenai, Upper Priest, Priest, Pack, and Clark Fork River systems.

Mature spruce-fir and cedar-hemlock forests are habitat for pygmy shrews and fishers. Pygmy shrews prefer moist habitats over dry areas. Fishers utilize forested riparian habitat in the spring, summer, and fall. The northern bog lemming is only found in peatland habitats in northern Idaho. Grizzly bear are known to utilize wetland and riparian habitat in the Selkirk Mountains and Priest

River Valley. Portions of the survey area are within the Selkirk and Cabinet-Yaak grizzly bear ecosystems. Information from the Idaho Vertebrate Atlas (Groves et al. 1997) on the status, range and habitat of vertebrate species of concern (with the exception of fish) is included in Appendix F.

Table 5. Rare animals of northern Idaho wetlands.

Species	Common Name	Rank
Birds		
<i>Glaucidium gnoma</i>	Northern pygmy owl	G5 S4
<i>Strix nebulosa</i>	Great gray owl	G5 S2
<i>Strix varia</i>	Barred owl	G5 S4
<i>Haliaeetus leucocephalus</i>	Bald eagle	G4 S3
<i>Falco peregrinus anatum</i>	American peregrine falcon	G4 S1
<i>Histrionicus histrionicus</i>	Harlequin duck	G4 S1
<i>Bucephala clangula</i>	Common goldeneye	G5 S3
<i>Bucephala islandica</i>	Barrow's goldeneye	G5 S3
<i>Lophodytes cucullatus</i>	Hooded merganser	G5 S2
<i>Gavia immer</i>	Common loon	G5 S1
<i>Numenius americanus</i>	Long-billed curlew	G5 S3
<i>Podiceps grisegena</i>	Red-necked grebe	G5 S3
<i>Aechmophoris occidentalis</i>	Western grebe	G5 S4
<i>Chlidonias niger</i>	Black tern	G4 S2
<i>Picoides arcticus</i>	Blackbacked woodpecker	G5 S3
<i>Picoides tridactylus</i>	Three-toed woodpecker	G3 S3
<i>Parus hudsonicus</i>	Boreal chickadee	G5 S1
Amphibians		
<i>Bufo boreas</i>	Western Toad	G4 S4
<i>Plethodon idahoensis</i>	Coeur d'Alene salamader	G3 S3
<i>Rana pipiens</i>	Northern leopard frog	G5 S3
<i>Rana pretiosa</i>	Spotted frog	G3G4 S3S4
<i>Rana sylvatica</i>	Wood frog	G5 SH
Fish		
<i>Accipenser transmontanus</i> pop. 1	White Sturgeon (Kootenai River)	G4 S1
<i>Salvelinus confluentus</i>	Bull trout	G5 S3
<i>Lota lota</i>	Burbot	G5 S2
Mammals		
<i>Sorex hoyi</i>	Pygmy shrew	G5 S2
<i>Synaptomys borealis</i>	Northern bog lemming	G4 S1
<i>Ursus arctos</i>	Grizzly bear	G4 S1
<i>Martes pennanti</i>	Fisher	G4G5 S1

METHODS

A list of potential sites was distributed to key individuals within federal, state, and private land management agencies. Input was sought on the condition and biological significance of listed sites as well as suggestions for additional sites which were overlooked or of local concern. Sites were surveyed during the summer of 1996 following Western Heritage Task Force methodology to assess site condition, catalog community types, and document rare plant and animal occurrences (Bougeron et al. 1992). The 1996 surveys, previous work by Bursik and Moseley (1995), and information on rare species distributions from the Biological and Conservation Database provided a method to allocate sites into four management categories. The categories differentiate wetlands based on the following criteria: richness, rarity, condition, and viability. The purpose is to identify wetlands that are irreplaceable or sensitivity to disturbance is high (Washington Department of Ecology 1991, Bursik and Moseley 1995, Grossman et al. 1994).

Table 6. Definitions and indicators of criteria for allocating wetland sites into management categories.		
CRITERIA	DEFINITION	INDICATORS
Richness	Habitat diversity within the site	<ul style="list-style-type: none"> ◆ Assemblage of numerous plant communities within a single unit of Cowardin's classification ◆ Assemblage of plant communities or ecological features (beaver ponds, peatlands, lakes...) within several units of Cowardin's classification (=high structural diversity)
Rarity	Presence of state rare plant community, plant or animal species.	<ul style="list-style-type: none"> ◆ High concentrations of state rare plant or animal species ◆ High quality occurrences of state rare plant communities
Condition	Extent which site has been altered from natural conditions.	<ul style="list-style-type: none"> ◆ Exotic species sparse or absent ◆ Native species contributing the majority of cover and reproducing
Viability	Likelihood of continued existence of biota within the site	<ul style="list-style-type: none"> ◆ Large size ◆ Offsite impacts (including hydrologic alteration, weed infestations, and incompatible land use) minimal

Additional wetlands are present in the survey area that have not been surveyed for rare plants, rare animals, or native plant communities. Based on extensive past survey work we are relatively confident that most Class I sites have been identified. The information presented in Table 6 can be summarized for unsurveyed or data poor wetlands by consulting National Wetland Inventory Maps, requesting plant and animal occurrence data from Idaho CDC, and on-site evaluation of impacts. In data poor wetlands, development of a plant species list with relative abundance (common, infrequent, rare) and rare plant surveys by a qualified botanist may be necessary to

determine the condition and rarity of the site. Site summaries for surveyed wetlands are included in Appendix D.

CLASS I SITES

Class I sites represent examples of plant communities in near pristine condition and often provide habitat for high concentrations of state rare plant or animal species. The high quality condition of the plant community is an indicator of intact site features such as hydrology and water quality. Impacts to Class I sites should be avoided as these sites are not mitigable and alteration (and in some cases enhancement) of these sites will result in significant degradation. Conservation efforts should focus on full protection including maintenance of hydrologic regimes. Class I federal lands should be designated as Research Natural Area (RNA), Special Interest Area (SIA), Area of Critical Environmental Concern (ACEC) or Wildlife Refuge. Private lands should be acquired by a conservation organization, or be secured by the establishment of conservation easements to protect biological features.

CLASS II SITES

Class II wetlands are differentiated from Class I sites based on condition or biological significance. Class II sites may provide habitat for state rare plant or animal species. However, human influences are apparent (i.e. portions of wetland in excellent condition, however drier, accessible sites are impacted). Good to excellent assemblages of common plant community types or the occurrence of rare community types qualifies a site as Class II. Wetlands with unique biological, geological, or other features may be included here. Impacts and modification to Class II sites should be avoided. Where impacts such as grazing are present they should be managed intensively or removed. Class II federal lands should be designated as Research Natural Area, Area of Critical Environmental Concern, or Special Interest Area. Private lands should be acquired by conservation organizations or have voluntary or legal protection. Frequently wetland meadows with hydrologic alterations are adjacent to Class I and Class II sites where the hydrology could be restored.

REFERENCE SITES

Reference sites represent high quality assemblages of common community types in the survey area or areas where changes in management practices can be documented. The use of a reference area as a model for restoration or enhancement projects is the best way to replicate wetland functions and the distribution and composition of native plant communities. Reference areas may also serve as donor sites for plant material. Application of Best Management Practices by the current landowner or manager, or fee title acquisition to ensure the continued existence of plant community types, should be the priority for reference sites.

HABITAT SITES

Habitat sites have moderate to outstanding wildlife values, such as food chain support or maintenance of water quality, and may have high potential for designation as or expansion of existing wildlife refuges or managed areas. Human influences are often present and management may be necessary to maintain natural communities. For the sites listed here livestock and human access management may be the only actions necessary. Public and federal lands should be managed to maintain and improve wildlife values. Voluntary protection and incentives for private landowners to apply Best Management Practices may be used on private lands.

CONSERVATION OF NORTHERN IDAHO WETLANDS

It is widely recognized that creation of wetlands is more costly than conservation or restoration. Wetland creation projects have had minimal success and are usually limited to small portions of the landscape. Conservation on the other hand, and the restoration of relatively intact wetland and riparian habitat accomplish resource goals efficiently by reducing labor and material costs (Stevens and Vanbianchi 1991). Large, viable wetland complexes can be the result.

The northern Idaho survey identified fifty-nine wetland sites based on work by Bursik and Moseley (1995) and Pfeifer and Toweill (1992) and consultation with agency personnel (Table 7, Figure 7.). Many of these wetland sites represent relatively intact systems where actions such as livestock management, buffer creation, and public education will maintain and in some cases improve wetland functions. Gains in wetland function can also be achieved by restoring hydrology at or adjacent to many of the identified sites.

CLASS I SITES

Thirteen wetland sites meet the richness, rarity, condition, and viability criteria to qualify as Class I sites. Five of these sites Bottle Lake, Kaniksu Marsh, Potholes, Smith Creek, and Three Ponds are currently designated as Forest Service Research Natural Areas. Armstrong Meadows is owned by the Forest Service and represents one of the most pristine peatlands in northern Idaho. Armstrong Meadows, as well as Packer Meadows, should be high priority for designation as Special Interest Area-Botanical.

The remaining Class I sites have mixed ownership or are privately owned. Chase Lake, Mosquito Bay Fen, Perkins Lake, Upper Priest Lake Fen, and Upper Priest River have mixed ownership with tracts held by private individuals, Idaho Department of Lands, and/or the Forest Service. Protection of these sites will require acquisition of private lands and cooperation with federal and/or state agencies. All of the sites meet the criteria for Research Natural Area designation. Projects to protect Perkins Lake and Upper Priest River are currently underway. Parties which own Mosquito Bay Fen are in litigation over water level management on Priest Lake. Once this is settled, Mosquito Bay Fen should be of the highest priority for acquisition. Chase Lake is mostly

owned by the Idaho Department of Lands. This organization should be approached about safeguarding this biologically significant site. Land protection efforts should also focus on portions of Chase Lake in private ownership. Lambertson Lake is owned by Idaho Forest Industries and is within a relatively unfragmented 14,000 acre partial. The long term protection of this site should be secured with a conservation easement.

CLASS II SITES

Nineteen Class II wetland sites were identified which should be of priority for protection. The majority of Class II sites provide habitat for significant numbers of rare species. Two Class II sites, Binarch Creek and Hunt Girl Creek, are designated as Research Natural Areas. While uplands represent a significant portion of these RNAs, wetland and aquatic habitats are represented also. Several sites are partially protected as they are within established Idaho Department of Fish Game Wildlife Management Areas, Bureau of Land Management Special Management Areas or Nature Conservancy Preserves. Most of the wetlands around Gamlin Lake are being protected by The Nature Conservancy and Bureau of Land Management. A portion of Hager Lake Fen is protected by a conservation easement. Clark Fork Delta and McArthur Lake are partially within IDFG Wildlife Management Areas. Biologically significant islands and wetlands at Clark Fork Delta are unprotected and this may be accomplished through mitigation for habitat loss associated with Albeni Falls dam.

Conservation of several Class II sites may be accomplished by working with a single landowner or manager. Bog Creek Fen, Cow Creek Meadows, and Grass Creek Meadows are entirely managed by the Forest Service and designation as Special Interest Area-Botanical is appropriate. Chipmunk Potholes is managed by Idaho Department of Lands. This agency should be contacted to proceed with protecting this and other high priority sites owned wholly or partially by the department. The following privately owned sites should be high priority for acquisition or conservation easement by conservation organizations or agencies; Bear Creek Fen, Beaver Lake Ranch, Fleming Creek, and Rose Fen.

The remaining Class II sites have mixed private, federal and state ownership where cooperation among involved agencies and individuals is essential to protection. For sites with mixed ownership that include Forest Service managed lands, Special Interest Area designation should be pursued when cooperation is achieved.

REFERENCE SITES

The reference sites represent lake fringe, meadow, and riparian wetlands. Lake associated wetlands include well developed and early seral peatlands. Beaver Lake South, Blue Lake, and Shepherd Lake are well developed peatlands supporting extensive floating mats and fen vegetation. Beaver Lake North and Robinson Lake have limited or what may be considered early seral peatland development that may be a function of topography or adjacent land use activities. Rich fen meadows associated with streams are present at Gleason Meadow, Bismark Meadows,

Lamb Creek Meadows, and Round Prairie. These meadows represent remnants which have not been completely seeded or interseeded with nonnative pasture grasses. Round Prairie has the additional value of potentially serving as a demonstration site for monitoring the effects of management (grazing management, stream channel fencing, and pond development) on wetland functions. Canyon Creek and Teepee Creek are established Research Natural Areas that may serve as reference areas for high gradient riparian systems. Hideaway Islands and Shorty's Island are some of the last remnant stands of riparian shrublands and forest on the Kootenai River. Hideaway Islands is currently designated as a Bureau of Land Management ACEC.

Best Management Practices should be applied to these and similar unprotected sites to maintain wetland plant communities. Special Interest Area-Botanical designation is appropriate at sites, such as Bismark Meadows and Lamb Creek Meadows, supporting rare plant populations and unique habitats. The primary threat to these sites is grazing and alteration of hydrology. For the lake fringe and meadow wetlands significant gains in wetland function may be obtained by restoring the natural hydrology (blocking peripheral drainages). Private land sites identified as reference areas may be eligible for protection under programs outlined in the following section, acquired by land trusts or used as potential mitigation sites.

HABITAT SITES

Five habitat sites, Dawson Lake, Freeman Lake, Hoodoo Lake, Morton Slough and Pack River are managed completely or in part by IDFG as Access Areas or Wildlife Management Areas. The Kootenai National Wildlife Refuge is managed by the United States Fish and Wildlife Service. Future projects could enhance the protection of wetland complexes by acquisition, easements, or conservation agreements on adjacent lands.

Cocollala Slough, Kalispell Bay Fen, and Walsh Lake are privately owned wetlands. Cocollala Slough is a potential mitigation site for habitat losses associated with the construction of Albeni Falls Dam. Conservation easements on or acquisition of lands at Walsh Lake should be pursued if opportunities arise. Kalispell Bay Fen is a peatland where conservation potential may have been lost due to development.

The remaining habitat sites are managed by the Forest Service, Idaho Department of Lands and private individuals. As opportunities for conservation easements, management agreements, or restoration projects on private lands arise they should be actively pursued. All of the habitat sites have potential for restoration or enhancement due to past use by domestic animals and/or alterations of hydrologic regimes. Restoration may be as simple as fencing and allowing native vegetation to recover. Revegetation, channel stabilization, weed control, and hydrologic restoration may be necessary and should be evaluated on a site by site basis.

OTHER SITES AND PRIORITIES FOR CONSERVATION

A number of wetland sites in northern Idaho are not summarized in this document. Other wetlands are present representing common vegetation types with significant wetland functions. Regulatory protection for jurisdictional wetlands is provided by the Clean Water Act, however, wetlands that do not meet the regulatory criteria are vulnerable. With less than 4% of wetlands in the survey area currently protected within established managed areas, projects which promote the conservation of all intact wetland habitats should be of high priority. Emphasis may be placed on those types which are unprotected (or under-protected), declining, or rare.

Emergent wetland types make up the largest percentage of wetlands in the survey area. This may reflect conversion of forested and scrub-shrub types to emergent types. Nearly ½ of the protected wetland vegetation types are in the emergent category. The common emergent plant communities *Phalaris arundinacea*, *Carex utriculata (rostrata)*, and *Typha latifolia* are widespread across the landscape and represented by large occurrences in several managed areas. Many of the peatland associated plant communities occur in small patches within a larger wetland mosaic. Two of the peatland communities, *Carex lasiocarpa* and Poor Fens are represented in multiple managed areas. Unprotected intermediate fen vegetation includes the following communities; *Carex limosa*, *Carex livida*, *Dulichium arundinaceum*, and Ombrotrophic Bogs. Seasonally flooded wetland meadow vegetation or rich fens have experienced significant declines in areal extent due to pasture development and are unprotected in managed areas in northern Idaho. Native vegetation types at these meadows include *Deschampsia cespitosa*, *Carex simulata*, and *Calamagrostis canadensis*. Restoration potential is generally high adjacent to the rich fens due to periphery ditches and drains.

Four percent of scrub-shrub wetlands are within managed areas. Nearly 95% of the protected scrub-shrub wetlands are dominated by monocultures of *Spiraea douglasii*. *Betula glandulosa* dominated communities are present in two managed areas. Shrublands dominated by willows and the tall shrubs *Alnus incana* and *Alnus rubra*, are poorly represented in managed areas.

Comparison of acreage of forested wetlands mapped by NWI and those mapped by the CDC at managed areas revealed discrepancies in acreage in the coniferous forested wetland category. This discrepancy is attributable to three factors: (1) stringer forests, such as those occurring along high gradient streams, are mapped as linear features, from which acreage was not calculated; (2) in forested landscapes coniferous wetland forests are sometimes mapped as inclusions with uplands; and (3) some of the coniferous forest habitat types listed in Table 3 are not restricted to wetland or riparian habitats and may occur on uplands. Coniferous forests occurring along high gradient streams are represented in several Research Natural Areas in the survey area. Wetland forests dominated by conifers on the perimeters of emergent wetlands and in broad valley bottoms are less well represented. Deciduous forested wetlands have seen significant declines in areal extent due to inundation of habitat and land clearing. Cottonwood forests are represented in managed areas by a small, low quality occurrence at Kootenai National Wildlife Refuge and high quality occurrences at Pend O'reille Wildlife Management Area. The islands at the mouth of the Lake

Pend O'reille represent one of the highest quality cottonwood and shrubland occurrences in the state. High quality deciduous forested wetlands, especially those with a relatively intact hydrologic regime, should be of high conservation priority.

Numerous programs provide opportunities for wetlands protection and restoration on private as well as publicly owned lands. Technical and restoration assistance for privately owned wetlands is available through the USFWS Partners for Wildlife program, IDFG Habitat Improvement Program (HIP), and the NRCS Wetland Reserve Program. Projects involving multiple cooperators are generally given higher priority. The HIP also provides assistance for projects on federal lands such as fencing and restoring wetlands and riparian areas. Technical assistance and assistance to secure project funds on lands with mixed ownership may be provided by Bring Back the Natives or Intermountain Joint Ventures. Special designation such as Research Natural Area (RNA), Area of Critical Environmental Concern (ACEC), or Special Interest Area (SIA) is a conservation approach for ecologically significant wetlands on federal lands. The State of Idaho Department of Lands has management responsibility for a significant percentage of wetlands and a number of high quality wetlands. No mechanisms exist for the protection of wetlands managed by the Department of Lands. The majority of wetlands in the survey area are in private ownership thus, the long-term goal of increasing the quality and quantity of wetlands will only be accomplished through continued cooperation between private landowners, federal, state, and local agencies and concerned citizens.

Figure 7. Location of wetland sites in northern Idaho. Site numbers correspond to those used in Table 7. (MAP NOT INCLUDED IN CDC HOMEPAGE VERSION)

Table 7. Wetland sites in northern Idaho. Management categories are defined in the text. Ownership: USFS = United States Forest Service, BLM = Bureau of Land Management, IDFG = Idaho Department of Fish and Game, IDL = Idaho Department of Lands, IPR=Idaho Department of Parks and Recreation, NPS = National Park Service, CPT = Corporate ownership, RR=Railroad, TNC = The Nature Conservancy, and PRI = private. Protection status: +=Full protection (e.g., Designated Research Natural Area or Special Interest Area, Nature Conservancy Preserve, Wildlife Management Area or Refuge), P=Partial protection (e.g., Potential Research Natural or Special Interest Area recognized in the Forest Plan, partially within a Wildlife Management Area, Privately owned with conservation easement in place), and -=Currently no protection.

Wetland Site	Category	Protection status	Ownership	Latitude/Longitude	County
1. ARMSTRONG MEADOWS	Class I	-	USFS	484457N 1165230W	Bonner
2. BOTTLE LAKE	Class I	+	USFS	484255N 1165237W	Bonner
3. CHASE LAKE	Class I	-	PRI,IDL	482717N 1164915W	Bonner
4. KANIKSU MARSH	Class I	+	USFS	482626N 1165505W	Bonner
5. LAMBERTSON LAKE	Class I	-	PRI	480309N 1164300W	Bonner
6. MOSQUITO BAY FEN	Class I	-	PRI,USFS,IDL	484435N 1165030W	Bonner
7. PACKER MEADOWS	Class I	-	USFS	484300N 1170000W	Bonner
8. PERKINS LAKE	Class I	-	PRI,USFS	484527N 1160515W	Boundary
9. POTHOLE	Class I	+	USFS	483655N 1170055W	Bonner
10. SMITH CREEK	Class I	+	USFS	485211N 1164522W	Boundary
11. THREE PONDS	Class I	+	USFS	483827N 1162552W	Boundary
12. UPPER PRIEST LAKE FEN	Class I	-	USFS,IDL	484603N 1165128W	Boundary
13. UPPER PRIEST RIVER	Class I	-	PRI,IDL,USFS	484902N 1165555W	Bonner
14. BEAR CREEK FEN	Class II	-	PRI,IDL	483800N 1165017W	Bonner
15. BEAVER LAKE RANCH	Class II	-	PRI	480230N 1164230W	Bonner
16. BINARCH CREEK	Class II	+	USFS	483003N 1170034W	Bonner
17. BOG CREEK FEN	Class II	-	USFS	485940N 1165235W	Boundary
18. BONNER LAKE	Class II	-	PRI,IDL	484338N 1160637W	Boundary
19. CHIPMUNK POTHOLE	Class II	-	IDL	482543N 1165358W	Bonner
20. CLARK FORK DELTA	Class II	P	PRI,IDFG	480845N 1161215W	Bonner
21. COW CREEK MEADOWS	Class II	-	USFS	485523N 1164529W	Boundary
22. DUBIUS CREEK FEN	Class II	-	PRI,USFS	482334N 1165724W	Bonner
23. FLEMING CREEK	Class II	-	PRI	484645N 1162051W	Boundary
24. GAMLIN LAKE	Class II	P	PRI,TNC,BLM	481301N 1162300W	Bonner
25. GRASS CREEK MEADOWS	Class II	-	USFS	485625N 1165012W	Boundary
26. HAGER LAKE FEN	Class II	P	PRI,USFS	483550N 1165815W	Bonner
27. HUNT GIRL CREEK	Class II	+	USFS	483148N 1160947W	Boundary
28. KELSO LAKE	Class II	-	PRI,USFS	480033N 1164150W	Bonner

Table 7. continued.

Wetland Site	Category	Protection status	Ownership	Latitude/Longitude	County
29. LEE LAKE	Class II	-	PRI,IDL	482840N 1164920W	Bonner
30. MCARTHUR LAKE	Class II	P	PRI,IDFG	483030N 1162700W	Bonner,Boundary
31. ROSE FEN	Class II	-	PRI	484007N 1160335W	Boundary
32. SINCLAIR LAKE	Class II	-	USFS,RR	485534N 1161032W	Boundary
33. BEAVER LAKE NORTH	Reference	-	IDL,USFS	483112N 1162223W	Boundary
34. BEAVER LAKE SOUTH	Reference	-	PRI	481217N 1162440W	Bonner
35. BISMARCK MEADOWS	Reference	-	PRI,USFS	483647N 1165755W	Bonner
36. BLUE LAKE	Reference	-	PRI,IDL	481642N 1164955W	Bonner
37. CANYON CREEK	Reference	+	USFS	482110N 1164448W	Bonner
38. GLEASON MEADOW	Reference	-	PRI	482420N 1165900W	Bonner
39. HIDEAWAY ISLANDS	Reference	+	BLM	484225N 1161250W	Boundary
40. LAMB CREEK MEADOWS	Reference	-	PRI,USFS	483227N 1165640W	Bonner
41. ROBINSON LAKE	Reference	-	PRI,USFS	485810N 1161242W	Boundary
42. ROUND PRAIRIE	Reference	-	PRI,USFS	485725N 1161443W	Boundary
43. SHORTY'S ISLAND	Reference	-	PRI	484600N 1162320W	Boundary
44. TEPEE CREEK	Reference	+	USFS	484331N 1165200W	Bonner
45. CARIBOU MARSH	Habitat	-	IDL	484805N 1165125W	Bonner
46. COCOLALLA SLOUGH	Habitat	-	PRI	481015N 1164005W	Bonner
47. CURLEY CREEK	Habitat	-	PRI,USFS	484215N 1160254W	Boundary
48. DAWSON LAKE	Habitat	P	PRI,IDFG	484631N 1161418W	Boundary
49. FREEMAN LAKE	Habitat	P	PRI,IDFG	481316N 1170146W	Bonner
50. HERMAN LAKE	Habitat	-	PRI	484142N 1160348W	Boundary
51. HOODOO LAKE	Habitat	P	PRI,IDFG	480252N 1164903W	Bonner
52. HUGHES MEADOWS	Habitat	-	USFS	485200N 1165950W	Boundary
53. KALISPELL BAY FEN	Habitat	-	PRI	483423N 1165511W	Bonner
54. KOOTENAI NWR	Habitat	+	USFWS	484313N 1162400W	Boundary
55. LOST LAKE	Habitat	-	PRI,USFS	481117N 1162321W	Bonner
56. MORTON SLOUGH	Habitat	+	IDFG	481203N 1164150W	Bonner
57. PACK RIVER	Habitat	P	PRI,IDFG	482008N 1162315W	Bonner
58. SHEPHERD LAKE	Habitat	P	PRI,IDFG	481119N 1163138W	Bonner
59. WALSH LAKE	Habitat	-	PRI	482549N 1162947W	Bonner

HOW TO REQUEST ADDITIONAL INFORMATION

Only part of the information on wetlands in northern Idaho has been summarized in this document. Additional data available for basin wide or site specific projects is housed at IDFG headquarters. Table 8 summarizes the available data and methods of accessing the data.

Table 8. Accessing wetlands related data housed at Idaho Department of Fish and Game. GAP=Gap Analysis Project, NWI=National Wetlands Inventory Maps, BCD=Biological and Conservation Database. Geographic Information System (GIS) data is available in ARCVIEW format.			
DATA	FORMAT	WHAT IS AVAILABLE?	HOW DATA IS ACCESSED?
NWI	GIS	<ul style="list-style-type: none"> ◆ United States Fish and Wildlife Service NWI maps at 1:24,000 	IDFG GIS Systems Analyst (also available from the National Wetlands Inventory Homepage: http://www.nwi.fws.gov:80/dlgdata)
BCD	GIS	<ul style="list-style-type: none"> ◆ Rare plant and animal distributions ◆ Conservation site locations ◆ Managed area locations 	IDFG CDC Information Manager
BCD	ANALOG/ DISK	<ul style="list-style-type: none"> ◆ Occurrence data for rare plant and animal species and plant communities ◆ Location and biological significance of currently managed wetland areas ◆ Location and biological significance of wetland conservation sites in need of protection ◆ Community abstracts 	IDFG CDC Information Manager

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Appendix A

Key to wetland plant communities in northern Idaho

Instructions for use of this key.

Locate a sample plot which represents the stand as a whole. Avoid ecotones between communities and microsites which represent small scale disturbances. Recommended plot size for forested communities is 1000 m² (20x50m), scrub-shrub communities 250 m² (25x10), and emergent communities 100 m² (10x10).

While in the plot identify the community type by following the key. In sites that have been heavily impacted by anthropogenic factors (such as grazing), search for remnants of native vegetation. The cover values in the key may be reduced for disturbed sites.

Record canopy cover for all species in the plot. Validate the key by comparing plot data with written descriptions (included for high ranking plant communities in Appendix 2) and stand tables to check for the presence of constant and characteristic species (Cooper et al. 1991, Daubenmire 1970, Hansen et al. 1995, Kovalchik 1993, Manning and Padgett 1995, Mattson 1984, Padgett et al. 1989, Pierce 1986, Steele et al. 1981, Steele et al. 1983, Youngblood et al. 1985).

The community types are from sites sampled by CDC and a summary of agency surveys in the basin. This work encompasses wide variation in environmental factors affecting the distribution of wetland community types. However, the key may not contain all wetland community types in the basin.

Key to overstory dominance groups

- | | | |
|----|---|---|
| 1. | Conifers including <i>Thuja plicata</i> , <i>Tsuga heterophylla</i> , <i>Abies lasiocarpa</i> , <i>Picea engelmannii</i> , or <i>Abies grandis</i> dominating the overstory with at least 25% cover either collectively or separately. | Needle-leaved evergreen forest types |
| 1. | Not as above. | 2 |
| 2. | <i>Populus trichocarpa</i> , <i>P. deltoides</i> , or <i>P. tremuloides</i> present with a canopy cover of at least 15% and not representing a sere to conifer or shrub dominated types. | Broad-leaved deciduous forest types |
| 2. | Trees absent or if present with less than 15% cover or restricted to macrosites. | 3 |
| 3. | Shrubs present with a canopy cover of at least 10%. | Scrub-Shrub types |
| 3. | Not as above. | 4 |
| 4. | Shrubs and trees contributing minor amounts to composition or restricted to microsites. Herbaceous species growing in less than 1 meter of water with a combined cover of at least 15% or emergent herbaceous species with at least 5% cover. | Emergent types |
| 4. | Not as above. | 5 |
| 5. | Emergent species in water 1 meter or more in depth. | Aquatic bed (and Lacustrine Littoral) types |

- | | | |
|----|---|------------------------------------|
| 5. | Not as above. | 6 |
| 6. | Nonvascular (sphagnum, moss) plants dominant. Vascular species may be present but contribute minor cover (5%) | Moss-lichen types |
| 6. | Not as above. | Unclassified or undocumented types |

Key to needle-leaved evergreen forest types

- | | | |
|----|--|---|
| 1. | Tsuga heterophylla present and successfully reproducing. | Tsuga heterophylla key (p. A-3) |
| 1. | Tsuga heterophylla absent or not reproducing. | 2 |
| 2. | Thuja plicata present and successfully reproducing. | Thuja plicata key (p. A-4) |
| 2. | Thuja plicata absent or not reproducing. | 3 |
| 3. | Abies lasiocarpa present and reproducing more successfully than any other tree species. | Abies lasiocarpa key (p. A-5) |
| 3. | Not as above. | 4 |
| 4. | Other conifer species not mentioned above present and reproducing more successfully than any other tree species. | Misc. Conifer key (p. A-6) |
| 4. | Not as above. | 5 |
| 5. | Overstory and understory dominated by native plant species. | Unclassified or undocumented palustrine needle-leaved evergreen forest community type |
| 5. | Overstory or understory dominated by exotic plant species. | Human induced palustrine needle-leaved evergreen forest |

Tsuga heterophylla key

- | | | |
|----|---|------------------------------------|
| 1. | Oplopanax horridum with at least 5% cover. | Thuja plicata/Oplopanax horridum |
| 1. | Not as above. | 2 |
| 2. | Athyrum felix-femina with at least 5% cover or common if in combination with other mesic forbs. | Thuja plicata/Athyrum felix-femina |
| | a. Athyrum felix-femina well represented. | -Athyrum felix-femina phase |
| | b. Adiantum pedatum well represented. | -Adiantum pedatum phase |
| 2. | Not as above. | 3 |
| 3. | Asarum caudatum | Tsuga heterophylla/Asarum caudatum |

<ul style="list-style-type: none"> a. <i>Aralia nudicaulis</i> common. b. <i>Menziesia ferruginea</i> well represented. c. Not as above. 	<ul style="list-style-type: none"> -<i>Aralia nudicaulis</i> phase -<i>Menziesia ferruginea</i> (upland) phase -<i>Asarum caudatum</i> phase 	
4.	<ul style="list-style-type: none"> <i>Gymnocarpium dryopteris</i> with at least 5% cover. 	<ul style="list-style-type: none"> <i>Tsuga heterophylla</i>/ <i>Gymnocarpium dryopteris</i>
4.	<ul style="list-style-type: none"> Not as above. 	5
5.	<ul style="list-style-type: none"> <i>Clintonia uniflora</i> common with at least 1% cover. a. <i>Aralia nudicaulis</i> present. b. Not as above. 	<ul style="list-style-type: none"> <i>Tsuga heterophylla</i>/<i>Clintonia uniflora</i> -<i>Aralia nudicaulis</i> phase -Upland phase
5.	<ul style="list-style-type: none"> Not as above. 	6
6.	<ul style="list-style-type: none"> Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. 	7
6.	<ul style="list-style-type: none"> Site without wetland characteristics. 	Upland Site
7.	<ul style="list-style-type: none"> Overstory and understory dominated by native plant species. 	Unclassified or undocumented palustrine needle-leaved forest type
7.	<ul style="list-style-type: none"> Overstory or understory dominated by exotic plant species. 	Human induced palustrine needle-leaved forest type

***Thuja plicata* key**

1.	<ul style="list-style-type: none"> <i>Oplopanax horridum</i> with at least 5% cover. 	<ul style="list-style-type: none"> <i>Thuja plicata</i>/<i>Oplopanax horridum</i>
1.	<ul style="list-style-type: none"> Not as above. 	2
2.	<ul style="list-style-type: none"> <i>Athyrium felix-femina</i> with at least 5% cover or common if in combination with other mesic forbs. a. <i>Adiantum pedatum</i> well represented. b. Not as above. 	<ul style="list-style-type: none"> <i>Thuja plicata</i>/<i>Athyrium felix-femina</i> -<i>Adiantum pedatum</i> phase -<i>Athyrium felix-femina</i> phase
2.	<ul style="list-style-type: none"> Not as above. 	3
3.	<ul style="list-style-type: none"> <i>Asarum caudatum</i> present or <i>Viola glabella</i> common. a. <i>Menziesia ferruginea</i> or <i>Taxus brevifolia</i> well represented. b. Not as above. 	<ul style="list-style-type: none"> <i>Thuja plicata</i>/<i>Asarum caudatum</i> -Upland phase -<i>Asarum caudatum</i> phase
4.	<ul style="list-style-type: none"> <i>Gymnocarpium dryopteris</i> with at least 5% cover. 	<ul style="list-style-type: none"> <i>Thuja plicata</i>/<i>Gymnocarpium dryopteris</i>
4.	<ul style="list-style-type: none"> Not as above. 	5

- | | | |
|----|---|---|
| 5. | Clintonia uniflora common with at least 1% cover. | Thuja plicata/Clintonia uniflora |
| 5. | Not as above. | 6 |
| 6. | Lysichitum americanum common with at least 10% cover. | Thuja plicata/Lysichitum americanum |
| 6. | Not as above. | 7 |
| 7. | Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. | 8 |
| 7. | Site without wetland characteristics. | Upland Site |
| 8. | Overstory and understory dominated by native plant species. | Unclassified or undocumented palustrine needle-leaved forest type |
| 8. | Overstory or understory dominated by exotic plant species. | Human induced palustrine needle-leaved forest type |

Abies lasiocarpa key

- | | | |
|----|--|---|
| 1. | Calamagrostis canadensis or Ledum glandulosum with at least 5% cover. | Abies lasiocarpa/Calamagrostis canadensis |
| | a. Ledum glandulosum with at least 5% cover. | -Ledum glandulosum phase |
| | b. Vaccinium caespitosum common (1% cover). | -Vaccinium caespitosum phase |
| | c. Ligusticum canbyi or Trautvetteria caroliniensis common (1% cover). | -Ligusticum canbyi phase |
| | d. Not as above, Calamagrostis canadensis clearly dominant. | -Calamagrostis canadensis phase |
| 1. | Not as above. | 2 |
| 2. | Oplopanax horridum with at least 5% cover. | Abies lasiocarpa/Oplopanax horridum |
| 2. | Not as above. | 3 |
| 3. | Streptopus amplexifolius alone or in combination with the following species with Senecio triangularis, Trautvetteria caroliniensis, Ligusticum canbyi, and Mitella species with at least 5% cover. | Abies lasiocarpa/Streptopus amplexifolius |
| | a. Menziesia ferruginea with at least 5% cover. | -Menziesia ferruginea phase |
| | b. Menziesia ferruginea poorly represented and Ligusticum canbyi with at least 1% cover. | -Ligusticum canbyi phase |
| | c. Not as above. | -Streptopus amplexifolius phase |
| 3. | Not as above. | |

4.	Rhodendron albiflorum with at least 5% cover.	Abies lasiocarpa/Rhododendron albiflorum
4.	Not as above.	5
5.	Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology.	6
5.	Site without wetland characteristics.	Upland Site
6.	Overstory and understory dominated by native plant species.	Unclassified or undocumented palustrine needle-leaved forest type
6.	Overstory or understory dominated by exotic plant species.	Human induced palustrine needle-leaved forest type

Misc. Conifer key

1.	Abies grandis present and successfully reproducing	2
1.	Not as above, other conifers dominant.	4
2.	Oplopanax horridum with at least 5% cover.	Abies lasiocarpa/Oplopanax horridum
2.	Not as above.	3
3.	Clintonia uniflora present and not restricted to microsites. a. Menziesia ferruginea, Taxus brevifolia, Xerophyllum tenax, Physocarpus malvaceus, and/or Holodiscus discolor well represented. b. Not as above.	Abies grandis/Clintonia uniflora -upland phase -Clintonia uniflora phase
3.	Not as above.	10
4.	Pseudotsuga menziesii present and successfully reproducing.	5
4.	Not as above, others conifers dominant.	6
5.	Physocarpus malvaceus and/or Holodiscus discolor with at least 5% cover. a. Disporum hookeri or Smilacina stellata present; or Larix occidentalis or Galium triflorum common. b. Not as above.	Pseudotsuga menziesii/Physocarpus malvaceus -Smilacina stellata phase -Upland phase
5.	Not as above.	10
6.	Pinus contorta the dominant tree.	7

6.	Not as above.	10
7.	Calamagrostis canadensis or Ledum glandulosum well represented	Abies lasiocarpa/Calamagrostis canadensis
	a. Ledum glandulosum with at least 5% cover.	-Ledum glandulosum phase
	b. Vaccinium caespitosum common (1% cover).	-Vaccinium caespitosum phase
	c. Ligusticum canbyi or Trautvetaria caroliniensis common (1% cover).	-Ligusticum canbyi phase
	d. Not as above, Calamagrostis canadensis clearly dominant.	-Calamagrostis canadensis phase
7.	Not as above.	8
8.	Streptopus amplexifolius alone or in combination with the following species with Senecio triangularis, Trautvetaria caroliniensis, Ligusticum canbyi, and Mitella species with at least 5% cover.	Abies lasiocarpa/Streptopus amplexifolius
	a. Menziesia ferruginea with at least 5% cover.	-Menziesia ferruginea phase
	b. Menziesia ferruginea poorly represented and Ligusticum canbyi with at least 1% cover.	-Ligusticum canbyi phase
	c. Not as above.	-Streptopus amplexifolius phase
8.	Not as above.	9
9.	Asaurum caudatum, Clintonia uniflora, Tierella trifoliata, or Coptis occidentalis present or Linnaea borealis common	see a-d
	a. Within the Tsuga heterophylla zone	Tsuga heterophylla types
	b. Within the Thuja plicata zone	Thuja plicata types
	c. Within the Abies grandis zone	Abies grandis types
	d. Within the Abies lasiocarpa zone	Abies lasiocarpa types
9.	Not as above.	10
10.	Overstory dominated by one or a mix of the above conifer species. Understory dominated by Sphagnum species with scattered vascular plants.	Paludified forest
10.	Not as above.	
11.	Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology.	12
11.	Site without wetland characteristics.	Upland Site
12.	Overstory and understory dominated by native plant species.	Unclassified or undocumented palustrine needle-leaved forest type
12.	Overstory or understory dominated by exotic plant species.	Human induced palustrine needle-leaved forest type

Key to broad-leaved deciduous forest types

1.	Populus tremuloides with greater than 25% cover.	2
1.	Not as above, other deciduous trees dominant.	4
2.	Cornus sericea with at least 25% cover.	Populus tremuloides/Cornus sericea
2.	Not as above.	3
3.	Calamagrostis canadensis with at least 15% cover.	Populus tremuloides/ Calamagrostis canadensis
3.	Not as above.	8
4.	Populus trichocarpa or Populus deltoides alone or in combination with P. acuminata with at least 15% cover.	5
4.	Not as above.	8
5.	Community occurs on recently deposited alluvial bar or island with seedlings and saplings dominating the site.	Populus trichocarpa/Recent alluvial bar
5.	Not as above.	6
6.	Cornus sericea with at least 25% cover.	Populus trichocarpa/Cornus sericea
6.	Not as above.	7
7.	Symphoricarpos albus with at least 25% cover.	Populus trichocarpa/ Symphoricarpos albus
7.	Not as above.	8
8.	Poa pratensis the understory dominant with at least 25% cover.	Populus trichocarpa/Poa pratensis
8.	Not as above.	9
9.	Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology.	10
9.	Site without wetland characteristics.	Upland Site
10.	Overstory and understory dominated by native plant species.	Unclassified or undocumented palustrine broad-leaved deciduous forest type

10. Overstory or understory dominated by exotic plant species. Human induced palustrine broad-leaved deciduous forest type

Key to Palustrine Scrub-Shrub types

1. Willows with at least 25% cover. 2
1. Willows absent or with less than 25% cover. Mixed scrub-shrub dominated types
2. Tall willow species such as *Salix exigua*, *S. drummondiana*, *S. geyeriana*, *S. sitchensis*, or *S. bebbiana* alone or in combination with at least 25% cover. Tall willow types
2. Low willow species including *Salix wolfii*, *S. farriarum*, *S. commutata*, *S. candida* or *S. planifolia* var. *monica* alone or in combination with at least 25% cover. Undocumented or undescribed low willow types

Key to mixed scrub-shrub types

1. *Betula glandulosa* with at least 10% cover. 2
1. Not as above, tall shrubs dominant. 4
2. *Carex utriculata* (rostrata) and/or *C. aquatilis* with at least 25% cover. *Betula glandulosa*/*Carex utriculata*
2. Not as above. 3
3. *Carex lasiocarpa* with at least with at least 10% cover *Betula glandulosa*/*Carex lasiocarpa*
3. Not as above. 20
4. *Alnus incana* with at least 25% cover. 5
4. Not as above. 13
5. *Cornus sericea* with at least 10% cover. *Alnus incana*/*Cornus sericea*
5. Not as above. 6
6. *Spiraea douglasii* with at least 10% cover. *Alnus incana*/*Spiraea douglasii*
6. Not as above. 7
7. *Carex utriculata* and/or *Carex vesicaria* with at least 25% cover and the dominant graminoid. *Alnus incana*/*Carex utriculata*

7.	Not as above.	8
8.	Calamagrostis canadensis with at least 10% cover and the dominant graminoid.	Alnus incana/Calamagrostis canadensis
8.	Not as above.	9
9.	Equisetum arvense with at least 15% cover and the dominant herb.	Alnus incana/Equisetum arvense
9.	Not as above.	10
10.	Lysichitum americanum with at least 5% cover.	Alnus incana/Lysichitum americanum
10.	Not as above.	11
11.	Athyrium felix-femina with at least 5% cover.	Alnus incana/Athyrium felix-femina
11.	Not as above.	12
12.	Senecio triangularis, Aconitum columbianum, Actaea rubra, Smilacina stellata, and other mesic forbs in combination with at least 15% cover.	Alnus incana/Mesic Forb
12.	Not as above.	20
13.	Cornus sericea with at least 25% cover.	14
13.	Not as above.	16
14.	Heracleum lanatum with at least 5% cover.	Cornus sericea/Heracleum lanatum
14.	Not as above.	14
15.	Understory barren due to shading, annual scouring or absence of soil development.	Cornus sericea
15.	Not as above.	20
16.	Crataegus douglasii with at least 25% cover.	17
16.	Not as above.	18
17.	Heracleum lanatum with at least 5% cover.	Crataegus douglasii/Heracleum lanatum
17.	Not as above.	20

18.	<i>Spiraea douglasii</i> the dominant shrub with at least 25% cover.	<i>Spiraea douglasii</i>
18.	Not as above.	19
19.	<i>Rhamnus alnifolia</i> with at least 25% cover.	<i>Rhamnus alnifolia</i>
19.	Not as above.	20
20.	Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology.	21
20.	Site without wetland characteristics.	Upland Site
21.	Overstory and understory dominated by native plant species.	Unclassified or undocumented palustrine scrub-shrub type
21.	Overstory or understory dominated by exotic plant species.	Human induced palustrine scrub-shrub vegetation

Key to tall willow types

1.	<i>S. exigua</i> or <i>S. bebbiana</i> alone or in combination with at least 25% cover.	2
1.	Not as above.	9
2.	<i>Salix exigua</i> with greater cover than any other tall willow species.	3
2.	Not as above.	6
3.	Understory poorly developed or barren due to annual scouring, sediment deposition, or <i>S. exigua</i> a recent colonizer.	<i>Salix exigua</i> /Barren
3.	Not as above.	4
4.	Mesic graminoids such as <i>Carex lanuginosa</i> , <i>C. nebraskensis</i> , or <i>Juncus balticus</i> alone or in combination contribute at least 25% cover to the understory.	<i>Salix exigua</i> /Mesic graminoid
4.	Not as above.	5
5.	Mesic forbs including <i>Heracleum lanatum</i> , <i>Senecio triangularis</i> , <i>Smilacina stellata</i> , and <i>Mertensia</i> sp. alone or in combination contribute at least 10% cover to the understory.	<i>Salix exigua</i> /Mesic forb
5.	Not as above.	13
6.	<i>Salix bebbiana</i> the dominant willow with at least 15%	

	cover.	7
6.	Not as above.	9
7.	Mesic graminoids including <i>Poa pratensis</i> and <i>Phalaris arundinacea</i> with at least 25% cover.	<i>Salix bebbiana</i> /Mesic graminoid
7.	Not as above.	8
8.	Understory not dominated by mesic graminoids, forbs or shrubs.	<i>Salix bebbiana</i>
8.	Not as above	13
9.	<i>Salix drummondiana</i> the dominant willow, alone or in combination with <i>S. geyeriana</i> , or <i>S. sitchensis</i> , with at least 25% cover.	10
9.	Not as above.	13
10.	<i>Calamagrostis canadensis</i> with at least 25% cover.	<i>Salix drummondiana</i> / <i>Calamagrostis canadensis</i>
10.	Not as above.	11
11.	<i>Carex utriculata</i> (rostrata) with at least 25% cover.	<i>Salix drummondiana</i> / <i>Carex utriculata</i>
11.	Not as above.	12
12.	Mesic forbs including <i>Smilacina stellata</i> , <i>Mertensia</i> sp., and <i>Senecio triangularis</i> dominate the understory.	<i>Salix boothii</i> /Mesic forb
12.	Not as above.	13
13.	Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology.	14
13.	Site without wetland characteristics.	Upland Site
14.	Overstory and understory dominated by native plant species.	Unclassified or undocumented palustrine scrub-shrub type
14.	Overstory or understory dominated by exotic plant species.	Human induced palustrine scrub-shrub vegetation

Key to Palustrine Emergent vegetation types

1.	<i>Carex</i> species dominant.	<i>Carex</i> community type key
1.	Not as above or grass or forb species dominant.	Non-carex community type key

Key to sedge types

1.	Carex utriculata (rostrata) with at least 50% cover or the dominant species.	Carex utriculata
1.	Not as above.	2
2.	Carex vesicaria with at least 50% cover or the dominant species.	Carex vesicaria
2.	Not as above.	3
3.	Carex aquatilis with at least 50% cover or the dominant species.	Carex aquatilis
3.	Not as above.	4
4.	Carex scopulorum the dominant species with at least 50% cover.	Carex scopulorum
4.	Not as above.	5
5.	Carex simulata with at least 25% cover or the dominant species.	Carex simulata
5.	Not as above.	6
6.	Carex buxbaumii with at least 25% cover or the dominant species.	Carex buxbaumii
6.	Not as above.	7
7.	Carex lasiocarpa with at least 25% cover or the dominant species.	Carex lasiocarpa
7.	Not as above.	8
8.	Carex lanuginosa with at least 25% cover or the dominant species.	Carex lanuginosa
8.	Not as above.	9
9.	Carex microptera with at least 25% cover or the dominant species.	Carex microptera
9.	Not as above.	10
10.	Carex limosa with at least 25% cover or the dominant species.	Carex limosa
10.	Not as above.	11
11.	Carex cusickii with at least 25% cover or the dominant species.	Carex cusickii
11.	Not as above.	12

12.	Carex livida prominent with at least 10% cover.	Carex livida
12.	Not as above.	13
13.	Carex nebraskensis with at least 25% cover or the dominant species.	Carex nebraskensis
13.	Not as above.	14
14.	Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology.	15
14.	Site without wetland characteristics.	Upland Site
15.	Community dominated by native plant species.	Unclassified or undocumented palustrine emergent vegetation
15.	Native species replaced or nearly replaced by exotic plant species.	Human induced palustrine emergent vegetation

Key to non-sedge types

1.	Graminoids dominant.	2
1.	Forbs dominant.	14
2.	Calamagrostis canadensis with at least 25% cover or the dominant species.	Calamagrostis canadensis
2.	Not as above.	3
3.	Deschampsia cespitosa with at least 15% cover and the dominant species.	Deschampsia cespitosa
	a. Danthonia intermedia and Calamagrostis canadensis contributing greater cover than sedge or forb species.	Deschampsia cespitosa/Danthonia intermedia/Calamagrostis canadensis
3.	Not as above.	4
4.	Glyceria borealis with at least 25% cover or the dominant species.	Glyceria borealis community type
4.	Not as above.	5
5.	Agropyron smithii with at least 50% cover or the dominant graminoid.	Agropyron smithii
5.	Not as above.	6

6.	Phalaris arundinacea with at least 25% cover or the dominant species.	Phalaris arundinacea
6.	Not as above.	7
7.	Dulichium arundinaceum with at least 15% cover or the dominant species.	Dulichium arundinaceum
7.	Not as above.	8
8.	Eriophorum polystachion alone or in combination with other Eriophorum species with at least 25% cover.	Eriophorum polystachion
8.	Not as above.	9
9.	Scirpus acutus with at least 25% cover or the dominant species.	Scirpus acutus
9.	Not as above.	10
10.	Scirpus validus with at least 25% cover or the dominant species.	Scirpus validus
10.	Not as above.	11
11.	Scirpus microcarpus with at least 25% cover or the dominant species.	Scirpus microcarpus
11.	Not as above.	12
12.	Eleocharis palustris with at least 25% cover or the dominant species.	Eleocharis palustris
12.	Not as above.	13
13.	Juncus effusus and/or J. compactus alone or in combination with at least 25% cover or the dominant species.	Juncus effusus
13.	Not as above.	17
14.	Typha latifolia and/or Typha angustifolia alone or in combination with at least 50% cover.	Typha latifolia
14.	Not as above.	15
15.	Equisetum fluviatile the dominant species with at least 25% cover.	Equisetum fluviatile
15.	Not as above.	16
16.	Polygonum amphibium with at least 25% cover.	Polygonum amphibium
16.	Not as above.	17

- | | | |
|-----|---|---|
| 17. | Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. | 18 |
| 17. | Site without wetland characteristics. | Upland Site |
| 18. | Community dominated by native plant species. | Unclassified or undocumented palustrine emergent community type |
| 18. | Native species replaced or nearly replaced by exotic plant species. | Human induced palustrine emergent vegetation |

Key to Palustrine Aquatic bed (and Lacustrine Littoral) types

- | | | |
|----|---|--|
| 1. | Nuphar polysepalum with greater cover than any other plant species. | Nuphar polysepalum |
| 1. | Not as above. | 2 |
| 2. | Brasenia shreberi with greater cover than any other plant species. | Brasenia shreberi |
| 2. | Not as above. | 3 |
| 3. | Community dominated by native plant species. | Unclassified or undocumented palustrine aquatic bed vegetation |
| 3. | Native species replaced or nearly replaced by exotic plant species. | Human induced palustrine aquatic bed vegetation |

Key to Palustrine Moss-Lichen types

- | | | |
|----|--|--|
| 1. | Vascular plant species absent or restricted to microsites. Sphagnum species dense (100% cover) and forming slightly raised hummocks. | Ombrotrophic bog |
| 1. | Not as above. | 2 |
| 2. | Vascular plant species including Carex lasiocarpa, Carex limosa, Dulichium arundinaceum, Scheuchzeria palustris, Vaccinium oxycoccos, and Eriophorum species scattered in a solid Sphagnum lawn. | Poor fen |
| 2. | Not as above. | Unclassified or undocumented moss-lichen community types |

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Appendix B

Characterization abstracts for high ranking plant communities in northern Idaho.

Abies lasiocarpa/*Oplopanax horridum* community type B-2

Paludified forest B-3

Populus trichocarpa/*Cornus sericea* community type B-6

Alnus incana/*Mesic forb* community type B-8

Cornua sericea/*Heracleum lanatum* community type B-10

Crataegus douglasii/*Heracleum lanatum* community type B-13

Betula glandulosa/*Carex utriculata* community type B-14

Salix drummondiana/*Calamagrostis canadensis* community type B-16

Agropyron smithii community type B-18

Carex buxbaumii community type B-19

Carex cusickii community type B-22

Carex lanuginosa community type B-23

Carex lasiocarpa community type B-25

Carex limosa community type B-28

Carex simulata community type B-29

Dulichium arundinaceum community type B-32

Eriophorum polystachion community type B-33

Glyceria borealis community type B-35

Ombrotrophic bog B-36

Poor fen B-38

ABIES LASIOCARPA/OPLOPANAX HORRIDUM

COMMON NAME SUBALPINE FIR/DEVILS CLUB

PHYSIOGNOMIC TYPE FOREST

SIMILAR COMMUNITIES Sites are similar to those supporting *Thuja plicata*/*Oplopanax horridum* habitat types except *Abies lasiocarpa* typically occurs in colder areas.

RANGE Minor type in Idaho, Montana, British Columbia, and Alberta.

ENVIRONMENTAL DESCRIPTION *Abies lasiocarpa*/*Oplopanax horridum* occurs on ravine bottoms and sites near streams, springs, or seepage areas where the water table remains near the surface year round. Surface soils are very acidic, nongravelly loams. The duff layer is thick (7 to 10 centimeters) and mineral soils are not exposed.

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Tree canopy	<i>Abies lasiocarpa</i> , <i>Picea</i> spp.
Tree sub-canopy	<i>Larix occidentalis</i>
Short shrub	<i>Oplopanax horridum</i>
Herbaceous	<i>Clintonia uniflora</i> , <i>Tiarella trifoliata</i>
Non-vascular	<i>Athyrium filix-femina</i> , <i>Gymnocarpium dryopteris</i>

VEGETATION DESCRIPTION Old growth stands are codominated by *Abies lasiocarpa* and *Picea* species. Minor amounts of *Pseudotsuga menziesii*, *Larix occidentalis*, and *Pinus monticola* occur in nearly all stands. *Oplopanax horridum* and *Taxus brevifolia* average 30% cover each in the shrub understory. The forbs, *Clintonia uniflora*, *Tiarella trifoliata*, *Smilacina stellata*, and *Trautvetteria carolinensis* and the ferns, *Athyrium filix-femina* and *Gymnocarpium dryopteris* are usually present (Pfister et al. 1977).

WILDLIFE VALUES Forage production for deer and elk is probably low. Many wildlife species such as chestnut back chickadees and goshawks, are partially to strongly dependent on large old growth trees for forage, cover, and nesting sites (Hansen et al. 1995).

OTHER NOTEWORTHY SPECIES Information not available.

ADJACENT COMMUNITIES Adjacent wetter sites support *Carex* communities and drier sites may include the *Abies lasiocarpa*/*Calamagrostis canadensis* habitat type (Hansen et al. 1995).

CONSERVATION RANK G2 S2

SUCCESSION AND MANAGEMENT *Abies lasiocarpa* and *Picea* spp. are typically codominants in seral stands. Other seral tree species may include *Pseudotsuga menziesii*, *Larix occidentalis*, and *Pinus monticola*.

Productivity potential for timber is moderate to high, but sites are generally not suitable for timber production. Shallow rooted species, fine textured soils, and high water tables contribute to a high degree of instability, especially following logging of adjacent stands. This habitat type usually occupies very small areas, often has high recreational and aesthetic values, and has high water tables precluding the use of heavy equipment. Road construction, trails, and site development problems can be minimized by avoiding these sites. Domestic grazing potential is low (Hansen et al. 1995, Pfister et al. 1977).

CLASSIFICATION COMMENTS Classification based on 4 stands in Montana. Cooper et al. (1991) includes this as an incidental or rare habitat type in northern Idaho.

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AUTHOR Mabel Jankovsky-Jones

PALUDIFIED FOREST

COMMON NAME PALUDIFIED FOREST

PHYSIOGNOMIC TYPE SPARSE WOODLAND

SIMILAR COMMUNITIES Kunze (1994) describes a number of Conifer/Sphagnum types including *Pinus contorta*/*Ledum groenlandicum*/Sphagnum spp., *Pinus contorta*/*Thuja plicata*/*Myrica gale*/Sphagnum spp., *Pinus monticola*/*Ledum groenlandicum*/Sphagnum spp., *Tsuga heterophylla*/*Ledum groenlandicum*/Sphagnum spp., *Tsuga heterophylla*/Sphagnum spp., *Thuja plicata*-*Tsuga heterophylla*/*Gaultheria shallon*/*Lysichiton americanum*/Sphagnum spp. Plot data from Idaho's Paludified Forest stands is necessary to determine the relationship to Kunze's types.

RANGE Minor type throughout northern latitudes of North America and Europe.

ENVIRONMENTAL DESCRIPTION Paludified forests typically occur on the margins of closed basin peatlands. Soils are deep sphagnum peat. Water is at or near the surface during most of the growing season.

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Tree canopy	<i>Pinus monticola</i> , <i>Pinus contorta</i> , <i>Abies grandis</i> , <i>Abies lasiocarpa</i> , <i>Picea engelmannii</i> , <i>Thuja plicata</i> , <i>Tsuga heterophylla</i>
Short shrub	<i>Cornus canadensis</i> , <i>Gaultheria hispidula</i> , <i>Vaccinium oxycoccus</i>
Non-vascular	<i>Sphagnum centrale</i> , <i>Sphagnum subsecundum</i> , <i>Sphagnum magellanicum</i> , <i>Sphagnum angustifolium</i>

VEGETATION DESCRIPTION Paludified forests are characterized by an overstory with one or a combination of the following conifers; *Pinus contorta*, *P. monticola*, *Abies grandis*, *A. lasiocarpa*, *Picea engelmannii*, *Thuja plicata* and *Tsuga heterophylla*. The forest occurs on peat composed of *Sphagnum centrale*, *S. subsecundum*, *S. magellanicum*, and *S. angustifolium*. *Vaccinium oxycoccus*, *Gaultheria hispidula*, *Cornus canadensis*, *Linnaea borealis*, and various *Carex* spp. may also be present.

WILDLIFE VALUES The northern bog lemming may occupy relatively open wetlands adjacent to Paludified Forests. Grizzly bears have been sighted at peatlands in northern Idaho.

OTHER NOTEWORTHY SPECIES The plant species of concern *Andromeda polifolia*, *Gaultheria hispidula*, *Lycopodiella inundata*, *Rhynchospora alba*, *Triantha occidentalis* ssp. *brevistyla*, *Trientalis arctica*, and *Vaccinium oxycoccus* may be present. The animal species of concern, *Synaptomys borealis*, may occur in peatlands adjacent to this community.

ADJACENT COMMUNITIES Paludified forests typically form a mosaic with poor fen, rich fen, shrublands, and open water. Adjacent communities are frequently dominated by

Typha latifolia, *Carex lasiocarpa*, *Carex cusickii*, *Carex utriculata*, and other sedge species. A moat is often present on wetland margins and is bordered by shrubs such as *Spiraea douglasii* and *Alnus incana*.

CONSERVATION RANK G5 S1

SUCCESSION AND MANAGEMENT Paludification is the expansion of peatlands resulting from a rise in the water table from peat accumulation. In the northern Rocky Mountains paludification is best observed adjacent to closed basin peatlands where peat accumulation creates wetter conditions at the outer edge of the peatland. These conditions are favorable to the growth of *Sphagnum* spp. which creep upslope into the adjacent forests. This process is little studied in the Rocky Mountains, but is well documented in boreal regions (Chadde et al. 1996). A number of studies have reported the remains of a forest layer occurring below the surface of *Sphagnum* peat indicating that the eventual climax for Paludified Forests may be a larger, deeper peatland.

Drought years may make occurrence accessible to both domestic and wild grazing animals which could cause rutted and hummocky soils on margins. These sites are generally so wet as to preclude most types of recreational uses. Activities altering hydrology or introducing sediments to these systems should be avoided. The abrupt, large scale, and often irreversible nature of changes in hydrology and nutrient concentrations resulting directly or indirectly from human activities may be beyond the tolerance level of Paludified Forest communities.

CLASSIFICATION COMMENTS Classification based on written description and analysis of occurrence records in Idaho.

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EDITION 97-01-08

AUTHOR Mabel Jankovsky-Jones

POPULUS TRICHOCARPA/CORNUS SERICEA

COMMON NAME BLACK COTTONWOOD/RED-OSIER DOGWOOD

PHYSIOGNOMIC TYPE FOREST

SIMILAR COMMUNITIES May be the same as *Populus trichocarpa/Cornus stolonifera*-*Salix* in Oregon.

RANGE The *Populus trichocarpa/Cornus sericea* community type occurs in Montana, Washington, Idaho, and Oregon.

ENVIRONMENTAL DESCRIPTION *Populus trichocarpa* communities occur on alluvial terraces of major streams and rivers, and around lakes and ponds. Soil textures vary from loam to coarse sand, and are generally well drained with a low available water holding capacity. These sites are often flooded in the spring with water tables lowering to 3 or more feet below the soil surface at the end of summer; upper soil profiles remain moist due to capillary action. Coarse textured soils, moderate stream gradients, and high coarse fragment contents throughout the soil profile provide an environment that produces a rapid movement of highly aerated groundwater. Redox concentrations (mottles) are common as evidence of a fluctuating water table (Kovalchik et al. 1993, and Hansen et al. 1995).

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Tree canopy	<i>Populus trichocarpa</i>
Tall shrub	<i>Cornus sericea</i>
Low shrub	<i>Rosa</i> spp.
Herbaceous	<i>Smilacina stellata</i>

VEGETATION DESCRIPTION The *Populus trichocarpa/Cornus sericea* community type is characterized by an overstory dominated by *Populus trichocarpa* (25-85% cover) with *Populus angustifolia* and *Populus balsamifera* sometimes occurring as subordinates in the eastern portion of the range and *Betula papyrifera* and *Populus tremuloides* occurring as subordinates in the western portion of the range. The dense shrub layer is diverse and dominated by *Cornus sericea* (20-90% cover). *Amelanchier alnifolia*, *Symphoricarpos oreophilus*, *Alnus incana*, *Rosa woodsii*, *Salix exigua* and other *Salix* species are often

present. *Maianthemum stellatum*, *Smilacina stellata*, and *Equisetum arvense* are often present along with native graminoids, none of which have high constancy.

WILDLIFE VALUES This community type provides valuable cover, shade, and food for a variety of species. Big game use may be high, depending upon the time of year. The spreading crown of *Populus trichocarpa* provides nesting sites for *Haliaeetus leucocephalus* (bald eagles), *Pandion haliaetus* (osprey), and *Ardea herodias* (great blue heron). Woodpeckers, great horned owls, wood ducks, and raccoons nest in trunk cavities. Beaver use both the cottonwood and dogwood vegetation for food and building material. Understory species provide food and cover for a variety of waterfowl, small birds, and mammals. The streamside location of this community type is very important in providing thermal cover, debris recruitment, and streambank stability for fish habitat (Hansen et al. 1995).

OTHER NOTEWORTHY SPECIES Information not available.

SUCCESSION AND MANAGEMENT *Populus* is a pioneering species that requires moist, barren, newly deposited alluvium that is exposed to full sunlight. In the absence of fluvial disturbance, succession continues to a variety of communities dominated by conifers such as *Pinus ponderosa*, *Pseudotsuga menziesii*, *Abies grandis*, *Picea*, *Thuja plicata*, *Tsuga heterophylla*, *Abies lasiocarpa*, and *Juniperus scopulorum*. If conifers are absent, shrubs and herbaceous species that formed the former undergrowth may persist. Stands in the moister regions are successional to habitat types from the *Populus tremuloides*, *Thuja plicata* series, and the *Picea/Cornus sericea* habitat types. In other instances, this community type may be successional to the *Salix geyeriana/Calamagrostis canadensis* habitat type or the *Salix lutea/Calamagrostis canadensis* habitat type, depending upon elevation. If disturbance is severe enough, all shrubs can be eliminated and the understory will be converted to a herbaceous one dominated by species such as *Poa pratensis*, *Phleum pratensis*, *Bromus inermis*, and *Centaurea maculosa* (Hansen et al. 1995).

Forage production is rated from low to moderate due to the dense nature of the stands which limit the amount of available forage. Timber productivity ranges from low to moderate. Because of its close proximity to streams and rivers and the flat topography, recreational developments and transportation corridors are common within this type; care must be taken when locating structures - some structures have been damaged by floods or lost altogether. Management should emphasize the importance of the understory shrub layer in streambank stabilization; a buffer strip of *Populus trichocarpa* dominated community types should be maintained adjacent to rivers and streams. Under certain conditions, fire may be used as a tool to extend the life span or rehabilitate a stand (Hansen et al. 1995 and Boggs et al. 1990).

ADJACENT COMMUNITIES Adjacent wetter communities may be dominated by the *Salix exigua*, *S. lasiandra*, *S. drummondiana*, *S. geyeriana*, *Carex utriculata*, *C. buxbaumii*, or a variety of *Alnus incana* or *Typha latifolia* community types. Adjacent drier communities may be dominated by *Populus trichocarpa* types, or habitat types from the *Pseudotsuga menziesii*, *Pinus ponderosa*, *Thuja plicata* and *Juniperus scopulorum* series (Hansen et al. 1995, Kovalchik et al. 1993, and Boggs et al. 1990).

CONSERVATION RANK G4 S1

CLASSIFICATION COMMENTS Classification based on 60 stands in Montana, 8 stands in Oregon, and an unknown number of stands in Idaho.

REFERENCES

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Kovalchik, B. L. 1993. Riparian plant associations on the national forests of eastern Washington- Draft version 1. USDA Forest Service, Colville National Forest, Colville, WA. 203 pp.

EDITION 95-08-07

AUTHOR L. Williams

ALNUS INCANA/MESIC FORB

COMMON NAME MOUNTAIN ALDER/MESIC FORB

PHYSIOGNOMIC TYPE SHRUBLAND

SIMILAR COMMUNITIES Kovalchik et al.'s (1993) Oregon stands have shrub and tree composition similar to Idaho, Utah, and Nevada stands. The understory is somewhat distinct with *Cinna latifolia*, *Streptopus amplexifolius*, and *Athyrium* spp. having high constancy. Additionally, Kovalchik may have included some stands treated by Youngblood et al. (1989) as *Alnus incana*/*Cornus sericea* in his Mesic forb type. Nevada stands are similar to Utah and southeastern Idaho stands (Manning and Padgett 1992). Hansen et al. (1995) treats all stands with *Alnus incana* as the dominant shrub as the *Alnus incana* dominance type.

RANGE Minor type in Montana, eastern Oregon, Idaho, Nevada, Utah, Wyoming, and Colorado.

ENVIRONMENTAL DESCRIPTION *Alnus incana*/Mesic forb occurs on terraces and floodplains adjacent to streams with bedloads of boulders, cobble, and gravel (Kovalchik 1993). Soils are generally shallow; surface textures range from sand to loamy sand. Mottling is typically present within 25 cm of the surface, indicating a seasonally high water table, and most sites remain somewhat moist and well-aerated through summer (Padgett et al. 1989, Kovalchik 1993).

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Tall shrub	<i>Alnus incana</i>
Herbaceous	<i>Heracleum lanatum</i> , <i>Geranium richardsonii</i> , <i>Equisetum arvense</i> , <i>Aconitum columbianum</i> , <i>Galium triflorum</i>

VEGETATION DESCRIPTION *Alnus incana* clearly dominates the tall shrub overstory with over 40% cover. Conifers, including *Abies lasiocarpa*, *Picea engelmannii* and *Pinus contorta*, are sometimes present. The undergrowth is characterized by mixed forb cover of *Heracleum lanatum*, *Geranium richardsonii*, *Equisetum arvense*, *Mertensia* spp., *Aconitum columbianum*, *Galium triflorum*, and *Smilacina stellata* with over 100% cover in combination. A somewhat sparse low shrub layer is often present and may include *Lonicera involucrata*, *Ribes* spp., and *Rosa* spp. The graminoids *Glyceria elata*, *Agrostis stolonifera*, *Elymus glaucus* and *Poa pratensis* may contribute a combined cover of up to 50%.

WILDLIFE VALUES The high structural diversity provided by this type provides thermal and hiding cover for native ungulates including mule and white tail deer. Numerous bird species make use of this type for food and nesting (Hansen et al. 1995).

OTHER NOTEWORTHY SPECIES Information not available.

SUCCESSION AND MANAGEMENT Some *Alnus incana*/Mesic forb sites may exist as stable seres, while others are successional to various tree- and shrub- dominated associations. Padgett et al. (1989) suggests a trend towards *Abies lasiocarpa* and *Picea engelmannii* types, or as sites become more xeric, *Acer negundo* types. In Montana, the *Alnus incana* community type is reported to become established after severe stream disturbance resulting from placer mining, annual ice jams, or historic tie drives. Hansen notes the *Alnus incana* community type may persist for a long time before finally being replaced by the *Salix geeyeriana* or *Salix lutea* types, depending upon elevation. Other areas may see a gradual conversion to *Pseudotsuga menziesii*/*Cornus stolonifera* habitat type (Hansen et al. 1995). Grazing may result in the type being replaced by the *Alnus incana*/Mesic graminoid community type (Padgett et al. 1989).

Alnus incana is highly adapted to most forms of disturbance and may exist as a stable sere. Forage value for livestock is rated low to moderate; livestock grazing should be minimized to maintain these communities (Manning et al. 1992). Padgett et al. (1989) notes that because of typically open undergrowth, this community type is more likely to be impacted by livestock grazing. *Alnus incana* community types generally occur immediately adjacent to stream channels, and therefore, provide stability to streambanks and shade to the stream channel, as well as providing habitat for a variety of wildlife and avian species. Cool fires will not kill *Alnus incana* if the root crown does not burn. Fire will rejuvenate older, decadent alder stands (Manning et al. 1992).

ADJACENT COMMUNITIES Adjacent riparian communities types may include the *Populus angustifolia/Rosa woodsii*, *Populus/Grass*, *Conifer/Equisetum arvense*, or *Salix* dominated types. Adjacent forested communities include those dominated by *Picea engelmannii* and *Pseudotsuga menziesii* (Padgett et al. 1989, Hansen et al. 1995, Manning et al. 1992, Kovalchik 1993).

CONSERVATION RANK G3G4 S1

CLASSIFICATION COMMENTS Classification based on 50 stands in Colorado, 15 stands in Utah, 10 stands in Nevada, 22 stands in Oregon (may include some *A. incana/Cornus sericea*) and an unknown number of stands in Montana (classified as a dominance type).

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- Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, D.K. Hinckley. 1995. Classification and Management of Montana's Riparian and Wetland Sites. Montana Forest and Conservation Experiment Station, School of Forestry, Missoula, MT. 646 pp.
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EDITION 1996

AUTHOR Linda Williams

CORNUS SERICEA/HERACLEUM LANATUM

COMMON NAME RED-OSIER DOGWOOD/COW PARSNIP

PHYSIOGNOMIC TYPE SHRUBLAND

SIMILAR COMMUNITIES Youngblood et al. (1985) consider *Cornus sericea*/*Galium triflorum* community type to be closely related to the *Cornus sericea*/*Heracleum lanatum* community type.

RANGE The *Cornus sericea*/*Heracleum lanatum* community type is a major type in northern Utah, and Idaho (Padgett et al. 1989, Youngblood et al. 1985). It is a minor type in southwestern Utah (Padgett et al. 1989).

ENVIRONMENTAL DESCRIPTION A combination of stream order and slope seem to be important in the establishment of the *Cornus sericea*/*Heracleum lanatum* community type. The development of a Mollic epipedon indicates that this community type, which occurs adjacent to stream channels, is stable enough for the incorporation of organic matter. Some soils may contain more than 35% rock fragments; the fine earth is usually loamy. Some sites where this community type occurs are currently elevated above the annual flood plain to a degree that annual fluvial action no longer takes place (Padgett et al. 1989, Youngblood et al. 1985).

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Tall shrub	<i>Cornus sericea</i> , <i>Salix exigua</i>
Low shrub	<i>Ribes</i> spp.
Herbaceous	<i>Heracleum lanatum</i>

VEGETATION DESCRIPTION *Cornus sericea* forms a dense shrub layer with 70% cover. *Salix exigua*, *S. lutea* and *S. drummondiana* may be codominants. Other shrubs including *Ribes aureum*, *R. hudsonianum*, *R. lacustre*, *R. inerme*, *Rosa woodsii* and *Crataegus douglasii* may be present. *Heracleum lanatum* is diagnostic with 5-20% cover. Other common herbaceous species include *Galium triflorum*, *Geum macrophyllum*, *Smilacina stellata*, *Mertensia ciliata* and *Urtica dioica* (Padgett et al. 1989, Youngblood et al. 1985).

WILDLIFE VALUES Small mammals and avian species may seek shelter and food in this type (Youngblood et al. 1985). The dominant shrub is browsed by native ungulates (moose) and livestock when other feed is in short supply or unavailable. Sampson and Jespersen (1963) rated *Cornus sericea* as poor browse for deer (Padgett et al. 1989).

OTHER NOTEWORTHY SPECIES Information not available.

SUCCESSION AND MANAGEMENT The community type is a relatively stable, early successional type that colonizes stream bars and adjacent areas (Padgett et al. 1989). Youngblood et al. (1985) tentatively suggests that the *Cornus sericea* community type is seral to the *Picea/Cornus sericea* community type. Dense shrubs and accumulation of organic matter on soil surfaces may prevent most seedling establishment, but if flooding, and the subsequent deposition of mineral soil occurs, conifer seedlings may become established.

Cornus sericea is an important streambank stabilizer due to its strongly rhizomatous nature, and the ability of above ground stems to slow water movement through the community during high water flows. This is particularly important on the higher gradient stream channels where scouring by seasonal flooding may occur. Some stream shading is provided adjacent to the streambanks. Little forage is available for grazing; the dense shrub stratum limits livestock movement through this community type (Padgett et al. 1989, Youngblood et al. 1985).

Management should emphasize the importance of *Cornus sericea* for streambank stabilization. Rehabilitation should include fencing to exclude grazing by domestic livestock. In sites with a more open shrub layer, *Cornus* will readily establish along stream edges by direct seeding or planting nursery grown stock. Its rapid growth will quickly stabilize deteriorating streambanks (Hansen et al. 1995).

ADJACENT COMMUNITIES Associated riparian communities may include *Betula occidentalis*, *Salix exigua*, and other low-elevation community types. Adjacent upland communities may be dominated by *Pseudotsuga menziesii*, *Quercus gambelii*, *Acer glabrum* and/or *Artemisia tridentata* ssp. *vaseyana* (Padgett et al. 1989).

CONSERVATION RANK G3 S2

CLASSIFICATION COMMENTS Classification based on 6 stands in eastern Idaho and western Wyoming, 11 stands in Utah and southeastern Idaho and an unknown number of stands in Utah.

REFERENCES

- Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, D.K. Hinckley. 1995. Classification and Management of Montana's Riparian and Wetland Sites. Montana Forest and Conservation Experiment Station, School of Forestry, Missoula, MT. 646 pp.
- Padgett, W. G., A. P. Youngblood, and A. H. Winward. 1989. Riparian community type classification of Utah and southeastern Idaho. USDA Forest Service R4-Ecol-89-01. Intermountain Region, Ogden, UT. 191 pp.

Youngblood, A. P., W. G. Padgett, and A. H. Winward. 1985. Riparian community type classification of eastern Idaho - western Wyoming. USDA Forest Service R4-Ecol-85-01. Intermountain Region, Ogden, UT. 78 pp.

EDITION 95-09-12

AUTHOR L. Williams

CRATAEGUS DOUGLASII/HERACLEUM LANATUM

COMMON NAME BLACK HAWTHORN/COW PARSNIP

PHYSIOGNOMIC TYPE SHRUBLAND

SIMILAR COMMUNITIES Includes Daubenmire's (1970) *Crataegus douglasii*/*Heracleum lanatum*, *Populus tremuloides* phase and the *Populus tremuloides*/*Crataegus douglasii*/*Heracleum lanatum* community type.

RANGE Found in the Columbia Basin within the Palouse grassland zone, of southeastern Washington, northeastern Oregon and into western Idaho. Type occasionally occurs in eastern Idaho and parts of Wyoming.

ENVIRONMENTAL DESCRIPTION Elevations range from 1800 to 2600 feet in the semi-arid steppe region of eastern Washington. Typically found on aggraded valley floors (locally called "flats") which border intermittent or permanent streams and with dependable soil moisture. These are valleys which accumulated glacial outwash materials of fine silts and clays. Often extends up contiguous north-facing slopes where there is seepage providing constant moisture.

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Tall shrub	<i>Crataegus douglasii</i> , <i>Prunus virginiana</i>
Herbaceous	<i>Heracleum lanatum</i> , <i>Hydrophyllum fendleri</i> , <i>Urtica dioica</i> , <i>Smilacina stellata</i>

VEGETATION DESCRIPTION This is a dense thicket of the broad-leaved, deciduous shrub *Crataegus douglasii* of 5 to 7 meters height. The understory is dominated by a lush layer of a combination of the tall (up to 2 m tall) perennial forbs *Heracleum lanatum*, *Hydrophyllum fendleri* or *Urtica dioica*. The dense herbaceous layer provides so much shade that few shorter species are able to establish, unless they have a growth peak in the

spring before the *Heracleum* develops. A few locations have a tree layer of *Populus tremuloides*, but apparently do not differ in environmental characteristics.

WILDLIFE VALUES *Crataegus* thickets support a rich avifauna. The berries are utilized for food well into autumn and the canopies are much used for nesting. Black-billed magpies build nests in the crowns which are then used by long-eared owls for nest foundations. Thrushes and vireos of the steppe region inhabit these thickets, apparently year-round.

OTHER NOTEWORTHY SPECIES This type frequently has a floristic component characteristic of the nearby mountains, such as *Circaea alpina*, *Cornus stolonifera*, *Elymus glaucus*, *Geum macrophyllum*, *Osmorhiza chilensis*, and *Pteridium aquilinum*. It is also very susceptible to degradation by livestock use, which results in an understory of the exotic annual grasses *Bromus tectorum* and *Poa pratensis*.

SUCCESSION AND MANAGEMENT

ADJACENT COMMUNITIES Adjacent wetter communities may be dominated by *Salix boothii*/*Carex utriculata*, *Salix boothii*/*Equisetum arvense*, or *Salix boothii*/*Poa pratensis*.

CONSERVATION RANK G2 S1

REFERENCES

Daubenmire, R. 1970. Steppe vegetation of Washington. Washington Agricultural Experiment Station, Technical Bulletin 62. 131 pp.

EDITION 93-06-10

AUTHOR REID

BETULA GLANDULOSA/CAREX UTRICULATA

COMMON NAME BOG BIRCH/BEAKED SEDGE

PHYSIOGNOMIC TYPE SHRUBLAND

SIMILAR COMMUNITIES The *Betula glandulosa*/*Carex utriculata* habitat type has not been previously described (Hansen et al. 1995). Stands dominated by *Betula glandulosa* are common throughout the Rocky Mountain region (Windell et al. 1986).

RANGE *Betula glandulosa*/*Carex utriculata* is a minor type at mid elevations in western Montana (Hansen et al. 1995), and throughout Idaho (Moseley et al. 1991, Bursik and Moseley 1995).

ENVIRONMENTAL DESCRIPTION This community type occurs adjacent to beaver ponds, lakes, or marshes, and on seeps, swales and wet alluvial terraces adjacent to low gradient meandering streams. Soils are commonly flooded until mid summer, and are saturated year round on wetter sites. Redox concentrations are present in some mineral soils; redox depletions (gleyed soil) occur rarely. Organic matter accumulations may form floating, quaking mats as this type encroaches onto open water. Drier extremes have shallow organic horizons overlying deeper mineral soil (Hansen et al. 1995).

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Short shrub	<i>Betula glandulosa</i> , <i>Potentilla fruticosa</i>
Herbaceous	<i>Carex utriculata</i> , <i>Carex aquatilis</i>

VEGETATION DESCRIPTION *Betula glandulosa* contributes an average of 35% to the overstory. Minor amounts of *Potentilla fruticosa* and *Salix* species are usually present. The canopy cover provided by the various shrubs is sparse to moderate, but the herbaceous layer cover is high. Associated shrubs include *Rhamnus alnifolia* and various willows. Understory species composition is dependent on water levels. The wettest sites support *Carex utriculata* and *C. aquatilis*. *Geum macrophyllum* and the graminoids *Poa pratensis* and *Agrostis stolonifera* are often present in drier micro-sites and/or disturbed sites (Hansen et al. 1995).

WILDLIFE VALUES *Betula glandulosa* provides fish and beaver habitat (Hansen et al. 1995) and is a valuable browse species for elk (Kufeld 1973).

OTHER NOTEWORTHY SPECIES Information not available.

SUCCESSION AND MANAGEMENT

Forage production is often moderate to high. The wet soils are susceptible to soil compaction and streambank sloughing when used by livestock and heavy machinery. Overuse may result in reduced vigor or eventual elimination of shrubs from the site. Burning of this type can temporarily increase productivity of *Carex* species; care should be taken when burning along streambanks because of the excellent erosion protection provided by *Betula glandulosa*/*Carex utriculata* habitat type. It has often been the policy of land managers to trap and kill beaver; however, because beaver produce such desirable habitat and provide many beneficial stream functions, their removal from a riparian system needs to be closely evaluated (Hansen et al. 1995).

ADJACENT COMMUNITIES Adjacent wetter sites may be dominated by *Salix drummondiana*, *S. geyeriana*, *Carex utriculata* or *C. buxbaumii* types. Drier wetland communities support *Poa pratensis*, *Populus trichocarpa*, and *Potentilla fruticosa*. At higher elevations, adjacent wetland forests are often dominated by *Picea engelmannii* or *Abies lasiocarpa*. Adjacent uplands support habitat types from the *Abies lasiocarpa*, *Pseudotsuga menziesii*, and *Pinus ponderosa* series, depending on elevation and aspect (Hansen et al. 1995).

CONSERVATION RANK G4? S3

CLASSIFICATION COMMENTS

REFERENCES

Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, D.K. Hinckley. 1995. Classification and Management of Montana's Riparian and Wetland Sites. Montana Forest and Conservation Experiment Station, School of Forestry, Missoula, MT. 646 pp.

EDITION 95-09-05

AUTHOR L. Williams

SALIX DRUMMONDIANA/CALAMAGROSTIS CANADENSIS

COMMON NAME DRUMMOND'S WILLOW/BLUEJOINT REEDGRASS

PHYSIOGNOMIC TYPE SHRUBLAND

SIMILAR COMMUNITIES Includes Tuhy's (1981) *Salix drummondiana*/*Ribes lacustre*/*Thalictrum occidentale*, Mutz's (1983) *Salix drummondiana*-*Salix boothii*/*Calamagrostis canadensis*, and Baker's (1989) *Salix drummondiana*-*Salix monticola*/*Calamagrostis canadensis*-*Carex rostrata* types.

RANGE Minor type in the middle Rocky Mountains.

ENVIRONMENTAL DESCRIPTION *Salix drummondiana*/*Calamagrostis canadensis* occurs on low gradient slopes adjacent to beaver ponds, lakes, marshes, rivers and streams, or on toeslopes below upland sites. Soils are coarse to fragmented loams or grass peat over deep, erosive, moderately fine textured alluvium (Kovalchik 1993, Tuhy et al. 1982). This community is relatively dry compared to other willow plant association with water levels ranging from at the surface to 100 cm below the surface during the growing season.

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Tall shrub	Salix drummondiana, Alnus incana
Low shrub	Lonicera involucrata, Ribes spp. Potentilla fruticosa
Herbaceous	Calamagrostis canadensis

VEGETATION DESCRIPTION Salix drummondiana dominates the tall shrub layer (25-60% cover). Salix gezeriana, Salix boothii and Salix monticola are sometimes present in lesser amounts than the dominant shrub. Lonicera involucrata, Ribes spp., Alnus incana, and Potentilla fruticosa are usually present with up to 15% cover individually. Calamagrostis canadensis contributes at least 5% and up to 60% cover to the understory. Other species with high constancy include Carex microptera, C. utriculata, C. aquatilis, Deschampsia cespitosa, Aster foliaceus, and Fragaria virginiana.

WILDLIFE VALUES Provides habitat for elk, moose, beaver, and a number of songbirds.

OTHER NOTEWORTHY SPECIES Information not available.

SUCCESSION AND MANAGEMENT Grazing pressure will cause a decrease in Calamagrostis canadensis and Deschampsia cespitosa, with a corresponding increase in either introduced or less desirable species such as Ribes setosum, Urtica dioica, and Equisetum arvense. Abundance of Calamagrostis canadensis suggests that communities may be seral stages of Abies lasiocarpa/Calamagrostis canadensis habitat type. The development of a conifer overstory tends to reduce and eventually eliminate the shade intolerant Salix species without affecting the herbaceous layer (Tuhy et al. 1982, Hansen et al. 1995).

The vigor of Salix spp. in these communities appears directly related to streambank stability and rate of sedimentation into stream systems (Tuhy et al. 1982). Sustained grazing decreases the vigor, reproductive success, and competitive ability of Calamagrostis canadensis and Deschampsia cespitosa. To maintain vigor and prevent damage to soils and vegetation, grazing should be deferred until soils dry; proper levels of grazing should range from light to moderate. Overuse by livestock will result in reduced vigor of willow species present, illustrated by uneven stem age distribution, highlining, clubbing or dead clumps. With continued overuse, willows may be eventually eliminated from the site (Hansen et al. 1995).

ADJACENT COMMUNITIES Adjacent wetter sites may support Salix drummondiana/Carex utriculata, Carex utriculata, C. aquatilis, or C. scirpoidea var. pseudoscirpoidea types, or open water. Drier sites may support Salix dominated types with a Poa pratensis or Juncus balticus understory, or Potentilla fruticosa, Alnus incana or conifer dominated types (Hansen et al. 1995, Kovalchik 1993).

CONSERVATION RANK G2 S3

CLASSIFICATION COMMENTS Classification is based on 25 stands in Montana, 83 stands in Idaho, 6 stands in eastern Washington, and an unknown number of stands in Colorado.

REFERENCES

Baker, W. L. 1989. Classification of the riparian vegetation of the montane and subalpine zones in western Colorado. Great Basin Naturalist 49(2):214-228.

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Kovalchik, B. L. 1993. Riparian plant associations on the national forests of eastern Washington-Draft version 1. USDA Forest Service, Colville National Forest, Colville, WA. 203 pp.

Mutz, K. M., and J. Queiroz. 1983. Riparian community classification for the Centennial Mountains and South Fork Salmon River, Idaho. Meiji Resource Consultants, Layton, UT. 170 pp.

Tuhy, J. S. 1981. Stream bottom community classification for the Sawtooth Valley, Idaho. Unpublished thesis, University of Idaho, Moscow. 230 pp.

Tuhy, J. S., and S. Jensen. 1982. Riparian classification for the Upper Salmon/Middle Fork Salmon River drainages, Idaho. White Horse Associates, Smithfield, UT. 183 pp.

EDITION 1996-06-13

AUTHOR Linda Williams

AGROPYRON SMITHII

COMMON NAME WESTERN WHEATGRASS HERBACEOUS VEGETATION

PHYSIOGTYPE HERBACEOUS

SIMILAR COMMUNITIES This community is similar to several others that are dominated or co-dominated by *Agropyron smithii*. Further work needs to be done to refine the differences in composition and environmental characteristics.

RANGE Minor type at lower elevations in Montana, Idaho, Colorado, Utah, Nebraska, Saskatchewan, and possibly North Dakota.

ENVIRONMENTAL DESCRIPTION This community occurs on flat to gently sloping topography. Soils are clay, clay loam, and silt loam. It is sometimes found on alluvial fans of small streams or in swales where either overland flow or fine textured soils allow for wetter moisture regimes. Seasonal flooding is common in spring following snowmelt. The community is able to withstand drought conditions.

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Herbaceous	Agropyron smithii

VEGETATION DESCRIPTION Agropyron smithii occurs in nearly pure stands (80% cover) with few associates. Species such as Koeleria macrantha and Poa spp. may be locally abundant. Artemisia ludoviciana, Bouteloua gricilis, Stipa viridula, and Stipa comata may also be present. The type occurs in swales and nearly level alluvial terraces where either overland flow or fine textured soils allow for a wetter moisture regime (Hansen et al. 1995).

WILDLIFE VALUES Agropyron smithii community types may be used by waterfowl for nesting sites. The dominant graminoid is preferred by antelope and deer during the spring.

OTHER NOTEWORTHY SPECIES Information not available

SUCCESSION AND MANAGEMENT Overgrazing of this type will reduce the vigor of the dominant graminoid and may eventually result into conversion to a type dominated by the exotics Poa pratensis or Agrostis stolonifera. When grazing is removed Symphoricarpos occidentalis, Glycyrrhiza lepidota, and Cirsium arvense may invade (Hansen et al. 1995).

Agropyron smithii is tolerant of fire during the dormant state. During the growing season recovery from fire may be delayed. The dominant graminoid has potential for revegetating disturbed or degraded wetland sites. Transplants are desirable since seedlings may be slow growing. Once the species becomes established, the plants are able to spread quickly by rhizomes (Hansen et al. 1995).

ADJACENT COMMUNITIES Adjacent wetter sites may include Spartina gracilis, Phragmites australis, or Phalaris aurundinacea communities. Drier sites are typically occupied by upland species (Hansen et al. 1995).

CONSERVATION RANK G3G5 S1

CLASSIFICATION COMMENTS Classification is based on 32 stands in Montana and an unknown number of stands in eastern Idaho.

REFERENCES

Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, D.K. Hinckley. 1995. Classification and Management of Montana's Riparian and Wetland Sites. Montana Forest and Conservation Experiment Station, School of Forestry, Missoula, MT. 646 pp.

EDITION 96-02-05

AUTHOR M. J.-Jones

CAREX BUXBAUMII

COMMON NAME BUXBAUM'S SEDGE

PHYSIOGNOMIC TYPE HERBACEOUS

SIMILAR COMMUNITIES Includes the *Carex buxbaumii*-*Carex saxatilis* (Tuhy 1981) c.t. and *Carex buxbaumii*-*Carex aquatilis* (Mattson 1984) h.t. and phases.

RANGE *Carex buxbaumii* is a minor type in the Uinta Mountains of Utah, western and south-central Montana, Yellowstone National Park, and 4 disjunct areas of Idaho.

ENVIRONMENTAL DESCRIPTION This community type occurs in moderately broad valley bottoms with gently sloping, adjacent forested uplands. Mineral soils of alluvial origin are overlaid by organic matter 20-50 cm thick, resulting in a well humified mucky peat. Saturated soil conditions persist in the surface peat from mid spring to mid summer. Water levels may then drop to the soil surface or, on drier stands, to several decimeters below the surface

MOST ABUNDANT SPECIES

Strata

Herbaceous

Species

Carex buxbaumii, *C. saxatilis*, *C. aquatilis*, *Deschampsia cespitosa*, *Pedicularis groenlandica*

VEGETATION DESCRIPTION *Carex buxbaumii* has 25% or greater cover. *Carex aquatilis* and/or *Carex saxatilis* are present and occasionally are co-dominants. Other associates are *Deschampsia cespitosa*, *Caltha leptosepala*, *Eleocharis pauciflora*, *Senecio cymbalaroides*, *Pedicularis groenlandica*, *Ligusticum tenuifolium* and *Carex lanuginosa*, *C. utriculata*, *C. lasiocarpa*, *C. muricata*, *C. livida*, *C. nebraskensis*, *C. praegracilis*, and *C. simulata* (Padgett et al 1989). Size of the occurrence is dependent on the presence of permanently saturated soils. This element is often along streams and in the wettest portion of the wetland complex and is interspersed with the *Carex utriculata*, *Salix* spp./*Carex aquatilis* and *Eleocharis pauciflorus* community types.

WILDLIFE VALUES The community type is generally flooded long enough to provide nesting habitat for waterfowl. It also provides important habitat for raptors, deer, and elk.

OTHER NOTEWORTHY SPECIES The plant species of concern *Carex buxbaumii* is always present and *Juncus tweedyi* may be present.

SUCCESSION AND MANAGEMENT Primary succession starting from the *Carex buxbaumii* community type will probably advance to fairly stable later stages where this community type occupies abandoned stream channels. These positions are no longer subject to periodic regression from abrasive flooding. The slow buildup of soil materials above the water table can result in trends toward the *Scirpus caespitosus/Carex livida* community type or the *Pinus contorta/Vaccinium occidentale* community type (Tuhy 1981).

Herbage production varies from low to moderate, the wet nature is a natural deterrent to livestock grazing. Drier stands with large amounts of *Deschampsia cespitosa* provide palatable forage, but the generally limited extent of the *C. buxbaumii* community type decreases its usefulness.

Viability of the community is threatened by presence of invasive exotics or increasers, and human activity which results in alterations of wetland processes, i.e. diversions, parking lots, roads, and clear cutting. Alteration of hydrology and subsequent dewatering may result in occurrences being accessible to cattle. Fencing of these relatively small communities is a practical management method for restoration when the hydrologic regime is intact.

ADJACENT COMMUNITIES In addition to occupying streamside locations, the *Carex buxbaumii* community may occur in depressions within adjacent riparian types; such as the *Scirpus caespitosus-Carex livida*, and *C. utriculata*, *Eleocharis pauciflorus*, and *Salix spp./Carex aquatilis* ct. Also prevalent within the forested valley bottoms are the *Abies lasiocarpa/Vaccinium caespitosum* HT- *Calamagrostis canadensis* phase, and *Abies lasiocarpa/Vaccinium caespitosum-Vaccinium caespitosum* habitat types. Boundaries among these are relatively distinct, but complex mosaics with small fragments of each type are common. Drier adjacent community types may be dominated by *Juncus balticus*, *Deschampsia cespitosa*, or *Betula glandulosa*. Upland forests include the *Pinus contorta-Vaccinium occidentale* or *Picea engelmanni/Vaccinium scoparium* habitat types (Tuhy 1981).

CONSERVATION RANK G3 S1

CLASSIFICATION COMMENTS Classification is based on 4 stands in Utah, 3 stands in Wyoming, 5 stands in Idaho, and an unknown number stands in Montana.

REFERENCES

Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, D.K. Hinckley. 1995. Classification and Management of Montana's Riparian and Wetland Sites. Montana Forest and Conservation Experiment Station, School of Forestry, Missoula, MT. 646 pp.

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Tuhy, J. S. 1981. Stream bottom community classification for the Sawtooth Valley, Idaho. Unpublished thesis, University of Idaho, Moscow. 230 pp.

EDITION 95-06-09

AUTHOR L. Williams

CAREX CUSICKII

COMMON NAME CUSICK SEDGE

PHYSIOGNOMIC TYPE HERBACEOUS

SIMILAR COMMUNITIES Similar communities are not known.

RANGE Minor type in north Idaho, eastern Oregon, and Washington.

ENVIRONMENTAL CONDITIONS The community type occurs in flat, moderately wide valleys at middle elevations and usually occupies former lake basins, kettle holes, abandoned beaver ponds, and lake and stream margins. Organic soils are saturated throughout much of the growing season. Textures are mostly ooze and mucks.

MOST ABUNDANT SPECIES

Strata

Herbaceous

Species

Carex cusickii, Carex vesicaria, Equisetum fluviatile

VEGETATION DESCRIPTION Carex cusickii is clearly dominant with 45-80% cover. Other herbaceous species are frequently present with low cover and may include Carex vesicaria or less frequently C. utriculata and the forbs Polemonium occidentale, Potentilla palustris, and Veronica americanus.

WILDLIFE VALUES Cusick's sedge may provide cover and forage (especially the seeds) for small mammals and birds (Crowe and Clausnitzer 1995).

OTHER NOTEWORTHY SPECIES The plant species of concern Epilobium palustre and Carex buxbaumii may be present in this community.

SUCCESSION AND MANAGEMENT Presence of Carex utriculata or Alnus incana may indicate eventual succession to Carex utriculata or Alnus incana/Carex utriculata community types. Sites may eventually be dominated by spruce or cedar but not in our lifetimes (Kovalchik 1993).

Grazing by large animals is not recommended because of the potential damage to fragile, wet soils. Cusick's sedge probably only burns during extremely dry years. Reaction to fire is unknown (Crowe and Clausnitzer 1995).

ADJACENT COMMUNITIES Adjacent wetter sites may be dominated by various Alnus or Salix communities, Carex utriculata, or Carex aquatilis. Aquatic communities are dominated by Equisetum fluviatile, Typha latifolia, or Eleocharis palustris. Drier fringes of the sites are dominated by various coniferous forest communities (Kovalchik 1993).

CONSERVATION RANK GQ S3

CLASSIFICATION COMMENTS Classification based on 11 stands in Oregon and 4 stands in Washington.

REFERENCES

- Crowe, E. A., and R. R. Clausnitzer. [1995?]. Mid-montane wetlands classification of the Malheur, Umatilla, and Wallowa-Whitman National Forests. Wallowa-Whitman National Forest, Pacific Northwest Region, USDA Forest Service. 188 pp. plus appendices.
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EDITION 97-01-06

AUTHOR Mabel Jankovsky-Jones

CAREX LANUGINOSA

COMMON NAME WOOLLY SEDGE COMMUNITY TYPE

PHYSIOGNOMIC TYPE HERBACEOUS

SIMILAR COMMUNITIES Hansen et al. (1995) included all combinations of *Carex lanuginosa*, *Carex lasiocarpa* and *Carex buxbaumii* in the *Carex lasiocarpa* h.t.

RANGE The *Carex lanuginosa* community type is a minor type in Utah, Wyoming, Idaho, Montana, and Oregon.

ENVIRONMENTAL DESCRIPTION The community occupies former active fluvial surfaces along low to moderate elevation floodplains, seeps, or headwater basins. It is frequently associated with meadows, basins, glacial depressions (kettles), and lake margins that are anaerobically favorable to the buildup of deep organic soils (Hansen et al. 1995). Kovalchik (1987) states surface textures range from fine sandy to sandy clay loams on floodplains to organic loam in the basins. Water tables of the *Carex lanuginosa* community type are typically within 60 cm (24 in) of the soil surface (Padgett et al. 1989). Floodplain soils are often flooded during spring runoff and the water table is well down in the rooting zone (within 50 inches of the surface) by mid summer. The basin sites have higher water tables and are moist through most summers (Kovalchik 1987).

MOST ABUNDANT SPECIES

Strata

Herbaceous

Species

Carex lanuginosa, *Carex saxatilis*, *Carex aquatilis*

VEGETATION DESCRIPTION *Carex lanuginosa* clearly dominates with 30-80% cover. Hansen et al. (1988) reports that *C. lasiocarpa* may be codominant in some stands. Low species diversity is characteristic; *Carex nebraskensis*, *C. lasiocarpa*, *C. utriculata*, *Deschampsia cespitosa*, *Juncus balticus*, *Poa pratensis*, *Scirpus acutus*, *S. microcarpus*, *Potamogeton gramineus*, *Phleum pratense*, *Geum macrophyllum*, and *Potentilla* sp. are sometimes present with low coverage.

WILDLIFE VALUES Landforms containing woolly sedge provide important habitat for raptors, deer, and elk (Kovalchik, 1987). Wet stands of the type may provide nesting and feeding areas for waterfowl (Hansen et al. 1995).

OTHER NOTEWORTHY SPECIES Information not available.

SUCCESSION AND MANAGEMENT The *Carex lanuginosa* community type appears to be a fairly stable type because of its strongly rhizomatous nature and occurrence on well developed soils. The type may replace the *Deschampsia cespitosa* community type under moderate to heavy grazing pressures (Padgett et al. 1989), or an increase in species such as *Agrostis stolonifera*, *Poa pratensis*, or *Juncus balticus* may be evident. Kovalchik (1987) reports that on sites where streambed downcutting has occurred, lowered water tables have changed the site potential to the sagebrush/Cusick bluegrass association. Hansen et al. (1988) states that on drier streambanks, this type may be in a disclimax state due to past grazing, and the potential for these sites may be a shrub community dominated by *Salix* spp.

Woolly sedge produces moderate to high amounts of herbage, and is palatable to domestic livestock. Grazing occurs in both the mesic basins and floodplain sites as they become surface dry. (Kovalchik 1987, Hansen 1988). *Carex lanuginosa* appears able to withstand moderate grazing pressures, though overuse of stands may increase the presence of invasive exotics such as *Agrostis stolonifera*, *Poa pratensis* or *Juncus balticus*. Trampling by livestock as well as heavy machinery use may result in compaction or displacement of soils. (Padgett et al. 1989).

Vegetation composition and structure can be altered due to impacts such as water development, recreational activities or agriculture. With management intervention such as grazing schedules, fencing, education, and stream rehabilitation to elevate water tables, moderately disturbed stands recover rapidly due to the rhizomatous habit of the sedge (Kovalchik 1987, Hansen et al. 1988).

Prescribed fire is a useful tool on this type. Fire can be used in spring or late summer to help reduce litter accumulation and competitors. Woolly sedge should be very resistant to damage by ground fire. (Kovalchik 1987, Hansen et al. 1988). This species is useful for improving degraded riparian sites. Its long, creeping rhizomes form a dense mat, effectively stabilizing streambank soils (Hansen et al. 1988).

ADJACENT COMMUNITIES Wetter communities include *Carex utriculata* and *Carex nebraskensis*. Drier sites may have the *Deschampsia cespitosa* and *Carex buxbaumii* community types. Uplands are typically dominated by *Artemisia tridentata* spp. *vaseyana* or *Artemisia cana* at lower elevations and *Pinus contorta*, *Abies lasiocarpa*, or *Populus tremuloides* at higher elevations (Hansen et al. 1995).

CONSERVATION RANK G3? S2

CLASSIFICATION COMMENTS Classification based on 5 stands in Utah and western Wyoming, 8 stands in Oregon and an unknown number of stands in Montana.

REFERENCES

Crowe, E. A., and R. R. Clausnitzer. [1995?]. Mid-montane wetlands classification of the Malheur, Umatilla, and Wallowa-Whitman National Forests. Wallowa-Whitman National Forest, Pacific Northwest Region, USDA Forest Service. 188 pp. plus appendices.

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Kovalchik, B. L. 1987. Riparian Zone Associations: Deschutes, Ochoco, Fremont, and Winema National Forests. USDA Forest Service, Region 6 Ecology Technical Paper 279-87. Pacific Northwest Region, Portland, OR. 171 pp.

Padgett, W. G., A. P. Youngblood, and A. H. Winward. 1989. Riparian community type classification of Utah and southeastern Idaho. USDA Forest Service R4-Ecol-89-01. Intermountain Region, Ogden, UT. 191 pp.

EDITION 95-12-27

AUTHOR L. Williams

CAREX LASIOCARPA

COMMON NAME SLENDER SEDGE

PHYSIOGNOMIC TYPE HERBACEOUS

SIMILAR COMMUNITIES *Carex lasiocarpa*/Sphagnum communities are treated as Poor fens, a distinct type in Idaho. Central Oregon (Kovalchik 1987) and Montana (Hansen et al. 1988 and 1990; Boggs et al. 1990) classifications include some stands which may fit in the *Carex buxbaumii* community type.

RANGE The *Carex lasiocarpa* community type is distributed globally throughout the northern hemisphere; in the western United States it is a minor type in eastern Washington, the Uinta Mountains of Utah, southeastern and northern Idaho, throughout much of Montana, and in central Yellowstone National Park.

ENVIRONMENTAL DESCRIPTION *Carex lasiocarpa* communities usually occupy former lake basins, glacial depressions (kettles), abandoned beaver ponds, and lake and stream margins which favor the accumulation of sedge or brown moss peat and occasionally occurs as floating or quaking mats on fluid peat subsoils. Sites are typically poorly to very poorly drained, flooded into mid summer with water tables remaining within the root zone throughout the growing season (Hansen et al. 1995).

MOST ABUNDANT SPECIES

<u>Strata</u>	<u>Species</u>
Herbaceous	Carex lasiocarpa

VEGETATION DESCRIPTION Carex lasiocarpa dominates the intermediate to rich fen with 30-80% cover. Carex utriculata is often the only other species with high constancy.

WILDLIFE VALUES Otters, beaver, sandhill cranes, and waterfowl use this habitat type for bedding and foraging areas. It is important habitat for raptors, deer, and elk. Deer use the type for fawning (Hansen et al. 1995).

OTHER NOTEWORTHY SPECIES The state species of concern, Carex buxbaumii may occur in this community type.

SUCCESSION AND MANAGEMENT Moderate disturbance will increase Carex aquatilis, Juncus balticus and associated forbs. Severe disturbance (resulting in dewatering) may lower the water table and cause the site to be dominated by Poa pratensis, P. palustris, Potentilla anserina, or Agrostis stolonifera.

Herbage production varies from low to moderate, the wet nature is a natural deterrent to livestock grazing. Drought years may make the community accessible to both domestic and wild grazing animals which could cause rutted and hummocky soils on margins.

These sites are generally so wet as to preclude most types of recreational uses except fishing. Heavy disturbance such as from ORV use should be avoided because the organic soils are slow to recover from mechanical damage. High water tables make burning difficult, but fire can be used on sites adjacent to floodplains; dominant sedges of this h.t. are resistant to damage by fire except where hot fires penetrate the peat soil (Hansen et al. 1995).

ADJACENT COMMUNITIES Adjacent wetter sites may be dominated by the Carex utriculata, C. aquatilis, or the C. nebrascensis community type. Drier sites may be dominated by the Deschampsia cespitosa, Artemisia cana/Festuca idahoensis, or Juncus balticus community types. Adjacent uplands are typically dominated by Artemisia tridentata at lower elevations and by Abies lasiocarpa at higher elevations (Hansen et al. 1995).

CONSERVATION RANK G4 S2

CLASSIFICATION COMMENTS Classification based on 6 stands in Utah, 9 stands in Washington, 6 stands in Oregon, and an unknown number of stands in Montana.

REFERENCES

Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, D.K. Hinckley. 1995. Classification and Management of Montana's Riparian and Wetland Sites. Montana Forest and Conservation Experiment Station, School of Forestry, Missoula, MT. 646 pp.

Kovalchik, B. L. 1987. Riparian Zone Associations: Deschutes, Ochoco, Fremont, and Winema National Forests. USDA Forest Service, Region 6 Ecology Technical Paper 279-87. Pacific Northwest Region, Portland, OR. 171 pp.

Kovalchik, B. L. 1993. Riparian plant associations on the national forests of eastern Washington-Draft version 1. USDA Forest Service, Colville National Forest, Colville, WA. 203 pp.

Padgett, W. G., A. P. Youngblood, and A. H. Winward. 1989. Riparian community type classification of Utah and southeastern Idaho. USDA Forest Service R4-Ecol-89-01. Intermountain Region, Ogden, UT. 191 pp.

EDITION 95-07-11

AUTHOR L. Williams

CAREX LIMOSA

COMMON NAME MUD SEDGE

PHYSIOGNOMIC TYPE HERBACEOUS

SIMILAR COMMUNITIES *Carex limosa* appears closely related to the *C. aquatilis* community type with which it is commonly associated (Padgett et al. 1989). Includes Mattson's (1984) *C. limosa* series and phases described for the central portion of Yellowstone National Park.

RANGE The *Carex limosa* community type is distributed throughout the northern hemisphere; in the western United States it is a minor type in the Uinta Mountains of Utah, Idaho, throughout much of Montana, and in central Yellowstone National Park.

ENVIRONMENTAL DESCRIPTION This community type is associated with pond and lake margins, and typically develops on floating or quaking mats. It may also occur on low gradient inflows or outflows of ponds or lakes. *Carex limosa* is strongly rhizomatous and when combined with mosses, maintains the fibric nature of the organic sedge and moss peat soils. Soils are very poorly drained and persistently saturated with standing water in spring. (Padgett et al. 1989, Hansen et al. 1995).

MOST ABUNDANT SPECIES

Strata

Herbaceous

Species

Carex limosa, C. aquatilis, C. utriculata, Eleocharis palustris, Scirpus cespitosus

VEGETATION DESCRIPTION Carex limosa has 50% or greater cover. Carex aquatilis, C. utriculata, Eleocharis palustris, and Scirpus cespitosus are often present and contribute up to 15% cover. Caltha leptosepala and Pedicularis groenlandica contribute trace amounts in nearly all stands.

WILDLIFE VALUES Otters, beaver, sandhill cranes, and waterfowl use this community type for bedding and foraging areas.

OTHER NOTEWORTHY SPECIES Information not available.

ADJACENT COMMUNITIES Adjacent wetter sites include the Eleocharis pauciflora habitat type or open water. Adjacent drier sites may include the Carex utriculata, C. aquatilis, C. lasiocarpa, or the Scirpus acutus community types.

CONSERVATION RANK G3 S1

SUCCESSION AND MANAGEMENT Carex limosa is considered a stable, long lived community type, however, dewatering and subsequent decomposition of organic soils may result in a shift in species composition due to invasion by exotic species or an increase in species such as Carex aquatilis (Padgett et al. 1989).

Herbage production varies from low to moderate, the wet nature is a natural deterrent to livestock. However, drought years may make occurrences accessible to both domestic and wild grazing animals which could cause rutted and hummocky soils on margins. These sites are generally so wet as to preclude most types of recreational uses except fishing. Heavy disturbance such as from ORV use should be avoided because the organic soils are slow to recover from mechanical damage. High water tables make burning difficult, but fire can be used on sites adjacent to floodplains; dominant sedges of this community type are resistant to damage by fire except where hot fires penetrate the peat soil (Hansen et al. 1995).

CLASSIFICATION COMMENTS Classification based on 11 stands in central Yellowstone National Park , 4 stands in southwestern Montana, 4 stands in Utah and southeastern Idaho , 4 stands in northwestern Montana and 5 stands in central and eastern Montana.

REFERENCES

Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, D.K. Hinckley. 1995. Classification and Management of Montana's Riparian and Wetland Sites. Montana Forest and Conservation Experiment Station, School of Forestry, Missoula, MT. 646 pp.

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EDITION 95-07-10

AUTHOR L. Williams

CAREX SIMULATA

COMMON NAME SHORT BEAKED SEDGE

PHYSIOGNOMIC TYPE HERBACEOUS

SIMILAR COMMUNITIES Represents a distinct well described type.

RANGE The *Carex simulata* community type is a minor type which occurs near the South Fork of the Salmon River and throughout the Centennial Mountains of Idaho (Mutz and Queiroz 1983); the Wyoming Range and the Yellowstone Volcanic Plateau of northwestern Wyoming (Youngblood 1985), the Uinta Mountains and the Wasatch Plateau of Utah (Padgett et al. 1989), the mountains of Montana (Hansen et al. 1995), and is scattered throughout central Oregon (Kovalchik 1987).

ENVIRONMENTAL DESCRIPTION Stands are located in wet depressions such as broad meadows, toe slope seeps or gentle slopes below seeps, flat alluvial terraces adjacent to streams, and swales formed by abandoned channels. Soils of the *Carex simulata* community type commonly have organic matter accumulation 30-120 cm thick (Brichta 1987); Padgett et al. (1989) noted that although the degree of organic matter decomposition is variable, communities within his study area were most often associated with organic soils rather than highly decomposed mineral soils. Kovalchik (1987) describes soils of this community type as organic loam and sedge peats. Redox depletions (segregated gleyed soil) or reduced matrices (gleyed throughout) are common throughout the profile of these soils. Water tables remain at or near the soil surface throughout the

growing season. Available water capacity is moderate to high. Soil reaction is slightly acid to neutral (Hansen et al. 1995).

MOST ABUNDANT SPECIES

Strata	Species
Herbaceous	Carex simulata, Carex utriculata, Deschampsia cespitosa, Carex aquatilis, Juncus balticus

VEGETATION DESCRIPTION Carex simulata dominates the intermediate to rich fen with 60-85% cover. Moss cover is typically high. Low species diversity, with Carex aquatilis, Deschampsia cespitosa and C. utriculata being the only associates with high constancy, is characteristic. The shrubs Potentilla fruticosa, Salix wolfii and S. brachycarpa are sometimes present. The most common forbs include Pedicularis groenlandica and Swertia perennis.

WILDLIFE VALUES Waterfowl may use wetter extremes of this type for foraging (Hansen et al. 1995). This type may provide early spring forage for deer when adjacent uplands are still covered by snow. Streams are too small or intermittent to support salmonids (Kovalchik 1987).

OTHER NOTEWORTHY SPECIES The state species of concern Eriophorum viridicarinatum, Primula incana, Salix candida, and Carex buxbaumii may sometimes be present in this community.

SUCCESSION AND MANAGEMENT The strongly rhizomatous Carex simulata appears to form a dense, stable community (Padgett et al. 1989). Continually high water tables limit the successful establishment of most other species. A lowered water table may result in site conditions similar to those of the C. utriculata habitat type. Due to the season long high water table, the sites are often inaccessible and minimally disturbed (Hansen et al. 1995).

Herbage production varies from low to moderate; grazing value of this type is limited by low palatability and persistently wet conditions. Carex simulata appears able to withstand moderate grazing pressures, though impacts on soils may include hummocking and pitting (Padgett et al. 1989). For a grazing program to be successful, it must meet the basic biological requirement of the plants; long rest periods may be required to maintain or improve a plant community (Hansen et al. 1995).

Prescribed fire is not a useful tool on this type. If the soil surface becomes dry, the organic soil may be quite flammable and fire will penetrate the soil and destroy sedge rhizomes (Kovalchik 1987).

ADJACENT COMMUNITIES Wetter sites support the *Scirpus acutus* community type, open water (Hansen et al. 1995), or the *Carex aquatilis* community type (Padgett et al. 1989). The *Carex utriculata* and *Potentilla fruticosa/Deschampsia cespitosa* community types are common on drier sites (Hansen et al. 1995), while uplands may be dominated by *Pinus contorta*, *Picea engelmannii*, and/or *Populus tremuloides* (Padgett et al. 1989).

CONSERVATION RANK G4 S2

CLASSIFICATION COMMENTS Classification based on 3 stands in Utah and southeastern Idaho, 12 stands in eastern Idaho-western Wyoming, 15 stands in Montana and 15 stands in Oregon.

REFERENCES

Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, D.K. Hinckley. 1995. Classification and Management of Montana's Riparian and Wetland Sites. Montana Forest and Conservation Experiment Station, School of Forestry, Missoula, MT. 646 pp.

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Youngblood, A. P., W. G. Padgett, and A. H. Winward. 1985. Riparian community type classification of eastern Idaho - western Wyoming. USDA Forest Service R4-Ecol-85-01. Intermountain Region, Ogden, UT. 78 pp.

EDITION 95-08-06

AUTHOR L. Williams

DULICHIMUM ARUNDINACEUM

COMMON NAME DULICHIMUM

PHYSIOGNOMIC TYPE HERBACEOUS

SIMILAR COMMUNITIES The community is easily recognized by the abundance of Dulichium and is either monospecific or moderately species rich.

RANGE Minor type in Montana, Idaho, Oregon, Washington and possibly Wyoming.

ENVIRONMENTAL DESCRIPTION The community occurs over mineral soils, fibrous peat, or muck on areas that are seasonally or permanently flooded with shallow water. In a few places it occurs adjacent to sphagnum peat (Kunze 1994).

MOST ABUNDANT SPECIES

Strata

Herbaceous

Species

Dulichium arundinaceum, Eleocharis palustris, Carex aquatilis

VEGETATION DESCRIPTION The Dulichium arundinaceum community type is of rare occurrence and poorly described. Dulichium arundinaceum typically occurs as a monoculture with few associated species. Minor amounts of the Eleocharis palustris, Carex aquatilis, C. limosa, or C. lasiocarpa may be present. The community occurs on organic soils, on lake margins and may occur on fixed or floating mats.

WILDLIFE VALUES Information not available.

OTHER NOTEWORTHY SPECIES Information not available.

SUCCESSION AND MANAGEMENT Dulichium arundinaceum is considered a stable, long lived community type, however, dewatering and subsequent decomposition of organic soils may result in a shift in species composition due to invasion by exotic species or an increase in species such as Carex aquatilis.

Drought years may make occurrences accessible to both domestic and wild grazing animals which causing rutted and hummocky soils on margins. These sites are generally so wet as to preclude most types of recreational uses except fishing. Heavy disturbance such as from ORV use should be avoided because the organic soils are slow to recover from mechanical damage.

ADJACENT COMMUNITIES The Dulichium arundinaceum community type frequently occurs in a mosaic of monocultures dominated by Carex aquatilis, Carex utriculata, Carex limosa and/or Sphagnum species. Adjacent uplands are dominated by conifers.

CONSERVATION RANK G3S2

CLASSIFICATION COMMENTS Classification based on 1 stand in Montana and an unknown number of stands in Washington.

REFERENCES

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.

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Pierce, J.R. 1986. Wetland community types of west-central Montana. Unpublished draft report prepared for the USDA Forest Service, Region One, Missoula, MT. 57 pp.

EDITION 97-01-06

AUTHOR Mabel Jankovsky-Jones

ERIOPHORUM POLYSTACHION

COMMON NAME COTTON-GRASS HERBACEOUS VEGETATION

PHYSIOGNOMIC TYPE HERBACEOUS

SIMILAR COMMUNITIES The Eriophorum polystachion type is similar in part to Kovalchik's (1987) Eleocharis pauciflora type in central Oregon.

RANGE Minor type in eastern Washington, central Oregon, and northern Idaho.

ENVIRONMENTAL DESCRIPTION Occurs at mid-elevations in u-shaped glacial valleys and cirques. Sites are generally poorly drained and saturated throughout the growing season. Soil textures range from sedge to sphagnum and moss peats. The community may occur as a floating mat on ponds, seeps, or springs.

MOST ABUNDANT SPECIES

Strata
Herbaceous

Species
Eriophorum polystachion, Eriophorum viridicarinatum,
Eriophorum gracile, Eleocharis palustris, Carex vesicaria,
Carex cusickii,

VEGETATION DESCRIPTION Eriophorum polystachion, E. viridicarinatum, and E. gracile are characteristic of this diverse vegetation type (20-40% cover). Lesser amounts of Eleocharis pauciflora, Carex vesicaria, and Carex cusuckii are frequently present with the latter two species occurring as dwarfed forms on these sites. Sphagnum and other mosses are conspicuous. Forbs include Drosera species, Menyanthes trifoliata, Pedicularis groenlandica, and Potentilla palustris. Dwarf shrubs such as Betula glandulosa, Kalmia microphylla, and Salix farriae are restricted to drier microsites (Kovalchik 1993).

WILDLIFE VALUES Information not available.

OTHER NOTEWORTHY SPECIES The state species of concern Eriophorum viridicarinatum, Trientalis arctica, Carex paupercula, Carex leptalea, and Carex flava may be present in this community.

SUCCESSION AND MANAGEMENT Long periods of drought may dry the surfaces of the peat soils, starting a trend where decomposition exceeds buildup or where fire drastically lowers the soil surface. In the long run, however, the association is self perpetuating. The eventual climax is likely a larger, deeper peatland and not forests as some ecologists suggest (Kovalchik 1993).

Drought years may make occurrence accessible to both domestic and wild grazing animals which could cause rutted and hummocky soils on margins. These sites are generally so wet as to preclude most types of recreational uses except fishing. Heavy disturbance such as from ORV use should be avoided because the organic soils are slow to recover from mechanical damage.

ADJACENT COMMUNITIES Adjacent wetter communities may be dominated by Carex species, or Sphagnum. Drier sites may be dominated by shrubs and wetland margins may be dominated by Spiraea douglasii, Alnus species, or Betula species. Uplands are typically coniferous forests.

CONSERVATION RANK G3 S3

CLASSIFICATION COMMENTS Classification based on 8 stands in eastern Washington.

REFERENCES

Kovalchik, B. L. 1993. Riparian plant associations on the national forests of eastern Washington- Draft version 1. USDA Forest Service, Colville National Forest, Colville, WA. 203 pp.

EDITION 97-02-06

AUTHOR Mabel Jankovsky-Jones

GLYCERIA BOREALIS

COMMON NAME NORTHERN MANNAGRASS

PHYSIOGNOMIC TYPE HERBACEOUS

SIMILAR COMMUNITIES Represents a distinctive type.

RANGE The *Glyceria borealis* community type is distributed globally throughout the northern hemisphere; in the west it is a minor type in Montana, Idaho and Ontario, Canada.

ENVIRONMENTAL DESCRIPTION *Glyceria borealis* communities occupy pond and lake margins, low-gradient streams, and occur in association with wet meadows. Soils vary widely from mineral to organic. Soil reaction varies little from slightly acid to neutral (pH 6.0 to 7.0). Soils are poorly to very poorly drained with water tables often remaining above the soil surface throughout the summer.

MOST ABUNDANT SPECIES

Strata	Species
Herbaceous	<i>Glyceria borealis</i>

VEGETATION DESCRIPTION Sites are generally monotypic in nature and are dominated by *Glyceria borealis*. Occasional associates include *Eleocharis palustris*, *E. acicularis* and *Glyceria elata* are present (Hansen et al. 1995).

WILDLIFE VALUES This habitat type provides valuable habitat for waterfowl. The seeds of *Glyceria borealis* provide good forage for ducks. Elk, moose, and deer may make moderate use of the habitat type (Hansen et al. 1995).

OTHER NOTEWORTHY SPECIES Information not available.

SUCCESSION AND MANAGEMENT The sites are so wet as to preclude most types of disturbances. Cattle and horses will consume both flowering stalks and leaves. Sheep tend to use only the leaves. Wet conditions tend to delay grazing until late in the season at which time the soils are normally drier and the forage is less succulent. Wildfire is rare in this community. These sites are generally so wet as to preclude most development activities and fishing is the main recreational use (Hansen et al. 1995).

ADJACENT COMMUNITIES Adjacent wetter communities are typically open water, while adjacent drier communities are often dominated by *Carex utriculata*. Adjacent uplands are dominated by a variety of communities.

CONSERVATION RANK G4 S1

CLASSIFICATION COMMENTS Classification based on 5 stands in Montana, and a similar type has been described in Ontario, Canada by Jeglum et al. (1974). Type has been documented but not described at several locations in Idaho.

REFERENCES

Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, D.K. Hinckley. 1995. Classification and Management of Montana's Riparian and Wetland Sites. Montana Forest and Conservation Experiment Station, School of Forestry, Missoula, MT. 646 pp.

EDITION 95-07-12

AUTHOR L. Williams

OMBROTROPHIC BOG

COMMON NAME OMBROTROPHIC BOG

PHYSIOGNOMIC TYPE NON-VASCULAR

SIMILAR COMMUNITIES Distinguished from Poor Fen communities by the absence or scarcity of vascular plants.

RANGE Minor type throughout northern latitudes of North America and Europe.

ENVIRONMENTAL DESCRIPTION Ombrotrophic bogs occur in glacial scours, kettle holes, isolated oxbows, old lake beds, and at or near the heads of drainages where inflow is limited. Thick layers of *Sphagnum* peat accumulates upward, often at the base of a shrub or downed log. Incoming water is held above the water table, primarily by the low hydraulic conductivity of the *sphagnum* peat. pH values range from 3-4.

MOST ABUNDANT SPECIES

Strata

Non-vascular

Species

Sphagnum fuscum, *Sphagnum magellanicum*, *Sphagnum centrale*, *Sphagnum angustifolium*, *Polytrichum strictum*

VEGETATION DESCRIPTION Ombrotrophic bogs are characterized by a solid mat of Sphagnum. The Sphagnum species, *Sphagnum fuscum*, *S. magellanicum*, *S. centrale*, *S. angustifolium*, along with the brown moss, *Polytrichum strictum*, dominate the surface. Vascular plant species are few in number and are restricted to those species tolerant of acidic conditions.

WILDLIFE VALUES Open water adjacent to ombrotrophic bogs provides important habitat for numerous invertebrate and vertebrate animal species. The macroinvertebrate fauna has been studied by Dr. Fred Rabe and is summarized in Chadde et al. (1996). The northern bog lemming often occupies relatively open wetlands, such as ombrotrophic bogs, lacking a shrub component. Grizzly bears have been sighted at peatlands in northern Idaho.

OTHER NOTEWORTHY SPECIES The state species of concern *Andromeda polifolia*, *Carex chordorrhiza*, *Carex rostrata*, *Gaultheria hispidula*, *Rhynchospora alba*, *Vaccinium oxycoccos*, and *Synaptomys borealis* may occur in ombrotrophic bogs.

SUCCESSION AND MANAGEMENT Ombrotrophic bog vegetation develops from lake fill processes. Terrestrialization occurs in lake basins, kettle holes, and ponds as the peat edge expands toward the center of the water body (Chadde et al. 1996). Thick layers of sphagnum peat accumulate such that the bog is above the influence of the local water table. Long periods of drought may dry the surfaces of the peat soils, starting a trend where decomposition exceeds buildup or where fire drastically lowers the soil surface. In the long run, however, the association is self-perpetuating. The eventual climax is likely a larger, deeper peatland and not forests as some ecologists suggest (Kovalchik 1993).

Drought years may make occurrence accessible to both domestic and wild grazing animals which could cause rutted and hummocky soils on margins. These sites are generally so wet as to preclude most types of recreational uses except fishing. Activities altering hydrology or introducing sediments to these systems should be avoided. The abrupt, large scale, and often irreversible nature of changes in hydrology and nutrient concentrations resulting directly or indirectly from human activities may be beyond the tolerance level of Ombrotrophic Bog communities.

ADJACENT COMMUNITIES Ombrotrophic bogs occur as raised microsites within larger wetland sites. The bogs occur as mosaic with poor fen, rich fen, shrub vegetation and open water. Adjacent poor fens are rich in Sphagnum species and have scattered vascular plants. Other communities are frequently dominated by *Typha latifolia*, *Carex cusickii*, *Carex utriculata*, and other sedge species. A moat is often present on wetland margins and is bordered by shrubs such as *Spiraea douglasii* and *Alnus incana*.

CONSERVATION RANK G5 S1

CLASSIFICATION COMMENTS Classification based on description of type in Idaho.

REFERENCES

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.

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Kovalchik, B. L. 1993. Riparian plant associations on the national forests of eastern Washington- Draft version 1. USDA Forest Service, Colville National Forest, Colville, WA. 203 pp.

EDITION 97-01-07

AUTHOR Mabel Jankovsky-Jones

POOR FEN

COMMON NAME POOR FEN

PHYSIOGNOMIC TYPE NON-VASCULAR

SIMILAR COMMUNITIES Includes a number of communities treated by Kunze (1994) as (Vascular species)/Sphagnum as well as the former Idaho type, Carex lasiocarpa/Sphagnum.

RANGE Minor type throughout northern latitudes of North America and Europe.

ENVIRONMENTAL DESCRIPTION Poor fens occur in glacial scours, kettle holes, isolated oxbows, old lake beds, and at or near the heads of drainages where inflow is limited. Thick layers of Sphagnum peat have accumulated since the last retreat of the continental glaciers. pH values range from 4-6.

MOST ABUNDANT SPECIES

Strata

Herbaceous

Non-vascular

Species

Carex lasiocarpa, Carex limosa, Dulichium arundinaceum, Potentilla palustris, Lycopus uniflorus
Sphagnum subsecundum, Sphagnum fuscum, Sphagnum angustifolium, Calliergon stramineum, Aulacomnium palustre

VEGETATION DESCRIPTION Poor fens are characterized by a solid mat of Sphagnum and scattered stems of vascular plants. The Sphagnum species, *Sphagnum subsecundum*, *S. fuscum*, *S. angustifolium*, along with the brown mosses, *Calliergon stramineum* and *Aulacomnium palustre*, dominate the surface. Vascular plant species such as *Scheuchzeria palustris*, *Vaccinium oxycoccos*, *Carex limosa*, *Carex lasiocarpa*, *Dulichium arundinaceum*, *Scheuchzeria palustris*, *Potentilla palustris* and *Lycopus uniflorus* occur as scattered individuals. The fens may occur on a fixed or floating mat.

WILDLIFE VALUES Open water adjacent to poor fens provides important habitat for numerous invertebrate and vertebrate animal species. The macroinvertebrate fauna has been studied by Dr. Fred Rabe and is summarized in Chadde et al. (1996). The northern bog lemming often occupies relatively open wetlands, such as poor fens, lacking a shrub component. Grizzly bears have been sighted at peatlands in northern Idaho.

OTHER NOTEWORTHY SPECIES The state species of concern *Carex leptalea*, *Carex paupercula*, *Epilobium palustre*, *Lycopodiella inundata*, *Rhynchospora alba*, *Salix pedicellaris*, *Scheuchzeria palustris*, *Trientalis arctica*, *Vaccinium oxycoccos*, and *Synaptomys borealis* may occur in Poor Fens.

SUCCESSION AND MANAGEMENT Poor fen vegetation develops from lake fill processes. Terrestrialization occurs in lake basins, kettle holes, and ponds as the peat edge expands toward the center of the water body (Chadde et al. 1996). Long periods of drought may dry the surfaces of the peat soils, starting a trend where decomposition exceeds buildup or where fire drastically lowers the soil surface. In the long run, however, the association is self-perpetuating. The eventual climax is likely a larger, deeper peatland and not forests as some ecologists suggest (Kovalchik 1993).

Drought years may make occurrence accessible to both domestic and wild grazing animals which could cause rutted and hummocky soils on margins. These sites are generally so wet as to preclude most types of recreational uses except fishing. Activities altering hydrology or introducing sediments to these systems should be avoided. The abrupt, large scale, and often irreversible nature of changes in hydrology and nutrient concentrations resulting directly or indirectly from human activities may be beyond the tolerance level of poor fen communities.

ADJACENT COMMUNITIES Poor fens typically form a mosaic with rich fen, shrub vegetation and open water. Adjacent communities are frequently dominated by *Typha latifolia*, *Carex cusickii*, *Carex utriculata*, and other sedge species. A moat is often present on wetland margins and is bordered by shrubs such as *Spiraea douglasii* and *Alnus incana*.

CONSERVATION RANK G4 S1

CLASSIFICATION COMMENTS Classification based on an unknown number of stands in Washington and Oregon and description of type in Idaho.

REFERENCES

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Appendix C.

Summary of State Element Ranks: With the substitution of globally for statewide this table can be used for global rankings.

- S1 Critically imperiled statewide (typically 5 or fewer occurrences or less than five percent of native range currently occupied by high quality examples of type) or especially vulnerable to extirpation from the state.
- S2 Imperiled statewide because of rarity (typically 6-20 occurrences or six to twenty-five percent of native range currently occupied by high quality occurrences of type) or especially vulnerable to extirpation from the state.
- S3 Rare or uncommon statewide (typically 21-100 occurrences or twenty-six to fifty percent of native range currently occupied by high quality occurrences of type).
- S4 Apparently secure statewide (many occurrences, fifty-one to seventy-five percent of native range currently occupied by high quality occurrences of type).
- S5 Demonstrably secure statewide and essentially ineradicable under present conditions (seventy-six to one hundred percent of native range currently occupied by high quality examples of type).
- SH Of historical occurrence statewide, perhaps not verified in the last 20 years but suspected to still be extant.
- SX Extirpated statewide.
- SE Represents human induced community type (exotic) which has been so altered that pre-settlement condition cannot be assessed or the end result of successional processes will continue to be an altered type.
- SP Purported for state. Includes types which are formally described for adjacent states, but lack persuasive documentation (i.e., plot data) for recognition as a state type.
- S#? Rank followed by a ? indicates the assigned rank is inexact.
- S? Type not yet ranked statewide.
- GQ Synecologic status of type is unclear. Type based on classification work in a small geographical area, habitat descriptions, or field notes. Full recognition of type dependent on additional analysis.
- UNK Plant communities with ranks as UNK or state ranks blank represent types listed by the MRA as occurring in the basin whose conservation status needs to be analyzed prior to assigning a rank. This information (stand tables and community descriptions) is currently unavailable.
-

Appendix D.
Site summaries for wetland sites in northern Idaho.

Armstrong Meadows	D-3
Bottle Lake	D-6
Chase Lake	D-8
Kaniksu Marsh	D-12
Lambertson Lake	D-14
Mosquito Bay Fen	D-15
Packer Meadows	D-19
Perkins Lake	D-22
Potholes	D-25
Smith Creek	D-27
Three Ponds	D-29
Upper Priest Lake Fen	D-32
Upper Priest River	D-34
Bear Creek Fen	D-36
Beaver Lake Ranch	D-39
Binarch Creek	D-41
Bog Creek Fen	D-43
Bonner Lake	D-45
Chipmunk Potholes	D-48
Clark Fork Delta	D-51
Cow Creek Meadows	D-53
Dubius Creek Fen	D-55
Fleming Creek	D-58
Gamlin Lake	D-60
Grass Creek Meadows	D-63
Hager Lake Fen	D-65
Hunt Girl Creek	D-68
Kelso Lake	D-70
Lee Lake	D-73
McArthur Lake	D-77
Rose Fen	D-81
Sinclair Lake	D-84
Beaver Lake North	D-86
Beaver Lake South	D-87
Bismark Meadows	D-91
Blue Lake	D-94
Canyon Creek	D-97
Gleason Meadow	D-99
Hideaway Islands	D-101
Lamb Creek Meadows	D-102
Robinson Lake	D-104
Round Prairie	D-107
Shorty's Island	D-108
Tepee Creek	D-109
Caribou Marsh	D-111

Cocolalla Slough	D-112
Curley Creek	D-114
Dawson Lake	D-116
Freeman Lake	D-118
Herman Lake	D-119
Hoodoo Lake	D-122
Hughes Meadows	D-125
Kalispell Bay Fen	D-126
Kootenai NWR	D-128
Lost Lake	D-129
Morton Slough	D-132
Pack River	D-133
Shepherd Lake	D-134
Walsh Lake	D-137

ARMSTRONG MEADOWS

Directions:

From Nordman, ID take the Priest Lake Rd. (2512) that heads up the west shore. Proceed to the Beaver Creek Campground. Go to the Plowboy trailhead to Upper Priest Lake. Hike up the trail approximately one mile. Where the new trail veers right and the old trail continues straight, skirting the edge of Armstrong Meadows and eventually crossing the meadows, take the old trail. Head west almost immediately to the peatland area which covers the south end of the open meadows. This area will be visible from the old trail.

Richness:

Armstrong Meadows is covered mostly by rich fen communities dominated by *Spiraea douglasii*, *Alnus incana*, *Calamagrostis canadensis*, *Carex utriculata*, *C. vesicaria*, *C. aquatilis*, and other sedges. Intermediate and poor fen communities are found in the southwestern lobe of the meadows and are dominated by *Sphagnum centrale*, *S. teres*, *Aulacomnium palustre*, *Carex lasiocarpa*, *C. cusickii*, *Eriophorum chamissonis*, *E. gracile*, *Menyanthes trifoliata*, *Spiraea douglasii*, *Betula glandulosa*, and *Salix pedicellaris* (bog willow, a rare sp.). A rich fen dominated by *C. lasiocarpa*, *C. buxbaumii* (Buxbaum's sedge, a rare sp.), and *C. cusickii* covers much of the south end of Armstrong Meadows. Areas of paludified forest are just south of the intermediate and poor fen *Sphagnum*-dominated portions of AM. Trees of *Thuja plicata*, *Tsuga heterophylla*, and *Pinus monticola* are covered at their base by hummocks of *Sphagnum centrale*. Between these raised sphagnum hummocks are pools of standing water with *Scirpus microcarpus*, *Equisetum sylvaticum*, *E. fluviatile*, *Calamagrostis canadensis*, *Senecio triangularis*, *Glyceria grandis*, *Carex brunnescens*, and *C. leptalea* (bristle-stalk sedge, a rare sp.) all being common. *Vaccinium globulare*, *Linnaea borealis*, *Cornus canadensis*, *Rubus pedatus*, *Aralia nudicaulis* are common on the hummocks. Most of the margins of the meadow are dominated by shrub carr rich fen characterized by *Spiraea douglasii*, *Alnus incana*, and other shrubs. A spring stream emerges somewhere in the eastern part of AM and runs through the northeastern portion of AM before dumping into the Thorofare.

Rarity:

Nearly 100 vascular and bryophyte plant species at AM during a detailed survey of the area in 1991 and 1994. This makes it one of the most floristically diverse peatlands in Idaho. Ten of the 12 critical habitat features identified for Panhandle peatlands are found at Armstrong Meadows. Lacking are floating mat and ombrotrophic bog microsites. Habitat diversity would likely increase with the return of beaver activity. Ten rare plant populations are known from AM: *Dryopteris cristata* (crested shield fern), *Carex leptalea* (bristle-stalk sedge), *C. paupercula* (poor sedge), *C. buxbaumii* (Buxbaum's sedge), *Gaultheria hispidula* (creeping snowberry), *Vaccinium oxycoccos* (bog cranberry), *Trientalis arctica* (northern starflower), *Salix pedicellaris* (bog willow), *Epilobium palustre* (swamp willow-weed), and *Botrychium lanceolatum* (lance-leaf moonwort). This is

one of the densest concentrations of rare species found in Idaho peatlands.

Condition:

All of the lands surrounding AM are owned and managed by the Idaho Panhandle NF, Priest Lake RD. The portion of the Priest Lake RD containing AM and its small, surrounding watershed is probably not part of the timber base due to its proximity to the Upper Priest Lake Scenic Area and the lack of road access. If this is so, there appear to be no direct or indirect threats to this site.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

All surrounding land is owned and managed by the USFS, Idaho Panhandle NF, Priest Lake RD. The watershed is probably not included in the timber base for the district so there appear to be no indirect threats to this site.

Other Values:

Armstrong Meadows is a beautiful, open meadow that is easy to get to for about anyone willing to do a short hike. Vistas from the new or old trail into the meadows provide for excellent wildlife viewing opportunities. There was abundant sign of bear, moose and deer use in the meadows. There is excellent potential for developing an interpretive trail about peatlands at this site. The Upper Priest Lake trail is one of the most heavily used in the area. Very limited human activities have occurred around AM and none were aimed directly at ditching or rerouting waters, which is fairly rare among Panhandle peatlands. Consequently, this is one of the most pristine peatlands in the Panhandle region.

Conservation Intent:

This site is entirely owned and managed by the USFS. Armstrong Meadows is recommended as Special Interest Area - Botanical in recognition of the unique flora and plant communities that the site supports. This designation will highlight the sensitive and rare nature of the peatland communities at Armstrong Meadows to give them special consideration when management activities are planned in the adjacent drainage that may affect them. Part of the SIA-B designation is to foster public education about the sites. This is one of a handful of Panhandle peatlands with interpretive potential. It would provide a unique wilderness- type peatland experience, even though it is very easy to access with only a short hike with little elevation gain required to reach it. Interpretive trails through the meadows can be constructed partially where the old trail crossed Armstrong Meadows. The old trail can be expanded with a trail into the Sphagnum-dominated fen habitats on the southwest end of the meadows.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Monitoring of peatland communities and rare plant populations

at AM will be valuable controls for monitoring their counterparts in peatlands surrounded by more intensively managed lands. This is one of the Panhandle peatland sites that can be evaluated for interpretive potential. If the Armstrong Meadows watershed is still currently in the Priest Lake RD timber base, its removal is recommended.

Information needs:

Floristic inventory of Armstrong Meadows was rather intensive in 1994 and is mostly complete. Studying the history of the paludified forest at this site would be very interesting. As yet no studies or surveys of aquatic or terrestrial invertebrate populations associated with the stream, fen and paludified forest habitats have been carried out. They ought to be surveyed and monitored in the future. Likewise surveys of habitat use by birds and mammals has yet to be accomplished. As with the other priority peatlands Bursik and Moseley suggested putting two to four permanent vegetation monitoring plots in the fen communities and paludified forests at AM following the methods established for Sawtooth Valley peatland monitoring (Moseley et al. 1994). Placement of plots in the areas likely to be flooded by beavers would be particularly interesting. AM is a good control site for monitoring peatlands surrounded by more intensively managed portions of the landscape that face many associated indirect threats.

Plant community occurrences:

SPIRAEA DOUGLASII	G5	S4
ALNUS INCANA/CAREX UTRICULATA	G3	S2
CAREX UTRICULATA	G5	S4
CAREX BUXBAUMII COMMUNITY TYPE		G3 S1
CAREX LASIOCARPA	G4	S2
PALUDIFIED FOREST	G5	S1
CAREX CUSICKII		GQ S3
POOR FEN	G4	S1

Rare plant occurrences:

SANICULA MARILANDICA	G5	S2
PETASITES SAGITTATUS	G4	S3
GAULTHERIA HISPIDULA	G5	S2
VACCINIUM OXYCOCCOS	G5	S2
EPILOBIUM PALUSTRE	G5	S3
TRIENTALIS ARCTICA	G5	S3
SALIX PEDICELLARIS	G5	S1
CAREX BUXBAUMII	G5	S3
CAREX LEPTALEA		G5 S2
CAREX PAUPERCULA	G5	S2
DRYOPTERIS CRISTATA	G5	S2
BOTRYCHIUM LANCEOLATUM VAR LANCEOLATUM		G5T4 S3
BOTRYCHIUM MINGANENSE	G4	S3

Author:
A. H. Pitner

BOTTLE LAKE

Directions:

Bottle Lake RNA lies along the west side of Priest Lake in northern Idaho, northwest of Bottle Bay, about 47 miles north of Priest River or about 11 miles north-northeast of Nordman. Access to Bottle Lake RNA is by paved road from Nordman, Idaho, eastward to Reeder Bay on Priest Lake, then northward on the West Shore Road to the turnoff of the Tango Creek Road, which is 9 miles from Nordman. Follow the Tango Creek Road for 1 mile to the first road turning off to the right. Turn right on this logging road for 0.25 mile and cross a creek. Turn right after crossing the creek and proceed for 0.25 mile to a point where the road is blocked by windfalls. Proceed on foot along the old logging road, around the point of a ridge where the old road enters the RNA. Follow the old road northward for 0.5 mile to Bottle Lake.

Richness:

Bottle Lake RNA consists of Bottle Lake, a 15-acre (6 ha) sphagnum fen and lake, and adjacent slopes. Elevations in the RNA range from 2800 feet (853 m) where Bottle Creek leaves the area to 3368 feet (1027 m) on the high knoll west of Bottle Lake. The primary feature of the RNA is the sphagnum fen. The open water of Bottle Lake presently covers 2 acres (0.8 ha). This open water zone is surrounded by a thick border of sphagnum moss and associated macrophytes which ranges between 15-65 feet (5-20 m) in width. Beyond this mat is a swampy border occupied by standing and down snags of trees and various aquatic flora. A 1-acre (0.4 ha) meadow on the northwest side of the lake is a wet muskeg bog during prolonged wet weather. The surrounding area is heavily forested with old-growth western redcedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), and western white pine (*Pinus monticola*). Grand fir (*Abies grandis*) and Douglas-fir (*Pseudotsuga menziesii*) also occur in the overstory.

Rarity:

Bottle Lake RNA contains an excellent example of a sphagnum bog and several rare species associated with the peatland. The wetland communities, along with the surrounding old growth western redcedar-western hemlock-western white pine forests, provide an excellent opportunity to study the aquatic environment of a muskeg lake. The rare plant species *Blechnum spicant*, *Gaultheria hispidula*, *Vaccinium oxycoccos*, *Scirpus subterminalis*, *Scheuchzeria palustris*, and *Lycopodiella inundata*, and rare animal species *Bucephala islandica* and *Sorex hoyi* are present in the site.

Condition:

Bottle Lake RNA is allocated to Management Area 14 (RNAs and experimental forests) in the Idaho Panhandle National Forests Plan (August 1987).

Western white pine in the RNA has been decimated by white pine blister rust (*Cronartium ribicola*) and the mountain pine beetle (*Dendroctonus monticolae*). As a result of this infestation, cover types in the area are changing with the trend moving towards more tolerant species such as grand fir, western hemlock, and western redcedar.

Viability:

Bottle Lake RNA is completely surrounded by National Forest lands. Tepee Creek RNA borders Bottle Lake on the northern side. The area just east of the RNA along Priest Lake is within Management Area 4 - lands designated for timber production within big game winter range. A small area bordering the western boundary of the RNA is within Management Area 9 - lands not suited for or incapable of timber production. Management Area 1 borders the RNA on the west and south. These are lands designated for timber production.

Other Values:

Bottle Lake RNA contains an excellent example of a rare ecosystem type (peatland) in Idaho.

Conservation Intent:

The site has been protected by designation as a Forest Service Research Natural Area.

Management needs:

Information not available.

Information needs:

Unknown.

Plant community occurrences:

ABIES GRANDIS/CLINTONIA UNIFLORA	G5	S3
PSEUDOTSUGA MENZIESII/PHYSOCARPUS MALVACEUS		G5 S5
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA		G4 S5
CAREX LASIOCARPA	G4	S2
VALLEY PEATLAND FLOATING MAT	G3	S1
POOR FEN	G4	S1

Rare plant occurrences:

GAULTHERIA HISPIDULA	G5	S2
VACCINIUM OXYCOCCOS	G5	S2
CAREX ROSTRATA	G5	S2
SCIRPUS SUBTERMINALIS	G4G5	S3
SCHEUCHZERIA PALUSTRIS	G5	S2
BLECHNUM SPICANT	G5	S3
LYCOPODIELLA INUNDATA		G5 S2

Rare animal occurrences:

BUCEPHALA ISLANDICA
SOREX HOYI

G5 S3B,S3N
G5 S2

Author:

J. H. KALTENECKER

CHASE LAKE

Directions:

Chase Lake is located 2 miles southeast of Coolin, ID, which is on the southeast end of Priest Lake. It can be accessed by following the East Side Road south of Coolin to the short access road to the Idaho Fish and Game boat launch on the west side of the lake. An access sign should point the way from the East Side Road. From the boat launch, the extensive peatland communities on the south end of the lake can be accessed on foot. A boat will offer access to peatland communities around the entire lake and down Chase Creek toward Priest Lake.

Richness:

Chase Lake is a shallow lake with extensive vegetated littoral and limnetic zones. The deeper limnetic zones are dominated by deepwater pondweeds, including *Potamogeton amplifolius*, *P. praegracilis*, and *P. richardsonii*. Shallower littoral zones are dominated by *Brasenia schreberi*, *Nymphaea odorata*, *P. natans*, and *Nuphar polysepalum*. One rare aquatic species, *Scirpus subterminalis* (water clubrush) is found in shallow littoral habitats. Chase Lake also contains the most extensive peatlands in the state. Floating mats ring the south and east margins of the lake. Floating mats are also found along the outlet toward Priest Lake. The floating mat system at Chase Lake is certainly the largest in Idaho. On the south end of the lake the mat contains ombrotrophic bog microsites up to 3 meters in diameter. These microsites are raised well-above the surrounding substrate and the prevailing level of the lake. They are covered with *Sphagnum fuscum*, *S. magellanicum*, *S. angustifolium*, *S. centrale*, and *Polytrichum strictum*. Only very scattered stems of *Vaccinium oxycoccos* (the rare bog cranberry), *Carex chordorrhiza* (the rare string-root sedge), *Kalmia microphylla*, and *Carex rostrata* (the true beaked sedge) are found on these moss-dominated bog microsites. Much of the floating mat around the lake is covered with poor fen dominated by the same group of species with slightly denser coverage of vascular species. Other vascular species found in the poor fen habitats include *Potentilla palustris*, *Lycopus uniflorus*, *Rhynchospora alba* (the rare white beakrush), *Scheuchzeria palustris* (the rare podgrass), and *Viola macloskeyi*. Other, less prominent rare species of the poor fen habitats include *Lycopodiella inundata* (bog clubmoss), *Cicuta bulbifera* (bulb-bearing waterhemlock), *Epilobium palustre* (swamp willow-weed), and *Trientalis arctica* (northern starwort). *Carex lasiocarpa* is prominent in intermediate and rich fen portions of the floating mat, along with many of the above-listed vascular and bryophyte species. Some rich fen areas of the floating mat are codominated by *C. lasiocarpa*, *Typha latifolia*, *C. cuskickii*, *C. utriculata*, and *C. aquatilis* with *Sphagnum teres*, *Calliergon stramineum* and other bryophytes in the understory. The floating mats

extend into the south end along ponds formed by beavers damming the inlet spring stream that originates just south of the wetland complex. Fixed mat habitats surround the floating mats. The fixed mats are characterized by rich fen communities dominated by the same group of graminoids that dominated rich fens on floating mats (listed above) and by shrub carr communities. Species dominant in the shrub carr communities include *Spiraea douglasii*, *Salix* spp., *Alnus incana*, *Betula glandulosa*, *Rhamnus alnifolia*, and other shrub species. *Carex leptalea* (bristle-stalk sedge), *Aster junciformis* (rush aster), *Hypericum majus* (large Canadian St. John's wort), *Dryopteris cristata* (crested shield fern), *Lycopodium dendroidium* (groundpine) and *Gaultheria hispidula* (creeping snowberry) are rare species of the marginal carr and rich fen communities. The latter three rare species are found on raised, hummocky areas along the fen margins covered by stunted trees of *Tsuga heterophylla*, *Thuja plicata*, *Pinus contorta*, *P. monticola*, *Picea engelmannii*, and *Abies lasiocarpa*. Some of the forested margins are paludified with mats of *Sphagnum centrale* and *S. angustifolium* growing over the base of trees. Very little survey work has been done of plant communities from the outlet on the northwest side of Chase Lake downstream to Priest Lake. Near Priest Lake (Coolin Bay), near the mouth of Chase Creek, the peatland was extensively ditched, drained, and cleared. Some areas remain in relatively good shape, however. A shrub carr community dominated by *Betula glandulosa*, *Salix geyeriana*, and *Spiraea douglasii* is interspersed between rich fen habitats dominated by *Carex lasiocarpa*, *C. utriculata*, *Phalaris arundinacea*, *Potentilla palustris*, and *C. cusickii*. *Carex livida* (pale sedge) is found in these rich fens along the lake.

Rarity:

The floristic diversity of Chase Lake is very high. More than 100 vascular and bryophyte species have been found and more will certainly be found with further survey of plant communities downstream from the lake. Chase Lake contains more habitat diversity than any other peatland in the state. It contains all habitat features identified in our recently completed comprehensive conservation strategy for Panhandle peatlands: ombrotrophic bog microsites, poor fen, intermediate fen, rich fen, floating mats, shrub carr, paludified forest, vegetated littoral zones, a lake, ponds, a stream, and beaver activity (Bursik and Moseley 1994). The bog microsites at Chase Lake are the most distinctive and extensive known in Idaho. Chase Lake supports 16 rare plant populations, one of the densest concentrations of rare plants among the 45 priority Panhandle peatlands. It would be ranked as one of the top five peatlands in Idaho in terms of biodiversity values. Common goldeneyes nest nearby and use the lake.

Condition:

Development of homesites on the south end of Chase Lake pose a direct threat to Chase Lake and its resident biota. A road has been constructed and a realty company in Priest River has advertised the sale of 20 acre parcels. The peatland areas along Chase Creek that are privately owned may be threatened by grazing, logging, land-clearing, etc. The fen communities along Coolin Bay along the mouth of Chase Creek will likely continue to face the threat of development as

well.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging and road construction and maintenance on the State of Idaho, Department of Lands holdings around the lake present offsite threats that could lead to enhanced eutrophication of the meadows and changes in the composition of the fen, shrub carr, and aquatic plant communities within Chase Lake and along Chase Creek, which could ultimately also threaten the viability of rare plant populations.

Other Values:

This one of the more popular small lake fisheries in northern Idaho with very healthy bass and panfish populations. The state record sunfish was caught in Chase Lake. Trout also enter the lake in the spring from Chase Creek and are highly sought by anglers at that time. I have seen bear and moose on more than one occasion at Chase Lake. Waterfowl use is very high too. It is an excellent lake for canoeing and leisure boating (electric motors only). The view of the Selkirk crest from Chase Lake is spectacular.

Conservation Intent:

Chase Lake is an exceptional site, largely in pristine condition, with more habitat diversity than any other peatland in Idaho. This site should be of very high priority for acquisition by public agencies, TNC, or private individuals interested in purchasing critical habitats. If critical privately owned lands can be acquired by TNC or a state or federal agency, and if a conservation agreement can be reached with the State of Idaho Department of Lands, establishment of Chase Lake as RNA should proceed immediately. The lake and wetland communities may be tentatively established as an RNA with other areas added as they are acquired, or as agreements are secured. Establishment of Chase Lake as an RNA will require land acquisition of the northwestern and southern portions of the surrounding wetlands that are currently in private ownership, and the cooperation of the State of Idaho, Department of Lands, which currently owns most of the upland area included within site boundaries as a buffer. The BLM owns a nearly one-mile stretch of Chase Creek about half-way between Chase Lake and the mouth on Priest Lake.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Monitoring of plant communities, aquatic invertebrates, and water chemistries should begin/continue as soon as possible.

Information needs:

Floristic inventory of the fen communities surrounding Chase Lake is largely

complete. Very little floristic or vegetational inventory has been done from the outlet of Chase Creek to the mouth on Priest Lake. This area should be surveyed in the near future. Fred Rabe measured water chemistries and sampled macroinvertebrate and zooplankton populations at Chase Lake in 1988 (Rabe et al. 1989). No follow-up has been done on this work. No work has been done on the terrestrial invertebrate populations or the small vertebrate populations of the Chase Lake fen communities. Both should be inventoried and monitored periodically in the future. As with other priority Panhandle peatlands, we recommend placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at Chase Lake to detect changes that may occur over time due to human activities or natural phenomena. We recommend following our methods for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/CAREX UTRICULATA	G3 S2
CAREX LASIOCARPA	G4 S2
NUPHAR POLYSEPALUM	G5 S4
OMBROTROPHIC BOG	G5 S1
PALUDIFIED FOREST	G5 S1
BETULA GLANDULOSA/CAREX LASIOCARPA	G4 S2
POOR FEN	G4 S1

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
PETASITES SAGITTATUS	G4 S3
HYPERICUM MAJUS	G5 S3
GAULTHERIA HISPIDULA	G5 S2
VACCINIUM OXYCOCCOS	G5 S2
EPILOBIUM PALUSTRE	G5 S3
TRIENTALIS ARCTICA	G5 S3
CAREX CHORDORRHIZA	G5 S2
CAREX LEPTALEA	G5 S2
CAREX LIVIDA	G5 S2
CAREX ROSTRATA	G5 S2
RHYNCHOSPORA ALBA	G5 S2
SCIRPUS SUBTERMINALIS	G4G5 S3
MUHLENBERGIA RACEMOSA	G5 S2
SCHEUCHZERIA PALUSTRIS	G5 S2
DRYOPTERIS CRISTATA	G5 S2
LYCOPODIUM DENDROIDEUM	G5 S2
LYCOPODIELLA INUNDATA	G5 S2

Rare animal occurrences:

BUCEPHALA CLANGULA	G5 S3B,S3N
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Author:

A. H. Pitner

KANIKSU MARSH

Directions:

Kaniksu Marsh RNA is located on the west side of the lower Priest River in the Idaho Panhandle. Access to Kaniksu Marsh RNA is by State Route 57 about 22 miles (36 km) north of the town of Priest River, Idaho, or 1.2 miles (1.9 km) south of the junction of Route 57 with the Dickensheet Road to Coolin, Idaho. At this point follow a logging road southeastward along the edge of the bench above the marsh, and then an old, unimproved, narrow road for about 1 mile (1.6 km) from the highway to the eastern edge of the area. An alternative is to park at the point where the improved logging road takes off from State Route 57 and climb down the steep slope to the northeast into the RNA.

Richness:

Kaniksu Marsh RNA consists of an undisturbed, 90-acre, crescent-shaped marsh and wet meadow, and adjacent forested slopes. Elevations in the RNA are low, ranging from 2420 feet (738 m) to 2525 feet (770 m). Open water, less than six feet deep, with submergent aquatic plants surrounds an "island" of emergent vegetation at the lower end of the marsh. The central portion of the marsh ranges from shallow water to saturated soil with sedges and rushes interspersed with beaver ponds. This habitat grades into spruce-hemlock (*Picea-Tsuga*) bog and Sphagnum bog to progressively drier sites with margins of bog birch (*Betula glandulosa*) and alder (*Alnus*) and a forest setting at the upper end. The old-growth and second-growth forests are composed of ponderosa pine (*Pinus ponderosa*), western white pine (*Pinus monticola*), western larch (*Larix occidentalis*), grand fir (*Abies grandis*), Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), Engelmann spruce (*Picea engelmannii*), and lodgepole pine (*Pinus contorta*). A number of rare plants are associated with the wetlands in the RNA, including *Eriophorum viridicarinarum*, *Gaultheria hispidula*, *Lycopodium inundatum*, *Trientalis arctica*, and *Vaccinium oxycoccus*.

Rarity:

The low-elevation wetlands in the RNA support a diversity of vegetation, including at least 16 rare plant species.

Condition:

Kaniksu Marsh RNA is allocated to Management Area 14 in the Idaho Panhandle National Forests Plan (August 1987). Recreational use of the area is extremely minimal.

Dandelion (*Taraxacum officinale*) and bull thistle (*Cirsium vulgare*) are invading at the southeast end of the marsh.

Viability:

The RNA is entirely surrounded by Forest Service lands within Management Area 4 - lands designated for timber production within big game winter range. These lands are managed to provide winter forage to support existing and projected big game populations through scheduled timber harvest and permanent forage areas.

Other Values:

The marsh supports a variety of wildlife including beaver and waterfowl. The western painted turtle (*Chrysemys picta*) has also been observed in the area.

Conservation Intent:

The site has been protected by designation as a Forest Service Research Natural Area.

Management needs:

Information not available.

Information needs:

Unknown

Plant community occurrences:

ABIES GRANDIS/CLINTONIA UNIFLORA	G5 S3
PSEUDOTSUGA MENZIESII/PHYSOCARPUS MALVACEUS	G5 S5
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA	G4 S5
BETULA GLANDULOSA/CAREX UTRICULATA	G4? S3
ALNUS INCANA/CAREX UTRICULATA	G3 S2
CAREX LASIOCARPA	G4 S2
PALUDIFIED FOREST	G5 S1
CAREX CUSICKII	GQ S3
POOR FEN	G4 S1

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
PETASITES SAGITTATUS	G4 S3
BETULA PUMILA VAR GLANDULIFERA	G5T5 S2
HYPERICUM MAJUS	G5 S3
GAULTHERIA HISPIDULA	G5 S2
VACCINIUM OXYCOCCOS	G5 S2
EPILOBIUM PALUSTRE	G5 S3
TRIENTALIS ARCTICA	G5 S3
SALIX PEDICELLARIS	G5 S1
CAREX CHORDORRHIZA	G5 S2
CAREX LEPTALEA	G5 S2
CAREX ROSTRATA	G5 S2
CAREX PAUPERCULA	G5 S2
ERIOPHORUM VIRIDICARINATUM	G4 S1
RHYNCHOSPORA ALBA	G5 S2
SCIRPUS SUBTERMINALIS	G4G5 S3

SCHEUCHZERIA PALUSTRIS	G5 S2
DRYOPTERIS CRISTATA	G5 S2
LYCOPODIUM DENDROIDEUM	G5 S2
LYCOPODIELLA INUNDATA	G5 S2

Author:

J. H. KALTENECKER

LAMBERTSON LAKE

Directions:

Lambertson Lake is located approximately 7 miles north of Athol, Idaho. From Athol, travel four miles north on Highway 95 to Kelso Lake Road. Travel about 3.5 miles west to Beaver Lake Ranch Road, just west of Kelso Lake. Continue north on Beaver Lake Ranch Road 1 mile. Lambertson Lake can be accessed by continuing west then north approximately four miles on a ranch road.

Richness:

Lambertson Lake is a kettle lake with no apparent inlet. The outlet flows south to Beaver Lake. Beaver have created a series of dams on the outlet which may function to maintain lake levels. Lambertson Lake's shallow littoral zone is covered by *Brasenia schreberi*, *Nuphar polysepalum*, and *Scirpus subterminalis*, a species on the Idaho rare plant list. *Typha latifolia* occurs along the lake margin. *Carex lasiocarpa* dominates the east end of the lake and grades into drier meadows dominated by *Juncus effusus*. The outlet downstream of the beaver dams has a band of *Alnus incana* with *Spiraea douglasii* in the understory. The west end of the lake is also dominated by *Carex lasiocarpa* community which partially occurs on a floating mat. A well-developed poor fen is present on the west end of the lake and supports a carpet of *Sphagnum* spp. and scattered vascular plants. Vegetation along the margins of the lake is dominated by *Spiraea douglasii*.

Rarity:

Lambertson Lake provides habitat for five plant species of conservation concern; *Epilobium palustris*, *Hypericum majus*, *Rhynchospora alba*, *Scheuchzeria palustris*, and *Scirpus subterminalis*.

Condition:

The primary land use of the area is for timber production. Livestock grazing occurs at low levels. Lambertson Lake also receives recreational use.

No exotic species that could have potential adverse impacts on wetland vegetation were observed.

Viability:

Logging activities on the ranch could have potential adverse impacts on

Lambertson Lake. Adequate buffers should be used to minimize impacts to the wetlands associated with the lake.

Other Values:

Lambertson Lake provides habitat for moose, black bear, waterfowl, herons, and other wildlife species. The area has high aesthetic values, and recreational uses include boating and angling.

Conservation Intent:

This site should be of the highest priority for a conservation easement. It represents unique wetland habitats in an area unfragmented by development. In addition, timber harvesting and livestock grazing in the area use Best Management Practices.

Management needs:

As much as possible, this site should be left alone. Road maintenance should minimize introducing fill material into the lake. Because the poor fen is relatively close to the road it may be beneficial to restrict access to the west side of the lake by posting a sign indicating the area's sensitivity to trampling or other disturbances.

Information needs:

The plant community inventory was restricted to the eastern, western, and northern sides of the lake. Several heron were observed indicating a rookery may be located nearby. A vertebrate species inventory, including migrating waterfowl, would be useful.

Plant community occurrences:

ALNUS INCANA/SPIRAEA DOUGLASII	G?	SP
CAREX LASIOCARPA	G4	S2
NUPHAR POLYSEPALUM	G5	S4
TYPHA LATIFOLIA		G5 S4
POOR FEN	G4	S1
JUNCUS EFFUSUS		GU SU

Rare plant occurrences:

HYPERICUM MAJUS	G5	S3
EPILOBIUM PALUSTRE	G5	S3
RHYNCHOSPORA ALBA	G5	S2
SCIRPUS SUBTERMINALIS	G4G5	S3
SCHEUCHZERIA PALUSTRIS	G5	S2

Author:

Michael Mancuso

MOSQUITO BAY FEN

Directions:

From Coolin, ID, go north up the east side of Priest Lake to the extreme northeastern end. Just north of Lions Head campground there is a gravel road to the west. Mosquito Bay Fen is just down this road.

Richness:

Mosquito Bay Fen covers slightly more than 30 hectares. It extends from near the edge of Priest Lake on the west side of Mosquito Bay, north more than one-quarter mile and west into the NE portion of sec. 9, T62N, R4W. A diversity of peatland habitats occur at Mosquito Bay Fen. A rich fen dominated by *Carex lasiocarpa*, *C. chordorrhiza*, and *C. muricata* covers as much as 1/3 of the open fen area. A wet, emergent rich fen dominated by *C. livida*, *Rhynchospora alba*, and *Equisetum fluviatile* covers about 1/4 of the open fen. The remainder of the open area is covered by intermediate fen characterized by the above species and *Sphagnum* spp., *Potentilla palustris*, *Kalmia microphylla*, *Vaccinium oxycoccus*, and *Andromeda polifolia*. Poor fen habitats are smaller and localized, usually in the form of slightly raised hummocks surrounded by intermediate or rich fen. Scattered patches of *Pinus contorta* (lodgepole pine) clearly mark some of the poor fen habitats at MBF. Extensive rich fen shrub carr communities ring the graminoid and bryophyte dominated central portions of the fen. They are dominated primarily by *Spiraea douglasii* and *Betula glandulosa*, *Rhamnus alnifolia*, *Alnus incana*, and other shrubs. Paludified forest habitats surround most of the graminoid- and shrub-dominated fen habitats. They are characterized by *Abies lasiocarpa*, *Picea engelmannii*, *Thuja plicata*, *Tsuga heterophylla*, *Pinus contorta*, and *P. monticola*. The understory of the paludified forests are dominated by *Sphagnum angustifolium*, *S. centrale*, *Scirpus microcarpus*, *Calamagrostis canadensis*, *Dulichium arundinaceum*, *Carex brunnescens*, *Spiraea douglasii*, and many others. There are some very interesting *Sphagnum* hummocks growing over old stumps in the paludified forest. The hummocks reach more than one meter in height above the surrounding substrate. I also observed *Sphagnum* growing on tipup mounds (with *Gaultheria hispidula*) that were sticking up above the surrounding substrate as much as 3 meters. They appeared to be thriving too.

Rarity:

141 species (11 bryophyte and 130 vascular) are known from Mosquito Bay Fen. This is the single most floristically diverse peatland in Idaho. It has the most exceptional paludified forest habitats in the state, as well. It contains 21 rare plant species: *Andromeda polifolia* (bog rosemary, only pop. known in Idaho), *Aster junciformis* (rush aster), *Carex buxbaumii* (Buxbaum's sedge), *C. chordorrhiza* (string root sedge), *C. leptalea* (bristle-stalk sedge), *C. livida* (pale sedge), *C. paupercula* (poor sedge), *Comandra livida* (northern comandra), *Epilobium palustre* (swamp willow-weed), *Eriophorum viridicarinatum* (green keeled cotton-grass), *Gaultheria hispidula* (creeping snowberry), *Hypericum majus* (large Canadian St. John's wort), *Iris versicolor* (blue flag iris, only site in Idaho or the Pacific NW), *Lycopodium dendroidium* (groundpine), *Lycopodiella inundata*

(bog clubmoss), *Rhynchospora alba* (white beakrush), *Salix pedicellaris* (bog willow), *Scheuchzeria palustris* (pod grass), *Triantha occidentalis* ssp. *brevistyla* (sticky tofieldia), *Trientalis arctica* (northern starflower), and *Vaccinium oxycoccos* (bog cranberry).

Condition:

There are several houses surrounding the fen on the east, west and south sides. Roads surround most of the main portion of the fen as well. Most of the homes have low- maintenance yards with little, if any, lawn so nutrient runoff from overfertilization or herbicide runoff doesn't seem to be a threat. Road maintenance could hasten nutrient runoff, creating problems, but it wouldn't, by itself, seem much of a threat. Logging could occur within the watershed and within the paludified margins.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging on State of Idaho Department of Lands holdings to the north within this watershed could prove a minor threat to this site, but it seems doubtful. Logging on the private land surrounding the fen and in the paludified forests could threaten this site.

Other Values:

This is a beautiful open site that is easy to get to with excellent interpretive potential if it is acquired by TNC or a federal or state agency. It is heavily used by white-tail deer.

Conservation Intent:

The privately-owned portions of Mosquito Bay Fen should be high priority for acquisition by the Nature Conservancy or other agency or organization and managed to protect the wetland features.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur. Before management options can be explored, Mosquito Bay Fen must be acquired by The Nature Conservancy. Bursik would label it the highest priority privately owned wetland in the state. Once acquired, we have suggested establishing Mosquito Bay Fen as a Research Natural Area for future research and education purposes. Monitoring of peatland communities and rare plant populations will then be critical given the scale of potential indirect threats coming from surrounding houses and timber lands owned by State of Idaho Department of Lands.

Information needs:

Floristic inventory of Mosquito Bay was very intensive and is mostly complete.

Only one plant of *Triantha occidentalis* ssp. *brevistyla* was found during field surveys related to the ongoing lawsuit in 1993. Further survey of marginal fen and paludified forest (where I found the one plant) will reveal any more plants that might exist. Studying the history of the paludified forest at this site would be very interesting. As yet no studies or surveys of aquatic and terrestrial invertebrate populations associated with the pond, fen and paludified forest habitats have been carried out, though they ought to be surveyed in the future. Likewise surveys of habitat use by birds and mammals has yet to be accomplished. As with the other priority peatlands we suggest putting two to four permanent vegetation monitoring plots in the fen communities and paludified forests (at least 4 plots are needed at this site) following the methods we used for Sawtooth Valley Peatland monitoring (Moseley et al. 1994). The area provides an excellent opportunity to study the recovery of disturbed, filled peatland habitats. The southwestern portion of the fen was filled by Orville Bailey in the early 1980s. The Army Corps of Engineers stopped him and he was forced to remove the fill. A pond was created in parts of this area and marsh and rich fen species have colonized it. Studying succession in this area may elucidate much about peatland succession in the region. None of the surveys or research will be possible until this area is acquired by TNC.

Plant community occurrences:

SPIRAEA DOUGLASII	G5	S4
RHAMNUS ALNIFOLIA	G3	S3
ALNUS INCANA/CAREX UTRICULATA	G3	S2
CAREX LASIOCARPA	G4	S2
EQUISETUM FLUVIATILE	G4	SP
VALLEY PEATLAND POND	G5	S2
OMBROTROPHIC BOG	G5	S1
PALUDIFIED FOREST	G5	S1
CAREX LIVIDA	GQ	S2
BETULA GLANDULOSA/CAREX LASIOCARPA	G4	S2
POOR FEN	G4	S1

Rare plant occurrences:

HYPERICUM MAJUS	G5	S3
ANDROMEDA POLIFOLIA	G5	S1
GAULTHERIA HISPIDULA	G5	S2
VACCINIUM OXYCOCCOS	G5	S2
EPILOBIUM PALUSTRE	G5	S3
TRIENTALIS ARCTICA	G5	S3
SALIX PEDICELLARIS	G5	S1
CAREX BUXBAUMII	G5	S3
CAREX CHORDORRHIZA	G5	S2
CAREX LEPTALEA	G5	S2
CAREX LIVIDA	G5	S2
CAREX PAUPERCULA	G5	S2
ERIOPHORUM VIRIDICARINATUM	G4	S1

RHYNCHOSPORA ALBA	G5 S2
TRIANTHA OCCIDENTALIS SSP BREVISTYLA	G5T4 S1
SCHEUCHZERIA PALUSTRIS	G5 S2
LYCOPODIUM DENDROIDEUM	G5 S2
LYCOPODIELLA INUNDATA	G5 S2

Author:

A. H. Pitner

PACKER MEADOWS

Directions:

From Nordman, ID, on the west side of Priest Lake, travel north on FS Rd. 302 approximately 3 miles. Where the pavement ends, take FS Rd. 1341 to the east. Travel 3 miles on this road until you reach FS 1373. Take 1373 left (northwest) approximately 3 miles. It will fork sometime after two miles. Take a hard left at the fork and follow the road to the end where you should see Packer Meadows down-slope (to the west from the road). I have also included the fen meadows along the East Fork of Packer Creek in this site, which can also be accessed off of FS 1373 (without traveling to the end of the road), or Packer Creek can be followed downstream from Packer Meadows, proper, to the East Fork of Packer Creek. Follow the east side of the East Fork a short distance upstream to the fen communities.

Richness:

Packer Meadows contains a unique mosaic of fen communities along the low-gradient meandering stretch of Packer Creek. Within the mosaic are somewhat patterned areas on slight slopes toward the creek with string-flark topography. The raised strings run perpendicular to the slope and are covered with *Sphagnum* spp., *Betula glandulosa*, *Pedicularis groenlandica*, *Carex utriculata*, *Salix pedicellaris* (bog willow; a rare species), *Salix* sp., and *Equisetum fluviatile*. The shallowly inundated flarks are dominated by *C. utriculata*, *C. cusickii*, *C. leptalea* (a rare species) and *C. aquatilis*. This area would be classified as intermediate fen given the codominance of *Sphagnum* spp. and various vascular species. Other, small areas of nearly level substrate are poor fen dominated by *Sphagnum* spp., *Carex limosa*, *Drosera rotundifolia*, *Eriophorum polystachion* and other poor fen species. Other intermediate fen areas are hummocky with *Sphagnum* centrale hummocks occurring beneath *Betula glandulosa*, *Picea engelmannii*, and *Abies lasiocarpa* individuals. *Trientalis arctica* (northern starflower), a rare species occurs on these hummocks. Sedge-dominated rich fen covers a majority of Packer Meadows. These areas appear more mesic with shallower, firmer peat. They are dominated by *Calamagrostis canadensis*, *Carex utriculata*, *Senecio triangularis*, *C. aquatilis*, and *C. scopulorum*. Periodic beaver activity on Packer Creek on the south end of Packer Meadows leads to the formation of a several-acre shallow lake. No lake was present at the time of my survey in 1991. The early 1970's aerial photo of the site showed the lake, however. The East

Fork of Packer Creek Fen is characterized by sloped intermediate fen communities that are subirrigated. The slopes are as great as 7%. They are covered with *Sphagnum* spp., *Calamagrostis canadensis*, *Carex scopulorum*, *Eriophorum polystachion*, *C. leptalea* (bristle-stalk sedge, a rare species), and *Eriophorum chamissonis*. These sloped fens are interspersed between areas of *Picea engelmannii* and *Abies lasiocarpa* paludified forest where deep hummocks of *Sphagnum centrale* cover the base of the trees.

Rarity:

Because of its elevation, Packer Meadows is somewhat intermediate floristically between subalpine and valley peatlands, containing numerous boreal species that are restricted to valley peatlands and many cordilleran species that are characteristic of subalpine peatlands (Bursik 1990); making it unique among the high-priority Panhandle peatlands. It is the highest known site with paludified forest habitat as well. The sloped intermediate fen communities in the East Fork fens are similar to those found at Smith Creek RNA, Cow Creek Meadows and Grass Creek Meadows at higher elevations in the northern Selkirks. Also unique is the string-flark patterned ground of the gradually sloped intermediate fen in Packer Meadows. Bursik has only previously seen this type of patterned ground in subalpine peatlands. Three rare species are found in the intermediate fen communities at Packer Meadows: *Carex leptalea* (bristle-stalk sedge), *Trientalis arctica* (northern starflower), and *Salix pedicellaris* (bog willow). Other rare species may be found with more intensive floristic inventory. The floristic inventory Bursik did in 1991, which was rather superficial revealed the presence of more than 40 species. I'm sure more than 60 vascular species alone inhabit this site, however.

Condition:

No landuse practices, past or present, appear to be direct threats to the fen communities along Packer Creek.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging and road construction and maintenance in the Packer Creek drainage present indirect threats to the biota of the Packer Meadows with enhanced eutrophication.

Other Values:

This is a remote, but easy to get to peatland. Because the meadows are so broad, the view of surrounding peaks from Packer Meadows is quite spectacular. Very little logging and relatively little roading has been done in the small West Fork drainage basin, which makes the site rather pristine. Although the East Fork drainage has been extensively roaded and logged, the East Fork fen communities have not been directly affected and may be isolated enough to escape indirect impacts. Packer Meadows appears to be an important wintering ground for

moose. All of the bog birch and bog willow is cropped to what appears to be snow level.

Conservation Intent:

As part of the comprehensive conservation strategy for Panhandle peatlands, Packer Meadows is recommended as a Special Interest Area in recognition of the unique flora and plant communities that the site supports. This designation will also serve to highlight the sensitive and rare nature of peatland communities at Packer Meadows to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the goal of SIA designation is to encourage public interpretation within these sites. Due to limited access and the relatively pristine state of Packer Meadows, it is not one of the sites recommended for public education.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Current management of Packer Meadows appears to be consistent with the long-term maintenance of the resident biodiversity. Formal designation of the site as SIA should be carried out as soon as possible.

Information needs:

Floristic inventory has been limited to a cursory visit the Packer Meadows and the East Fork fens. More intensive survey of the vascular flora and an initial survey of the bryophyte flora are necessary for full documentation. No work has been done on the aquatic invertebrate populations of Packer Creek. Water chemistry monitoring should also be initiated at this site. Small vertebrate and terrestrial invertebrate populations should also be surveyed in the future. It would be desirable to establish two or more permanent vegetation monitoring plots in Packer Meadows to detect changes that could occur as a result of human activities or natural processes. We suggest following the methods we established for peatland vegetation monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994). At least one of the monitoring plots should be placed in the area periodically inundated by beavers.

Plant community occurrences:

CAREX UTRICULATA	G5 S4
CAREX AQUATILIS	G5 S4
CAREX LIMOSA	G3 S1
PALUDIFIED FOREST	G5 S1
ERIOPHORUM POLYSTACHION	G3? S3
CAREX CUSICKII	GQ S3
POOR FEN	G4 S1

Rare plant occurrences:

TRIENTALIS ARCTICA	G5 S3
SALIX PEDICELLARIS	G5 S1

Author:

A. H. Pitner

PERKINS LAKE

Directions:

From Moyie Springs, travel 3 miles east on Hwy 2 to FS Rd 72, take it to the north and follow the signs to Perkins Lake (ca. 6 miles from Hwy 2).

Richness:

Perkins Lake contains a diversity of peatland (fen) communities along the northeastern shore (east of the boat landing) and on the western side (which is mostly privately owned). Extensive floating mats ring the lake margins and fixed mats extend into the fen area west of the lake. More than half of the lake is vegetated littoral and limnetic zones. The floating mats on the northeastern side of the lake are very unstable and are dominated by *Betula pumila* (dwarf birch), *Alnus incana* (speckled alder), and *Spiraea douglasii* (hard-hack). The understories are covered by *Carex lasiocarpa* (slender sedge), *Calamagrostis canadensis* (bluejoint reedgrass) and various *Sphagnum* and brown mosses. Access (for viewing) to this area is provided by the angler's access dock which was constructed through the mat in the late 1980s. Most of this mat area is floating. The lake margins are dominated by *Typha latifolia* (cattail) and various sedges, including *C. lasiocarpa*, *C. cusickii*, and *Dulichium arundinaceum* (three way sedge). Shrub carr also covers much of the fen west of the lake. It is interspersed with *Carex/Sphagnum*-dominated intermediate and poor fen communities, which extend at least 1/4 mile from the lake margin to the west.

Rarity:

Perkins Lake contains some very unique peatland plant communities unlike those found elsewhere in the Panhandle region. The *Betula pumila* (dwarf birch) carr is very unique and unusual in that it occurs on a floating mat which is very unstable. Most of the fen communities are intermediate fens with a nearly solid mat of sphagnum and brown mosses and greater than 50% cover by vascular species. Scattered areas are poor fen while areas closer to the upland boundary are rich fen with little moss cover and greater vascular plant prominence. The intermediate fen communities are very diverse with shrub carr communities being interspersed with sedge/graminoid-dominated areas with the two types grading freely into one another. Some scattered patches of lodgepole (*Pinus contorta*) and white pine (*Pinus monticola*) give evidence of historically dynamic water levels, possibly related to beaver activity on the outlet. The lake contains some of the highest diversity of aquatic plant species known in the state. Populations of fifteen rare plant species occur in the fen and aquatic communities around the lake, including *Aster junciformis* (rush aster), *Betula pumila*, *Carex chordorrhiza* (string root sedge), *C. comosa* (bristly sedge, one of only three populations in the state), *C. flava* (yellow sedge), *C. leptalea*

(bristle-stalk sedge), *Cicuta bulbifera* (bulb-bearing waterhemlock), *Dryopteris cristata* (crested shield fern), *Epilobium palustre* (swamp willow weed), *Rhynchospora alba* (white beakrush), *Salix pedicellaris* (bog willow), *Scheuchzeria palustris* (pod grass), *Scirpus subterminalis* (water clubrush), *Petasites sagittatus* (arrowleaf coltsfoot), and *Muhlenbergia racemosa* (green muhly). Several other rare species, including *C. buxbaumii*, *C. paupercula*, and *Salix candida* likely occur there and would be found with further survey. More than 100 vascular and bryophyte plant species have been identified from Perkins Lake making it one of the most floristically diverse peatland ecosystems in the state. Common goldeneyes nest nearby and use the lake.

Condition:

Perkins Lake is currently one of the more popular warm water and trout lake fisheries in the area. Its popularity has led to the construction and maintenance of a well traveled road along the north side, the construction of a boat launch, and the construction of a floating angler dock through one of the most unique floating mat communities. Additionally because it sits within a low, broad valley, portions of the watershed adjacent to the lake were homesteaded and are still under private ownership. Logging within the watershed on public and private lands and grazing within the Perkins Lake wetland complex on the west and northeast ends are also ongoing threats.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging, road construction and maintenance anywhere in the Perkins Lake watershed and grazing in the wetland communities around the lake could lead to enhanced eutrophication within the lake and changes in the composition of the fen communities which could ultimately threaten the viability of rare plant populations. Beaver activity that has produced flooding on the Perkins Lake road on the northwest side of the lake has recently been discouraged, which could, in the long term threaten some species and communities by maintaining very uniform water levels and/or eliminating flooding of fixed mats and marshes surrounding the lake.

Other Values:

This is a beautiful, easy-to-access lake that is enjoyed by many fishermen, in spite of (or because of) its eutrophic, weedy nature. The south side of the lake contrasts sharply with the north side, with the upland rising steeply from the edge of the lake rather than grading into floating and fixed mat habitats. Although the floating dock, road, and boat launch can, on one hand, be viewed as threats; on the other hand, they provide for excellent interpretive opportunities to educate the public about the unique and sensitive fen communities. Interpretive displays have been constructed at the floating dock.

Conservation Intent:

Fee title acquisition or conservation easements on private parcels should be high priority. If this is accomplished designation as Research Natural Area would be appropriate. This would add to the network of peatland RNAs in the region to achieve representation of the full range of species and habitat diversity within RNAs. Perkins Lake was selected because of its high floristic diversity and its unique communities unlike those found in other regional peatlands.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or be minimized. Careful monitoring of any road maintenance in the vicinity should be carried out to assure that sensitive communities around Perkins Lake are not affected. Additional interpretive trails at Perkins Lake using the Perkins Lake road educate the public about the unique plant communities and species diversity at this site could be constructed. Placement of several permanent vegetation monitoring plots in various peatland communities is recommended using our methods for peatland monitoring in the Sawtooth Valley (Moseley et al. 1994). Acquisition of the privately owned portions of the Perkins Lake proposed Research Natural Area should be a priority for the USFS, Idaho Fish and Game, BLM, TNC or any other public or private group interested in preserving critical habitats. Establishment of the area as an RNA should proceed immediately with or without acquisition of privately owned lands.

Information needs:

Floristic inventory has been rather extensive, but survey has been limited to a fairly small portion of the lake due to difficulty of access to portions of the wetland/fen communities. We suggest that the small vertebrate and terrestrial and aquatic invertebrate populations be surveyed in the future. As with the other priority peatlands that are publicly owned, we suggest several permanent vegetation monitoring plots be established in the various fen, marsh, and aquatic communities around and within the lake to detect changes that could occur as a result of human or natural processes.

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/CAREX UTRICULATA	G3 S2
CAREX LASIOCARPA	G4 S2
DULICHIMUM ARUNDINACEUM	G3? S2
TYPHA LATIFOLIA	G5 S4
CAREX CUSICKII	GQ S3
POOR FEN	G4 S1

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
PETASITES SAGITTATUS	G4 S3
BETULA PUMILA VAR GLANDULIFERA	G5T5 S2
EPILOBIUM PALUSTRE	G5 S3

SALIX PEDICELLARIS	G5 S1
CAREX CHORDORRHIZA	G5 S2
CAREX COMOSA	G5 S1
CAREX FLAVA	G5 S3
CAREX LEPTALEA	G5 S2
RHYNCHOSPORA ALBA	G5 S2
SCIRPUS SUBTERMINALIS	G4G5 S3
MUHLENBERGIA RACEMOSA	G5 S2
SCHEUCHZERIA PALUSTRIS	G5 S2
DRYOPTERIS CRISTATA	G5 S2

Rare animal occurrences:

BUCEPHALA CLANGULA	G5 S3B,S3N
GULO GULO LUSCUS	G4T4 S2

Author:

A. H. Pitner

POTHOLES

Directions:

Potholes RNA is located on the north side of Kalispell Creek near the Idaho/Washington border in the Idaho Panhandle, approximately 38 miles (62 km) north-northwest of Priest River, Idaho. From the intersection of U.S. Route 2 with State Route 57 in the town of Priest River, go 33 miles (53 km) north on State Route 57 to the Priest Lake Ranger Station. Continue north on State Route 57 for another 2 miles (3.2 km) to the turnoff of FS Road 308. Follow 308 up Kalispell Creek for 2.3 miles (3.7 km) where it crosses the creek. Within sight of the bridge, about 100 feet, is FS Road 1362 turning off northward from 308. The Potholes area is accessible from FS Road 308, from FS Road 1362 on the eastern side of the area, or from FS Road 657 on the western side. A good access route is to follow FS Road 308 up Kalispell Creek for 0.9 mile (1.5 km) from the bridge. Take an old trail (not maintained) up the hill and into the center of Potholes RNA. The trail forks near the marsh area. One fork goes south of the marsh and on around to join the old road on the north boundary. The other fork continues along the western side of the marsh to the spring and joins the north boundary road a short distance beyond the spring.

Richness:

Potholes RNA is an example of a diverse aquatic-wetland area, resulting from Pleistocene glaciation, surrounded by forests of western hemlock (*Tsuga heterophylla*) and associates. Elevations in the RNA range from 2750 to 3150 feet (828 to 960 m). The area contains a large upwelling cold spring. Spring ponds drain into a stream which supplies water for wet meadows, a fen, and several beaver ponds. In places, low dams have been built by beaver (*Castor canadensis*), and elsewhere *Sphagnum* moss and sedges have formed dams. The ponds are drained by three streams. Two of these unite on a lower bench of alder (*Alnus* sp.)

meadows, marshes, and a Sphagnum fen. The streams have reaches of gentle gradient, and the two that break over the bench and tumble to Kalispell Creek become steep gradient streams. A number of rare and interesting plant species are found in the area including *Gaultheria hispidula*, *Vaccinium oxycoccos*, *Epilobium palustre*, *Trientalis arctica*, *Salix pedicellaris*, *Carex leptalea*, and *C. paupercula*, all of which are U.S. Forest Service Region 1 Sensitive Species. A rare plant communities also occurs in the RNA, western redcedar/skunk cabbage (*Thuja plicata/Lysichitum americanum*) habitat type. Additionally western redcedar is present with an understory dominated by common horsetail.

Rarity:

The RNA contains a rare plant community, a variety of aquatic features, and at least 9 rare plant species which are associated with the wetlands. The area is within proposed recovery habitat for grizzly bear (*Ursus arctos*).

Condition:

Potholes RNA is allocated to Management Area 14 in the Idaho Panhandle National Forests Plan (August 1987). The RNA receives only minor recreational use.

Viability:

The RNA is entirely surrounded by Forest Service lands within Management Area 4 - lands designated for timber production within big game winter range. These lands are managed to provide winter forage to support existing and projected big game populations through scheduled timber harvest and permanent forage areas.

Other Values:

The large, upwelling cold spring that occurs in the area is an unusual feature. The forests in the RNA contain undisturbed examples of various habitat types in climax condition.

Conservation Intent:

The site has been protected by designation as a Forest Service Research Natural Area.

Management needs:

Research has occurred in the RNA without permission of the USFS, and without reports being submitted to the Intermountain Research Station. Researchers should be made aware of the requirements for doing research in RNAs.

Information needs:

Unknown

Plant community occurrences:

THUJA PLICATA/LYSICHITUM AMERICANUM	G4Q S2
THUJA PLICATA/OPLOPANAX HORRIDUM	G3 S3
ALNUS INCANA/CAREX UTRICULATA	G3 S2
ALNUS INCANA/LYSICHITUM AMERICANUM	G3 S3

PALUDIFIED FOREST	G5	S1
POOR FEN	G4	S1
THUJA PLICATA/ATHYRIUM FILIX-FEMINA, ATHYRIUM FILIX-FEMINA	G3	S3
TSUGA HETEROPHYLLA/ASARUM CAUDATUM, ARALIA NUDICAULIS	G3	S3
TSUGA HETEROPHYLLA/ASARUM CAUDATUM, ASARUM CAUDATUM	G3	S3
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA, CLINTONIA UNIFLORA	G5	S4

Rare plant occurrences:

PETASITES SAGITTATUS	G4	S3
GAULTHERIA HISPIDULA	G5	S2
VACCINIUM OXYCOCCOS	G5	S2
EPILOBIUM PALUSTRE	G5	S3
TRIENTALIS ARCTICA	G5	S3
SALIX PEDICELLARIS	G5	S1
CAREX LEPTALEA	G5	S2
CAREX PAUPERCULA	G5	S2
DRYOPTERIS CRISTATA	G5	S2

Author:

J. H. KALTENECKER

SMITH CREEK

Directions:

Smith Creek RNA is located along the crest of the Selkirk Mountains in the Idaho Panhandle, 23 miles northwest of Bonners Ferry. Access to Smith Creek RNA is gained from State Route 1 at Porthill by crossing the Kootenai River valley on a county road to the mouth of Smith Creek, a distance of approximately 5 miles. Proceed up Smith Creek on FS Road 281 for approximately 9 miles to its junction with FS Road 2464. Proceed up FS Road 2464 for approximately 2.5 miles to its end. Proceed on Forest Trail 21 about 0.5 mile to the RNA.

Richness:

Smith Creek RNA is located along the crest of the Selkirk Mountains on the West Fork of the West Fork Smith Creek. The topography of the RNA is the result of Pleistocene glaciation. An outstanding example of divide crossing by glacial ice occurs in the RNA, as evidenced by the glacial trough that runs across the Selkirk Crest in an east-west direction. Elevations in the RNA range from 4700 feet (1433 m), at the lower boundary of the RNA, to 6742 feet (2055 m) on the summit of Joe Peak. The main features of the area are the outstanding wetland communities of the valley bottom, including undisturbed sphagnum fen and associated ponds, and other wetland areas dominated by sedges (*Carex* spp.), cottongrass (*Eriophorum polystachion*), Engelmann spruce (*Picea engelmannii*), and

subalpine fir (*Abies lasiocarpa*). The vegetation of the area consists largely of subalpine fir series forest associations. Of special interest is the subalpine fir/white rhododendron (*Rhododendron albiflorum*) community type. Small portions of the RNA, mostly at higher elevations, consist of open rocky areas. Forest stands around the summit of Joe Peak were intensely burned in the 1967 Trapper Creek Fire. These areas are still largely treeless, even after 26 years. The area contains habitat for the woodland caribou (*Rangifer tarandus caribou*), an endangered species, the grizzly bear (*Ursus arctos*), a threatened species, and supports a population of the heather vole (*Phenacomys intermedius*), considered rare in Idaho. Five rare plant species are found in the RNA: *Trientalis arctica*, *Drosera intermedia*, *Ribes howellii*, *Lycopodium sitchense*, and *Carex paupercula*. Additionally, *Leptarrhena pyrolifolia* occurs in the RNA. This plant has a limited distribution in Idaho, occurring only in the wettest forest communities of extreme northern Idaho. Unusual aquatic species occur in the area, including the algae *Ulothrix zonata*, which occurs in unusually high densities in the streams of the RNA, and an uncommon Diptera, *Palpomyia* sp.

Rarity:

The site contains outstanding peatland communities; habitat for the woodland caribou, an endangered species, and the grizzly bear, a threatened species; populations of four rare plants: *Trientalis arctica*, *Ribes howellii*, *Lycopodium sitchense*, and *Carex paupercula*; and one rare animal, the heather vole.

Condition:

Smith Creek RNA is allocated to Management Area 14 in the Idaho Panhandle National Forests Plan (August 1987). This area is remote, located at the north end of the highly scenic Selkirk Crest, and lies less than 1 mile north of the recommended Selkirk Crest Wilderness, No. 00125. A 200-foot radius exclusion in the RNA was made for the West Fork Cabin, an old Forest Service log structure located in a meadow near the eastern boundary. Forest Trail 21 probably will be maintained to access the cabin from the west end of Forest Road 2464. A snow survey course exists, and a few trees may be cut from time to time to maintain data consistency. Trespass cattle were observed in the RNA in the 1980's. The District Ranger promised to keep livestock out of the area, although the RNA's proximity to grazed, private land might make this difficult. The area is used for winter camping.

Viability:

The Forest Service lands north and south of the RNA area in Management Area 10 - lands that have high value for semi-primitive recreation. These lands are managed to maintain their present condition with no new roads. The area is within designated recovery habitat for grizzly bear and caribou. The lands to the west of the RNA are within Priest Lake State Forest. Land in section 33 adjacent to the eastern boundary is private land owned by W-I Forest Products. A small area in section 28 adjacent to the eastern boundary is Forest Service land within Management Area 7 - lands designated for caribou management.

Other Values:

The combination of the forest and peatland communities contained within the site is considered to be at least regionally unique. The peatlands are large and relatively undisturbed.

Conservation Intent:

The site has been protected by designation as a Forest Service Research Natural Area.

Management needs:

Trespass of cattle into the RNA needs to be prevented. Steps should be taken to avoid impacts of winter camping in the RNA - perhaps signing to inform campers of the area's designation.

Information needs:

Plant community occurrences:

ABIES LASIOCARPA/RHODODENDRON ALBIFLORUM	G5	S5
CAREX SCOPULORUM	G4	S3
ERIOPHORUM POLYSTACHION	G3?	S3
ABIES LASIOCARPA/CALAMAGROSTIS CANADENSIS, CALAMAGROSTIS CANADENSIS	G5	S5
ABIES LASIOCARPA/CALAMAGROSTIS CANADENSIS, LIGUSTICUM CANBYI	G5	S5
ABIES LASIOCARPA/CALAMAGROSTIS CANADENSIS, VACCINIUM CAESPITOSUM	G5	S5
POOR FEN	G4	S1
ABIES LASIOCARPA/CLINTONIA UNIFLORA, CLINTONIA UNIFLORA	G5	S4
ABIES LASIOCARPA/CLINTONIA UNIFLORA, XEROPHYLLUM TENAX	G5	S4
ABIES LASIOCARPA/STREPTOPUS AMPLEXIFOLIUS, MENZIESIA FERRUGINEA	G4	S4

Rare plant occurrences:

DROSERIA INTERMEDIA	G5	S1
TRIENTALIS ARCTICA	G5	S3
CAREX PAUPERCUA	G5	S2
DIPHASIASTRUM SITCHENSE	G5	S2

Author:

J. H. KALTENECKER

Directions:

Three Ponds RNA is located on the western edge of the Purcell Trench near Bonners Ferry, Idaho. The RNA is 4.5 air miles (7.3 km) southwest of the Bonners Ferry Ranger Station, which is on U.S. Route 95. From U.S. Route 95 turn west on County Highway 2, 1.3 miles (2.1 km) south of Bonners Ferry Ranger Station (the turn-off is at the golf course). Follow County Highway 2 westward and southward for 2.6 miles (4.2 km), then turn west on FS Road 417 for 0.5 mile (0.8 km), crossing Deep Creek followed by a sharp turn to the north. Follow FS Road 417 northward for 1.1 miles (1.8 km). Shortly after crossing Caribou Creek, turn westward on a dirt road up Caribou Creek and follow this road for 0.3 mile (0.5 km). Park here, hike southward across Caribou Creek, and climb the steep ridge to the southwest for 1.1 miles (1.8 km) to the boundary of Three Ponds RNA. Go southward down the slope for 0.3 mile (0.5 km) to Middle Pond. The vertical elevational climb from the car parking area to the boundary of the RNA is 1900 feet. Time from car to pond is ordinarily 2.5 hours. There is no trail, except game trails, up the ridge.

Richness:

Three Ponds RNA is a small, heavily-glaciated basin containing three small, productive lakes or ponds. Each pond is shallow, between three to five acres in size, without fish, and with the pond level controlled by beavers. Middle Pond has a central mat dominated by *Carex lasiocarpa* and sphagnum about one acre (0.4 ha) in area. About a third of the RNA is mature forest which originated about 1850, and approximately two-thirds is a mixture of older trees and young stands that originated following a 1929 fire. Much of the 1929 burn was severe and has restocked to cover types of either Douglas-fir (*Pseudotsuga menziesii*) or lodgepole pine (*Pinus contorta*). Tree cover in parts of the RNA is low, with shrub species common. The RNA contains Douglas-fir, grand fir (*Abies grandis*), western redcedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*) habitat types. An excellent stand of western paper birch (*Betula papyrifera* var. *commutata*) occurs on the northern side of East Pond. A sharp, deep valley near the western boundary of the RNA marks a fault line. A small stream in this valley is bordered by alder (*Alnus sinuata*) and lady-fern (*Athyrium filix-femina*). Elevations in the RNA range from 3340 feet (1018 m), where the boundary crosses the creek in the southwestern corner of the RNA, to 3905 feet (1190 m), the high point on the ridge on the north boundary.

Rarity:

Undisturbed, high-production lakes, especially at low- to mid-elevations are rare in Idaho.

Condition:

Three Ponds RNA is allocated to Management Area 14 in the Idaho Panhandle National Forests Plan (August 1987). Access to the area is difficult, therefore recreational use is minimal. Some big game hunting occurs in the area.

Viability:

The RNA is completely surrounded by Forests Service lands within Management Area 9 - lands unsuited for timber production. These lands are managed to maintain and protect existing improvements and resource productive potential, and to meet visual quality objectives.

Other Values:

The RNA protects the watershed values of the area, which are moderately high. The area contains habitat for a variety of animals including beaver (*Castor canadensis*), moose (*Alces alces*), deer (*Odocoileus hemionus* and *O. virginianus*), elk (*Cervus canadensis*), plus various species of raptors and waterfowl.

Conservation Intent:

The site has been protected by designation as a Forest Service Research Natural Area.

Management needs:

Information not available.

Information needs:

Unknown

Plant community occurrences:

PSEUDOTSUGA MENZIESII/VACCINIUM GLOBULARE	G5Q S2
THUJA PLICATA/ATHYRIUM FILIX-FEMINA	G3G4 S3
CAREX LASIOCARPA	G4 S2
ALNUS INCANA/ATHYRIUM FELIX-FEMINA	G? SP
VALLEY PEATLAND POND	G5 S2
VALLEY PEATLAND FLOATING MAT	G3 S1
ABIES GRANDIS/CLINTONIA UNIFLORA, CLINTONIA UNIFLORA	G4 S3
ABIES GRANDIS/CLINTONIA UNIFLORA, PHYSOCARPUS MALVECEUS	G4 S3
PSEUDOTSUGA MENZIESII/PHYSOCARPUS MALVACEUS, SMILACINA STELLATA	G5 S5
TSUGA HETEROPHYLLA/ASARUM CAUDATUM, ARALIA NUDICAULIS	G3 S3
TSUGA HETEROPHYLLA/ASARUM CAUDATUM, ASARUM CAUDATUM	G3 S3
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA, ARALIA NUDICAULIS	G5 S2?
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA, CLINTONIA UNIFLORA	G5 S4
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA, XEROPHYLLUM TENAX	G5 S3?

Author:

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UPPER PRIEST LAKE FEN

Directions:

From Coolin, ID, go north up the east side of Priest Lake to the extreme northeastern end. Approximately 1 mile north of the entrance to the Lions Head campground there is a tank-trapped road that heads more or less north. There is a small sign on one of the trees near the tank trap marking the road as part of the Idaho Centennial Trail. The sign is small, however. Take this road north and eventually you will come to a well-used campsite (about 1 mile) on Caribou Creek. Take trail upstream 100 meters from the campsite to the site of an old bridge (no longer there). Ford the stream somehow and proceed up the trail. Approximately 1 mile from the creek crossing you should see Upper Priest Lake fen to the west. There is an old road headed to the west that will allow easy access to the south end of the fen.

Richness:

Upper Priest Lake Fen covers perhaps 25 hectares. It contains a short spring stream that emerges within the fen and runs for a short distance. It feeds a small, shallow pond 0.2 hectare in size, whose origin could relate to past beaver activity. Portions of the peatland communities are intermediate sedge/sphagnum fen dominated by *Carex lasiocarpa*, *C. diandra*, *C. utriculata* and various *Sphagnum* spp. A unique poor/intermediate fen shrub carr dominates much of the non-treed peatland. This community is dominated by very tall *Betula pumila* (rare), *Spiraea douglasii*, *Salix pedicellaris*, *Kalmia microphylla*, and *Vaccinium oxycoccos* over a nearly continuous mat of *Sphagnum*. Paludified forest areas with *Abies lasiocarpa*, *Tsuga heterophylla*, *Thuja plicata*, *Picea engelmannii*, and *Abies grandis* surround the open fen. The understory is characterized by *Sphagnum angustifolium*, *S. teres*, *S. centrale*, *S. magellanicum*, and *S. rubellum*? and the vascular spp. *Carex brunnescens*, *Scirpus microcarpus*, *Athyrium felix-femina*, *Linnaea borealis*, *Vaccinium globulare*, *Calamagrostis canadensis*, *Cornus canadensis*, and others. Stringer marshy meadows extend from Upper Priest Lake Fen all the way to the southeast edge of Upper Priest Lake. The banks of Upper Priest Lake have a mix of shrub species including *Alnus incana*, *Rhamnus alnifolia*, *Spiraea douglasii*, *Salix bebbiana*, and *Cornus sericea*.

Rarity:

At least 60 vascular and bryophyte plant species are known from Upper Priest Lake Fen. It contains the most exceptional paludified habitat in Idaho (along with Mosquito Bay Fen). The intermediate shrub carr fen is unique, unlike any other shrub carr in northern Idaho. If the *Betula* population is indeed *B. pumila* and not unusually tall *B. glandulosa* (which occurs elsewhere in the northern Priest River valley peatlands), it is indeed unique. Rare plants at this site include: *Carex lepatalea* (bristle stalk sedge), *Vaccinium oxycoccos* (bog cranberry), *Gautheria hispidula* (creeping snowberry), *Salix pedicellaris* (bog willow), *Trientalis arctica* (northern starflower), and *Comandra livida* (northern

comandra).

Condition:

There is currently no obvious use of this area by humans except for the occasional hunter.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

The entire watershed of Upper Priest Lake Fen is protected within the Upper Priest Lake Scenic area, although most of it is owned and managed by the State of Idaho Department of Lands and I don't know how formal the protection measures are.

Other Values:

This is an very picturesque site, and rather remote. It is along the Idaho Centennial Trail, although this stretch doesn't appear to be well-used yet. There is abundant game sign, including deer, elk, and bear (very large, possible grizzly scat).

Conservation Intent:

As part of the comprehensive conservation strategy for Panhandle peatlands, Upper Priest Lake Fen is recommended as Special Interest Areas - Botanical to recognize the biodiversity values and to give the areas special consideration when weighing management options. Public education through interpretive trails at some of the sites is also a priority with the SIA designation. This site has some interpretive potential because of its proximity to the Idaho Centennial Trail which will presumably be a showcase of the state's natural heritage. A short boardwalk trail from the Centennial Trail into a viewing area within Upper Priest Lake Fen could provide a wilderness peatland experience.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur. Under current management schemes this should not be a concern. We would like to see Upper Priest Lake Fen established as a SIA in recognition of its unique flora and habitat conditions. We would also see some interpretive work done at this site to provide those interested in learning about and experiencing Idaho Panhandle peatlands a chance to see a remote, pristine peatland in a wilderness-type setting. Placement of two to four permanent vegetation monitoring plots in the fen communities is recommended using our methods for peatland monitoring in the Sawtooth Valley (Moseley et al. 1994). This will be particularly useful as control plots to monitor other peatlands in the area that face direct or indirect threats (e.g., Mosquito Bay Fen). We would like to see a let-burn policy for wildfires in this area, if possible.

Information needs:

Floristic inventory of Upper Priest Lake Fen is largely complete. Aquatic and terrestrial invertebrate populations associated with the pond, fen and paludified forest habitats ought to be surveyed in the future. Likewise habitat studies of use by birds and mammals has yet to be accomplished. As with the other priority peatlands that are publicly owned, we suggest putting two to four permanent vegetation monitoring plots in the fen communities. This site is an excellent control for monitoring communities and rare plant populations at Mosquito Bay Fen, which is surrounded by housing developments and potential indirect human-mitigated threats.

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/SPIRAEA DOUGLASII	G? SP
CAREX UTRICULATA	G5 S4
PALUDIFIED FOREST	G5 S1
POOR FEN	G4 S1

Rare plant occurrences:

BETULA PUMILA VAR GLANDULIFERA	G5T5 S2
GAULTHERIA HISPIDULA	G5 S2
VACCINIUM OXYCOCCOS	G5 S2
TRIENTALIS ARCTICA	G5 S3
SALIX PEDICELLARIS	G5 S1
CAREX BUXBAUMII	G5 S3
CAREX LEPTALEA	G5 S2
LYCOPODIUM DENDROIDEUM	G5 S2

Rare animal occurrences:

GAVIA IMMER	G5 S1B,S2N
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Author:

A. H. Pitner

UPPER PRIEST RIVER

Directions:

Upper Priest River is located at the northwest end of Upper Priest Lake, near the confluence of the Hughes Fork and Upper Priest River, in the Idaho Panhandle. The site is approximately 13 air miles north of Nordman, Idaho.

Richness:

Upper Priest River encompasses the level land of Upper Priest River and the Hughes Fork, to the mouth of Upper Priest Lake. The elevation in the proposed RNA varies little - from 2460 to 2600 feet. Included are riparian floodplain lands along the two rivers, isolated oxbows in various stages of filling, and a series of old river terraces that become drier with increasing elevation. The

vegetation types of the proposed RNA are distributed along the soil moisture gradient. The driest types are western hemlock (*Tsuga heterophylla*) habitat types occurring on the highest river terraces, which are well drained. On the lower terraces, where the water table is near the surface, western redcedar (*Thuja plicata*) habitat types occur with an understory flora rich in ferns. A diversity of habitat types occur where surface water is present, ranging in sequence from western redcedar/skunk cabbage (*Lysichitum americanum*) and western redcedar/devils club (*Oplopanax horridum*) in drier areas to thinleaf alder/skunk cabbage (*Alnus incana*) to thinleaf alder/mesic forb to red-osier dogwood (*Cornus stolonifera*) to Bebb's willow (*Salix bebbiana*) to pink spiraea (*Spiraea douglasii*) to inflated sedge (*Carex vesicaria*) and finally to open water with bladderwort (*Utricularia vulgaris*).

Rarity:

The proposed RNA contains four rare plant species: *Petasites sagittatus*, *Sanicula marilandica*, *Phegopteris connectilis*, and *Polystichum braunii*. The area contains habitat for the harlequin duck (Forest Service Region 1 Sensitive species and Category 2 candidate), boreal chickadee, great gray owl, and bull trout, (state Species of Special Concern). An active bald eagle nest is present at the mouth of the Upper Priest River. The proposed RNA is located within recovery habitat for grizzly bear (*Ursus arctos*), a Threatened species.

Condition:

The site is allocated to Management Area 14 (RNAs and Experimental Forests) in the Idaho Panhandle National Forests Plan (August 1987). The SE4SE4 of section 11 and all of section 13 except the SW4 (520 acres) are in private ownership. A portion of the proposed RNA is within the recommended Upper Priest Wild River corridor.

Viability:

Lands in section 13 (except the SW4) are privately owned. A portion of the site lies within state land ownership. The remainder of the boundary is adjacent to Forest Service lands. The area north and east of the proposed RNA is in Management Area 12 - the Upper Priest River corridor is proposed for establishment as a Wild River. This area is managed to preserve the free-flowing condition of the river, visual quality, and wildlife habitat. The area south and west of the proposed RNA is in Management Area 3 - lands designated for timber production within identified grizzly bear habitat and big game winter range.

Other Values:

The proposed RNA contains a wide variety of habitat types associated with the floodplain and river terraces, including old-growth forest of western redcedar and western hemlock. Maidenhair fern (*Adiantum pedatum*) is present in the proposed RNA - this species occurs sparingly in the Idaho Panhandle.

Conservation Intent:

The site has been determined to be suitable for designation as a Research

Natural Area if private lands can be acquired by the Forest Service.

Management needs:

The river corridor should be closed to motorized water craft to maintain current wildlife values.

Information needs:

Plant community occurrences:

THUJA PLICATA/LYSICHTUM AMERICANUM	G4Q S2
THUJA PLICATA/OPLOPANAX HORRIDUM	G3 S3
TSUGA HETEROPHYLLA/GYMNOCARPIUM DRYOPTERIS	G3G4 S3
SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/MESIC FORB	G3G4QS1
CORNUS STOLONIFERA	G4Q S3
SALIX BEBBIANA	G? SP
ALNUS INCANA/LYSICHTUM AMERICANUM	G3 S3
CAREX VESICARIA	GU S3
THUJA PLICATA/ASARUM CAUDATUM, ASARUM CAUDATUM	G4 S4
THUJA PLICATA/ATHYRIUM FILIX-FEMINA, ADIANTUM PEDATUM	G3 S2
THUJA PLICATA/ATHYRIUM FILIX-FEMINA, ATHYRIUM FILIX-FEMINA	G3 S3
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA, CLINTONIA UNIFLORA	G5 S4

Rare plant occurrences:

SANICULA MARILANDICA	G5 S2
PETASITES SAGITTATUS	G4 S3
TELLIMA GRANDIFLORA	G5 S2
POLYSTICHUM BRAUNII	G5 S1
PHEGopteris connectilis	G5 S2

Rare animal occurrences:

HISTRIONICUS HISTRIONICUS	G4 S1B,SZN
HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N
STRIX NEBULOSA	G5 S3
PARUS HUDSONICUS	G5 S1?

Author:

M. Jankovsky-Jones

BEAR CREEK FEN

Directions:

From Coolin, ID travel north up the East Shore Road approximately 13 miles to

the bridge over Bear Creek. From the bridge, walk downstream to the fen communities.

Richness:

Bear Creek Fen has formed along the low-gradient stretch of Bear Creek near the mouth of Priest Lake. Bursik surveyed the area around the mouth at Bear Creek Bay in 1991. This area was apparently drained and cleared in the past. There is no continuing agricultural activity, however. Along the margins of Priest Lake is a stand of *Typha latifolia* and *Carex lasiocarpa*, which gives way to a rich fen characterized by *C. utriculata*, *C. lasiocarpa*, and *Dulichium arundinaceum*. These high-quality fen communities, however, occur in a relatively narrow band. Back from the lake approximately 10 meters, they give way to dense monocultures of *Phalaris arundinacea*. Along the margins of Bear Creek, near the mouth is a shrub carr dominated by *Salix* spp., *Spiraea douglasii* with *C. utriculata*, *C. vesicaria*, and *P. arundinacea* in the understory. The flow of Bear Creek becomes almost imperceptible near the mouth. The very sluggish margins support *Hippurus montanus* and *Challitriche* sp. The high quality peatlands are further upstream from the mouth approximately 1/4 mile and were not surveyed by Bursik. From brief descriptions by other biologists who have surveyed the site (Diane Ammato and Janice Hill) it sounds like the site supports the full range of peatland communities: poor fen, intermediate fen, rich fen, shrub carr, and paludified forest along the lower stretch of Bear Creek, to the east of the East Shore Road. Several rare plant populations were found in these habitats in 1994, including the only known population of *Maianthemum dilitatum* (false lily-of-the-valley, a coastal disjunct species) in Idaho.

Rarity:

Bear Creek Fen contains the only known population of *Maianthemum dilitatum* (false lily-of-the-valley) in Idaho. Several other rare plant populations were also found in fen communities at this site. The site apparently contains the full complement of peatland communities and habitat features identified at Panhandle peatlands, including poor fen, intermediate fen, rich fen, paludified forest, and a stream (Bursik and Moseley 1994). More surveys will be required to fully document the biodiversity values of this site.

Condition:

Most of the Bear Creek watershed to the east is intensively managed for timber production. Much of it has been logged over the last several decades. The portion of Bear Creek Fen near the mouth of Bear Creek was drained and cleared for hay production and pasturing during the early 20th century and has yet to recover. Roads skirt the margins of the site and a road formerly ran through the fen and crossed Bear Creek near the mouth. Plans are currently being made to construct housing developments at this site. The developer is interested in protecting the fen as part of mitigation for development, which may involve placing a road in a portion of the fen.

No exotic species appear to threaten the native flora and fauna of this site.

Viability:

Logging, road construction and maintenance, and housing development in the adjacent uplands around Bear Creek Fen present offsite threats that could lead to enhanced eutrophication and changes in the composition of the fen, shrub carr, marsh, and aquatic plant communities within the site.

Other Values:

Because it is adjacent to vast forest land to the east, this site is likely very important big game habitat. It is an important tributary in the Priest Lake watershed and it is one of growingly few bays on the east side of Priest Lake that does not contain housing developments.

Conservation Intent:

As part of the comprehensive conservation strategy for Panhandle peatlands, Bursik and Moseley (1994) recommended establishing Bear Creek Fen as Special Interest Areas - Botanical in recognition of the unique flora and habitat diversity. This land designation will also highlight the rare and sensitive nature of the communities present at Bear Creek Fen to give them special consideration when management decisions are made within the site and in the surrounding basin. Part of the SIA land designation is to encourage public interpretation about the interesting features of the areas. This may be a site to consider for interpretation in the future if public ownership and conservation easements are achieved.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur. Uplands included within the site boundaries should be protected from potentially harmful logging or development activities. Monitoring of plant communities, aquatic invertebrates, and water chemistries should begin as soon as possible at Bear Creek Fen.

Information needs:

The 1994 floristic inventory of Bear Creek Fen by several biologists was likely very thorough. No work has been done on the aquatic or terrestrial invertebrate populations, small vertebrate populations, or the water chemistries of Bear Creek Fen. All should be inventoried and monitored periodically in the future. As with other priority Panhandle peatlands, Bursik and Moseley (1994) recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommended following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
PHALARIS ARUNDINACEA	G4 S5

CAREX UTRICULATA	G5 S4
CAREX LASIOCARPA	G4 S2
TYPHA LATIFOLIA	G5 S4
PALUDIFIED FOREST	G5 S1
POOR FEN	G4 S1

Rare plant occurrences:

PETASITES SAGITTATUS	G4 S3
BETULA PUMILA VAR GLANDULIFERA	G5T5 S2
GAULTHERIA HISPIDULA	G5 S2
VACCINIUM OXYCOCCOS	G5 S2
TRIENTALIS ARCTICA	G5 S3
SALIX CANDIDA	G5 S2
CAREX LEPTALEA	G5 S2
CAREX PAUPERCULA	G5 S2
MAIANTHEMUM DILATATUM	G5 S1
DRYOPTERIS CRISTATA	G5 S2

Author:

A. H. Pitner

BEAVER LAKE RANCH

Directions:

Beaver Lake Ranch is located ca 5 miles north of Athol, Idaho. From Athol, travel four miles north on Highway 95 to Kelso Lake Road, then ca 0.5 mile west to Beaver Lake Ranch Road just west of Kelso Lake. Continue north on the Ranch road 0.75 mile to the south gate. Perimeter roads are in good condition and four-wheel drive roads are present to access the ranch.

Richness:

Beaver Lake Ranch is an approximately 14,000 acre parcel owned and managed by Idaho Forest Industries. The site includes forests on glacial moraines, numerous kettle holes, two lakes, and broad meadows. Surveyed wetlands include Lambertson Lake, the headquarters meadow (section 8), Smythe Meadow (section 17), two kettles (section 17 NW1/4), section 20 pond (NE1/4), Beaver Lake, and section 9 pond (SE1/4). Lambertson Lake has the highest biological diversity of the surveyed wetlands with a poor fen supporting numerous rare plants and an extensive Carex lasiocarpa intermediate fen. Information regarding Lambertson Lake is summarized in a separate site record. Drainage ditches and hay pastures are present at Smythe meadow, headquarters meadow, and the large meadows south of Beaver Lake. Most of the meadows have been successfully drained except for the wetlands at the north end of Smythe and headquarters meadows. The north end of headquarters meadow has standing water (0.5 m deep) and supports the Glyceria borealis, Carex vesicaria, and Eleocharis palustris community types. The wet areas grade into drier sites dominated by Phalaris arundinacea and Agrostis stolonifera. Meadow margins are dominated by Spiraea douglasii. The south end of

headquarters meadow contains a population of the rare plant *Hypericum majus*. The southwest end of Smythe meadow continues to support native wetland vegetation. The wettest portions are dominated by *Carex vesicaria*, while drier hummocks support *Juncus effusus*, *Phalaris arundinacea*, and *Agrostis stolonifera*. Meadow margins are dominated by *Alnus incana* with a *Lysichitum americanum* understory. The understory of the alder stand has been somewhat degraded by past livestock grazing, and there is abundant *Alopecurus pratense*, *Urtica dioica*, and *Agrostis stolonifera*. This area is currently fenced and the potential for recovery is high. Two kettle holes occur in the NW1/4 of section 17. The west kettle is dominated by *Glyceria borealis* and *Eleocharis palustris*. The east kettle is a little deeper and nearly covered by *Nuphar polysepalum*. Both kettles are bounded by dense stands of *Spiraea douglasii*. The shallow pond in section 20 has open water areas nearly covered by *Potamogeton natans*. *Eleocharis palustris* and *Typha latifolia* community types occur along the pond margins. Significant amounts of *Glyceria borealis* are present within the *Eleocharis palustris* community type. Less saturated areas support *Juncus effusus* and *Phalaris arundinacea*, and *Spiraea douglasii* outlines the perimeter of the pond. Beaver Lake is approximately 40 acres in size and may have been enlarged by the construction of a ditch from Lambertson Creek. Historically, it appears that Lambertson Creek flowed directly into Beaver Lake outlet creek. Beaver Lake's shallow littoral zone supports *Nuphar polysepalum*, with lesser amounts of *Brasenia schreberi* and *Typha latifolia*. Saturated wetlands north and south of the Lake are dominated by *Carex vesicaria* that grade into more mesic areas dominated by *Juncus ensifolius*. Ponds in the SE1/4 of section 9 were visited briefly and appear to be mostly dominated by *Typha latifolia* and *Carex* spp. (possibly *C. lasiocarpa*).

Rarity:

At least nine wetland community types have been identified at the site. Populations of five rare plant species have also been documented. The poor fen at Lambertson Lake supports the rare plant species *Epilobium palustris*, *Hypericum majus*, *Rhynchospora alba*, *Scheuchzeria palustris*, and *Scirpus subterminalis*. Another population of *Hypericum majus* is found at the south end of headquarters meadow. *Scirpus cyperinus*, formerly on the Idaho rare plant list, also occurs within the site.

Condition:

The primary land use is for timber and hay production. The area also receives light recreational use.

Centaurea solstitialis and other weedy exotics occur in disturbed upland areas.

Viability:

No threats to viability are known.

Other Values:

Beaver Lake ranch provides important wildlife habitat, especially for big game such as moose, black bear and whitetail deer, waterfowl and other birds.

Conservation Intent:

Beaver Lake Ranch represents a large private tract with unique wetland and wildlife values. The ranch, and especially Lambertson Lake should be a high priority for a conservation easement. Land ownership is such that goals which protect or enhance the entire watershed can be accomplished by working with a single landowner.

Management needs:

Streambanks and larger lakes have been fenced to exclude grazing. Some trailing is occurring around the kettles. It may be beneficial to monitor trailing and determine if it is affecting hydrology and/or water quality.

Information needs:

Spruce-cedar swamps in section 9 E1/2 NW1/4, and alder swamps in section 8 SW1/4 are unsurveyed. Other kettles/depressions that are likely present have not been surveyed, nor have upland forest communities (check with Mike Welling to see if habitat typing has occurred for the forests). Inventory of waterfowl and other vertebrates would be useful.

Plant community occurrences:

SPIRAEA DOUGLASII	G5	S4
PHALARIS ARUNDINACEA	G4	S5
GLYCERIA BOREALIS	G4	S1
ELEOCHARIS PALUSTRIS		G5 S3
NUPHAR POLYSEPALUM	G5	S4
TYPHA LATIFOLIA		G5 S4
ALNUS INCANA/LYSICHITUM AMERICANUM		G3 S3
CAREX VESICARIA		GU S3
JUNCUS EFFUSUS		GU SU

Rare plant occurrences:

HYPERICUM MAJUS	G5	S3
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Author:

M. Mancuso

BINARCH CREEK

Directions:

Binarch Creek RNA is located in the upper portion of the Binarch Creek drainage on the Priest Lake Ranger District, approximately 30 miles north-northwest of Priest River. To access the southeast, lower boundary of the RNA: from US Route 2, turn north on State Route 57 in Priest River and go north for approximately 25 miles to the Binarch Creek Road (FS Road 639). Follow FS Road 639 for about one mile then turn left on FS Road 639N which goes up Binarch Creek. The road is gated with a lock at about 0.8 mile (a key and permission to

travel on FS Road 639N must be obtained from the Priest Lake District Ranger). Continue on FS Road 639N for about 2 miles up Binarch Creek to the end of the road, which is about 0.25 mile past the boundary of the RNA. To access the upper, northwest boundary of the RNA: go about 30 miles north of Priest River on State Route 57, about 5 miles beyond the Binarch Creek Road to the Lamb Creek Road (FS Road 310). Follow FS Road 310 for about 0.3 mile to FS Road 639. Turn left on FS Road 639 and go about 6 miles to the ridgeline east of the northern portion of the RNA. Park here and go downslope about 300 feet to FS Trail 220. Follow Trail 220 southeastward into the RNA. Trail 220 traverses the length of the RNA.

Richness:

Binarch Creek RNA consists of a low gradient stream with beaver dams and ponds, inhabited by a very pure strain of westslope cutthroat trout (*Oncorhynchus clarki lewisi*), and adjacent steep forested slopes containing habitat types dominated by grand fir (*Abies grandis*), western redcedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), and western hemlock (*Tsuga heterophylla*). The stream valley is 50 to 400 feet (15.2 to 121.9 m) wide and is floored by glaciofluvial outwash gravels. The adjacent slopes are partially underlain by granites and partly by Belt metasediments. Elevations in the RNA range from 2660 to 3200 feet (811 to 975 m). The stream and ponds harbor an unusually high diversity of aquatic invertebrates and plants. Once a predominantly western white pine (*Pinus monticola*) drainage, infestation of white pine by the white pine blister rust (*Cronartium ribicola*) and mountain pine beetle (*Dendroctonus ponderosae*) has decimated the species and converted most of the white pine cover type to other types.

Rarity:

Binarch Creek supports an unusually diverse assemblage of aquatic plants and invertebrates, and an extremely pure strain of westslope cutthroat trout, a Forest Service Sensitive species. The marshes and wet meadows in the RNA contain a rich array of sedges, grasses, and other vegetation.

Condition:

Binarch Creek RNA is allocated to Management Area 14 (RNAs and experimental forests) in the Idaho Panhandle National Forests Plan (August 1987). Due to the wetness of the valley bottom the RNA receives little recreational use other than light fishing and hunting. Occasional hikers use the pack trail. FS Trail 220 will be maintained.

Viability:

The RNA is surrounded by Forest Service lands, the majority of which are in Management Area 1 - lands managed for timber production. The southeastern boundary, north of the creek, is adjacent to Management Area 9 - lands unsuited for timber production.

Other Values:

The RNA is an excellent example of a glaciated, low gradient stream valley. The area is in a high precipitation area and has high watershed values.

Conservation Intent:

The site has been protected by designation as a Forest Service Research Natural Area.

Management needs:

Information not available.

Information needs:

Effects of logging on slopes above the RNA should be determined.

Plant community occurrences:

PSEUDOTSUGA MENZIESII/PHYSOCARPUS MALVACEUS	G5	S5
THUJA PLICATA/OPLOPANAX HORRIDUM	G3	S3
ABIES GRANDIS/ASARUM CAUDATUM, ASARUM CAUDATUM	G4	S3
ABIES GRANDIS/CLINTONIA UNIFLORA, PHYSOCARPUS MALVACEUS	G4	S3
THUJA PLICATA/ASARUM CAUDATUM, ASARUM CAUDATUM	G4	S4
THUJA PLICATA/ATHYRIUM FILIX-FEMINA, ATHYRIUM FILIX-FEMINA	G3	S3
THUJA PLICATA/CLINTONIA UNIFLORA, CLINTONIA UNIFLORA	G5	S4
TSUGA HETEROPHYLLA/ASARUM CAUDATUM, ASARUM CAUDATUM	G3	S3
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA, CLINTONIA UNIFLORA	G5	S4

Author:

J. H. KALTENECKER

BOG CREEK FEN

Directions:

Bog Creek is in the extreme northernmost portion of the U.S. Selkirk Mountains. It flows into Canada where it feeds Blue Joe Creek, and ultimately the Kootenai River. It can be accessed from either the Priest Lake side of the Selkirks or from the Kootenai River side. In either case, anticipate a minor hike of two to three miles from where the FS roads are gated.

Richness:

Bog Creek is a slow-moving, low gradient, meandering stream. Fen communities have formed along the stream scattered between subalpine fir/Engelmann spruce/lodgepole pine (*Abies lasiocarpa*/*Picea engelmannii*/*Pinus contorta*) moist to wet forest types. Some high quality cedar/hemlock (*Thuja plicata*/*Tsuga*

heterophylla) forests also occur in this area. These are mostly sphagnum-poor fen communities dominated by sedges (*Carex* spp. and *Eriophorum polystachion*). This is one of the few subalpine peatland sites to contain slender sedge (*Carex lasiocarpa*) as an important constituent in fen communities. It is typically restricted to valley peatlands. *Carex utriculata*, *C. aquatilis*, *C. scopulorum*, *C. lasiocarpa*, and cottongrass (*Eriophorum polystachion*) are the prominent sedges. Scattered patches of *Sphagnum* mosses also occur in the portions of the fen.

Rarity:

This site contains populations of yellow sedge (*Carex flava* 008), Buxbaum's sedge (*C. buxbaumii* 021), poor sedge (*C. paupercula* 011), and Mingan moonwort (*Botrychium minganense* 002). As yet, only cursory surveys of the fen communities at Bog Creek have been made. More rare plant populations surely occur in the fen communities. The presence of slender sedge (*C. lasiocarpa*) as a dominant in the fens there leads me to believe that other species otherwise restricted to low-elevation valley peatlands might also occur here. Grizzly bears (*Ursus arctos*) and woodland caribou (*Rangifer tarandus caribou*) are also known to utilize this drainage. This appears to be a unique and valuable peatland site, which may represent an intermediate between the low elevation valley peatlands dominated by boreal species and the higher subalpine peatlands dominated by numerous western cordilleran species. It is one of few recognized high quality subalpine peatland sites in the Panhandle region.

Condition:

The only foreseeable potential threat to this site is timber harvest or road building activities associated with timber harvest or mining. No current threats are apparent.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

This site is surrounded by lands owned by the U.S. Forest Service, Idaho Panhandle National Forests, Bonners Ferry Ranger District and, to the north by Canadian timber lands, ownership of which is unknown. Extensive timber harvesting has occurred in this area in the last several decades, although much of the virgin old-growth forest remains.

Other Values:

The rather remote site, with little human traffic or activity, offers potential for research where such controlled circumstances are necessary or desired. Aesthetic values are high for those willing to hike in and see this area.

Conservation Intent:

Site should be recognized as a Special Interest Botanical Area.
Ground-disturbing activities should occur no closer than 200 meters from the

margin of the wetlands (including all wetland types, not just the scattered peatlands), or basically no ground-disturbing activities should occur in the Bog Creek Watershed from FS Rd 1013, north to the Canadian border. If at all possible, FS Road 1013 should remain closed and unmaintained.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Timber harvest or road building that could affect local hydrology or nutrient concentration of the waters flowing into Bog Creek Fen should be avoided. Natural wildfires should be allowed to burn in this area if possible.

Information needs:

Basic floristic survey is needed at this site to document the full extent of peatland communities in this small watershed and to document all species, including rare elements they support. Documentation of land use history, particularly grazing and timber harvest associated with this site would be valuable. If more detailed study of the ecology of peatlands in Idaho were carried out, this would be a valuable site to include because of it appearing to be somewhat between valley peatlands and subalpine peatlands floristically.

Plant community occurrences:

CAREX UTRICULATA	G5 S4
CAREX AQUATILIS	G5 S4
CAREX LASIOCARPA	G4 S2
CAREX SCOPULORUM	G4 S3
VALLEY PEATLAND POND	G5 S2
ERIOPHORUM POLYSTACHION	G3? S3
POOR FEN	G4 S1

Rare plant occurrences:

CAREX BUXBAUMII	G5 S3
CAREX FLAVA	G5 S3
CAREX PAUPERCULA	G5 S2

Rare animal occurrences:

SOREX HOYI	G5 S2
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Author:

A. H. Pitner

BONNER LAKE

Directions:

From Moyie Springs, ID, travel 3 miles east on Hwy 2 to FS Rd 72, take it to the north and follow it approximately 4 miles to FS Rd 72D (which heads south). Take

72D approximately 2 miles where it more or less ends at the Idaho Fish and Game public boat launch on the north end of Bonner Lake.

Richness:

Bonner Lake is very unique among Panhandle peatlands. It is an alkaline lake with a flocculent, marly bottom and a nearly 100% cover of *Chara* sp. The *Chara* grows to depths of more than 5 meters thanks to the amazing clarity of the water. The lake margins support stands of several vascular aquatics, including *Typha latifolia*, *Scirpus validus*, *Scirpus acutus*, *Eleocharis palustris*, *Juncus* sp., *Juncus alpinus*, *Nuphar variegatum*, *Polygonum amphibium*, and *Potamogeton gramineus*. Sedge-dominated rich fen communities occur on the north and south ends of the lake. The rich fens are characterized by *Carex lasiocarpa*, *C. simulata*, *C. utriculata*, *C. cusickii*, *Calamagrostis stricta*, *Potentilla palustris*, *Lycopus uniflorus*, *Scirpus microcarpus*, *S. americanus*, *Bidens cernua*, *Phalaris arundinacea*, *Lysimachia thyrsoiflora*, and the rare species: *Aster junciformis* (rush aster), *Carex buxbaumii* (Buxbaum's sedge), *C. flava* (yellow sedge), and *Cicuta bulbifera* (bulb-bearing waterhemlock). The peat depth in this rich fen is unknown. The narrow wetland margins on the east and west sides of Bonner Lake are shrub dominated. Characteristic species include the rare *Betula pumila* as well as *Salix bebbiana*, *Alnus incana*, *Cornus stolonifera*, and very scattered plants of *Salix candida*. *S. candida* has been also been found in the meadows just north of (upstream from) Bonner Lake.

Rarity:

Bonner Lake is the most alkaline of the 45 high- priority peatlands of the Idaho Panhandle region identified by Bursik and Moseley (1995). The *Chara*-dominated littoral and limnetic zones which reach more than 5 meters deep are very unique, the likes of which I have seen nowhere else in northern Idaho. The fen communities contain a moderate diversity of vascular species, including six considered rare in Idaho: *Carex buxbaumii* (Buxbaum's sedge), *Carex flava* (yellow sedge), *Cicuta bulbifera* (bulb-bearing waterhemlock), *Aster junciformis* (rush aster), *Betula pumila* (dwarf birch), and *Salix candida* (hoary willow). The sedge-dominated rich fen on the north and south ends of the lake contain an exceptional diversity of *Carex* spp., but the community composition is similar to that seen elsewhere in the Panhandle region. The *Betula pumila*-dominated carr that occurs along the east and west margins of Bonner Lake and along Sand Creek north of the lake is restricted to this corner of Idaho. Two rich fen species, *Scirpus americanus* and *Carex simulata* are rather rare in northern Idaho, although both are more common in peatlands of east-central Idaho.

Condition:

Bonner Lake is a minor warm-water fishery. Angler use appears to be rather limited and is not much of a threat. The fen communities around the boat launch on the north end of the lake have been trampled a bit by shore anglers. A dock or more summer precipitation than there was in 1994 may reduce this threat significantly. Logging and cattle grazing in the drainage will be ongoing threats to the biota of Bonner Lake.

No exotic species have been identified which threaten the native flora and fauna of this site.

Viability:

Logging, road construction and maintenance, and grazing upstream from and around the margins of Bonner Lake present offsite threats that could lead to enhanced eutrophication within the lake and changes in the composition of the fen and aquatic plant communities which could ultimately threaten the viability of rare plant populations.

Other Values:

This is a small, tranquil easy-to-access lake that is enjoyed by a moderate number of fishermen. The clarity of the lake is very impressive. Small bass could be seen cruising down to more than 5 meters in depth. In spite of the cattle grazing on the south end of the lake, Bonner Lake offers picturesque views of the surrounding basin.

Conservation Intent:

Acquisition of the privately owned portions of the Bonner Lake and the Sand Creek drainage above the lake should be a priority for the USFS, Idaho Fish and Game, BLM, TNC or any other public or private group interested in preserving critical habitats.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Cost-share agreements should be reached with cattle farmers above and around Bonner Lake to fence off at least the creek and the critical peatland habitats to limit cattle impacts. Placement of several permanent vegetation monitoring plots in various peatland communities is recommended using our methods for peatland monitoring in the Sawtooth Valley (Moseley et al. 1994). Acquisition of the privately owned portions of the Bonner Lake and the Sand Creek drainage above the lake should be a priority for the USFS, Idaho Fish and Game, BLM, TNC or any other public or private group interested in preserving critical habitats.

Information needs:

Floristic inventory has been limited to cursory looks at communities surrounding the lake. This survey was likely enough to account for most of the floristic diversity of the site. Further survey, however, is desirable to more fully document the vascular flora. Bursik made no effort to document the bryophyte flora, which may be quite unique given the alkaline nature of the site. No work has been done on the aquatic invertebrate populations of the lake, which could also be very unique given the alkaline waters. Water chemistry monitoring should also be initiated at this site. Small vertebrate and terrestrial invertebrate populations should also be surveyed in the future. As with the other priority

peatlands that are at least partially publicly owned, we suggest two or more permanent vegetation monitoring plots be established in the various fen, marsh, and aquatic communities around and within the lake to detect changes that could occur as a result of human or natural processes. We recommend using our methods for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

CAREX UTRICULATA	G5 S4
CAREX LASIOCARPA	G4 S2
CAREX SIMULATA	G4 S2
ELEOCHARIS PALUSTRIS	G5 S3
SCIRPUS ACUTUS	G5 S4
TYPHA LATIFOLIA	G5 S4
SCIRPUS VALIDUS	G4 S2
CAREX CUSICKII	GQ S3

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
SANICULA MARILANDICA	G5 S2
BETULA PUMILA VAR GLANDULIFERA	G5T5 S2
SALIX CANDIDA	G5 S2
CAREX BUXBAUMII	G5 S3
CAREX FLAVA	G5 S3

Author:

A. H. Pitner

CHIPMUNK POTHOLES

Directions:

Chipmunk Potholes is located on the east side of the Priest River two miles south of the Dickensheet Junction. From Priest River, Idaho travel 22 miles north of Highway 57 to the Dickensheet Junction. Take a left (head toward Coolin). Travel about two miles. About one mile after crossing the river there is a road to the south. About one mile down the road there is a fork. Take the left fork (along the river). About 1 mile past the fork, Chipmunk Potholes will be downslope toward the river from the road. It should be visible through the trees.

Richness:

Chipmunk Potholes is in an oxbow just north of Chipmunk Rapids on the Priest River. The potholes area is doughnut-shaped with an island of upland forest in the middle. The surveyed pothole is just down-slope from the road (the south portion of the doughnut indicated by a small pond on the USGS Outlet Bay quad. map. The pond is approximately one acre in size and is mostly littoral with scattered patches of Nuphar polysepalum. There is evidence of recent beaver activity at the pond. The pond is surrounded by floating Sphagnum mats dominated

by an intermediate fen community characterized by *Sphagnum* spp., *Menyanthes trifoliata*, *Carex lasiocarpa*, *C. utriculata*, and *C. cusickii*. *Epilobium palustre* (the rare swamp willow-weed) is found scattered throughout the floating mat. An extensive *Spiraea douglasii* shrub carr surrounds the floating mats. The shrub carr is fixed (not floating) and apparently prone to flooding because it is hummocky and well-vegetated between the hummocks. *Trientalis arctica* (northern starflower), *Carex paupercula* (poor sedge), and *Dryopteris cristata* (crested shield fern) are rare species that occur on hummocks beneath *S. douglasii*. Small pools containing *Glyceria borealis*, *Utricularia minor*, *Ranunculus gmelinii*, and *Potamogeton gramineus* are found in beaver channels between the *S. douglasii* hummocks. The northern, eastern, and western portions of Chipmunk Potholes appear to be dominated by *S. douglasii* shrub carr also.

Rarity:

This is apparently a rather young peatland. Much younger than Kaniksu Marsh RNA, which is directly northwest on the other side of the Priest River in a much more isolated oxbow, no longer frequently influenced by flooding events on the river. Chipmunk Rapids pothole probably still floods regularly and could actually be reclaimed by the river given the current arrangement of the meander channels in the vicinity of the site. The major plant communities at the site are the *Spiraea* shrub carr, which is common in the region and the intermediate fen on the floating mats which is not particularly common in Panhandle peatlands. We identified several of the Panhandle peatland habitat features at this site: intermediate fen, rich fen, floating mats, shrub carr, vegetated littoral zones, ponds, and beaver activity (Bursik and Moseley 1994). Lacking are bog microsites, poor fen, paludified forest, a lake, and a stream. Four rare species that are of fairly wide occurrence in the Panhandle region are found at Chipmunk Potholes (*Carex paupercula*, *Trientalis arctica*, *Dryopteris cristata*, and *Epilobium palustre*).

Condition:

No management activities appear to be direct threats to Chipmunk Potholes and its resident biota. Logging adjacent to Chipmunk Potholes could greatly alter the site due to enhanced eutrophication. Given that all lands managed by the Department of Lands are managed for timber production, it is not unlikely for harvests to occur immediately adjacent to the wetland in the future.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging and road construction and maintenance on the State of Idaho, Department of Lands holdings around the lake present offsite threats that could lead to enhanced eutrophication of the wetlands and changes in the composition of the fen, shrub carr, and aquatic plant communities within the site which could ultimately also threaten the viability of rare plant populations.

Other Values:

This site is probably quite valuable for waterfowl due to the abundance of aquatic vegetation and the dense nature of the surrounding wetland vegetation. There was sign of deer, elk, and moose there and black bear were observed during surveys.

Conservation Intent:

As part of the comprehensive conservation strategy for Panhandle peatlands, we have recommended establishing most of the high-priority sites, including Chipmunk Potholes, as Special Interest Areas - Botanical in recognition of the unique flora and plant communities that the sites support. This designation will highlight the sensitive and rare nature of peatland communities at Chipmunk Potholes to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the SIA-B designation is to encourage public interpretation within the site. Due to the steep slopes that must be navigated to access this site, however, no public interpretation is recommended. Cooperation with the State of Idaho Department of Lands, of course must be achieved to proceed with this designation.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Protection of the immediately adjacent uplands from potentially harmful logging activities should be sought as soon as possible. If the Department of Lands agrees to participate in the conservation of critical Panhandle peatlands, then establishment of Chipmunk Potholes as SIA-B should proceed immediately. Monitoring of plant communities, aquatic invertebrates, and water chemistries should begin as soon as possible.

Information needs:

Floristic inventory of Chipmunk Potholes was very cursory and needs to be more intensive, particularly on the north, east, and west sides of the site. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of Chipmunk Potholes. All should be inventoried and monitored periodically in the future. As with other priority Panhandle peatlands, we recommend placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. We recommend following our methods for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
CAREX UTRICULATA	G5 S4
CAREX LASIOCARPA	G4 S2
NUPHAR POLYSEPALUM	G5 S4
CAREX CUSICKII	GQ S3

Rare plant occurrences:

EPILOBIUM PALUSTRE	G5 S3
TRIENTALIS ARCTICA	G5 S3
CAREX PAUPERCULA	G5 S2
DRYOPTERIS CRISTATA	G5 S2

Author:

A. H. Pitner

CLARK FORK DELTA

Directions:

The Clark Fork Delta is south of Clark Fork, Idaho and extends from near the stateline to the mouth of Lake Pend Oreille. The island system is best accessed by boat from boat ramps at the north end of the delta or at Clarks Fork. The southern portion of the site can be accessed by vehicle and foot by driving south of Clark Fork across the river and traveling on the road that parallels the Burlington Northern Railroad.

Richness:

The Clark Fork Delta enters Lake Pend Oreille in a valley at the south end of the Cabinet Mountains and the north end of the Coeur d'Alene Mountains. The islands are vegetated by forests, shrublands, and grasslands. Forests include both upland and riparian types. Islands with raised topography support upland forests with mature *Thuja plicata* and *Abies grandis*. Low lying islands are vegetated with a mosaic of *Populus trichocarpa*, *Cornus sericea*, *Salix bebbiana*, *Salix exigua*, *Symphoricarpos albus*, and *Phalaris arundinacea*. Broad meadows occupy the former floodplain of the Clark Fork River at the south end of the site. Wetter portions of the meadows which have not been successfully drained are dominated by *Typha latifolia*, *Eleocharis palustris*, and *Scirpus* species. *Phalaris arundinacea* is major dominant in meadows where water levels have been manipulated.

Rarity:

Several rare bird species breed in the area, including bald eagle, hooded merganser, and common goldeneye. In addition, common loons are thought to breed in the delta; young have been seen in the vicinity. The area is within a bald eagle wintering area. Bull trout are also present. Very high quality occurrences of black cottonwood and red-osier dogwood communities are present on islands.

Condition:

Old growth cedar stands on the large island in sections 3 and 4 have been logged. The extreme northern and southern portions of the delta have been ditched and drained for hay pasture.

Phalaris arundinacea is well established and an aggressive competitor with emergent vegetation and may reduce cottonwood and shrub regeneration.

Viability:

Upstream dams influence site hydrology.

Other Values:

A large heron rookery is present on one of the islands. The site provides habitat for black bear, whitetail deer, moose, osprey and waterfowl.

Conservation Intent:

The site is partially within Pend O'reille WMA. Undeveloped private islands and shoreline should be high priority for acquisition or conservation easements. Conservation easements or agreements should be acquired for remaining lands in agriculture or where structures are in place.

Management needs:

In places, island banks and channel banks have sloughed due to daily water fluctuations (power peaking). There may be potential to work with power companies to reduce the daily fluxes. The site hydrology in agricultural lands could potentially be restored by removing tile drains and blocking ditches.

Information needs:

It is likely that Phalaris arundinacea has replaced plant communities previously dominated by Glyceria borealis, Carex utriculata, Eleocharis spp., and Scirpus spp. The graminoid is also abundant in the understory of tree and shrub communities. It is unknown how to decrease Phalaris arundinacea to restore a mosaic of native habitat.

Plant community occurrences:

POPULUS TRICHOCARPA/CORNUS STOLONIFERA	G4 S1
CORNUS STOLONIFERA	G4Q S3
SALIX BEBBIANA	G? SP
SALIX EXIGUA/MESIC GRAMINOID	G3Q S3?
PHALARIS ARUNDINACEA	G4 S5
ELEOCHARIS PALUSTRIS	G5 S3
TYPHA LATIFOLIA	G5 S4
SCIRPUS MICROCARPUS	GU SU
THUJA PLICATA/ASARUM CAUDATUM, ASARUM CAUDATU	G4 S4

Rare animal occurrences:

BUCEPHALA CLANGULA	G5 S3B,S3N
LOPHODYTES CUCULLATUS	G5 S2B,S3N
HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N
HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N
HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N

Author:

Mabel Jankovsky-Jones

COW CREEK MEADOWS

Directions:

The Cow Creek Meadows (CCM) are located along Cow Creek, which is in the extreme northern portion of the Selkirk Mts. in the U.S. Cow Creek is a tributary of Smith Creek, which is a direct tributary of the the Kootenai River. It can be accessed by taking FS rd 281 (Smith Creek Rd.) to 655 all the way to the FS gate. Sphagnum-dominated fen communities occur along Cow Creek from where the Beaver Creek Rd (FS2545) crosses Cow Creek (near the gate), upstream 4-5 km. The densest concentration of fen communities is at the informal "Cow Camp" approximately 2.5 km upstream from the gate (hike or bike up the road, take short road into Cow Camp/meadows).

Richness:

Cow Creek Meadows contains scattered open sphagnum- rich and sphagnum-poor fen habitats over a 5 km stretch along the upper reaches of Cow Cr. Bursik (1993) described four wetland plant communities at Cow Creek Meadows: 1) Sphagnum-dominated intermediate fen which contains the rare species known from the site (*Carex buxbaumii*, *C. paupercula*, *C. leptalea*, *C. flava*, *Lycopodiella inundata*, *Trientalis arctica*, and *Scirpus hudsonianus*), 2.) *Carex scopulorum* (Rocky Mountain sedge) fen, 3.) *Carex vesicaria*/*C. utriculata* (inflated sedge/beaked sedge) fen, and 4.) *Deschampsia cespitosa*/*Danthonia intermedia*/*Calamagrostis canadensis* (tufted hairgrass/intermediate oatgrass/blue joint reedgrass) moist meadows. *Pinus contorta* (lodgepole pine), *Abies lasiocarpa* (subalpine fir) and *Picea engelmannii* (Engelmann spruce) moist to wet forests occur between the fen communities. Much of the upper portion of the drainage was burned in the 1967 Trapper Peak fire, which even burned down to the creek in some portions of Cow Creek Meadows. Much of the area was salvage logged following the fire.

Rarity:

Subalpine Sphagnum-dominated fen communities as exist in Cow Creek Meadows are more rare in extreme northern Idaho than in the major river valleys of north central Idaho (e.g. the Lochsa). They appear to be somewhat transitional in floristic composition to valley peatland communities based on the number of boreal species they contain. 101 plant species, 11 bryophyte and 90 vascular, are known from the fen communities at Cow Creek Meadows, seven of which are considered rare in the state: *Carex buxbaumii* (Buxbaum's sedge), *C. flava* (yellow sedge), *C. leptalea* (bristle stalk sedge), *C. paupercula* (poor sedge), *Lycopodiella inundata* (bog clubmoss), *Scirpus hudsonianus* (Hudson's Bay bulrush), and *Trientalis arctica* (northern starflower). The population of Hudson's Bay bulrush (*Scirpus hudsonianus*) is one of only two found in the state. One of the few documented populations of the northern bog lemming (*Synaptomys borealis*) occurs in CCM. Grizzly bear and woodland caribou use is high in the Cow Creek Meadows.

Condition:

The Cow Creek drainage adjacent to the CCM is heavily roaded and has been extensively logged in the past. Most recently, timber was sold in stands immediately adjacent to CCM in 1992. This has probably been logged now. Cattle grazing has occurred in CCM since the early 1920s. Because of the gate on the Cow Creek Rd and the presence of cows, there is little recreational use of the area aside from some hunting.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging and road maintenance anywhere in the Cow Creek drainage could impact the fen and other wetland communities by increasing nutrient runoff from disturbed soils. Peatland species are very sensitive to the nutrient status of incoming ground and surface waters.

Other Values:

The remote nature and restricted access (thanks to a gate on the Cow Creek Rd.) to Cow Creek Meadows make them very important for big game habitat and recreation for hunters and hikers. Cow Creek supports a good brook trout fishery and is an important tributary to the Kootenai River. The view from the meadows to surrounding peaks is spectacular and offers a unique perspective on the effects of wildfire on the landscape. Some very large individuals of *Pinus monticola* (white pine) occur in forests in the lower portion of the SIA.

Conservation Intent:

Cow Creek Meadows is recommended as Special Interest Area to recognize the biodiversity values and to give the area special consideration when weighing management options. Public education through interpretive trails at some of the sites (not at Cow Creek Meadows) is also a priority with the proposed SIA designation.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Timber harvest or road building that could affect local hydrology or nutrient concentration of the waters flowing into CCM should be avoided. We recommend that road closures for this drainage remain in affect. Natural wildfires should be allowed to burn in this watershed if possible. Continued vegetation monitoring (rereading permanent plots) is necessary to determine the effects of cattle grazing and logging on sensitive plants and communities. If negative trends are discovered, these management activities should be modified to eliminate threats or abandoned as land use options altogether.

Information needs:

Floristic inventory of CCM is complete. Nine permanent vegetation monitoring plots have also been established. We desired to implement a water quality

monitoring study at the time of the vegetation monitoring but ran out of time

Plant community occurrences:

CAREX UTRICULATA	G5 S4
CAREX SCOPULORUM	G4 S3
VALLEY PEATLAND POND	G5 S2
DESCHAMPSIA CESPITOSA/DANTHONIA INTERMEDIA/ CALAMAGROSTIS CANADENSIS	GQ S?
POOR FEN	G4 S1

Rare plant occurrences:

TRIENTALIS ARCTICA	G5 S3
CAREX BUXBAUMII	G5 S3
CAREX FLAVA	G5 S3
CAREX LEPTALEA	G5 S2
CAREX PAUPERCULA	G5 S2
SCIRPUS HUDSONIANUS	G5 S1
ERIOPHORUM VIRIDICARINATUM	G4 S1
LYCOPODIELLA INUNDATA	G5 S2

Rare animal occurrences:

AEGOLIUS FUNEREUS	G5 S2
SYNAPTOMYS BOREALIS	G4 S1
GULO GULO LUSCUS	G4T4 S2

Author:

A. H. Pitner

DUBIUS CREEK FEN

Directions:

Dubius Creek Fen (DCF) is located approximately 17 miles north of Priest River, ID and five miles south of the Dickensheet Junction just east of Hwy 57. From Priest River, ID travel approximately 17 miles north on Highway 57. Take FS Rd 334 to the right (east). Go down this road approximately 1/2 mile to the gravel pit on the south side of the road. Park there and hike southeast to find Dubius Creek Fen. The fen, which continues down the Moores Creek drainage (which runs south, parallelling Hwy 57), can also be accessed directly off of Hwy 57 1/2 mile south of the junction of FS 334 with Hwy 57.

Richness:

Dubius Creek Fen contains a diverse mosaic of peatland communities. The western portion of the site along Moores Creek is dominated by shrub carr communities adjacent to uplands. Characteristic species in the shrub carr include *Spiraea douglasii*, *Betula glandulosa*, *Salix geyeriana*, *S. pedicellaris* (the rare bog willow), *S. bebbiana*, *Rhamnus alnifolia*, and *Alnus incana*. In some portions of

the carr, *Sphagnum centrale* forms hummocks beneath the shrubs. Further west toward Highway 57, the entire meadow is covered by shrub carr dominated exclusively by *S. douglasii*. The wetter portions of western lobe of DCF are covered by intermediate fen dominated by *Sphagnum subsecundum*, *Carex lasiocarpa*, *C. utriculata*, *Agrostis scabra*, *Veronica scutellata*, *Potentilla palustris*, *Lycopus uniflorus*, *Scutellaria galericulata*, *C. aquatilis*, *C. muricata*, *C. cusickii*, and *Scirpus microcarpus*. Two rare species, *Epilobium palustre* (swamp willow-weed) and *Salix pedicellaris* are common in this habitat. A large lobe of the fen extends to the north (just east of the gravel pit) near the divide between Dubius Creek to the east and Moores Creek to the southwest. The north end of the northern lobe is covered by a rich fen codominated by *C. lasiocarpa*, *C. chordorrhiza* (the rare string-root sedge), *C. utriculata*, and *Potentilla palustris*. Only a few scattered patches of intermediate fen, which are characterized by *Sphagnum subsecundum* and *Carex limosa*, break up this extensive, uniform rich fen. *Scheuchzeria palustris* (the rare podgrass) is found in the scattered intermediate fen habitats. On the south end of the northern lobe is an area that is periodically inundated thanks to beaver damming of the spring stream that emerges somewhere in this area and flows east into Dubius Creek. The slightly inundated lake margins are covered by *Eleocharis palustris*, *Equisetum fluviatile*, *Carex canescens*, *C. arcta*, *Puccinellia pauciflora*, *Glyceria borealis*, *Sparganium emersum*, *S. minimum*, *Typha latifolia*, *Phalaris arundinacea*, *Alisma plantago-aquatica*, *C. lenticularis*, *C. nebraskensis*, *Bidens cernua*, and *Agrostis scabra*. A truly diverse emergent rich fen community. The lake was mostly dried up in 1994. The remains of a beaver lodge of evidence of relatively recent beaver activity, however. The mudflats contain *Potamogeton natans*, *Typha latifolia*, *Nuphar polysepalum*, *Sparganium emersum*, and *Bidens cernua*. *Hypericum majus* (the rare large Canadian St. John's-wort) is found on disturbed peat on the old beaver lodge. The privately-owned meadows along Dubius Creek, which are part of the Dubius Creek Fen peatland, were not surveyed in 1994. The fen communities along Dubius Creek are likely ditched and cleared for hay and pasture.

Rarity:

DCF contains one of the most extensive *Carex lasiocarpa*-dominated rich fen communities in the Panhandle region. The fact that this rich fen is codominated by *C. chordorrhiza*, the rare string-root sedge, makes it even more exceptional. The emergent rich fen community around the ephemeral beaver pond is very diverse and unique. Overall, seven of the 12 habitat features of Panhandle peatlands were identified at this site: intermediate fen, rich fen, shrub carr, vegetated littoral zones, ponds, a stream, and beaver activity (Bursik and Moseley 1994). Lacking are bog microsites, poor fen, floating mats, paludified forest, and a lake. This is one of few low-elevation Panhandle valley peatlands that have formed along a stream and not along a lake, although the northern lobe of DCF is a filled-in shallow lake basin in all likelihood. More than 60 plant species were identified at DCF in a rather extensive floristic survey by Bursik in 1994. Further survey to the east along Dubius Creek will reveal the presence of more species, probably including more rare species. Five species considered rare in

Idaho are found in DCF: *Carex chordorrhiza*, *Epilobium palustre*, *Hypericum majus*, *Scheuchzeria palustris*, and *Salix pedicellaris*.

Condition:

No management activities appear to be direct threats to the main fen communities at DCF. The area along Dubius Creek to the east, which has not been surveyed for flora or vegetation is believed to be ditched and drained for hay and pasture. Forested areas northwest of the main fen communities have recently been selectively logged. No direct impacts from logging were seen on the fen margins, however.

No exotic species appear to threaten the native flora and fauna of this site.

Viability:

Logging, road construction and maintenance, and gravel excavation on the USFS and privately owned uplands adjacent to DCF present offsite threats that could lead to enhanced eutrophication and changes in the composition of the fen, shrub carr, and aquatic plant communities within the site. Enhanced eutrophication could ultimately also threaten the viability of rare plant populations at DCF.

Other Values:

This site supplies water to two low-elevation drainages that have been highly impacted by human development. This is one of few stretches of low-gradient stream at a low elevation on the west side of the Priest River that is not still ranched to a certain degree. Wildlife sign was abundant at DCF. It is likely a very valuable site for waterfowl habitat, particularly during periods when beaver maintain the pond. The eastern portion of DCF along Dubius Creek is still hayed and pastured for livestock production.

Conservation Intent:

If private lands within DCF are acquired by a public agency or private conservation buyer, recognition as a Special Interest Areas - Botanical Area would be appropriate. This designation will highlight the sensitive and rare nature of peatland communities at DCF to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the SIA-B designation is to encourage public interpretation within the site. DCF would be an excellent site for public interpretation about peatland communities in the Panhandle region. Access for interpretive trails could be directly off of Hwy 57, or off of FS Rd 334. Due to the extensive nature of fen and carr communities in DCF, trails could easily be placed in a manner that would not threaten any of the communities or rare plant populations at the site.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Uplands immediately adjacent to DCF (included within the proposed site boundaries) should be protected from potentially harmful logging

activities. If privately owned portions of DCF along Moores Creek and Dubius Creek are acquired, hydrology-modifying ditches should be plugged to reestablish natural hydrology to allow native plant communities to recolonize the area. Establishment of DCF as SIA-B should proceed immediately. Plans to develop interpretive trails on the USFS-owned portions of DCF should also proceed. Monitoring of plant communities, aquatic invertebrates, and water chemistries should begin as soon as possible.

Information needs:

Floristic inventory of DCF was rather intensive in 1994, but was limited to the area near the divide between Moores Creek and Dubius Creek. Further inventory along the two creeks would be valuable. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of DCF. All should be inventoried and monitored periodically in the future. As with other priority Panhandle peatlands, Bursik and Moseley (1994) recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommended following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5	S4
PHALARIS ARUNDINACEA	G4	S5
CAREX UTRICULATA	G5	S4
GLYCERIA BOREALIS	G4	S1
CAREX LASIOCARPA	G4	S2
CAREX LIMOSA	G3	S1
NUPHAR POLYSEPALUM	G5	S4
TYPHA LATIFOLIA	G5	S4

Rare plant occurrences:

EPILOBIUM PALUSTRE	G5	S3
SALIX PEDICELLARIS	G5	S1
CAREX CHORDORRHIZA	G5	S2
SCHEUCHZERIA PALUSTRIS	G5	S2

Author:

A. H. Pitner

FLEMING CREEK

Directions:

From Bonners Ferry travel 4.5 miles north to District 5 Road. Travel west on District 5 Road approximately 2.5 miles to Fleming Creek. Site can be accessed by foot.

Richness:

Fleming Creek emerges from springs in a narrow valley along the west side of the North Bench of the Kootenai River. The site includes wetlands hydrologically influenced by hillside seeps as well as springs. The emergents *Typha latifolia* and *Scirpus acutus* dominate the site. Wetland margins have been logged and support second growth *Thuja plicata* with an understory dominated by *Lysichitum americanum*, *Aralia nudicaulis*, and *Equisetum fluviatile*. *Alnus incana* swamps with *Lysichitum americanum* in the understory are also present on valley bottom margins. Where the valley narrows and seeps are absent bands of *Alnus incana* and *Cornus sericea* are present.

Rarity:

The site provides habitat for the rare plant species *Epipactus gigantea*, *Carex flava*, *Epilobium palustre*, *Petasites sagittatus*, and *Thalictrum dasycarpum*. The narrow valley bottom has a significant amount of structure with open water, tall emergents, shrubs, and trees.

Condition:

An approximately 200 square meter weed patch is present near the middle of the site. The patch is dominated by *Solanum dulcamara*, *Convolvulus sepium*, and *Cirsium arvense*. Some method of control may be necessary to discourage this suite of species from establishing in adjacent *Scirpus acutus* communities.

Viability:

Considerable mass wasting has occurred on slopes above roads on both the north and south sides of the site. Sediments have reached the wetland in places and cover moss dominated substrates with sand. The south road (District 5 Road) is maintained and road grading places sediments and coarse fragments into the valley bottom. The north road is not currently maintained as the stream crossing at Fleming Creek has washed out. Repair of crossing and road maintenance on the north side of Fleming Creek is definitely a possibility. Logging has occurred in the drainage right up to the spring channels. Rolling uplands are in agriculture.

Other Values:

The stream corridor provides migration routes for wildlife in a landscape fragmented by agriculture.

Conservation Intent:

The site should be high priority for fee title acquisition or conservation easements by a conservation organization. Conservation easements on headwater and tributary springs should be acquired to maintain flows.

Management needs:

It would be beneficial to install sediment traps along District 5 Road. Beaver populations should be maintained and adequate buffers should be established in future logging efforts.

Information needs:

Plant community occurrences:

ALNUS INCANA/CORNUS STOLONIFERA	G3Q S3
SCIRPUS ACUTUS	G5 S4
TYPHA LATIFOLIA	G5 S4
ALNUS INCANA/LYSICHTUM AMERICANUM	G3 S3

Rare plant occurrences:

PETASITES SAGITTATUS	G4 S3
EPILOBIUM PALUSTRE	G5 S3
THALICTRUM DASYPARPUM	G5 S1
CAREX FLAVA	G5 S3
EPIPACTIS GIGANTEA	G4 S3

Author:

Mabel Jankovsky-Jones

GAMLIN LAKE

Directions:

Gamlin Lake is located on the northeastern point of the Pend Orielle peninsula south and east of Lake Pend Orielle. The lake is incorrectly referred to as Gamble Lake on many maps of the area. From Sandpoint, ID travel south on Hwy 95 five miles to Sagle, ID. Take a left (head east) on the Garfield Bay road. At about mile seven this road forks. Take the left fork (the right fork heads to Garfield Bay). Continue down the road nearly five more miles to Gamlin Lake. The boat launch is along the road that runs down the east side of the lake. A boat is necessary to access most of the floating rich fen mats.

Richness:

Gamlin Lake is a 200-acre seepage lake with no apparent inlet or outlet. It is a eutrophic lake with extensive vegetated littoral (less than two meters deep) and limnetic zones (greater than two meters deep). The deep littoral and limnetic zones (1.5-3.5 meters deep) are dominated by *Potamogeton amplifolius*, *P. praelongus*, and *Elodea canadensis*. Shallow littoral zones are covered by patches of *Brasenia schreberi*, *Nuphar polysepalum*, *Nymphaea odorata*, *Potamogeton natans*, *P. gramineus*, *P. robbinsii*, *Utricularia vulgaris*, and the rare *Scirpus subterminalis* (water clubrush). The lake margins support extensive floating mats dominated by a rich fen community including *Typha latifolia*, *Scirpus acutus*, *Carex lasiocarpa*, *Agrostis scabra*, *Dulichium arundinaceum*, *Potentilla palustris*, and *Lycopus uniflorus*. *Calliergonella cuspidata*, a brown moss, forms a thick mat over many of the floating mats. Very few patches of *Sphagnum teres* were also found on the mats. Two rare species were found scattered throughout the floating mats: *Cicuta bulbifera* (bulb-bearing waterhemlock) and *Hypericum majus* (large Canadian St. John's-wort). Surrounding the floating mats are rich fens on fixed

substrate dominated by *Carex utriculata*, *C. stipata*, *Potentilla palustris*, *Scirpus microcarpus*, *Scirpus cyperinus*, *Scutellaria galericulata*, and *Lycopus uniflorus*. A few scattered shrub carr habitats dominated by *Spiraea douglasii*, *Alnus incana*, *Salix geyeriana*, and *S. bebbiana* are found on the fixed mats around the lake.

Rarity:

Gamlin Lake is very similar to the rest of the peatlands in the vicinity of Lake Pend Orielle (Shepherd Lake, Beaver Lake South, Lost Lake, and Kelso Lake). They have moderately high floristic diversity (more than 50 species) thanks in part to the abundant aquatic and marsh communities at the sites, in addition to the rich fen peatland habitats. The floating rich fens are very interesting and diverse. They contain many species typically associated with marsh habitats (e.g., *Typha latifolia* and *Scirpus acutus*) along with species nearly restricted to peatlands (e.g., *Carex lasiocarpa*, *Dulichium arundinaceum*, *Potentilla palustris*, and *Drosera rotundifolia*). This type of rich fen is only of very scattered occurrence north of Lake Pend Orielle and the Pend Orielle River. This is perhaps due to differences in parent material. All five sites have diverse aquatic floras, most with a diversity of aquatic habitats, including shallow littoral zones dominated by *Brasenia schreberi* and *Nuphar polysepalum* and deep littoral and limnetic zones dominated by various pondweeds. Gamlin Lake contains three rare plant populations: *Scirpus subterminalis* (water clubrush), *Hypericum majus* (large Canadian St. John's wort), and *Cicuta bulbifera* (bulb-bearing waterhemlock). Six of the 12 critical habitat features of Panhandle peatlands were identified at Gamlin Lake: rich fen, floating mat, vegetated littoral and limnetic zones, shrub carr, a lake, and beaver activity (Bursik and Moseley 1994). Lacking are bog microsites, poor fen, intermediate fen, paludified forest, a pond, and a stream.

Condition:

Current land use surrounding Gamlin Lake appears consistent with the long-term protection of the critical peatland and aquatic communities within the site. The Gamlin Lake road was very poorly placed along the east side of the lake. Its construction certainly had a great impact on the lake. The important thing now is to assure that ongoing maintenance of this road does not further degrade water quality at the site, which could lead to enhanced eutrophication and significant vegetation changes. Grazing and logging around the lake margins could affect the site in the future. Likewise, more housing developments would also have an impact on incoming water quality.

No exotic species threatening the viability of this site have been identified.

Viability:

Logging, road building, grazing, and housing developments in the surrounding drainage basin, could enhance eutrophication and lead to changes in the composition of plant communities at this site. Enhanced eutrophication could ultimately also threaten the viability of the three rare plant populations.

Other Values:

Gamlin Lake provides excellent waterfowl habitat due to the abundance of aquatic vegetation and the dense nature of the surrounding wetland vegetation. It is well-used by big game animals in spite of the houses in the vicinity of the lake. The lake is a popular warm water fishery with excellent bass, northern pike, and panfish populations. It is a very picturesque site and valuable for recreational canoeing as well.

Conservation Intent:

Portions of the shores of Gamlin Lake have been acquired by the Nature Conservancy and BLM. BLM lands are designated as a Special Management Area. Additional private tracts are present on the lake where acquisition or conservation easements should be a priority. The Area of Critical Environmental Concern (ACEC) designation is appropriate for this site given that the BLM is the main public landowner. The designation will highlight the sensitive and rare nature of peatland and aquatic communities at Gamlin Lake to give them special consideration when management decisions are made in the drainage that may adversely affect them.

Management needs:

This site, like other peatland sites in northern Idaho, should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Monitoring of the plant communities, aquatic invertebrate populations, and water chemistries at Gamlin Lake should be initiated as soon as possible. If private lands are offered for sale around the lake, state and federal agencies, private conservation groups, and individuals interested in preserving critical habitats should consider purchasing them to incorporate the lands into the Gamlin Lake preserve.

Information needs:

Floristic inventory has been thorough at this site. Certain areas remain unsurveyed but most floristic diversity is accounted for. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of Gamlin Lake. All should be inventoried and monitored periodically. As with other priority Panhandle peatlands, Bursik and Moseley recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommended following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5	S4
ALNUS INCANA/CAREX UTRICULATA	G3	S2
CAREX UTRICULATA	G5	S4
CAREX LASIOCARPA	G4	S2

SCIRPUS ACUTUS	G5 S4
NUPHAR POLYSEPALUM	G5 S4
TYPHA LATIFOLIA	G5 S4

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
HYPERICUM MAJUS	G5 S3
SCIRPUS SUBTERMINALIS	G4G5 S3
BOTRYCHIUM MINGANENSE	G4 S3
BOTRYCHIUM ASCENDENS	G3? S1

Author:

A. H. Pitner

GRASS CREEK MEADOWS

Directions:

Grass Creek Meadows is located along Grass Creek, which is in the extreme northern portion of the Selkirk Mts. in the U.S. It drains into Canada and ultimately into the Kootenai River. It can be accessed by taking FS Rd 281 (Smith Creek Rd.) to 655 to 282 to 2454 to 1009 and finally to 636 which runs along Grass Creek and provides good access to the meadows (though it is gated somewhere along the way).

Richness:

Grass Creek contains open sphagnum-rich and sphagnum-poor fen habitats scattered along its upper reach. All the communities described in Bursik (1993) for Cow Creek and Smith Creek RNA peatland communities occur along Grass Creek. The Sphagnum-dominated fens contain the rare species known from the site (*Carex paupercula*, *Trientalis arctica*, and *Scirpus hudsonianus*). Other communities include: 1.) *Carex scopulorum* (Rocky Mountain sedge) fen, 2.) *Carex vesicaria*/*C. utriculata* (inflated sedge/beaked sedge) fen, and the 3.) *Deschampsia cespitosa*/*Danthonia intermedia*/*Calamagrostis canadensis* (tufted hairgrass/intermediate oatgrass/blue joint reedgrass) moist meadows. This meadow system has not been surveyed in detail by CDC staff, but it has been surveyed by Diane Amatto of the Bonners Ferry Ranger District. She would have more details on the vegetation of the fen communities and the rare plants.

Rarity:

Subalpine Sphagnum-dominated fen communities as exist in Grass Creek Meadows are more rare in extreme northern Idaho than in the major river valleys of north central Idaho (e.g. the Lochsa). They appear to be somewhat transitional in floristic composition to valley peatland communities based on the number of boreal species they contain. The fen communities contain several rare plant populations, including one of two populations of Hudson's Bay bulrush (*Scirpus hudsonianus*) found in the state. Grizzly bear and woodland caribou use is high in the Grass Creek Meadows.

Condition:

The Grass Creek drainage is heavily roaded and much timber harvest has taken place in the past. Grazing may have also occurred in the past. Additional timber harvest and road maintenance have been proposed in the vicinity of the fen communities (in 1993-94).

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging and road maintenance anywhere in the Grass Creek drainage could impact the fen and other wetland communities by increasing nutrient runoff from disturbed soils. Peatland species are very sensitive to the nutrient status of incoming ground and surface waters.

Other Values:

The remote, hard-to-access nature of Grass Creek Meadows make them very important for big game habitat and recreation for hunters and hikers. Grass Creek supports a good brook trout fishery and is an important tributary to the Kootenai River.

Conservation Intent:

Grass Creek Meadows is recommended as a Special Interest Areas to recognize the biodiversity values and to give the area special consideration when weighing management options. Public education through interpretive trails is not a priority at Grass Creek Meadows.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Timber harvest or road building that could affect local hydrology or nutrient concentration of the waters flowing into fen communities along Grass Creek. As part of the Comprehensive Conservation Strategy for Panhandle Peatlands, we recommend placing two or more permanent vegetation monitoring plots in peatland communities in the drainage. Natural wildfires should be allowed to burn in this watershed if possible.

Information needs:

CDC botanists have done only cursory floristic inventory of the Grass Creek drainage. Diane Amato, botanist for the Bonners Ferry RD, has done most of the work. Getting this information into the database would be valuable. Several ECODATA plots were placed along Grass Creek by Paul Sieraki and Craig Norris as part of the grizzly bear habitat review of the 1980's. This information would also be valuable. Further floristic inventory may be needed, particularly for documenting bryophytes. No work has been done on small vertebrates (these meadows are very likely to support a population of northern bog lemmings, *Synaptomys borealis*), terrestrial or aquatic invertebrates. The history of the

land use (grazing and timber harvest) would be worth compiling for this drainage too.

Plant community occurrences:

CAREX UTRICULATA	G5 S4
CAREX SCOPULORUM	G4 S3
DESCHAMPSIA CESPITOSA/DANTHONIA INTERMEDIA/ CALAMAGROSTIS CANADENSIS	GQ S?
POOR FEN	G4 S1

Rare plant occurrences:

TRIENTALIS ARCTICA	G5 S3
CAREX LEPTALEA	G5 S2
CAREX PAUPERCULA	G5 S2
SCIRPUS HUDSONIANUS	G5 S1
STREPTOPUS STREPTOPOIDES VAR BREVIPES	G5T4 S1
DIPHASIASTRUM SITCHENSE	G5 S2

Rare animal occurrences:

LYNX CANADENSIS	G4G5 S1
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Author:

A. H. Pitner

HAGER LAKE FEN

Directions:

From Nordman, ID, travel 2.3 miles south on Hwy 57. Park in the large pullout on the east side of the road just south of the Hwy 57 bridge over Kalispell Creek. Cross highway 57 and walk down the old logging road. Where it T's, take a left and follow it around to the south side of Hager Lake.

Richness:

Hager Lake is a two-hectare pond located in the Priest River Valley, Bonner County, Idaho. It is a seepage pond with no apparent inlet or outlet. The basin of Hager Lake is enclosed and underlain by ice-contact fluvial gravels. The depression likely formed as a result of an ice block melting near the terminus of the glacier that occupied this portion of the Priest River Valley; a depression commonly referred to as a "glacial kettle" (Mack et al. 1978). The origin of the basin dates between 11,500 and 12,000 years before present based on the presence of Glacier Peak tephra near the base of peat cores extracted in 1992 (Bursik et al. 1994). Several distinct plant communities are found at Hager Lake Fen (HLF). The most extensive is a shrub carr dominated by a dense stand of *Spiraea douglasii*. This shrub carr covers most of the fen north of Hager Lake, except for the northeastern corner, which was cleared and reditched in 1988. This area was harvested for hay in 1994. The *Spiraea douglasii* shrub carr also occurs in a band around Hager Lake. Lodgepole (*Pinus contorta*) and western white

pine (*Pinus monticola*) trees are scattered throughout the shrub carr. The middle of the fen basin north of Hager Lake is covered by a rich fen codominated by *Carex lasiocarpa* and *Spiraea douglasii*. An extensive (one-hectare) floating mat encroaches on the south side of the lake. The floating mat is covered by a poor fen community dominated by *Sphagnum angustifolium*, *S. subsecundum*, and *S. centrale*. Common vascular species include *Vaccinium oxycoccos* (the rare bog cranberry), *Scheuchzeria palustris* (the rare podgrass), *Carex limosa*, *Kalmia microphylla*, and *Lycopus uniflorus*. Coring done on the floating mat indicates that it dates from sometime near 6700 years before present based on the presence of Mount Mazama tephra near the top of lake sediments below the mat (Mehringer unpublished data). Between the floating mat and the *S. douglasii* shrub carr to the south is a fixed mat zone. The fixed mat also occurs around the east, west, and north lake margins. The fixed mat is characterized by intermeidate fen vegetation codominated by *Sphagnum subsecundum*, *C. lasiocarpa*, and *Dulichium arundinaceum*. Two rare species are found in this community: *Lycopodiella inundata* (bog clubmoss) and *Hypericum majus* (large Canadian St. John's-wort). A narrow, shallow littoral zone is found on the east, west, and north lake margins. It is characterized by *Nuphar polysepalum*, *Brasenia schreberi*, *Potamogeton natans*, *Scirpus acutus*, and the rare *Scirpus subterminalis* (water clubrush).

Rarity:

Hager Lake Fen supports 75 vascular and bryophyte plant species, including six considered rare in Idaho: *Scirpus subterminalis* (water clubrush), *Trientalis arctica* (northern starflower), *Vaccinium oxycoccos* (bog cranberry), *Scheuchzeria palustris* (podgrass), and *Hypericum majus* (large Canadian St. John's-wort). Four other rare species were previously documented from HLF and are now believed extirpated: *Epilobium palustre* (swamp willow weed), *Dryopteris cristata* (crested shield fern), *Carex leptalea* (bristle stalk sedge), and *Lycopodium dendroidium* (groundpine). Hager Lake contains one of the more extensive floating mats in Idaho and the poor fen community growing on the mat is exceptional.

Condition:

Aside from the hay harvesting that is occurring in the northeastern portion of HLF, and the ongoing effects of drainage ditches, no other human uses appear to have any impact on the site. Some timber harvest has occurred in the recent past just north of HLF.

No exotic species appear to threaten the native flora and fauna of this site.

Viability:

Logging and road construction and maintenance present offsite threats that could lead to enhanced eutrophication within the lake and changes in the composition of the fen and aquatic plant communities, which could ultimately threaten the viability of rare plant populations. The analysis of 40-year changes in the vegetation of HLF showed that fen communities were significantly affected by enhanced eutrophication from land clearing surrounding the lake during the first

half of the 20th century (Bursik and Moseley 1992).

Other Values:

This is a beautiful little lake that is enjoyed by many locals who, I am told, forage for cranberries there. It is as picturesque as any of the peatlands in Idaho. The rocky bluff on the east face of Bismark Mountain to the west is spectacular. Additionally, it is probably the most well studied peatland in the state. Several paleoecological studies have been carried out at HLF (Hansen 1939; Rumely 1956; Mack et al. 1978; Bursik et al. 1994; Mehringer and Vandewater in prep.). Several ecological studies have also been carried out. Jack Rumely (1956) did a detailed study of the flora and vegetation which was used in 1992 (Bursik and Moseley 1992) to analyze 40-year changes at the site. Fred Rabe of the University of Idaho has studied macroinvertebrate and zooplankton communities of HLF for more than a decade (Rabe et al. 1986). The 1992 study has laid the foundation for carrying on a long-term monitoring program at HLF to learn more about Idaho peatlands and to evaluate the effects that management activities in surrounding forests can have on sensitive ecosystems such as peatlands.

Conservation Intent:

Much of the privately owned portion of HLF, including the lake and surrounding poor and intermediate fen communities was acquired by Archie and Mary George of Moscow, Idaho in 1994. A conservation easement has been developed with the Nature Conservancy to assure the long-term part protection of this site. The north end of the fen remains owned by the Sudnikovith family. It would be valuable for a public or private agency, or a conservation-minded individual like the George's to acquire this. As part of the comprehensive conservation strategy for Panhandle peatlands, Bursik and Moseley (1994) recommended establishing most of the high-priority sites as Special Interest Areas - Botanical in recognition of the unique flora and plant communities that the sites support. This designation will also serve to highlight the sensitive and rare nature of peatland communities at HLF to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the SIA land designation is to encourage public interpretation within the sites. Hager Lake, however is not one of the sites recommended for interpretation.

Management needs:

This site, like other peatland sites in northern Idaho, should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. In addition to wier construction in the ditch that exits the lake, it would be ideal to eliminate hay cutting in the northeastern corner of the fen. It is probably best to allow the drainage ditches north of the lake to slowly fill in by themselves. Acquisition of the HLF portion of the Sudnikovitch property would also be valuable.

Information needs:

Floristic inventory of the site is complete. Fred Rabe's data on the

invertebrate fauna should be organized to be used for future monitoring. No work has been done on the terrestrial invertebrate populations of HLF. This portion of the fauna should also be monitored as part of the comprehensive monitoring program at HLF. Water chemistry and water level monitoring should be done on an annual or biennial schedule. Measurements should be taken (following out methods - Bursik and Moseley [1992]) June 1, August 1, and October 1 to account for seasonal variation. Archie George is planning to place peizometers along the permanent transect to monitor water levels throughout HLF. Lake water level monitoring stations should also be used to monitor water levels, particularly before and after the placement of the log wier in the ditch exiting the lake. Vegetation analysis along the permanent transect should be carried out every 8 to 10 years.

Plant community occurrences:

SPIRAEA DOUGLASII	G5	S4
CAREX LASIOCARPA	G4	S2
CAREX LIMOSA	G3	S1
DULICHIMUM ARUNDINACEUM	G3?	S2
NUPHAR POLYSEPALUM	G5	S4
POOR FEN	G4	S1

Rare plant occurrences:

HYPERICUM MAJUS	G5	S3
VACCINIUM OXYCOCCOS	G5	S2
EPILOBIUM PALUSTRE	G5	S3
TRIENTALIS ARCTICA	G5	S3
CAREX LEPTALEA	G5	S2
CAREX ROSTRATA	G5	S2
SCIRPUS SUBTERMINALIS	G4G5	S3
SCHEUCHZERIA PALUSTRIS	G5	S2
DRYOPTERIS CRISTATA	G5	S2
LYCOPODIUM DENDROIDEUM	G5	S2
LYCOPODIELLA INUNDATA	G5	S2

Author:

A. H. Pitner

HUNT GIRL CREEK

Directions:

Hunt Girl Creek RNA is located ca 11 air miles southeast of Naples in the Cabinet Mountains of northern Idaho. Access to Hunt Girl Creek RNA from Naples is via US Route 95 north to Blue Lake, Twentymile Creek Road (FS Road 408) east, over Twentymile Pass to Boulder Creek, then Boulder Creek Road (FS Road 427) south to the end of the road. The Boulder Mountain Trail (FS Trail 51) provides access to Divide Lake.

Richness:

Hunt Girl Creek RNA encompasses the upper portion of the Hunt Girl Creek drainage in the Cabinet Mountains, extending from elevations below 4000 feet (1219 m) to nearly 6300 feet (1920 m) on Boulder Mountain. The bedrock underlying the area consists of Precambrian metasedimentary and intrusive igneous rocks, and granitics of the Kaniksu Batholith. Geologic features include a narrow gorge carved out of sediments and landforms resulting from alpine and continental glaciations. Most of the slopes above 4500 feet (1372 m) are covered with vegetation that is, or potentially will be, dominated by subalpine fir (*Abies lasiocarpa*). Western hemlock (*Tsuga heterophylla*) and western redcedar (*Thuja plicata*) forests occur at the lowest elevations within the RNA. Divide Lake, located near the southwestern boundary is a system of wetland sites. The wet sedge meadows, peatlands, and streams increase the area's diversity and wildlife habitat.

Rarity:

The area contains a great diversity of natural features including habitat types in the subalpine fir, western hemlock and western redcedar series; aquatic ecosystems and geological formations. Grizzly bear (*Ursus arctos*) of the Cabinet Mountains use the general area.

Condition:

Hunt Girl Creek RNA is allocated to Management Area 14 (RNAs and experimental forests) in the Idaho Panhandle National Forests Plan (August 1987). The area is visited by a low number of hikers during the summer months and hunters during the fall. The area surrounding Divide Lake shows signs of human activity such as camping.

Viability:

The RNA is surrounded by Forest Service lands within Management Area 19 - lands which are managed for semi-primitive recreation as well as for low levels of timber harvest with minimum standard roads.

Other Values:

The site protects the entire basin surrounding the upper portion of Hunt Girl Creek. In addition to the variety of geological features and habitat types, the area supports Divide Lake, a high elevation lake, and wetland types including peatlands, marshes, seeps, wet meadows, and snowfield margins. Habitat exists in the area for a variety of animals including grizzly bear, several big game species, and an abundance of smaller mammals and birds. Hunt Girl Creek supports rainbow trout (*Oncorhynchus mykiss*) and cutthroat trout (*Oncorhynchus clarki*).

Conservation Intent:

The site has been protected by designation as a Forest Service Research Natural Area.

Management needs:

Information not available.

Information needs:

Unknown

Plant community occurrences:

ABIES LASIOCARPA/CLINTONIA UNIFLORA	G5 S4
ABIES LASIOCARPA/LUZULA HITCHCOCKII	G5 S5
ABIES LASIOCARPA/MENZIESIA FERRUGINEA	G5 S5
ABIES LASIOCARPA/XEROPHYLLUM TENAX	G5 S5
THUJA PLICATA/OPLOPANAX HORRIDUM	G3 S3
TSUGA HETEROPHYLLA/GYMNOCARPIUM DRYOPTERIS	G3G4 S3
ABIES LASIOCARPA/STREPTOPUS AMPLEXIFOLIUS, MENZIESIA FERRUGINEA	G4 S4
THUJA PLICATA/ATHYRIUM FILIX-FEMINA, ATHYRIUM FILIX-FEMINA	G3 S3
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA, CLINTONIA UNIFLORA	G5 S4

Author:

J. H. Kaltenecker

KELSO LAKE

Directions:

Kelso Lake is located approximately 20 miles north of Coeur d'Alene, ID and four miles directly north of Athol, ID. Travel north from Coeur d'Alene on Highway 95. Proceed through Athol. Approximately four miles north of Athol there will be a Sportsman's Access Sign to Granite and Kelso Lakes. Follow the sign to the lake (west of Hwy 95). There is a Fish and Game boat launch on the north side of the lake. A boat is required to access most of the aquatic and peatland communities around the lake.

Richness:

Kelso Lake is a 150-acre drainage lake with an apparent inlet coming from Beaver Lake, two miles to the north and from Hoodoo Creek, which flows to the northwest from the meadow to the west of Kelso Lake and may now be connected to Kelso Lake via a ditch. The outlet is to the east through Round Lake and Granite Lake. The outlet is obscure and ephemeral. There may be weirs to regulate the levels of these lakes. Round and Granite Lakes are included within the Kelso Lake proposed natural area because of this connection and the presence of fen communities surrounding the lakes. Round Lake is approximately 20 acres in size and Granite Lake covers approximately 60 acres. All three are eutrophic lakes with extensive vegetated littoral (less than two meters deep) and limnetic zones (greater than two meters deep). The vegetation descriptions that follow are for Kelso Lake, which Bursik surveyed in 1993. Very cursory visits around the margins of the other lakes make it clear that they are very similar. The deep littoral and

limnetic zones (1.5-3.0 meters deep) are dominated by *Potamogeton amplifolius*, *P. praelongus*, *P. robbinsii*, *P. zosteriformis*, *Myriophyllum sibiricum*, and *Elodea canadensis*. Shallow littoral zones are covered by patches of *Brasenia schreberi*, *Nuphar polysepalum*, *Potamogeton natans*, *P. epiphydrus*, *P. robbinsii*, *Utricularia vulgaris*, *Ceratophyllum demersum*, and the rare *Scirpus subterminalis* (water clubrush). On the east and west ends of Kelso Lake floating mats are dominated by a rich fen community including *Typha latifolia*, *Scirpus acutus*, *Carex lasiocarpa*, *Agrostis scabra*, *Dulichium arundinaceum*, *Potentilla palustris*, *Lysimachia thrysiflora*, *Sium suave*, *Eleocharis palustris*, *Carex cusickii*, *Viola macloskeyi*, *Bidens cernua*, and *Lycopus uniflorus*. Various brown mosses, probably including *Calliergonella cuspidata*, *Aulacomnium palustre*, and *Calliergon stramineum* (not identified during 1993 field visit) were common on the mats. A few patches of sphagnum (probably *S. teres*) were also observed. A similar floating rich fen is found on the east end of Granite Lake. One rare species, *Cicuta bulbifera* (bulb-bearing waterhemlock) was found scattered throughout the floating mats. Bursik's 1993 survey of the mat habitats was very cursory. Other rare species, including *Hypericum majus* (large Canadian St. John's-wort) and *Epilobium palustre* (swamp willow-weed) are likely present. Surrounding the floating mats are rich fens on fixed substrate dominated by *Carex utriculata*, *C. stipata*, *Potentilla palustris*, *Scirpus microcarpus*, *Scirpus cyperinus*, *Scutellaria galericulata*, and *Lycopus uniflorus*. A few scattered shrub carr habitats dominated by *Spiraea douglasii*, *Alnus incana*, *Salix geyeriana*, *S. sitchensis*, and *S. bebbiana* are found on the fixed and floating mats around the lakes.

Rarity:

Kelso Lake (Round and Granite included) is very similar to the rest of the peatlands in the vicinity of Lake Pend Orielle (Gamlin Lake, Beaver Lake South, Lost Lake, and Shepherd Lake). They have moderately high floristic diversity (approximately 50 species were identified) thanks in part to the abundant aquatic and marsh communities at the sites, in addition to the rich fen peatland habitats. The floating rich fens are very interesting and diverse. They contain many species typically associated with marsh habitats (e.g., *Typha latifolia* and *Scirpus acutus*) along with species nearly restricted to peatlands (e.g., *Carex lasiocarpa*, *Dulichium arundinaceum*, *Potentilla palustris*, and *Drosera rotundifolia*). This type of rich fen is of only very scattered occurrence north of Lake Pend Orielle and the Pend Orielle River. This is perhaps due to differences in parent material. All five sites have diverse aquatic floras. Kelso Lake contains two known rare plant populations: *Scirpus subterminalis* (water clubrush) and *Cicuta bulbifera* (bulb-bearing waterhemlock). It is also the historical location of *Nymphaea tetragona* (pygmy waterlily; in Granite Lake) which is now believed extinct in Idaho. Given this, it appears that habitat modifications may have done great damage to this site. More area, which could still support this species, remains to be surveyed. Eight of the 12 critical habitat features of Panhandle peatlands at Kelso Lake: intermediate fen, rich fen, floating mat, vegetated littoral and limnetic zones, shrub carr, a lake, a stream, and beaver activity (Bursik and Moseley 1994). Lacking are bog microsites, poor

fen, paludified forest, ponds, and a stream.

Condition:

Current land use surrounding Kelso Lake does not appear to directly threaten the wetland and aquatic plant communities. Road maintenance, grazing and logging around the lake margins could affect the site indirectly, however. Likewise, more housing development within the drainage would also have an impact on incoming water quality. The hydrology of some of the wetland areas around the three lakes included within this site, particularly the area west of Kelso Lake has been altered and may have contributed to significant habitat degradation.

No exotic species threatening the viability of this site have been identified.

Viability:

Logging, road building, grazing, and housing developments in the surrounding drainage basin, could enhance eutrophication and lead to changes in the composition of plant communities at this site. Enhanced eutrophication could ultimately also threaten the viability of the three rare plant populations at Kelso Lake.

Other Values:

Kelso and Granite Lakes are popular fisheries. Both contain bass and panfish and Kelso Lake also contains trout. Round Lake is directly connected to Kelso Lake and therefore must also support fish. All three provides excellent waterfowl habitat due to the abundance of aquatic vegetation and the dense nature of the surrounding wetland vegetation. The area is probably also used heavily by deer and perhaps other big game animals in spite of the houses in the vicinity of the lake. Kelso and Granite are also nice canoeing lakes because no motor boats are allowed.

Conservation Intent:

Most of the lands at Kelso Lake are privately owned. If these lands can be acquired by a conservation organization designation of Kelso Lake as Special Interest Area - Botanical is recommended in recognition of the unique flora and plant communities that the sites support. This special designation will highlight the sensitive and rare nature of peatland and aquatic communities at Kelso Lake to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the SIA-B designation is to encourage public interpretation within the site. Given that much of this site is currently privately owned, and that access to the fen communities is somewhat difficult, development of interpretive trails is not recommended.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Monitoring of the plant communities, aquatic invertebrate populations, and water chemistries at Kelso, Round, and Granite

Lakes should be initiated as soon as possible. If privately-owned lands within the proposed SIA-B are offered for sale, state and federal agencies, private conservation groups, and individuals interested in preserving critical habitats should consider purchasing them to incorporate the lands into the Kelso Lake preserve.

Information needs:

Floristic inventory has been cursory at this site. Bursik inventoried the aquatic flora of Kelso Lake in 1993, but took only cursory stock of the flora on floating rich fen habitats. Round Lake and Granite Lake were not surveyed. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of these lakes, either. All should be inventoried and monitored periodically. As with other priority Panhandle peatlands, Bursik and Moseley (1994) recommend placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommend following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
CAREX UTRICULATA	G5 S4
CAREX LASIOCARPA	G4 S2
SCIRPUS ACUTUS	G5 S4
NUPHAR POLYSEPALUM	G5 S4
TYPHA LATIFOLIA	G5 S4

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
PETASITES SAGITTATUS	G4 S3
HYPERICUM MAJUS	G5 S3
CAREX COMOSA	G5 S1
CAREX LEPTALEA	G5 S2
SCIRPUS SUBTERMINALIS	G4G5 S3
DRYOPTERIS CRISTATA	G5 S2

Author:

A. H. Pitner

LEE LAKE

Directions:

Lee Lake is located 1.5 miles due east of Coolin, ID on the southeast end of Priest Lake. It can be reached by taking the East Side Road north of Coolin approximately 2 miles to a forest access road that heads east (Lee Creek Rd?). Down this road approximately 3/4 mile, Lee Lake can be observed on the left (north) side of the road just down-slope.

Richness:

Floating mats ring the margins of Lee Lake on most sides. Many of these mats were not buoyant in 1994 due to very low water levels. The mat on the east end, which encroaches on one of the deepest parts of the lake was buoyant in 1994. The mat communities range from intermediate to poor fen communities that are *Sphagnum* spp. and *Carex*-dominated. *Sphagnum angustifolium*, *S. magellanicum*, *S. teres*, *Kalmia microphylla*, *Vaccinium oxycoccos* (the rare bog cranberry), *Carex lasiocarpa*, *C. limosa*, and *C. rostrata* are all prominent on the floating mats. Other Idaho rare species that occur on the floating mats include *Epilobium palustre* (swamp willow-weed), *Cicuta bulbifera* (bulb-bearing waterhemlock), *Carex chordorrhiza* (string-root sedge), *Rhynchospora alba* (white beakrush), *Scheuchzeria palustris* (podgrass), and *Hypericum majus* (large Canadian St. John's-wort), all of which are scattered around the lake. *Scheuchzeria palustris* achieves local prominence in some portions of the floating mats. A rather extensive pioneer mat has formed on lake mudflats that have been exposed on the south side of the lake due to dropping water levels (resulting from the prevailing drought). In 1987 and 1988, when Bursik first surveyed Lee Lake, there were only scattered patches of *Eleocharis palustris*, *Glyceria borealis*, and other aquatic emergent species in this area. Now there is a diverse mat community that is stable enough to walk on due to the dense network of rhizomes. As water levels rise again in the future, this pioneer mat may become buoyant and greatly expand the floating mat area on Lee Lake. Species occupying the pioneer mat include *Eleocharis palustris*, *E. ovata*, *Drosera rotundifolia*, *Dulichium arundinaceum*, *Glyceria borealis*, *Juncus ensifolius*, and *Sphagnum teres*. Stands of *Potamogeton amplifolius* and *Nuphar polysepalum* are common throughout the shallow lake. Nearly the entire lake is shallow and littoral. *Scirpus subterminalis* (the rare water clubrush) occurs in several patches in the lake. On the upland side of the floating mats is an extensive shrub carr (intermediate to rich fen shrub carr). Throughout much of the shrub carr, *Betula glandulosa* forms a shrub overstory; *Kalmia microphylla* and *Vaccinium oxycoccos* form a low- shrub layer beneath; while *Sphagnum centrale*, *Aulacomnium palustre*, and other mosses dominate the herb layer. Near the upland margins, *Spiraea douglasii* increases in prominence (replacing *B. glandulosa*) and the understory of low shrubs and mosses disappears. *Trientalis arctica* (northern starflower), *Salix pedicellaris* (bog willow), and *Dryopteris cristata* (crested shield fern) are rare species found scattered throughout the shrub carr. North of the lake, a dome of peat is found over the top of a slightly raised moraine that separates Lee Lake from the rest of the Lee Creek wetland basin to the north. The peat dome is covered by paludified forest with *Pinus contorta*, *P. monticola*, *Picea engelmannii*, *Tsuga heterophylla*, *Abies grandis*, and *Thuja plicata* all being common. The understory is mostly covered by *Sphagnum centrale* and *Polytrichum strictum*. Common vascular species include *Betula glandulosa*, *Lycopodium annotinum*, *L. clavatum*, *Linnaea borealis*, *Carex brunnescens*, *Kalmia microphylla*, *Vaccinium oxycoccos*, *Trientalis arctica*, *Rhamnus purshiana*, *Vaccinium caespitosum*, and the rare *Lycopodium dendroidium* (groundpine). The Lee Lake fen basin north of the lake is almost entirely unsurveyed and is apparently highly altered for hay and cattle

production.

Rarity:

The floristic diversity of Lee Lake is very high (nearly 100 vascular and bryophyte species). Although three communities predominate in the fen area: floating mat, shrub carr, and paludified forest; it is the variation within these communities that make the floristic diversity exceptionally high. Additionally there is a unique pioneer mat in the exposed mudflats in the lake; moderately high aquatic plant diversity due to the shallow nature of the lake; and marshy areas near the upland margins; each of which supports species found nowhere else in the site. The shrub carr community with *Betula glandulosa* in the overstory; *Kalmia microphylla* and *Vaccinium oxycoccos* in the understory, and *Sphagnum centrale*, *Aulacomnium palustre* and other bryophytes on the ground layer, is exceptional. There are similar shrub carr communities at Potholes RNA, Upper Priest Lake Fen, and Mosquito Bay Fen, but all are somewhat different. Lee Lake contains most of the habitat diversity identified for Panhandle peatlands in the recently completed comprehensive conservation strategy: poor fen, intermediate fen, rich fen, floating mats, shrub carr, paludified forest, vegetated littoral zones, a pond, a stream, and beaver activity; while only lacking bog microsites and a lake (Bursik and Moseley 1994). Lee Lake supports 12 rare plant populations, one of the highest concentrations of rare species among the northern Idaho peatlands. The bog cranberry population at Lee Lake is one of the largest in Idaho.

Condition:

Hay harvesting, pasturing, and ditching and draining influence most of the site north of the paludified forest area, which is just north of the lake. Logging and road building and maintenance in the forested uplands surrounding Lee Lake threaten the aquatic and peatland plant communities with enhanced eutrophication. Enhanced eutrophication could lead to changes in the native plant communities.

No exotic species appear to threaten the native flora and fauna of this site.

Viability:

Logging and road construction and maintenance on the State of Idaho, Department of Lands holdings around the lake present offsite threats that could lead to enhanced eutrophication of the lake and peatland communities at Lee Lake. Eutrophication could result in changes in the composition of the fen, shrub carr, and aquatic plant communities of Lee Lake. Such disturbance could also threaten the viability of the 12 rare plant populations found within the site..

Other Values:

The open water of Lee Lake is very shallow and supports aquatic plant growth, and the lake is surrounded by dense carr vegetation, which makes it excellent habitat for various waterfowl species. Trout were present in Lee Lake in 1993, although they were not seen there in the late 1980's. They apparently froze out

over the winter because there was no sign of them during the 1994 field visit. This is a very beautiful site. In spite of the surrounding landuse (extensive roading and logging) it appears to be very important habitat for deer, elk, moose, and bear, all of which had left scat to show their presence.

Conservation Intent:

Public agencies, TNC or private agencies interested in purchasing critical habitats should consider Lee Lake. As part of the comprehensive conservation strategy for Panhandle peatlands, Bursik and Moseley (1994) recommended establishing most of the high-priority sites, including Lee Lake, as Special Interest Areas - Botanical in recognition of the unique flora and plant communities that the sites support. This designation will highlight the sensitive and rare nature of peatland communities at Lee Lake to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the SIA land designation is to encourage public interpretation within the sites. Under the current ownership (the Lake and surrounding fen communities are privately owned), however, interpretation is not recommended at Lee Lake. Due to relatively easy access, and the extensive nature of the plant communities, Lee Lake would be a site to consider for public interpretation in the future if it is acquired by a public or private group for conservation purposes. Establishment of Lee Lake as SIA-B will probably also require land acquisition of the lake and wetland communities, and the cooperation of the State of Idaho, Department of Lands, which currently owns and manages most of the upland area included within site boundaries as a buffer.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. If Lee Lake and the surrounding fen communities are acquired by public agencies, the TNC or individuals that want to rehabilitate the site, drainage ditches should be plugged with wiers to reestablish natural hydrology in the area to allow the original peatland communities to establish themselves. Monitoring of plant communities, aquatic invertebrates, and water chemistries should begin/continue as soon as possible.

Information needs:

Floristic inventory of Lee Lake is largely complete (Bursik and Henderson 1994). Fred Rabe measured water chemistries and sampled macroinvertebrate and zooplankton populations at Lee Lake in 1988 (Rabe et al. 1989). No follow-up has been done on this work. Follow-up studies would be interesting given that water levels have fallen considerably since that time. No work has been done on the terrestrial invertebrate populations or the small vertebrate populations of fen communities surrounding Lee Lake. Both should be inventoried and monitored periodically in the future. As with other priority Panhandle peatlands, Bursik and Moseley recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at Lee Lake to detect changes that may occur over time due to human activities or natural phenomena. They

recommended following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
CAREX UTRICULATA	G5 S4
CAREX LIMOSA	G3 S1
NUPHAR POLYSEPALUM	G5 S4
PALUDIFIED FOREST	G5 S1
BETULA GLANDULOSA/CAREX LASIOCARPA	G4 S2
POOR FEN	G4 S1

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
HYPERICUM MAJUS	G5 S3
VACCINIUM OXYCOCCOS	G5 S2
EPILOBIUM PALUSTRE	G5 S3
TRIENTALIS ARCTICA	G5 S3
TRIENTALIS LATIFOLIA	G5 S3
SALIX PEDICELLARIS	G5 S1
CAREX CHORDORRHIZA	G5 S2
CAREX ROSTRATA	G5 S2
RHYNCHOSPORA ALBA	G5 S2
SCIRPUS SUBTERMINALIS	G4G5 S3
SCHEUCHZERIA PALUSTRIS	G5 S2
DRYOPTERIS CRISTATA	G5 S2
LYCOPODIUM DENDROIDEUM	G5 S2

Author:

A. H. Pitner

MCARTHUR LAKE WILDLIFE MANAGEMENT AREA

Directions:

McArthur Lake is located near the headwaters of the Deep Creek drainage, which is a tributary of the Kootenai River. From Sandpoint, ID, travel approximately 18 miles north on US Hwy 2 to the Idaho Fish and Game boat launch on the north side of the lake. Look for the access sign along Hwy 2.

Richness:

McArthur Lake is a drainage lake located near the headwaters of Deep Creek, which flows north through the Purcell Trench south of Bonners Ferry, Idaho, where it ultimately feeds the Kootenai River just west of Bonners Ferry in the Kootenai National Wildlife Refuge. It is a glacial depression in the Purcell Trench that has been enhanced with a dam on the Deep Creek outlet on the northeast side of the lake. Extensive rich fen and shrub carr communities are found around most sides of the lake. Marsh habitats are interspersed with the

peatland communities. The area near the mouth of Dodge Creek, which enters McArthur Lake on the northwest end, is an extensive marsh. The lake is very shallow and almost entirely vegetated littoral zone. *Nuphar polysepalum*, *Potamogeton richardsonii*, *P. zosteriformis*, *P. amplifolius*, *P. berchtoldii*, *P. pectinatus*, *P. natans*, *Hippurus vulgaris*, *Ceratophyllum demersum*, *Myriophyllum spicatum*, *M. sibericum*, *Brasenia schreberi*, *Ranunculus aquatilis*, *Polygonum amphibium*, *Typha latifolia*, *Elodea canadensis*, and *Menyanthes trifoliata* are of widespread or local prominence in the lake littoral communities. The rich fen habitats are sedge dominated. Characteristic species include *Carex lasiocarpa*, *C. utriculata*, *C. aquatilis*, *C. nebraskensis*, *C. stipata*, *C. bebbii*, *C. cusickii*, *C. retrorsa*, *Dulichium arundinaceum*, *Scirpus microcarpus*, *S. cyperinus*, *Calamagrostis canadensis*, *Potentilla palustris*, and *Phalaris arundinacea*. Shrub carr areas are dominated by *Spiraea douglasii*, *Alnus incana*, *Betula pumila* (the rare dwarf birch), *Rhamnus alnifolia*, *Salix bebbiana*, and other *Salix* spp. On the south end of the lake, scattered clumps of shrubs are interspersed within the graminoid fen. This fen area, even more so than other areas around the lake, appears to be highly modified hydrologically, and appears to be drying out. The graminoid fen is characterized by a number of typical rich fen species, including *Equisetum fluviatile*, *Lycopus uniflorus*, *Eleocharis tenuis* (the rare slender spikerush), *Carex muricata*, other *Carex* spp. However, a number of weedy and mesic-indicator species, including *Agrostis stolonifera*, *Phleum pratense*, *Poa pratensis*, *Poa palustris*, *Phalaris arundinacea*, *Cirsium arvense*, *Prunella vulgaris*, and *Agropyron repens*, are common to prominent in the area. This is one of the most unique wetland habitats I have seen in Idaho, although it appears the sight quality is degrading rapidly. Rare species found in this area include *Cypripedium parviflorum* (small yellow lady's slipper, one of only two Idaho populations), *Eriophorum viridicarinatum* (green-keeled cottongrass, one of less than five populations in Idaho), *Betula pumila* (dwarf birch, one of less than 10 known sites in Idaho and one of few where it is prominent in the vegetation), and *Eleocharis tenuis* (slender spikerush, one of only two known populations in Idaho).

Rarity:

The floristic diversity of this site is very high (more than 100 species have been identified), perhaps in part due to the scale of habitat and hydrological modifications that have occurred at McArthur Lake during the 20th century. Extensive marsh habitats certainly contributes the the floristic diversity. The sedge-dominated rich fen communities are extensive and diverse with several sedges and grasses being dominant in various areas. Overall, however, the rich fen is similar to other sedge-dominated rich fens seen elsewhere in the Panhandle region. The shrub carr community with *Betula pumila* being of widespread prominence is unique and exclusive to the Purcell Trench region of northeastern Idaho. The graminoid/shrub fen on the south end of the lake is very unique, but appears to be degrading rapidly based on the number of weedy grasses and forbs that are well-established there. The reason for the deterioration of habitat conditions is unclear, but appears consistent with drying or lowering of water levels. This doesn't make sense, however, given that the dam on the outlet

raised water levels significantly since the 1950s. This area contains three rare plant populations of critical concern in addition to the *Betula pumila* population: *Cypripedium parviflorum*, which is found in only one other location in Idaho; *Eleocharis tenuis*, which is found at only one other site in Fremont county, Idaho, and *Eriophorum viridicarinatum*, which is known from two sites in the Priest River Valley and one site in Fremont county. *Epilobium palustre* (swamp willow-weed) and *Cicuta bulbifera* (bulb-bearing waterhemlock) are rare species found in fen communities at McArthur Lake that are of more widespread occurrence in the Panhandle region. A single plant of *Salix candida* (hoary willow) was also found on the south end of the lake in 1993. If no more individuals are located, its viability is in grave jeopardy. Common goldeneye and hooded merganser use nest boxes erected on the site. Eight of the 12 critical habitat features were identified at McArthur Lake: rich fen, floating mats, shrub carr, vegetated littoral zones, ponds, a lake, and beaver activity (Bursik and Moseley 1994). Lacking are bog microsites, poor fen, intermediate fen, and paludified forest.

Condition:

The general management routine at McArthur Lake WMA is consistent with the long-term protection of the critical peatland, marsh, and aquatic communities around the lake. The effects of water level manipulations on fen communities on the south end of the lake, however, is a concern. Some logging was occurring along the edge of the wetlands on private land on the southeast end of McArthur Lake in 1993 also. Soil disturbance associated with this logging may locally enhance eutrophication and lead to changes in the composition in the plant communities on the south end of the lake. Nest boxes have been erected for cavity-nesting ducks.

A number of introduced weed species are invading the fen communities on the south end of McArthur Lake, displacing the dominant native species and threatening the rare plant populations found there with extirpation.

Viability:

Logging and road building in the surrounding drainage basin, including along Dodge and Deep Creeks could enhance eutrophication leading to changes in the composition of plant communities at this site. Enhanced eutrophication could ultimately also threaten the viability of the seven rare plant populations.

Other Values:

This site is excellent for waterfowl due to the abundance of aquatic vegetation and the dense nature of the surrounding wetland vegetation. It is also heavily used by deer, elk, moose and black bear. It is a popular site for hunting and bird watching. Due to the size of the lake, it is also an excellent body of water for canoeing. The lake is a minor fishery for panfish and bass and should improve in the near future for trout thanks to the construction of a fish ladder at the outlet dam.

Conservation Intent:

Interpretive trails at McArthur Lake would be appropriate given the relatively easy access available on the north end of the WMA, the extensive nature of the plant communities, and the abundant wildlife at the site. McArthur Lake is already part of the Watchable Wildlife site and potential exists to link the value of critical habitats with healthy wildlife populations through an interpretive trail system.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Researching the possible causes of habitat deterioration in the fen communities on the south end of the lake should be a priority. Protection of the immediately adjacent uplands and the upland corridors along Deep and Dodge Creeks from potentially harmful logging activities is also critical to protecting this site. Monitoring of plant communities, aquatic invertebrates, and water chemistries should begin as soon as possible. The possibility of developing interpretive trails at McArthur Lake should also be considered in the near future.

Information needs:

Floristic inventory has been intensive in the northern and southern fen communities around the lake and the aquatic communities within the lake. Only cursory surveys have been done on the east and west sides of the lake. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of McArthur Lake. Pat Cole, the Panhandle regional Habitat Biologist who manages McArthur Lake WMA for Idaho Fish and Game may have some information on the fauna and water chemistry of this site. In the near future all should be inventoried and monitored periodically. As with other priority Panhandle peatlands, Bursik and Moseley have recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They suggested following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
PHALARIS ARUNDINACEA	G4 S5
CAREX UTRICULATA	G5 S4
CAREX LASIOCARPA	G4 S2
NUPHAR POLYSEPALUM	G5 S4
TYPHA LATIFOLIA	G5 S4

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
PETASITES SAGITTATUS	G4 S3
BETULA PUMILA VAR GLANDULIFERA	G5T5 S2

BETULA PUMILA VAR GLANDULIFERA	G5T5 S2
EPILOBIUM PALUSTRE	G5 S3
CAREX FLAVA	G5 S3
ERIOPHORUM VIRIDICARINATUM	G4 S1
CYPRIPEDIUM PARVIFLORUM VAR PUBESCENS	G5T5 S1

Rare animal occurrences:

PODICEPS GRISEGENA	G5 S3B,SZN
BUCEPHALA CLANGULA	G5 S3B,S3N
LOPHODYTES CUCULLATUS	G5 S2B,S3N
HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N
GULO GULO LUSCUS	G4T4 S2

Author:

A. H. Pitner

ROSE FEN

Directions:

From Moyie Springs, ID, travel ca. 10 miles east on Hwy 2. Approximately two miles east of FS Rd 75 you will see a road that heads northeast. Go straight on this road approximately one mile to the home of Jan Rose and her family, whose house overlooks the larger of the two wetland depressions that constitute Rose Fen.

Richness:

Rose Fen includes two small glacial depressions in the Curley Creek drainage. The depressions contain scattered open ponds, which were apparently much larger as recently as a few years ago. The smaller of the two is shown entirely as a pond on the USGS Curley Creek quad (1965). The shrinkage of open water is likely due to the decade-long drought in northern Idaho. These ponds contain a diversity of aquatic macrophytes, including *Nuphar variegatum*, *Scirpus acutus*, *Menyanthes trifoliata*, *Eleocharis palustris*, *Potamogeton gramineus*, *Scirpus subterminalis* (a rare species), *Utricularia vulgaris*, *U. intermedia*, *Glyceria borealis*, *Ranunculus gmelinii*, *Lemna minor*, and *Potamogeton berchtoldii*. Most of the rest of the fen is saturated or seasonally inundated rich fen dominated by brown mosses, including *Aulacomnium palustre*, *Calliergon stramineum*, *Warnstorfia exannulata* and an abundance of sedges. The sedges that dominate the rich fen in rhizomatous patches include *Carex lasiocarpa*, *C. utriculata*, *C. chordorrhiza* (a rare species), *Carex* sp., *Scirpus microcarpus*, and *S. acutus*. Another rare rhizomatous graminoid, *Scheuchzeria palustris* (podgrass) is locally prominent, particularly around the ponds and in seasonally inundated portions of the fen on floating mats. Other common species include *Potentilla palustris*, *Lycopus uniflorus*, *Scutellaria galericulata*, *Menyanthes trifoliata*, *Typha latifolia*, *Carex diandra*, *Dulichium arundinaceum*, *Agrostis scabra*, and *Phalaris arundinacea*. A narrow band along the fen margin is shrub carr dominated by *Alnus*

incana, *Spiraea douglasii*, and *Salix bebbiana*. Just east of the larger depression out from Jan Rose's house (Rose Fen proper) is a smaller depression with a doughnut-shaped pond on the north end (this depression will be referred to as Doughnut Fen and will be considered part of the Rose Fen site) that was dug perhaps 10 years ago. This smaller depression is owned by the adjacent ranch and is managed as a quasi-wildlife refuge, although they have a number of cattle grazing the property. Much of doughnut fen is covered by intermediate fen characterized by many of the same sedge species plus *Carex limosa*, *Sphagnum subsecundum*, and *Eriophorum gracile*. The majority of Doughnut Fen is rich fen much the same as in Rose Fen proper.

Rarity:

Rose Fen is one of the most alkaline of the 45 high- priority peatlands of the Idaho Panhandle region, identified in our recently completed comprehensive conservation strategy for Panhandle peatlands (Bursik and Moseley 1994). It is somewhat influenced by calcareous parent material which is localized in this small area of northeastern Idaho. Rose Fen is considerably less alkaline than nearby Herman and Bonner lakes, but it is clearly more alkaline than Perkins Lake, which is also nearby, given the paucity of *Sphagnum* spp. and the lack of even localized poor fen habitat. There is exceptional vascular floristic diversity at Rose Fen, despite the lack of structural diversity (i.e., the area is characterized mostly by graminoid-dominated rich fen, with very little shrub carr, and no scattered trees, and very limited open water). We documented 75 species in an extensive floristic survey in 1993. The rare plants at Rose Fen include the aquatic macrophyte *Scirpus subterminalis* (water clubrush) which grows in the scattered ponds; *Carex chordorrhiza* (string-root sedge) and *Scheuchzeria palustris* (podgrass) which are prominent in portions of the rich fen; and *Epilobium palustre* (swamp willow-weed) and *Aster junciformis* (rush aster), which occur scattered throughout the rich fen. The small ponds contain a surprising diversity of aquatic macrophytes. This site has some of the most extensive sedge-dominated rich fen in the Panhandle region with some of the highest sedge diversity. This is one of only four Panhandle peatlands where *Carex chordorrhiza* is a codominant in a rich fen community with *C. lasiocarpa*.

Condition:

Currently, no ongoing landuse activities around Rose Fen proper present any threats. Grazing in Doughnut Fen could threaten the plant communities and rare plant populations there, however.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging, road construction and maintenance, and grazing in the surrounding basin could threaten the biota of the Rose Fen depressions with enhanced eutrophication.

Other Values:

This is an isolated, private site with only a couple of houses in the area and very little human activity. Jan Rose and her family are dedicated to preserving and protecting Rose Fen proper, which they own. Her husband works on the nearby ranch that owns the Doughnut Fen depression and can probably influence its protection as well. It is probably one of the more valuable peatlands for waterfowl production in the Panhandle region, particularly considering that much of both depressions are inundated in the spring. Leopard frogs were found by Jan Rose 10-15 years ago. The population may still exist, but they have not been searched for for the past few years.

Conservation Intent:

This site should be of high priority for conservation organizations interested in preserving critical habitats. Major property owners of the site, particularly Jan Rose and her family are dedicated to preserving the site.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Cost-share agreements might be reached with the adjacent ranch to fence the cows out of the Doughnut Fen depression, allowing cattle access only to a small bit of the artificial pond on the north end of the fen. Getting a legal conservation easement on the property to assure the long-term protection of Rose Fen would also be desirable.

Information needs:

Floristic inventory has been intensive and is largely complete at Rose Fen. No work has been done on the aquatic invertebrate populations of the ponds, which could be very unique given the slightly alkaline waters. Water chemistry monitoring should also be initiated at this site. Small vertebrate and terrestrial invertebrate populations should also be surveyed in the future. It would be desirable to establish two or more permanent vegetation monitoring plots in each of the Rose Fen depressions to detect changes that could occur as a result of human activities or natural processes. We suggest using our methods for peatland vegetation monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994). Given that a much greater portion of the depressions were inundated throughout the season in the past, it would be interesting to document vegetational changes when water levels rise again.

Plant community occurrences:

SPIRAEA DOUGLASII	G5	S4
CAREX UTRICULATA	G5	S4
CAREX LASIOCARPA	G4	S2
CAREX LIMOSA		G3 S1
SCIRPUS ACUTUS		G5 S4

Rare plant occurrences:

EPILOBIUM PALUSTRE	G5 S3
SALIX PEDICELLARIS	G5 S1
CAREX CHORDORRHIZA	G5 S2
SCIRPUS SUBTERMINALIS	G4G5 S3
SCHEUCHZERIA PALUSTRIS	G5 S2

Author:

A. H. Pitner

SINCLAIR LAKE

Directions:

Sinclair Lake is located approximately 1.5 miles due south of Good Grief, Idaho, and approximately 5 miles south of Eastport, Idaho, on the Canadian border. Take road 2517 south off of US 95 at Good Grief, and look for the Sportsman's Access sign at the lake. The lake is next to the Spokane International RR. Sinclair Lake is in the Moyie River Valley which cuts through the Purcell Mt. Range of extreme northeastern, ID.

Richness:

Floating mats supporting intermediate fen communities occur immediately around Sinclair Lake. The mat community is dominated by *Sphagnum angustifolium*, *S. subsecundum*, *Carex lasiocarpa*, *C. muricata*, *C. limosa*, *Potentilla palustris*, *Drosera anglica*, *D. rotundifolia*, and *Lycopus uniflorus*. A *C. lasiocarpa* rich fen extends over several acres west of the lake and is ringed by a *Spiraea douglasii* shrub carr. Littoral zones of the lake are characterized by *Nuphar variegatum*, *Brasenia schreberi*, *Potamogeton gramineus*, *Dulichium arundinaceum*, *Carex lasiocarpa*, and scattered plants of the rare *Scirpus subterminalis*. The Spokane International RR bed partially filled in the eastern side of the lake. A fishing dock is on the north side of the lake near the parking area.

Rarity:

Sinclair Lake contains nice representative rich and intermediate fen communities and floating mats. Four rare plants occur around the lake: *Scirpus subterminalis* (water clubrush), *Scheuchzeria palustris* (podgrass), *Hypericum majus* (large Canadian St. John's-wort), and *Aster junciformis* (rush aster). Two species of sundew (*Drosera anglica* and *D. rotundifolia*) are sympatric as are two cottongrass spp. (*Eriophorum gracile* and *E. chamissonis*). This is one of few Panhandle peatlands with spike reedgrass (*Calamagrostis stricta*), which is more common in fens of east-central Idaho. The lake contains a fair diversity of aquatic plants, including *Nuphar variegatum*, the less common of two native yellow waterlily spp.

Condition:

Sinclair Lake is currently used as a trout fishery. Construction of interpretive trails around portions of the lake may also eliminate trampling threats to floating mats by giving anglers access to all parts of the lake they may want to

access. The existing dock has not significantly impacted Sinclair Lake communities and it would be an asset for developing interpretive trails. The east side of the lake was partially filled by the Spokane International RR bed, but the peatland communities seem to be in very good shape in spite of the impacts that must have accompanied RR construction.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging, road and RR maintenance anywhere in the immediate vicinity of Sinclair Lake could increase nutrient runoff into the lake/peatlands from disturbed soils. Peatland species are very sensitive to the nutrient status of incoming ground and surface waters.

Other Values:

This is a beautiful little lake (in spite of the ugly RR bed) with very easy access and interpretive potential. It is a popular fishing lake and if the fishermen keep to the dock, they pose no threat to the fen communities.

Conservation Intent:

Acquisition of railroad lands by a conservation organization or a conservation easement should be a priority. The site is recommended for designation as Special Interest Area - Botanical to recognize the biodiversity values and to give the area special consideration when weighing management options. Public education through interpretive trails is also a priority with the SIA designation. The dock already present would be very useful and a wooden walkway could be constructed to access surrounding fen communities.

Management needs:

This site, like other peatland sites in northern Idaho, should be left alone as much as possible. Ground disturbance within the site boundaries should not occur. Careful monitoring of any RR bed maintenance in the vicinity should be carried out to assure that sensitive communities around Sinclair Lake are not affected. We recommend developing interpretive trails at Sinclair Lake. The wooden walkways that will serve as trails through the fen should be placed to avoid impacting sensitive plant populations as much as possible and should be designed to give anglers access to the west side of the lake to keep them off of the sensitive mat communities. Placement of two to four permanent vegetation monitoring plots in various peatland communities is recommended using our methods for peatland monitoring in the Sawtooth Valley (Moseley et al. 1994). Monitoring of impacts associated with trail construction is also a good idea.

Information needs:

Floristic inventory of Sinclair Lake is mostly complete. We suggest that the small vertebrate and the terrestrial and aquatic invertebrate populations be surveyed in the future. As with the other priority peatlands that are publicly

owned, we suggest putting two to four permanent vegetation monitoring plots into the fen communities to detect changes that could occur as a result of human or natural processes.

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
CAREX LASIOCARPA	G4 S2
CAREX LIMOSA	G3 S1

Rare plant occurrences:

HYPERICUM MAJUS	G5 S3
SCIRPUS SUBTERMINALIS	G4G5 S3
SCHEUCHZERIA PALUSTRIS	G5 S2

Author:

A. H. Pitner

BEAVER LAKE NORTH

Directions:

Beaver Lake is located along the west slope of the Cabinet Mountains, ca 3.5 miles S of Naples and ca 12 miles S of Bonners Ferry. It lies about 100 feet above the valley floor of the Purcell Trench. It is accessed via some FS roads, eventually up Dyree Creek. It's a short hike up the drainage to the lake.

Richness:

Beaver Lake (North) is a small pond that sits nearly on the crest of a west-east trending ridge. The pond was formed by continental ice that flowed down the Purcell Trench during the Pliocene, scouring adjacent mountain slopes. The pond is the headwaters of Dyree Creek, a small creek flowing SE from the pond, eventually to the Pack River. Most of the shoreline is steep and has little littoral zone or wetland vegetation. The eastern shore, however, has a narrow zone of *Carex flava* along the edge of the lake and several floating sphagnum mats, some of which contain *Lycopodium inundatum*. *Carex lasiocarpa*, *Drosera rotundifolia*, and *Potentilla palustris* are common on the sphagnum substrate of the mats.

Rarity:

The biodiversity highlight of Beaver Lake (North) are the small floating mats at the eastern end of the pond, which contains the relatively rare peatland species, *Lycopodium inundatum*. Otherwise, floristic diversity is relatively low, due to the limited number of habitats around this pond with a steep shoreline. A small population of the rare sedge, *Carex flava*, occurs on the shore near the mats. The site contains six of the 12 peatland ecological features used in a conservation strategy for Panhandle peatlands.

Condition:

No exotic species currently threatened the site integrity.

Viability:

The ridgeline position of this site precludes much impact from surrounding forestry practices.

Other Values:

Trout inhabit the lake and appear to provide a moderate amount of recreation for anglers.

Conservation Intent:

As part of the comprehensive conservation strategy for Panhandle peatlands, Beaver Lake North was recommended as Special Interest Botanical Area (SIA) in recognition of the unique flora and plant communities the site supports. This will require the cooperation of the State Department of lands. The special designation will highlight the sensitive and rare nature of peatland and aquatic communities at Beaver Lake (North) to give them special consideration when management decisions are made in the drainages that may adversely affect them. In part, the SIA designation is to encourage public interpretation within the site. Due to limited access to the site, interpretation is not recommended at this time.

Management needs:

This site, like other peatland sites in northern Idaho, should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Management action is needed to prevent further decline in *Lycopodium inundatum* habitat.

Information needs:

Moseley made a cursory visit to the pond in 1989. No systematic inventory of any kind has been made at Beaver Lake (North). The peatland community is too small to establish much of an ecosystem monitoring plot.

Plant community occurrences:

CAREX LASIOCARPA G4 S2

Rare plant occurrences

CAREX FLAVA G5 S3
LYCOPODIELLA INUNDATA G5 S2

Author:

A. H. Pitner

BEAVER LAKE SOUTH

Directions:

Beaver Lake South is located just north of Garfield Bay on the south side of the Pend Orielle peninsula south and west of Lake Pend Orielle. From Sandpoint, ID travel south on Hwy 95 five miles to Sagle, ID. Take a left (head east) on the Garfield Bay road. This road goes into the Garfield Bay area and then heads back north toward the Newman School. From Garfield Bay head about 2.25 miles north to a driveway to the right (east). Take it down to the house (owned by Scott Engstrom) who should be contacted before you arrive. She will gladly allow access. A boat is necessary to access most parts of the lake.

Richness:

Beaver Lake is a nearly 100-acre drainage lake, which receives effluent from the nearby Garfield Bay sewage lagoons and has a very slow-moving outlet to the north that was apparently made into an outlet by the Soil Conservation Service in an effort to drain the lake for cattle pasture. Beavers had traditionally kept the outlet dammed up and the lake level was usually kept high (as it was in 1994). For several decades (1940's to 1970's?) the beavers were removed and much of the lake was pastured. It appears that it was originally a seepage lake, although it is now effectively a drainage lake. The lake contains a central deep pothole that remained a lake, even during the years that the site was ditched, drained, and grazed. This central area is unvegetated limnetic zone and covers approximately 15 acres. It abruptly transitions into zones less than 1.5 meters deep dominated by *Brasenia schreberi*, *Nuphar polysepalum*, *Potamogeton natans*, *P. berchtoldii*, *Utricularia minor*, *Utricularia vulgaris*, and *Ceratophyllum demersum*. A few patches of the rare *Scirpus subterminalis* (water clubrush) are found in very shallow portions of the littoral zone with *Brasenia schreberi* and *Potamogeton natans*. The eastern lake margins support extensive floating mats dominated by a rich fen community including *Typha latifolia*, *Scirpus acutus*, *Carex lasiocarpa*, *Agrostis scabra*, *Dulichium arundinaceum*, *Potentilla palustris*, and *Lycopus uniflorus*. *Calliergonella cuspidata*, a brown moss, forms a thick mat over some of the floating mats. No *Sphagnum* was seen in these rich fens at Beaver Lake. Two rare species were found scattered throughout the floating mats: *Cicuta bulbifera* (bulb-bearing waterhemlock) and *Hypericum majus* (large Canadian St. John's-wort). Surrounding the floating mats (and directly around the western and northern lake margins) are rich fens on fixed substrate dominated by *Carex utriculata*, *C. stipata*, *C. arcta*, *C. lasiocarpa*, *Galium trifidum*, *Impatiens aurella*, *Mimulus moschatus*, *Mentha arvensis*, *Potentilla palustris*, *Scirpus microcarpus*, *Scirpus cyperinus*, *Scutellaria galericulata*, and *Lycopus uniflorus*. Another rare species, *Aster junciformis* (rush aster) is found in these marginal fens. Beaver Lake is connected to Eaton Lake to the southeast by a narrow channel and an extensive shallow bay southeast of the main portion of Beaver Lake. The shallow bay is densely covered by aquatic macrophytes including *Myriophyllum sibiricum*, *Nuphar polysepalum*, *Potamogeton natans*, *P. berchtoldii*, *Polygonum amphibium*, *P. pectinatus*, *P. gramineus*, *Lemna minor*, and *Spirodela*

polyrhiza. The fen on the east side of this bay is dominated by *Phalaris arundinacea* with some *Scirpus microcarpus*, *Carex cusickii*, *Polygonum amphibium*, and *Potentilla palustris*. A few scattered shrub carr habitats dominated by *Spiraea douglasii*, *Salix geeyeriana*, and *S. bebbiana* are found on the fixed mats around Beaver Lake and on the margins of the bay between Beaver and Eaton Lakes. Eaton Lake is also included in this site. It is separated from Beaver Lake by a berm that was probably part of the ditching and draining efforts. It is a very shallow lake with extensive littoral vegetation zones dominated by the same species as occur in Beaver Lake. Eaton Lake may entirely lack limnetic zones.

Rarity:

Beaver Lake South is very similar to the rest of the peatlands in the vicinity of Lake Pend Orielle (Gamlin Lake, Shepherd Lake, Lost Lake, and Kelso Lake). They have moderately high floristic diversity (more than 50 species) thanks in part to the abundant aquatic and marsh communities at the sites, in addition to the rich fen peatland habitats. The floating rich fens are very interesting and diverse. They contain many species typically associated with marsh habitats (e.g., *Typha latifolia* and *Scirpus acutus*) along with species mostly restricted to peatlands (e.g., *Carex lasiocarpa*, *Dulichium arundinaceum*, *Potentilla palustris*, and *Drosera rotundifolia*). This type of rich fen is only of very scattered occurrence north of Lake Pend Orielle and the Pend Orielle River. This is perhaps due to differences in parent material. All five sites have diverse aquatic floras in a diversity of aquatic habitats, including shallow littoral zones dominated by *Brasenia schreberi* and *Nuphar polysepalum* and deep littoral and limnetic zones dominated by various pondweeds. Beaver Lake contains four rare plant populations: *Scirpus subterminalis* (water clubrush), *Hypericum majus* (large Canadian St. John's wort), *Cicuta bulbifera* (bulb-bearing waterhemlock), and *Aster junciformis* (rush aster). Eight of the 12 critical habitat features of Panhandle peatlands are found at Beaver Lake: rich fen, floating mat, vegetated littoral zones, shrub carr, a lake, a pond, a stream, and beaver activity (Bursik and Moseley 1994). Lacking are bog microsites, poor fen, intermediate fen, and paludified forest. An active bald eagle nest is located on the extensive shallow bay between Beaver and Eaton Lakes. Hooded merganser and common goldeneye are known to nest here in artificial nest boxes.

Condition:

Current land use surrounding Beaver and Eaton Lakes appears consistent with the long-term protection of the critical peatland, marsh, and aquatic communities within the site. Grazing, logging, and the incoming effluent from the Garfield Bay sewage lagoons could affect the site in the future. Likewise, more housing development within the drainage would also have an impact on incoming water quality.

No exotic species threatening the stability of this site have been identified.

Viability:

Logging, road building, grazing, construction of housing developments, and poor

treatment of the effluent entering Beaver Lake from the Garfield Bay sewage lagoons could enhance eutrophication and lead to changes in the composition of plant communities at this site. Enhanced eutrophication could ultimately also threaten the viability of the four rare plant populations at Beaver Lake.

Other Values:

Beaver Lake provides excellent waterfowl habitat due to the abundance of aquatic vegetation and the dense nature of the surrounding wetland vegetation. Canada goose, wood duck, mallard, cinnamon teal, green-winged teal, and ring-necked duck are known to nest here. The site is well-used by big game. It is a poor lake fishery with bullhead and stunted panfish populations. There is no public access to the site. It is a very picturesque site, however. Cattle graze around the edges of the lakes in some portions of the site.

Conservation Intent:

If privately owned lands within the Beaver Lake South site are offered for sale, state and federal agencies, private conservation groups and individuals interested in preserving critical habitats should consider purchasing them to incorporate the lands into a preserve. Protection may also be accomplished by securing conservation easements with current or future landowners. One of the landowners who owns much of the Beaver Lake and Eaton Lake frontage has been contacted and is very interested in conservation of the site.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Monitoring of the plant communities, aquatic invertebrate populations, and water chemistries at Beaver and Eaton Lakes should be initiated as soon as possible.

Information needs:

Floristic inventory has been thorough at this site. Certain areas remain unsurveyed but most floristic diversity is accounted for. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of Beaver or Eaton Lakes. All should be inventoried and monitored periodically. As with other priority Panhandle peatlands, Bursik and Moseley (1994) recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommended following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
PHALARIS ARUNDINACEA	G4 S5
CAREX UTRICULATA	G5 S4
CAREX LASIOCARPA	G4 S2

SCIRPUS ACUTUS	G5 S4
NUPHAR POLYSEPALUM	G5 S4
TYPHA LATIFOLIA	G5 S4

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
HYPERICUM MAJUS	G5 S3
SCIRPUS SUBTERMINALIS	G4G5 S3

Rare animal occurrences:

BUCEPHALA CLANGULA	G5 S3B,S3N
LOPHODYTES CUCULLATUS	G5 S2B,S3N
HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N

Author:

A. H. Pitner

BISMARK MEADOWS

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 that I have formerly referred to as Reeder Creek Meadows, but it is effectively just another part of the larger Bismark Meadows.

Richness:

Bismark Meadows contains a unique mosaic of fen communities along the low-gradient meandering Reeder Creek. 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. vesicaria*, *C. buxbaumii* (a rare species), *C. cusickii*, *Juncus balticus*, *Petasites sagittatus*, and *Phalaris arundinacea*. Another rare species, *Epilobium palustre* was found in this habitat near the Bismark Work Center. *Lycopodium dendroidium*, also a rare species, grows in the wet forested habitats around the Bismark Work Center. In the northwestern lobe of Bismark Meadows, upstream along Reeder Creek, similar rich fen communities were found with a different assemblage of dominant species: *Carex utriculata*,

Scirpus microcarpus, *Carex canescens*, *C. aquatilis*, *Potentilla palustris*, and *Calamagrostis canadensis*. These rich fens are interspersed among shrub carr habitats. On the west side of Reeder Creek are scattered patches of *Sphagnum centrale* and *S. angustifolium* growing beneath shrubs and around the base of *Picea engelmannii*, *Tsuga heterophylla*, *Thuja plicata*, and *Abies lasiocarpa* trees in a paludified forest area. These small habitats support four rare species: *Carex leptalea* (bristle-stalk sedge), *Dryopteris cristata* (crested shield fern), *Gaultheria hispidula* (creeping snowberry), and *Trientalis arctica* (northern starflower). There are also historical collections of *Vaccinium oxycoccos* (bog cranberry) from Bismark Meadows. I failed to relocate it but it is possible that it occurs somewhere in the very extensive meadows. My survey was limited to a very small portion of the meadows on USFS land. Although much of Bismark Meadows is drained and hayed or grazed, much of it to the east appears to be intact and may indeed support extensive intermediate or poor fen habitats suitable to bog cranberry and other rare species.

Rarity:

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, the condition of the common communities remains very good and the scattered pockets of *Sphagnum*-dominated paludified forest may actually be rather extensive to the west (where I have not surveyed). In spite of the impacts, the area still supports seven rare plant populations: *Carex buxbaumii* (Buxbaum's sedge), *Carex leptalea* (bristle-stalk sedge), *Dryopteris cristata* (crested shield fern), *Epilobium palustre* (swamp willow-weed), *Gaultheria hispidula* (creeping snowberry), *Lycopodium dendroideum* (groundpine), and *Trientalis arctica* (northern starflower). More, including *Carex paupercula*, *Salix pedicellaris*, and *Carex chordorrhiza* will surely be found with more intensive floristic survey. The site is very diverse floristically due to the habitat diversity, though I have not cataloged it intensively.

Condition:

Grazing of livestock and some haying occurs in much of Bismark Meadows. Much of Bismark Meadows has been ditched and drained to some degree to allow the above activities. All of these activities represent threats to the native biota.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

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

Other Values:

This site provides a lot of forage for cattle every year. It is surely important habitat for big and small game 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. Reeder Creek is one of the big tributaries feeding Priest Lake and hosts one of the dwindling runs of native cutthroat trout.

Conservation Intent:

Special Interest Area - Botanical in recognition of the unique flora and plant communities that this site supports. This designation will also serve to highlight the sensitive and rare nature of peatland communities at Bismark Meadows to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the goal of SIA-B designation is to encourage public interpretation within these sites. Public interpretation, however is not recommended at this site. Private lands should be high priority for acquisition by a conservation organization.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or be minimized. In the best of all worlds, grazing would be eliminated in the meadows and the natural hydrology would be restored. Restoration of the site would involve filling the ditches and allowing natural recolonization run its course. This will take agencies, The Nature Conservancy or dedicated and rich private individuals to first acquire the land before this pipe-dream could come true.

Information needs:

Floristic inventory has been limited to cursory visits to two areas of Bismark Meadows: the northwestern lobe up Reeder Creek and the area directly south of the Bismark Work Center. Further survey will be valuable to detail the vascular and bryophyte floras. No work has been done on the aquatic invertebrate populations of Reeder Creek or the scattered ponds within Bismark Meadows. Water chemistry monitoring should also be initiated at this site. Small vertebrate and terrestrial invertebrate populations should also be surveyed in the future. It would be desirable to establish two or more permanent vegetation monitoring plots in Bismark Meadows to detect changes that could occur as a result of human activities or natural processes. It would also be valuable to document the effects that cattle are having on the native flora in the privately owned areas that are grazed. Forest Service lands could be used as ungrazed controls.

Plant community occurrences:

BETULA GLANDULOSA/CAREX UTRICULATA	G4? S3
SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/CAREX UTRICULATA	G3 S2
CAREX UTRICULATA	G5 S4
CAREX BUXBAUMII COMMUNITY TYPE	G3 S1

CAREX LASIOCARPA	G4 S2
PALUDIFIED FOREST	G5 S1
CAREX CUSICKII	GQ S3
Rare plant occurrences	
SANICULA MARILANDICA	G5 S2
PETASITES SAGITTATUS	G4 S3
PETASITES SAGITTATUS	G4 S3
HYPERICUM MAJUS	G5 S3
GAULTHERIA HISPIDULA	G5 S2
VACCINIUM OXYCOCCOS	G5 S2
EPILOBIUM PALUSTRE	G5 S3
TRIENTALIS ARCTICA	G5 S3
CAREX BUXBAUMII	G5 S3
CAREX LEPTALEA	G5 S2
CAREX PAUPERCULA	G5 S2
SCHEUCHZERIA PALUSTRIS	G5 S2
DRYOPTERIS CRISTATA	G5 S2
LYCOPODIUM DENDROIDEUM	G5 S2
BOTRYCHIUM LANCEOLATUM VAR LANCEOLATUM	G5T4 S3
Rare animal species:	
STRIX VARIA	G5 S4

Author:

A. H. Pitner

BLUE LAKE

Directions:

Blue Lake is located approximately eight airmiles northeast of Priest River, ID. From Priest River travel east on Hwy 2 one mile. Just after crossing the bridge over the Priest River, take a left (head north) on the East Side Road. Travel eight miles north on the East Side Road to the Blue Lake Road. Take Blue Lake Road east 1.5 miles to the narrow, primitive Idaho Fish and Game access on the north side of the lake. Access to wetland communities around the lake is best from a boat due to the unstable nature of the floating mats around the lake.

Richness:

Blue Lake is a glacial kettle drainage lake nearly 100 acres in size. The Blue Creek inlet is on the east side and the outlet is on the west side of the lake. Much of the lake is covered by vegetated littoral zones. Deep littoral zones are dominated by the submerged aquatic macrophytes *Potamogeton praelongus*, *P. amplifolius*, and *Myriophyllum sibiricum*. Shallow littoral zones are dominated by *Brasenia schreberi*, *Nuphar polysepalum*, *Utricularia vulgaris*, *Potamogeton berchtoldii*, *Elodea canadensis*, and *Ceratophyllum demersum*. The north and west

sides of the lake are encroached on by diverse floating mats, dominated by shrub carr and graminoid rich fens that intermix with each other freely. Characteristic species include *Spiraea douglasii*, *Salix geyeriana*, *S. sitchensis*, *S. bebbiana*, *Alnus incana*, *Betula glandulosa*, *Typha latifolia*, *Carex utriculata*, *C. cusickii*, *Potentilla palustris*, *Juncus effusus*, *Phalaris arundinacea*, *Carex lasiocarpa*, *Dulichium arundinaceum*, and *Eleocharis palustris*. *Sphagnum* spp. are found in a few scattered areas, usually associated with *C. lasiocarpa* and *D. arundinaceum*. Toward the upland from the lake, shrub coverage increases significantly as the floating mat gives way to fixed mats. Trees of *Pinus contorta* and other conifers become common on the fixed mat. To the west of the lake the fen opens up into a sedge-dominated rich fen covered by *C. lasiocarpa*, *C. utriculata*, *C. cusickii*, *C. muricata*, and *Dulichium arundinaceum* with little bryophyte cover. To the east, along the inlet, the riparian community is dominated by *Salix* spp., *Spiraea douglasii*, and *Alnus incana*. The riparian zone also opens up into graminoid-dominated fens to the east which were not surveyed.

Rarity:

Blue Lake is a mesotrophic-eutrophic lake surrounded by relatively young, rich fen and shrub carr peatland communities. The floating mats are very diverse with variation in vegetational composition being very high. For example, very small scale intermediate fen habitats give way to dense shrub carrs, which grade into *Typha latifolia*/*Carex lasiocarpa* rich fen over only a few meters. The diversity and lack of extensive, uniform, communities is unique and striking. The floating mat communities appear to be rather young due to the instability of the mats. It is difficult to walk to the edge of the mat without having it sink under water or give way in most areas. Most of the habitat features known from Panhandle peatlands are present at Blue Lake, including intermediate fen, rich fen, floating mats, shrub carr, a lake, vegetated littoral zones, and beaver activity (Bursik and Moseley 1994). The only features lacking were bog microsites, poor fen, paludified forest, and ponds (which are found further upstream at the north fork headwaters). Three rare species were found on the floating mats: *Carex leptalea* (bristle-stalk sedge), *Cicuta bulbifera* (bulb-bearing waterhemlock), and *Dryopteris cristata* (crested shield fern). Other rare species will surely be found with further floristic survey. More than 40 vascular plant species have been identified from this site based on two field visits by Bursik (1991 and 1993).

Condition:

Pasturing of the fen communities to the east and west of Blue Lake continues to alter the hydrology of these areas (with drainage ditches) and prevents the native plant communities from reclaiming them entirely. The area to the west that were surveyed by Bursik in 1991 were in pretty good condition (it is covered by sedge-dominated rich fen). Other portions of the meadow to the west, have been highly altered. The condition of the fen communities to the east, which are also pastured, is unknown. If these private lands are acquired, drainage ditches should be plugged with wiers to reestablish natural hydrology

to allow native vegetation to reclaim the areas.

No exotic species appear to threaten the native flora and fauna of this site.

Viability:

Logging and road construction and maintenance on surrounding State of Idaho Department of Lands and private holdings in the Blue Creek drainage above the lake present offsite threats that could lead to enhanced eutrophication of the lake and wetlands which could result in changes in the composition of the fen, shrub carr, and aquatic plant communities within the site. Enhanced eutrophication could also threaten the viability of rare plant populations.

Other Values:

This is a nice little fishing lake with healthy bass and panfish populations. The lake has excellent forage and wetland habitat for migratory waterfowl. Big game usage of the surrounding fen habitats appeared to be high. The rocky cliffs to the south are very impressive. Blue Creek is also an important tributary to the Priest River. The lake is also likely an important spawning ground for native trout populations in the Priest River.

Conservation Intent:

Protection of Blue Lake will require cooperation of the State Department of Lands and private landowners. Designation as Special Interest Areas - Botanical is appropriate in recognition of the unique flora and plant communities that the site supports. This designation will highlight the sensitive and rare nature of peatland communities at Blue Lake to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the SIA-B designation is to encourage public interpretation within the site. Given the lack of public access to Blue Lake and the inhospitable nature of the substrate, public interpretation at this site is not advisable.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Uplands immediately adjacent to Blue Lake and along the north and south forks of Blue Creek upstream from the lake should be protected from potentially harmful logging activities to protect the quality of incoming water. If privately owned areas east and west of Blue Lake are acquired by state or federal agencies or TNC, hydrology-modifying ditches should be plugged to reestablish natural hydrology to allow native plant communities to recolonize the area. Any group interested in buying and protecting critical habitats should consider this site. Monitoring of plant communities, aquatic invertebrates, and water chemistries should begin as soon as possible.

Information needs:

Floristic inventory has been cursory in the fen communities surrounding the lake and intensive for the aquatic flora of the lake. More floristic survey is needed

in the wetland habitats around the lake. Further floristic inventory of the floating mat communities will probably result in finding more rare plant populations as well. Floristic inventory in the pastured areas to the east and west of the lake is also needed. No analysis of the flora and vegetation has been done further upstream along the north and south forks of Blue Creek, either. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of Blue Lake. All should be inventoried and monitored periodically in the future. As with other priority Panhandle peatlands, Bursik and Moseley (1994) recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommend following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/CAREX UTRICULATA	G3 S2
PHALARIS ARUNDINACEA	G4 S5
CAREX UTRICULATA	G5 S4
CAREX LASIOCARPA	G4 S2
NUPHAR POLYSEPALUM	G5 S4
TYPHA LATIFOLIA	G5 S4
ALNUS INCANA/LYSICHTUM AMERICANUM	G3 S3
CAREX CUSICKII	GQ S3
THUJA PLICATA/ATHYRIUM FILIX-FEMINA, ATHYRIUM FILIX-FEMINA	G3 S3

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
CAREX LEPTALEA	G5 S2
DRYOPTERIS CRISTATA	G5 S2

Author:

A. H. Pitner

CANYON CREEK

Directions:

Canyon Creek RNA is located in the southeastern corner of the Priest River Experimental Forest in the vicinity of Gisborne Mountain, in the Priest River drainage of the Idaho Panhandle. From Priest River, Idaho, travel north on the road to Coolin for approximately 15 miles to the Priest River Experimental Forest Headquarters, which is about 0.3 mile east of the road. The RNA is accessible via roads through the Experimental Forest, approximately 5-7 miles (depending on route) east of the headquarters.

Richness:

Canyon Creek RNA lies at the southern end of the Selkirk Mountains. Elevations in the RNA range from 4150 feet (2165 m) at the point where Canyon Creek flows out of the tract to 5970 feet (1820 m) on the ridge at the extreme southeast corner near the location of the old Experimental Forest lookout. Most of the RNA is forested with near-climax stands, primarily of western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), and subalpine fir (*Abies lasiocarpa*) cover types. Other tree species found in the RNA are western white pine (*Pinus monticola*), Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), western larch (*Larix occidentalis*), lodgepole pine (*Pinus contorta*), ponderosa pine (*Pinus ponderosa*), Englemann spruce (*Picea engelmannii*), and whitebark pine (*Pinus monticola*). About 30 acres on the southern slope are an upper-slope "bald" grassland dominated by green fescue (*Festuca viridula*) and patches of beargrass (*Xerophyllum tenax*). Huge rockslides occur throughout the RNA. A cold spring on the west slope of the RNA is the origin of Benton Creek. Canyon Creek originates from several springs within the RNA and flows northward.

Rarity:

The RNA supports a variety of coniferous habitat types over an elevational range 1750 feet (530 m). Additionally the green fescue-Idaho fescue type is an excellent example of an upper south slope grassland "bald".

Condition:

Canyon Creek RNA is allocated to Management Area 14 (RNAs and Experimental Forests) in the Idaho Panhandle National Forests Plan. (August 1987). A five-acre area surrounding the lookout on Gisborne Mountain and the road to the lookout have been excluded from the area.

Viability:

The lands adjacent to the western and northern boundaries are Forest Service lands within the Priest River Experimental Forest in Management Area 14. The lands adjacent to the eastern and southern boundaries are managed by the State of Idaho, within Priest Lake State Forest. These lands have been logged.

Other Values:

Because the RNA is an upper-slope tract of relatively deep snowfall, it has high watershed values. The site has been used by a number of scientists for various studies, and many times for educational purposes.

Conservation Intent:

The site has been protected by designation as a Forest Service Research Natural Area.

Management needs:

Information not available.

Information needs:

Unknown

Plant community occurrences:

ABIES LASIOCARPA/CLINTONIA UNIFLORA	G5 S4
ABIES LASIOCARPA/MENZIESIA FERRUGINEA	G5 S5
ABIES LASIOCARPA/STREPTOPUS AMPLEXIFOLIUS	G4 S4
ABIES LASIOCARPA/XEROPHYLLUM TENAX	G5 S5
THUJA PLICATA/ATHYRIUM FILIX-FEMINA	G3G4 S3
THUJA PLICATA/OPLOPANAX HORRIDUM	G3 S3
TSUGA HETEROPHYLLA/ASARUM CAUDATUM	G4 S3
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA	G4 S5
TSUGA HETEROPHYLLA/GYMNOCARPIUM DRYOPTERIS	G3G4 S3
TSUGA HETEROPHYLLA/MENZIESIA FERRUGINEA	G2 S1
FESTUCA VIRIDULA	G? S3

Rare plant occurrences:

BOTRYCHIUM PINNATUM	G4? S2
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Author:

J. H. KALTENECKER

GLEASON MEADOW

Directions:

Gleason Meadow is located ca 15 air miles north of Priest River and ca 4.5 air miles southwest of Dickensheet Junction. From Priest River travel north 17 miles on Highway 57 to unmarked ranch road to the west. Travel ca 1 mile west to ranch headquarters which is in the mid section of the site. Site can be accessed by foot from the headquarters.

Richness:

Gleason Meadow lies along a ca 2 mile reach of Moores Creek. Portions of the meadow (approximately 1/2) have not been seeded and are dominated by the native grasses *Deschampsia cespitosa* (Tufted hairgrass) and *Carex microptera* (Small-winged sedge). *Danthonia californica* (California oatgrass), *Carex cusickii* (Cusick's sedge), *Glyceria grandis* (Reed mannagrass) and *Agrostis scabra* (Tickle-grass) are also well represented in the native meadow. Moores Creek has been channelized through the site for pasture development. Pastures have been seeded with a mix of *Phleum pratense* (Common timothy), *Alopecurus pratensis* (Meadow foxtail), and *Dactylis glomerata* (Orchard grass). Where Gleason Meadow narrows at the east side of the site an extensive shrubland is present which has been influenced by past beaver activity. *Nuphar polysepalum* (Pond lily) covers deep open water ponds and is present in sluggish channels. The emergent species *Eleocharis palustris* (Common spike rush) and *Carex vesicaria* (Inflated sedge) form large swards with significant amounts of *Glyceria borealis* (Northern mannagrass) in shallow water areas. The majority of the pond complex is dominated by *Salix drummondiana* (Drummond's willow) with a barren/saturated understory, or with an understory dominated by *Carex* species.

Spiraea douglasii (Hardhack) forms a dense band around the perimeter of the shrubland.

Rarity:

Site includes a large, high quality (A rank) occurrence of the *Salix drummondiana* community type and good quality (AB rank) occurrence of the *Deschampsia cespitosa* community type.

Condition:

Moore's Creek has been channelized through the site which has successfully drained portions of the meadow for hay production.

Pasture grasses have been planted, but they do not seem to be encroaching into native community types.

Viability:

No threats known.

Other Values:

Site is surrounded by lands managed by the United States Forest Service. The meadow is an important migration corridor for big game (elk, moose, white tail deer, and bear).

Conservation Intent:

The owner is interested in establishing a conservation easement on Gleason Meadow and on Daggett Meadow downstream of the site. There is potential for creating a large conservation site by incorporating the Dubius Creek Fen site into the site planning process.

Management needs:

Current management is compatible with continued existence of element occurrences. There is potential for management to enhance existing values through restoration.

Information needs:

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/MESIC GRAMINOID	G2G3?SE
DESCHAMPSIA CESPITOSA	G4? S3
CAREX MICROPTERA	G4 S3
ELEOCHARIS PALUSTRIS	G5 S3
NUPHAR POLYSEPALUM	G5 S4
SALIX DRUMMONDIANA/CAREX UTRICULATA	G? SP
CAREX VESICARIA	GU S3
THUJA PLICATA/ATHYRIUM FILIX-FEMINA, ATHYRIUM	

Author:

M. Jankovsky-Jones

HIDEAWAY ISLANDS

Directions:

Hideaway Islands RNA/ACEC is located in the Kootenai River between river miles 158 and 159, upstream and east of Bonners Ferry and about 2.5 miles downstream from the mouth of the Moyie River.

Richness:

Hideaway Islands includes two islands on the Kootenai River upstream of Bonners Ferry. The east island has greater topographic relief and supports mid-seral cottonwood stands with significant amounts of red-osier dogwood (*Cornus sericea*). The west island is younger and of low relief supporting early-seral cottonwood and willow stands with the exception of a band of 20 to 30 year old cottonwoods on the south side of the island. Sand and cobble bars on both islands are being pioneered by *Salix exigua* (coyote willow), *Populus* spp. (black cottonwood, plains cottonwood, and eastern cottonwood), *Apocynum cannabinum* (hemp dogbane), and *Artemisia ludoviciana* (Louisiana sagewort). A low swale on the west island supports a large sward of *Agropyron smithii* (bluestem wheatgrass).

Rarity:

Bald eagles nest here. Mid- and late-seral cottonwood stands are present. Cottonwood stands are rare on the Kootenai River due to construction of levees, land clearing, and alteration of flows.

Condition:

Portions of the cottonwoods on the east island have a homogenous understory of *Cirsium arvense* (Canadian thistle) that is outcompeting native shrubs and herbs.

Viability:

Libby Dam is upstream of the site and alters the natural hydrograph with high winter flows which correspond to high demand for electricity. The fluctuation as well as wave action from boat wakes has created steep eroded banks on the west island.

Other Values:

Information not available.

Conservation Intent:

Established Research Natural Area

Management needs:

Evidence of livestock grazing was observed in 1996 on the east island. Apparently water levels get low enough during part of the year to allow trespass grazing. Grazing should be excluded and trespass use prevented.

Information needs:

Plant community occurrences:

POPULUS TRICHOCARPA/CORNUS STOLONIFERA	G4 S1
POPULUS TRICHOCARPA/SYMPHORICARPOS ALBUS	G3 SP
CORNUS STOLONIFERA	G4Q S3
SALIX EXIGUA/BARREN	G3? S4
AGROPYRON SMITHII	G3G5 S1
POPULUS TRICHOCARPA/RECENT ALLUVIAL BAR	G? SP

Rare animal occurrences

HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N
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Author:

Mabel Jankovsky-Jones

LAMB CREEK MEADOWS

Directions:

Lamb Creek Meadows (LCM) is located approximately one mile north of the Priest Lake School and golf course, and is just north of the junction of FS RD 302 with State Highway 57. It runs north-south parallel to Hwy 57 for approximately 2 miles north of the junction. The northeastern corner of LCM includes the headwaters of Reynolds Creek east of Hwy 57.

Richness:

The south end of LCM is covered by a rich sedge-dominated fen characterized by *Carex lasiocarpa*, *C. lanuginosa*, *C. utriculata*, *C. buxbaumii* (the rare Buxbaum's sedge), *C. cusickii*, *Eriophorum gracile*, *E. chamissonis*, and a few patches of *Typha latifolia*. The entire fen was covered with shallow standing water in June 1991. The perimeter of the fen is ditched. The margins of the ditch are covered by a dense monoculture of *Spiraea douglasii*. Several slightly raised areas are found within the fen otherwise dominated by sedges. The raised areas are covered with shrub carr dominated by *S. douglasii*, *Betula glandulosa*, *Salix geyeriana*, and *Alnus incana*. The northwestern portion of LCM is successfully ditched and is seasonally cut for hay. From the road it appears that fen species still prevail in the area. On the northeastern end (headwaters of Reynolds Creek) rich sedge-dominated fen similar to that found on the south end is interspersed with shrub carr similar to that found on the south end. *Trientalis arctica* (northern starflower), *Carex buxbaumii* (Buxbaum's sedge), *Hypericum majus* (large Canadian St. John's-wort), and *Epilobium palustre* (swamp willow-weed) are rare plants

found in this area. A series of beaver ponds form the headwaters of Reynolds Creek, which enters Priest Lake on the south side of Kalispell Bay. The ponds are shallow and well vegetated. *Potamogeton gramineus*, *P. berchtoldii*, *Utricularia vulgaris*, *Eleocharis acicularis*, and *Sparganium fluctuans* are all common in the ponds.

Rarity:

Cursory floristic inventory have revealed the presence of more than 35 vascular species in LCM. More will certainly be found with more intensive surveys. Four Idaho rare species are found in LCM: *Trientalis arctica* (northern starflower), *Hypericum majus* (large Canadian St. John's-wort), *Epilobium palustre* (swamp willow weed), and *Carex buxbaumii* (Buxbaum's sedge). Others, including *Dryopteris cristata* (crested shield fern), *Carex leptalea* (bristle stalk sedge), and *Lycopodium dendroidium* (groundpine) likely also occur in the area. LCM contain seven of the habitat features identified in Panhandle peatlands: rich fen, shrub carr, small ponds, vegetated littoral zones, a stream and beaver activity; while lacking bog microsites, poor fen, intermediate fen, a floating mat, paludified forest, and a lake (Bursik and Moseley 1995).

Condition:

Hay harvesting influences the northwestern portion of LCM. Drainage ditches throughout LCM west of Hwy 57 continue to affect the plant communities as well.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging and road construction and maintenance on Hwy 57 and FS roads within the LCM drainage present offsite threats that could lead to enhanced eutrophication of the meadows and changes in the composition of the fen, shrub carr, and aquatic plant communities, which could ultimately also threaten the viability of rare plant populations.

Other Values:

This is a rather impacted peatland site found along one of the major highways in northern Idaho. It still provides some marginal hay for the owner of the northwestern portion of the site and is probably important big game habitat. The drainage ditch around the rich fen on the south end of LCM contains brook trout.

Conservation Intent:

As part of the comprehensive conservation strategy for Panhandle peatlands, most of the high-priority sites are recommended as Special Interest Areas in recognition of the unique flora and plant communities that the sites support. This designation will also serve to highlight the sensitive and rare nature of peatland communities at LCM to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the SIA land designation is to encourage public interpretation within the sites.

Under the current ownership (the most accessible portions of LCM are privately owned), however, interpretation is not recommended at LCM.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. If LCM is acquired by public agencies, the TNC or individuals that want to rehabilitate the site, wiers should be constructed in the drainage ditches to reestablish natural hydrology in the area to allow the original peatland communities to establish themselves. Public agencies, TNC, or private individuals interested in purchasing critical habitats should consider this site.

Information needs:

A more intensive floristic inventory of the LCM is required to fully document the flora. No work has been done on the aquatic and terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry. All should be inventoried and monitored periodically in the future. As with other priority Panhandle peatlands, we recommend placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at LCM to detect changes that may occur over time due to human or natural activities. We recommend following our methods for peatland monitoring in the Sawtooth Valley of Idaho

Plant community occurrences:

BETULA GLANDULOSA/CAREX UTRICULATA	G4?	S3
SPIRAEA DOUGLASII	G5	S4
ALNUS INCANA/CAREX UTRICULATA	G3	S2
CAREX UTRICULATA	G5	S4
CAREX BUXBAUMII COMMUNITY TYPE		G3 S1
CAREX LANUGINOSA	G3?	S2
CAREX LASIOCARPA	G4	S2
TYPHA LATIFOLIA		G5 S4
CAREX CUSICKII		GQ S3

Rare plant occurrences:

PETASITES SAGITTATUS	G4	S3
HYPERICUM MAJUS	G5	S3
EPILOBIUM PALUSTRE	G5	S3
TRIENTALIS ARCTICA	G5	S3
CAREX BUXBAUMII	G5	S3
LYCOPODIUM DENDROIDEUM		G5 S2

Author:

A. H. Pitner

ROBINSON LAKE

Directions:

Robinson Lake is located 2 miles south of the Canadian border just southeast of Eastport, Idaho in the Moyie River Valley of the Purcell Mountains. It is accessible from the southwest at the Robinson Lake Campground (USFS), just north of Highway 95, or from the northeast at the USFS-maintained boat launch.

Richness:

Robinson Lake is in the pioneering stages of peatland development. The eastern lobe of the lake appears to be growing through a lake-fill sequence with an accumulating island of lake sediment building up in the middle (now dominated by yellow water lilies, *Nuphar polysepalum*, and some patches of hard stem bulrush, *Scirpus acutus*) of the basin with slightly deeper moat areas adjacent to uplands. The western lobe of the lake contains numerous small floating pioneer mat communities on floating and partially emergent logs. This site offers a glimpse at the initial stages of two different types of peatland formation. The small mats contain several of the most prominent of the peatland-dominating sedges in the region: slender sedge (*Carex lasiocarpa*), *C. canescens*, *C. diandra*, and *C. muricata*; two rare species: bulb-bearing water hemlock (*Cicuta bulbifera*) and large Canadian St. John's wort (*Hypericum majus*); and a host of other species, including roundleaf sundew (*Drosera rotundifolia*) that are restricted to peatland habitats in northern Idaho.

Rarity:

This site contains populations of two species considered rare in Idaho: bulb-bearing waterhemlock (*Cicuta bulbifera*) and large Canadian St. John's wort (*Hypericum majus*). It appears to represent the earliest stages of peatland development (as an entire system) that Bursik has seen in northern Idaho and is therefore significant in allowing us to understand the process of peatland formation and the changes that occur during formation. Despite the fact that water levels are regulated at the outlet and that this may have increased the size of the lake, it is Bursik's impression that the pioneering peatland communities are largely the product of natural processes, making this a critical site in our understanding of rare peatland habitats in northern Idaho.

Condition:

The only foreseeable potential threat to this site is the indirect result of eutrophication from timber harvest in the watershed surrounding the lake. Other than that, no current threats are apparent.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Approximately 3/4 of the lakefront property on Robinson Lake is privately owned. The development threat is unknown. Only two houses occur on the lakeshore now and due to the small area of shore they impact, they are not seen as a threat. The remaining shoreline and most of the watershed is owned by the U.S. Forest

Service, Idaho Panhandle National Forests, Bonners Ferry Ranger District.
Extensive timber harvesting has occurred on these FS lands.

Other Values:

This is a beautiful little lake, highly accessible due to its proximity to the highway. It is an excellent bass fishing lake as well. The diversity of aquatic plants is also high. Populations of two rare species occur along Gillon Creek just west of the lake too (*Thelypteris phegopteris* and *Sanicula marilandica*).

Conservation Intent:

Robinson Lake has mixed ownership with parcels held by private landowners and the USFS. If conservation easements can be established with private landowners it would be beneficial to pursue designation as a Special Interest Area - Botanical in recognition of the unique botanical resources at the site.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Timber harvest or road building that could affect local hydrology or nutrient concentration of the waters flowing into Robinson Lake should be avoided. Ground-disturbing activities (logging, road building, campground expansion, etc.) should be restricted to areas no closer than 200 meters from the edge of the lake and no closer than 400 meters from the edge of the lake where the slope exceeds 25%, which it does around much of the lake. Periodic water chemistry monitoring of the site would also be valuable as would periodic checkups to make sure the small pioneer mats are not being trashed by anglers. Wildfires should be allowed to burn in this watershed if possible.

Information needs:

Basic floristic survey has been completed for this site. The history of the lake would be valuable, especially the history of water level regulation and its effect on the size of the lake and whether or not the regulation was preceded by beaver regulation of the water level. Looking at the composition of the peat that constitutes the pioneer mats and analyzing the growth rings on the logs the mats have formed on could shed light on the initiation of mat formation in the region.

Plant community occurrences:

CAREX LASIOCARPA	G4	S2
SCIRPUS ACUTUS	G5	S4
NUPHAR POLYSEPALUM	G5	S4

Rare plant occurrences:

CICUTA BULBIFERA	G5	S2
SANICULA MARILANDICA	G5	S2
HYPERICUM MAJUS	G5	S3
PHEGOPTERIS CONNECTILIS	G5	S2

Rare animal occurrences:
HALIAEETUS LEUCOCEPHALUS

G4 S3B,S4N

Author:
A. H. Pitner

ROUND PRAIRIE

Directions:

Round Prairie is ca 2.5 miles west of Good Grief, Idaho. From Bonners Ferry travel north 15.5 miles on U.S. Highway 95 to the junction with Highway 1. Continue northeast on Highway 95 ca 9 miles to site. The broad meadow can be accessed by foot.

Richness:

Round Prairie includes a broad meadow bottom at the base of Harvey Mountain. Much of the prairie has been impacted by development of meadows and livestock activity. The north side of the prairie is bounded by a band of *Alnus incana*. The westernmost end of the prairie still supports native emergent vegetation due to permanent inundation; large patches of *Carex utriculata* and *Equisetum fluviatile* cover this area. Lesser amounts of *Eleocharis palustris*, *Calamagrostis canadensis*, and *Glyceria borealis* are present. *Phalaris arundinacea* has significant cover throughout the site, with inclusions having many native species. Former channels and vernal wet areas have a carpet of *Juncus bufonius*. Where the valley narrows, at the west end of the site, the bottom is dominated by *Spiraea douglasii* with lesser amounts of *Salix bebbiana*, *S. geyeriana*, and *S. drummondiana*.

Rarity:

High sedge and native graminoid diversity.

Condition:

A pond has been constructed in the southern portion of the site and provides habitat for nesting waterfowl and shorebirds.

Somewhat drier hummocks are weedy with abundant *Trifolium* sp. and *Cirsium arvense*. Pastures which have been successfully drained have a mix of pasture grasses including *Alopecurus pratense* and *Phleum pratense*.

Viability:

Lands upstream are used for livestock grazing and hay pasture. From the road it appears that channels are in poor condition.

Other Values:

Spotted frog (several observations), spotted sandpiper, solitary sandpiper, hooded merganser, goldeneye and 3 great blue herons have been observed at the

site.

Conservation Intent:

Current management under HIP agreements should continue. There may be potential to get similar agreements with landowners upstream of site.

Management needs:

Currently under a HIP management agreement (USFWS and IDFG funded). Projects have included a riparian fence and establishing deferred grazing of 24 cow/calf pairs. It may be beneficial to work with upstream landowners to fence riparian areas. There is potential to reroute Round Prairie Creek back into its original channel through the site, as it is currently channelized. This would function to rewater portions of the site.

Information needs:

Plant community occurrences:

SPIRAEA DOUGLASII	G5	S4
PHALARIS ARUNDINACEA	G4	S5
CALAMAGROSTIS CANADENSIS	G4Q	S4
CAREX UTRICULATA	G5	S4
ELEOCHARIS PALUSTRIS (WETLAND/RIPARIAN)	G5	S3
EQUISETUM FLUVIATILE	G4	SP
NUPHAR POLYSEPALUM	G5	S4
ALNUS INCANA/LYSICHTUM AMERICANUM	G3	S3

Author:

R. K. Moseley

SHORTY'S ISLAND

Directions:

Shorty's Island is approximately 5 miles northwest of Bonners Ferry on the Kootenai River. The site must be accessed by boat.

Richness:

Shorty's Island is a 85 acre island on the Kootenai River. The island supports a diverse mosaic of native trees and shrubs including *Populus trichocarpa*, *Cornus sericea*, *Rhamnus purshiana*, *Cratageus douglasii*, *Prunus virginiana*, and *Symphoricarpos albus* with some *Apocynum cannabinum*. The perimeter of the island and some openings are dominated by *Phalaris arundinacea* or *Cirsium arvense*.

Rarity:

The Kootenai River provides habitat for sturgeon and burbot. Shorty's Island is one of only two islands on the Kootenai River between Bonners Ferry and the Canadian border. The island represents moderate to good quality riparian

vegetation. The viability of cottonwood stands is questionable as there is little regeneration. However, native shrubs are present, reproducing, and should persist over time.

Condition:

Cirsium arvense forms large patches in canopy openings and small patches on the perimeter of the island. *Tanacetum vulgare* is present (1% cover) on island banks. Exotic plant species are usually present in low elevation riparian systems and should be of low concern here, as native species are present and reproducing.

Viability:

Site hydrology has been altered by Libby Dam. The Kootenai River has been diked for flood control.

Other Values:

The site has high structural diversity and provides habitat for osprey and neotropical migrants.

Conservation Intent:

Fee title acquisition by a conservation group or purchase by a conservation buyer.

Management needs:

Bank failure has occurred on the perimeter of the island. As gently sloping banks are formed it may be beneficial to plant shrubs. *Phalaris arundinacea* is currently establishing on these sites. *Cirsium arvense* populations should be monitored and potentially controlled.

Information needs:

Plant community occurrences:

POPULUS TRICHOCARPA/CORNUS STOLONIFERA	G4	S1
CORNUS STOLONIFERA/HERACLEUM LANATUM	G3	S2
PHALARIS ARUNDINACEA	G4	S5

Author:

Mabel Jankovsky-Jones

TEPEE CREEK

Directions:

Tepee Creek RNA is located about 0.25 mile west of Priest Lake on the northwest side of the lake, about 11 miles north-northeast of Nordman, Idaho; about 18 miles north-northwest of Coolin, Idaho; or 41 miles north of Priest River,

Idaho. From Priest River, Idaho, take State Route 57 north to Nordman. At Nordman take FS Road 1339 east to Reeder Bay on the west side of Priest Lake, then go north on the West Shore Road (FS Road 2512) to Tepee Creek.

Richness:

Tepee Creek RNA contains the Tepee Creek drainage, consisting of a rather flat valley, a few short tributary gulches, and low, rounded ridges. The RNA is a virtual island of climax forest within an otherwise largely cutover area of extremely productive forests. Elevations in the RNA range from 2450 feet at lake level to about 3200 feet at the head of the creek. The soil is a deep, sandy loam, overlying schistose rocks of the Idaho Batholith. The area was subjected to continental glaciation. The RNA was established in 1935 for its stands of 300-year-old western white pine (*Pinus monticola*), western redcedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*). Since that time white pine blister rust (*Cronartium ribicola*), mountain pine beetle (*Dendroctonus ponderosae*), and windthrow have taken a heavy toll on the western white pine. The RNA supports one rare plant, *Rubus spectabilis*, and is partially within proposed recovery habitat for the grizzly bear (*Ursus arctos*).

Rarity:

The RNA support one rare plant: *Rubus spectabilis*. The RNA is partially within recovery habitat for the grizzly bear, a Threatened species.

Condition:

Tepee Creek RNA is allocated to Management Area 14 (RNAs and experimental forests) in the Idaho Panhandle National Forests Plan (August 1987).

Viability:

Tepee Creek RNA is completely surrounded by National Forest lands. Bottle Lake RNA borders Tepee Creek on the southern side. The area just east of the RNA along Priest Lake is within Management Area 4 - lands designated for timber production within big game winter range. A small area bordering the western boundary of the RNA is within Management Area 9 - lands not suited for or incapable of timber production. Management Area 1 borders the RNA on the west and north. These are lands designated for timber production.

Other Values:

The RNA protects almost the entire Tepee Creek drainage and has high watershed values. Tepee Creek RNA has been useful for almost 60 years for research and educational purposes.

Conservation Intent:

The site has been protected by designation as a Forest Service Research Natural Area.

Management needs:

Information not available.

Information needs:

Plant community occurrences:

PSEUDOTSUGA MENZIESII/PHYSOCARPUS MALVACEUS	G5 S5
THUJA PLICATA/ATHYRIUM FILIX-FEMINA	G3G4 S3
THUJA PLICATA/OPLOPANAX HORRIDUM	G3 S3
TSUGA HETEROPHYLLA/CLINTONIA UNIFLORA	G4 S5

Rare plant occurrences:

RUBUS SPECTABILIS	G5 S1
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Rare animal occurrences:

PICOIDES TRIDACTYLUS	G5 S3?
SYNAPTOMYS BOREALIS	G4 S1

Author:

J. H. KALTENECKER

CARIBOU MARSH

Directions:

Caribou Marsh is approximately 3.5 miles northeast of Mosquito Bay. Park at Upper Priest Lake Trailhead just east of Mosquito Bay. Walk on logging road ca 1 mile to where the road becomes a trail. Continue on the trail 1 mile to Y. Take the north Y ca 2 miles to Caribou Marsh. A logging road was noted near the marsh and may potentially provide vehicle access.

Richness:

Caribou Marsh includes the marsh system associated with Floss Creek southwest of Caribou Hill. Kettle ponds are present at the north end of the site and beaver activity occurs along the channel. The surveyed kettlehole was dominated by a large sward of *Carex limosa* with smaller patches of *Dulichium arundinaceum*. Many of the beaver dams have breached and support the *Glyceria borealis* community type with local dominance by *Juncus ensifolius*. The shrubs, *Spiraea douglasii* and *Alnus incana*, and the graminoid *Carex utriculata* are present on pond margins and on undammed reaches of Floss Creek.

Rarity:

The site provides habitat for the state species of concern *Scheuchzeria palustris* and the rare *Carex limosa* plant community. Populations of *Lycopodium inundatum* were formerly present, but may have been eliminated when dams on the south end of the site breached. A grizzly bear collar was found near the site and abundant bear sign was observed.

Condition:

No exotic species were observed which threaten site viability.

Viability:

A clearcut and road are present on the west slope above the marsh. Logging activities, including road building, may contribute sediments to the stream and it's associated wetlands.

Other Values:

Conservation Intent:

Site should be designated as a State Department of Lands Natural Area.

Management needs:

The south beaver pond has breeched and it appeared that this may have been human caused (dynamited). It is unknown what the intent of this management action was. Maintenance of beaver populations is essential to ensure the long term viability of the site.

Information needs:

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/CAREX UTRICULATA	G3 S2
CAREX UTRICULATA	G5 S4
GLYCERIA BOREALIS	G4 S1
CAREX LIMOSA	G3 S1
DULICHIMUM ARUNDINACEUM	G3? S2

Rare plant occurrences:

SCHEUCHZERIA PALUSTRIS	G5 S2
LYCOPODIELLA INUNDATA	G5 S2

Author:

Mabel Jankovsky-Jones

COCOLALLA SLOUGH

Directions:

Cocolalla slough is approximately 10 miles SW of Sandpoint. From Dufort, travel 3.5 miles NW on Dufort Road. The site is south of Dufort road at the mouth of Cocolalla Creek.

Richness:

Cocolalla Creek is a moderate gradient, meandering stream. The creek bottom has dense shrub stands dominated by *Spiraea douglasii*, *Alnus incana*, *Crataegus*

columbiana var. columbianum, *Prunus emarginata*, and *Salix bebbiana*. Seeps and wet swales have the graminoids *Carex utriculata*, *C. lanuginosa*, *C. vesicaria*, *C. cusickii*, *C. lenticularis*, and *Scirpus microcarpus*. Open meadows are present at the downstream end of the site. The meadows include areas dominated by *Carex lenticularis*, *C. utriculata*, *Phalaris arundinacea*, and the pasture grasses *Agropyron repens*, *Phleum pratense*, and *Poa pratensis*.

Rarity:

Bald eagle foraging and wintering area. Two successful nest sites occur within 2 miles of site boundaries.

Condition:

Drier portions of the site have been used for hay pasture and range land.

Pyrus malus occurs along Cocolalla Creek. Portions of the valley bottom have abundant pasture grasses including *Lolium perenne*, *Agropyron repens*, *Phleum pratense*, and *Poa pratensis*.

Viability:

The water regime at Cocolalla Slough is influenced by operation of Albeni Falls Dam on the Pend Oreille River. Water levels fluctuate by as much as 15 feet, from a maximum of 2062.5 feet in the summer to 2074 feet in the winter. The winter drawdown has eliminated or at least greatly reduced, the optimum growth zone for a variety of aquatic and wetland plant species that require shallow water conditions during the growing season. Exposed, unvegetated mudflats have replaced natural wetland plant communities. Historically, Cocolalla Creek supported a high quality fishery. The fishery was eliminated with the construction of the dam at Round Lake (Richardson pers. conv. 1996).

Other Values:

Site provides habitat for osprey, and great blue heron. A heron rookery is present within the site.

Conservation Intent:

The Idaho Department of Fish and Game should pursue acquisition of private lands on a willing seller basis only. Acquisition of entire parcels should be considered first as a means of protecting the entire site from ensuing development. Conservation easements or long-term lease agreements should be considered for a 100-200 foot buffer above the high water mark to provide wildlife protection from human disturbance activities. Protection of the heron rookery in the southwest portion of the site should be a priority since the timber stand contains merchantable timber and could be logged. Potential partners include Ducks Unlimited, The Nature Conservancy, Army Corp of Engineers, Natural Resources Conservation Service, Kalispell Tribe, and Intermountain West Joint Venture.

Management needs:

Native meadow lands and shrub lands need to be rested from grazing. Much of the emergent habitat at the downstream portion of the site has been eliminated and replaced with mudflats due to winter drawdown. There is potential to create impoundments to stabilize water levels and restore emergent habitat.

Information needs:

Vegetation surveys focused on Section 26. The slough and upland forests have not been surveyed.

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/MESIC GRAMINOID	G2G3?SE
SALIX BEBBIANA	G? SP
PHALARIS ARUNDINACEA	G4 S5
CAREX UTRICULATA	G5 S4
CAREX LANUGINOSA	G3? S2
CAREX NEBRASKENSIS	G4 S3
TYPHA LATIFOLIA	G5 S4

Rare animal occurrences:

HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N
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Author:

Bob Moseley

CURLEY CREEK

Directions:

Curley Creek is approximately 5 miles east of Moyie Springs, Idaho, near the Idaho/Montana border. From Moyie Springs travel 3 miles east on U.S. 2 to FS Road 72. Take FS Road 72 ca. 6 miles north to the north end of the site. FS Road continues south from Perkins Lake to provide access to the Curley Creek drainage.

Richness:

Curley Creek is a moderate gradient stream which drains an area of the Purcell Mountains on the Idaho/Montana border, including Murphy, Cross, and Haystack Mountains. Curley Creek trends to the south and features kettle lakes, riparian forests, and meadows. Information on Rose Fen and Perkins Lake, two peatlands within the site, is summarized elsewhere. Broad meadows alternate with forest and shrub-dominated reaches. Meadows have largely been influenced by draining and reseeding. Portions of Curley Creek are dominated by dense stands of Phalaris arundinaceae. This was observed in areas with past beaver activity. It is likely that when dams failed reed canarygrass rather than sedges established. Most meadows support a mix of pasture grasses. A native meadow is present near the confluence of Kingsley Creek and Curley Creek. The meadow is a mix of Agrostis

stolonifera, *Glyceria striata*, *Glyceria grandis*, *Carex stipata*, *Carex bebbii*, *Carex lanuginosa*, and *Eleocharis palustris*. East of this meadow a *Betula pumila* carr is present. Narrow bands of *Alnus incana* x *rubra* occur on meadow margins. Where valleys narrow, riparian vegetation is dominated by alder and *Thuja plicata*.

Rarity:

Includes 2 high priority peatland sites that contain numerous rare plants and communities. In addition, Curley Creek bottomland provides habitat for isolated rare plant populations: *Carex flava*, *Betula pumila*, and *Petasites sagittatus*.

Condition:

No exotic species were observed (aside from pasture grasses and reed canarygrass) which threaten wetlands. Disturbed uplands have abundant black medic, spotted knapweed, and St. John's-wort.

Viability:

Logging, road building, and housing development in the Curley Creek watershed present threats that could lead to eutrophication and changes to wetlands in the site.

Other Values:

Painted turtles utilize habitat in a pond north of Kingsley Creek.

Conservation Intent:

Full protection of Rose Fen (including Doughnut Pond) and Perkins Lake should be a priority. Cooperative management agreements should be established with Curley Creek landowners.

Management needs:

There is a potential to rewater meadows by blocking drainage ditches to encourage establishment of native graminoid species.

Information needs:

Forested and shrub stream bottoms were not thoroughly surveyed.

Plant community occurrences:

ALNUS INCANA/CAREX UTRICULATA	G3	S2
PHALARIS ARUNDINACEA	G4	S5
CAREX NEBRASKENSIS	G4	S3

Rare plant occurrences:

PETASITES SAGITTATUS	G4	S3
BETULA PUMILA VAR GLANDULIFERA	G5T5	S2
CAREX FLAVA	G5	S3

Author:

DAWSON LAKE

Directions:

Dawson Lake is located approximately 3.5 miles north and slightly west of Moyie Springs, ID. From Moyie Springs drive west on Hwy 2 two miles to FS Rd 229. Go north on 229 ca. 3 miles and see Dawson Lake on your left. There are boat launches on the south and east sides of the lake. Dawson Lake is in the Kootenai River valley. It serves as the headwaters of Fry Creek.

Richness:

Dawson Lake is approximately 1.5 miles long (north to south) and ca. 0.25 miles wide for most of its length. A simple earth dam was constructed within the last several decades on the south end to enhance the size of the lake. Bursik believes that this replaced the beaver dams that historically formed the lake. The lake supports an array of aquatic macrophytes in the extensive vegetated littoral and limnetic zones, including *Nuphar polysepalum*, *N. variegatum*, *Potamogeton amplifolius*, *P. praelongus*, *P. natans*, *P. berchtoldii*, *Elodea canadensis*, *Myriophyllum sibiricum*, *Lemna minor*, *Ceratophyllum demersum*, *Spirodela polyrhiza*, and *Utricularia vulgaris*. Scattered floating mats are on the west and north ends of the lake. Most are 10 square meters or less in size. They appear to have formed on partially submerged logs as has been observed at earlier stages in Robinson Lake and Huff Laken. Rich fen vegetation dominates the mats. A mat of an unidentified brown moss covers the ground layer. Vascular plants including *Carex diandra*, *C. lasiocarpa*, *C. canescens*, *Lysimachia thyrsoiflora*, *Dulichium arundinaceum*, *Spiraea douglasii*, *Menyanthes trifoliata*, *Bidens cernua*, *Lycopus uniflorus*, *Potentilla palustris*, *Alnus incana*, and *Typha latifolia* dominate the herb and shrub layers. One rare species, *Cicuta bulbifera* (bulb-bearing waterhemlock) is found on the mat. Standing dead trees on the south and west sides of the lake in 0.5 meters of water attests to relatively recent water level fluctuations or relatively recent human damming.

Rarity:

The mats in Dawson Lake are relatively young. They are similar in composition to the mats found at Robinson Lake, to the north of Dawson Lake, but quite a bit larger and therefore older. At both sites the mats appear to have formed over partially submerged logs. Beaver activity is an important part of this site's history. The more permanent dam of human construction will prevent water fluctuations which are surely responsible for the expansion of the floating mats. Approximately 40 vascular species were identified on the mats and in the lake. More certainly exist in marshy areas around the lake. Aquatic plant diversity is quite high in Dawson Lake. Common goldeneyes nest nearby and use the lake.

Condition:

Dawson Lake is currently a popular warmwater fishery featuring perch, sunfish,

crappie, large mouth bass, and tiger musky. Because of its length, it is a nice canoeing lake. It is a Watchable Wildlife viewing area (on the docks on the east side of the lake). Some grazing takes place in the headwaters area north of the lake and the surrounding private lands are managed for timber production. The water level of Dawson Lake have been artificially enhanced by an earthen dam on the south end of the lake, though the water level is probably not higher than levels historically achieved by beaver damming.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging, road maintenance, and grazing within the small watershed of Dawson Lake pose threats to the resident biotic diversity. Soil disturbance anywhere in the immediate vicinity of Dawson Lake could increase nutrient runoff into the lake, possibly affecting the composition of the fen communities. Peatland species are very sensitive to the nutrient status of incoming ground and surface waters.

Other Values:

This is a beautiful little lake, very nice for canoeing and fishing. The floating mats and stumps provide excellent cover for waterfowl, which have ample forage in the well-vegetated littoral zones. Not surprisingly Dawson Lake is one of Idaho Fish and Game's Watchable Wildlife sites.

Conservation Intent:

Approximately 2/3 of the site is owned by IDFG and managed as an access area. As part of the comprehensive conservation strategy for Panhandle peatlands, establishing this site is recommended as a Special Interest Area to recognize the biodiversity values and to give the area special consideration when weighing management options. This designation could apply to Forest Service as well as state owned lands. This site has some interpretive potential that can be worked into the interpretive information put into Watchable Wildlife pamphlets that feature Dawson Lake. Discussing the origin and unique composition of the mats, which are easily viewed from the Watchable Wildlife dock, would be appropriate.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur. Careful monitoring of any road maintenance on FS Rd 229 along the lake is necessary to assure that the lake is not affected. It is recommended that the significance of Dawson Lake be recognized and protected in some fashion by the State of Idaho and that establishment of the USFS portion of Dawson Lake as a SIA proceed regardless of state actions. Placement of two to four permanent vegetation monitoring plots on the floating mats is recommended using our methods for peatland monitoring in the Sawtooth Valley (Moseley et al. 1994). This may help us ascertain changes that may be related to artificially maintained water levels. Incorporating discussions of the fen communities at

Dawson Lake into literature available to the public through the Watchable Wildlife Program is also recommended.

Information needs:

Floristic inventory of Dawson Lake was restricted to floating mat communities and aquatic habitats. Aquatic and terrestrial invertebrate populations associated with the lake and floating mats ought to be surveyed in the future. As with the other priority peatlands that are at least in part publicly owned, we suggest putting two to four permanent vegetation monitoring plots on the floating mats and perhaps in littoral zones to detect changes that could occur as a result of human or natural processes.

Plant community occurrences:

CAREX LASIOCARPA	G4	S2
NUPHAR POLYSEPALUM	G5	S4
TYPHA LATIFOLIA		G5 S4
VALLEY PEATLAND FLOATING MAT	G3	S1

Rare plant occurrences:

CICUTA BULBIFERA		G5 S2
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Rare animal occurrences:

BUCEPHALA CLANGULA	G5	S3B,S3N
PICOIDES ARCTICUS	G5	S3

Author:

A. H. Pitner

FREEMAN LAKE

Directions:

Freeman Lake is approximately 3 miles north of Oldtown. From Newport, Washington travel 1 mile east across the Pend Oreille River. Travel 1 mile on paved road just east of the bridge north to Langell Canyon Road. At T travel approximately 1.25 miles northwest on the main road to Idaho/Washington state line and the Fish and Game Access Road. Continue northeast on access road 0.5 miles to Freeman Lake.

Richness:

Freeman Lake is a 40 acre kettle lake north of Oldtown, Idaho. The deep littoral and shallow limnetic zones of the lake have aquatic communities dominated by *Potamogeton amplifolius* in 2-3 meter deep zones and *Brasenia shreberi* in 1-2 meter deep zones. *Typha latifolia* forms a fringe of vegetation around the lake which grades into shrublands dominated by *Spiraea douglasii* and *Alnus incana*.

Rarity:

The rare plant species *Scirpus subterminalis* is found here. A high quality

occurrence of the *Alnus incana*/*Lysichitum americanum* community type occurs on the north shore of the lake.

Condition:

No exotic species were observed which threaten the wetland or aquatic communities.

Viability:

No threats to viability were noted.

Other Values:

The lake is a popular recreation spot for camping and fishing.

Conservation Intent:

Partially within an established Fish and Game Access Area.

Management needs:

Current management is compatible with the wetland values at the site.

Information needs:

Plant community occurrences:

TYPHA LATIFOLIA	G5 S4
ALNUS INCANA/LYSICHTUM AMERICANUM	G3 S3

Rare plant occurrences:

SCIRPUS SUBTERMINALIS	G4G5 S3
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Author:

Mabel Jankovsky-Jones

HERMAN LAKE

Directions:

From Moyie Springs, ID, travel ca. 8 miles east on Hwy 2 to FS Rd 75. Take it to the northeast 2 miles to FS Rd. 72. Take a left on 72 (head northwest) and within one mile you will see Herman Lake on the left. A resort on the east side of the lake offers access to the lake for a fee.

Richness:

Herman Lake is an alkaline, very shallow lake. Most of the lake is covered by vegetated littoral and limnetic zones. A fair diversity of aquatic plants were documented in cursory visits to the area around the resort and the north side of the lake. Aquatic species present in Herman Lake, include: *Typha latifolia*, *Nuphar variegatum*, *Chara* sp., *Najas flexilis*, *Scirpus subterminalis* (rare), *Potamogeton praelongus*, *Utricularia vulgaris*, *Scirpus acutus*, *Phalaris arundinacea*, *Potamogeton natans*, *Potamogeton berchtoldii*, and *Polygonum coccineum*. More species may be found with a boat survey. Most of the lake

supports a ring of cattails and hard-stem bulrush behind which is a sedge-dominated rich fen over peat of an unknown depth. My survey of the rich fen is limited to a cursory visit along the north end of Herman Lake in September, 1992. The north end supports a marginal fen dominated by *Carex lasiocarpa*, *C. utriculata*, *Carex* sp., and *C. flava* (rare). Three other rare species occur in the rich fen: *Cicuta bulbifera* (a very small population), *Betula pumila* (a very small population), and *Aster junciformis* (common throughout the rich fen). Other rare plants such as *Carex buxbaumii* and perhaps even *C. chondorrhiza* may reside in the rich fen. No *Sphagnum* spp. were found in the fen although a brown moss was identified, *Warnstorfia exannulata*, which is prominent throughout much of the fen.

Rarity:

Herman Lake is one of the most alkaline of the 45 high-priority peatlands of the Idaho Panhandle region, identified in our recently completed comprehensive conservation strategy for Panhandle peatlands (Bursik and Moseley 1994). It is not as alkaline as nearby Bonner Lake but it is considerably more alkaline than Rose Fen and Perkins Lake, which are also nearby. The small lake contains an exceptional diversity of aquatic macrophytes, including one rare species: *Scirpus subterminalis* (water clubrush). The rich fen community on the north end of the lake that Bursik surveyed in 1992 contains a moderate diversity of vascular species, including four considered rare in Idaho: *Carex flava* (yellow sedge), *Betula pumila* (dwarf birch), *Cicuta bulbifera* (bulb-bearing waterhemlock), and *Aster junciformis* (rush aster). Other rare species likely occur in the rich fen and will be found with further survey. The assemblage of species in the sedge-dominated rich fen is similar to that found elsewhere in this corner of Idaho.

Condition:

Herman Lake is a minor warm-water fishery. Angler use of the lake is not a threat to surrounding rich fen communities or to the aquatic communities in the lake. Logging in the surrounding basin and livestock grazing in the drainage will be ongoing threats to the biota of Herman Lake.

No exotic species which threaten the native flora and fauna of this site have been identified.

Viability:

Logging, road construction and maintenance, and grazing upstream from and around the margins of Herman Lake present offsite threats that could lead to enhanced eutrophication of the lake and changes in the composition of the fen and aquatic plant communities which could ultimately threaten the viability of rare plant populations.

Other Values:

This is a small, easy-to-access lake that is enjoyed by a moderate number of fishermen. The lake is known for both trout and bass fishing. The lake is also

the watering hole for cattle and horses that are grazed in the marsh and fen communities surrounding it.

Conservation Intent:

Acquisition of the privately owned lands surrounding Herman Lake should be considered by the USFS, Idaho Fish and Game, BLM, TNC or any other public or private group interested in preserving critical habitats.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Cost-share agreements should be reached with cattle and horse owners who graze their stock in the Herman Lake drainage to fence off at least the creek and the critical peatland habitats around the lake to limit cattle impacts. Placement of several permanent vegetation monitoring plots in fen, marsh, and aquatic communities is recommended using our methods for peatland monitoring in the Sawtooth Valley (Moseley et al. 1994).

Information needs:

Floristic inventory has been limited to cursory looks at aquatic communities on the north and east margins of the lake and to the rich sedge fen community on the north edge of the lake. Further survey is desirable to more fully document the vascular flora. Bursik made no effort to document the bryophyte flora, which may be quite unique given the alkaline nature of the site. No work has been done on the aquatic invertebrate populations of the lake, which could also be very unique given the alkaline waters. Water chemistry monitoring should also be initiated at this site. Small vertebrate and terrestrial invertebrate populations should also be surveyed in the future. If access is granted, it would be desirable to establish two or more permanent vegetation monitoring plots in the various fen, marsh, and aquatic communities around and within the lake to detect changes that could occur as a result of human activities or natural processes. We suggest using the methods we established for peatland vegetation monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

CAREX UTRICULATA	G5 S4
CAREX LASIOCARPA	G4 S2
SCIRPUS ACUTUS	G5 S4
TYPHA LATIFOLIA	G5 S4
CICUTA BULBIFERA	G5 S2
BETULA PUMILA VAR GLANDULIFERA	G5T5 S2

Rare plant occurrences:

CAREX FLAVA	G5 S3
SCIRPUS SUBTERMINALIS	G4G5 S3

Rare animal occurrences:

Author:

A. H. Pitner

HOODOO LAKE

Directions:

Hoodoo Lake is located six air miles northeast of Spirit Lake, ID. From Spirit Lake, travel north on Highway 41 four miles to the county road that heads east toward Clagstone. Take it to the east approximately six miles to Clagstone. At the main intersection in Clagstone take a left (head north) on the road that parallels Hoodoo Creek to the east and the Spokane International RR to the west. 1.3 miles north of Clagstone the road forks. Take the left fork and travel 3/4 of a mile to the south end of Hoodoo Lake, which will be on the right (east) side of the road. Most of the lake margin fens can be accessed on foot.

Richness:

Hoodoo Lake is a 200 acre, very shallow drainage lake that completely dried up in 1994. The drying-up was probably the result of prolonged drought, but also possibly due to drainage and diversion of meadows along Hoodoo Creek upstream from the lake. There was little evidence of pondweeds or other species in the dried up lake mudflats. The mud was still saturated, but was largely unvegetated in July 1994. The lake is surrounded by an emergent (usually, only saturated in 1994) rich fen dominated by *Scirpus acutus*, *Typha latifolia*, *Eleocharis palustris*, *Glyceria borealis*, *Juncus* spp., *Carex lasiocarpa*, *Potentilla palustris*, and the very rare (but locally prominent at Hoodoo Lake) *Carex comosa* (bristly sedge), which is known from only one other site in Idaho. Drier fen areas around the emergent rich fen are also rich fen communities characterized by *Carex lasiocarpa*, *C. utriculata*, *C. oederi*, *Calamagrostis stricta*, *Agrostis scabra*, and *Potentilla palustris*. Scattered plants of *Hypericum majus* (the rare large Canadian St. John's wort) are found in these rich fen habitats. The rich fen grades into a mesic marsh meadow with scattered *Spiraea douglasii*, *Alnus incana*, and *Salix bebbiana* shrubs with *Agrostis stolonifera*, *Phalaris arundinacea*, *Danthonia intermedia*, *Prunella vulgaris*, *Poa palustris*, *Glyceria striata*, *Prunella vulgaris*, *Cirsium vulgare*, and *C. arvense* being prominent herbaceous species. All of the communities at Hoodoo Lake were being rather heavily grazed in the very dry summer of 1994.

Rarity:

The floristic diversity of this site is moderate (approximately 50 species have been identified). Hoodoo Lake supports one of only two known populations of *Carex comosa* (bristly sedge) in Idaho. It is rather prominent with *Scirpus acutus*, *Carex lasiocarpa*, and *Eleocharis palustris* in the emergent fen surrounding the lake. Only one other rare species, *Hypericum majus* (large Canadian St. John's-wort) is found at Hoodoo Lake. The rich fen communities are very interesting and tend toward marsh conditions. They are similar to the rich

fen communities found elsewhere in northern Idaho, particularly those at Walsh Lake, north of Sandpoint. These types of fen communities are more common in low-elevation valley peatlands elsewhere in Idaho. *Carex oederi* is prominent in the drier fen habitats at Hoodoo Lake. It is rather rare in northern Idaho, though it is common in valley peatlands in Fremont County in extreme eastcentral Idaho. Five of the 12 critical habitat features of Panhandle peatlands were identified at Hoodoo Lake: rich fen, shrub carr, vegetated littoral zone, a lake, and a stream (Bursik and Moseley 1994). Lacking are bog microsites, poor fen, intermediate fen, floating mats, paludified forest, a pond, and beaver activity.

Condition:

Current land use surrounding Hoodoo Lake is not compatible with the long-term maintenance of the site's biodiversity, particularly when the grazing is coupled with a decade-long drought. Grazing in the wettest fen communities during "normal" precipitation patterns is probably not a threat because they are too wet for cattle to access. By July of 1994, cattle had grazed heavily in the drier fen communities and were already accessing the wettest (normally emergent) fen around the lake. Water diversion and draining and ditching of the meadows along Hoodoo Creek upstream from the lake is also a critical concern due to the possible effects it may have on water levels in Hoodoo Lake. Logging in adjacent uplands, road, and railroad bed maintenance are also potential direct and indirect threats to this site, which could lead to enhanced eutrophication and concomitant changes in the plant communities.

I am aware of no exotic species threatening the stability of this site.

Viability:

Logging, road building and maintenance, railroad bed maintenance, grazing, water diversion and wetland drainage upstream from Hoodoo Lake are offsite threats that may lead to enhanced eutrophication or further lowering of water levels, both of which could threaten plant communities and rare plant populations at this site.

Other Values:

Hoodoo Lake was good waterfowl habitat before the lake dried up due to the abundance of dense, emergent fen vegetation surrounding open water. The mudflats were heavily used by shore birds in 1994. The site is probably used by deer and perhaps moose in spite of the cattle grazing around the lake. Bursik was told by a Fish and Game biologist that Hoodoo Lake was at one time an excellent bass fishery, which seems hard to believe now. The lake was probably extremely important for native trout populations before all of the human modifications took place in the drainage.

Conservation Intent:

The site was considered as a potential project by the Nature Conservancy, but water rights issues complicated wetland protection and restoration. If these

issues can be resolved this would be an important site for acquisition by a public agency or conservation minded individual. If this site is acquired Special Interest Areas - Botanical designation, in recognition of the unique flora and plant communities that the site supports may be appropriate. This designation will highlight the sensitive and rare nature of peatland and aquatic communities at Hoodoo Lake to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the SIA-B designation is to encourage public interpretation within the site. Given the current landuse at Hoodoo Lake, interpretation is not recommended.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Monitoring of the plant communities, aquatic invertebrate populations, and water chemistries at Hoodoo Lake should be initiated as soon as possible. The grazing allotment on U.S. Forest Service-owned lands surrounding Hoodoo Lake should be carefully evaluated for the effect of this activity on the plant communities and rare plant populations at Hoodoo Lake. It is the opinion of Bursik, based on a 1994 field visit to the site, that the impacts were severe and seriously threaten the site with degradation, particularly during the current period of prevailing drought. If private lands along the western side of the lake are offered for sale, state and federal agencies, private conservation groups, and individuals interested in preserving critical habitats should consider purchasing them. Rehabilitation of Hoodoo Creek upstream from Hoodoo Lake may also be critical to maintaining and improving habitat conditions in the fen communities surrounding the lake and to restoring the lake.

Information needs:

Floristic inventory has been cursory at this site, but it probably accounted for most of the diversity. The survey of Bursik in 1994 was limited to the southwest end of the lake. Further floristic inventory around the lake may reveal the presence of different plant communities and more rare plant populations. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of Hoodoo Lake. All should be inventoried and monitored periodically. Work on the aquatic invertebrate populations and water chemistries cannot be resumed until the lake refills with water, however. As with other priority Panhandle peatlands, Bursik and Moseley (1994) recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommend following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
CAREX UTRICULATA	G5 S4

GLYCERIA BOREALIS	G4 S1
CAREX LASIOCARPA	G4 S2
SCIRPUS ACUTUS	G5 S4
TYPHA LATIFOLIA	G5 S4

Rare plant occurrences:

HYPERICUM MAJUS	G5 S3
CAREX COMOSA	G5 S1

Author:

A. H. Pitner

HUGHES MEADOWS

Directions:

Hughes Meadows is approximately 16 miles north of Nordman, Idaho. From Nordman travel 20 miles north to Hughes Meadows Road. Travel north on Hughes Meadows Road 2 miles to the Y. Take west Y one mile to Hughes Meadows Guard Station. Site can be accessed by foot.

Richness:

Beaver activity has created a broad meadow bottom at Hughes Meadows. The wettest portion of the meadow is dominated by *Carex utriculata*. A sward of *Carex cusickii* is also present. The north end of the meadow is somewhat drier, which is likely a product of attempts at drainage, and supports *Phalaris arundinacea* with remnant patches of *Calamagrostis canadensis*. As the valley narrows downstream, emergent wetlands are replaced with shrublands dominated by *Salix drummondiana*. An old growth stand of *Thuja plicata* is present on the west side of the wetland.

Rarity:

Old growth cedar stands (ca 7 feet DBH) are present at the site. A high quality occurrence of the *Carex cusickii* community is present in the wetland. The site also provides habitat for the rare plants *Petasites sagittatus*, *Epilobium palustre*, *Tellima grandiflora*, and *Streptopus streptopoides* var. *brevipes*. *Histrionicus histrionicus* (Harlequin duck), and *Salvelinus confluentus* (Bull trout) are known to occur in Hughes Meadows.

Condition:

The site is located near the old Hughes Meadows Guard Station. The log guard station is intact, however outbuildings have been flooded. The Hughes Creek channel was routed into a canal by the US Army Corp of Engineers during World War II to create an emergency landing strip. The stream has attempted to reclaim the meadow and beaver activity has helped this process. However, the depth of the canal has made recovery slow.

Chrysanthemum leucanthemum is abundant at the north end of the meadow. This may

be the area of the former landing strip.

Viability:

Clearcuts are present on uplands at the south end of the meadow. Roads and timber activity may contribute sediment to the wetlands.

Other Values:

The meadow and open water provides habitat for waterfowl, white-tail deer, and moose.

Conservation Intent:

Apply Best Management Practices, including control of exotic species and grazing management, to maintain existing wetland values.

Management needs:

Maintain existing beaver populations. The meadow vegetation and downstream water quality would benefit from actions which accelerate the recovery of the Hughes Fork Channel within the site.

Information needs:

Plant community occurrences:

SALIX BOOTHII/MESIC FORB	G3 S3?
PHALARIS ARUNDINACEA	G4 S5
CALAMAGROSTIS CANADENSIS	G4Q S4
CAREX UTRICULATA	G5 S4
CAREX CUSICKII	GQ S3
THUJA PLICATA/ATHYRIUM FILIX-FEMINA, ATHYRIUM FILIX-FEMINA	G3 S3

Rare plant occurrences:

PETASITES SAGITTATUS	G4 S3
EPILOBIUM PALUSTRE	G5 S3
TELLIMA GRANDIFLORA	G5 S2
STREPTOPUS STREPTOPOIDES VAR BREVIPES	G5T4 S1

Author:

Mabel Jankovsky-Jones

KALISPELL BAY FEN

Directions:

Kalispell Bay Fen is along the lower reaches of an unnamed tributary to lower Kalispell Creek just north of Kalispell Bay on Priest Lake. Access is from State Route 57 at Hanna Flats, head east on FS Road 237, park ca 0.125 mile past the crossing of Kalispell Creek and head NNW into the fen.

Richness:

Information not available.

Rarity:

The rare plant species *Petasites sagittatus*, *Vaccinium oxycoccos*, *Trientalis arctica*, *Carex leptalea*, *Carex paupercula*, and *Dryopteris cristata* occur at the site.

Condition:

Viability:

Residential development seriously threatens the viability of the site.

Other Values:

Conservation Intent:

Due to intensive residential development the conservation potential of the site is likely lost.

Management needs:

Information needs:

Plant community occurrences:

ALNUS INCANA/CAREX UTRICULATA	G3 S2
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Rare plant occurrences:

PETASITES SAGITTATUS	G4 S3
VACCINIUM OXYCOCCOS	G5 S2
TRIENTALIS ARCTICA	G5 S3
CAREX LEPTALEA	G5 S2
CAREX PAUPERCUA	G5 S2
DRYOPTERIS CRISTATA	G5 S2

Author:

A. H. Pitner

KOOTENAI NATIONAL WILDLIFE REFUGE

Directions:

Kootenai National Wildlife Refuge is approximately 5 air miles west of Bonners Ferry. To reach the refuge take Riverside Road, on the south bank of the Kootenai River at Bonners Ferry. Drive west for five miles to the refuge entrance. The office is 2 miles beyond the entrance. A 4 1/2 mile auto loop tour begins at the refuge office and exits on the county road near the mouth of Deep Creek. Several foot trails provide views of wildlife habitats and access to

observation points and photo blinds. Portions of the refuge are closed during waterfowl hunting season for public safety.

Richness:

Kootenai National Wildlife Refuge is in the former floodplain of the Kootenai River. Water is diverted into the refuge from Myrtle Creek and pumped from Deep Creek and the Kootenai River to maintain permanent ponds and flood waterfowl food plots. Deep Creek and the Kootenai River have been diked and support narrow bands of *Populus trichocarpa* and *Populus deltoides*. Over 800 acres of wetlands provide aquatic vegetation, invertebrates, and fish that form the food resource for a variety of wildlife. Ponds within the refuge support emergent vegetation including stands of *Typha latifolia*, *Scirpus acutus*, and *Phalaris arundinacea*. Somewhat drier areas support a mix of pasture grasses. Small patches of *Salix bebbiana* are also present. Local farmers grow over 600 acres of wheat and barley on the refuge which are used as wildlife food plots.

Rarity:

An active bald eagle nest is on the refuge. Black terns and common goldeneyes nest here. The Kootenai River provides habitat for white sturgeon, burbot, and bull trout.

Condition:

Polypogon monspeliensis has established on roads and in vernal pools. Scattered *Centaurea maculata* and *Cynoglossum officinale* were observed in cottonwood forests. The pasture grasses, *Phleum pratense*, *Alopecurus pratensis*, *Agropyron repens*, and *Agrostis stolonifera* are present on drier sites. Where exotics are present they pose minimal threats to the goals of the refuge.

Viability:

Libby dam is upstream of the site. The dam is operated for hydropower and flood control.

Other Values:

Open water habitat is provided year-round for nesting and migrating waterfowl. Principal species are mallards, cinnamon teals, redheads, wood ducks, and Canada geese.

Conservation Intent:

Established USFWS refuge.

Management needs:

Moist soil management areas have been designated where drawdown occurs at different times of the growing season to encourage the growth of desirable emergent vegetation (sedges, rushes, and native aquatics) and discourage the growth of *Phalaris arundinacea*. These sites are being monitored to document what species become established with various drawdown regimes. The results of this study have application to wetland meadows throughout northern Idaho, as many are

a near monoculture of Phalaris.

Information needs:

Plant community occurrences:

PHALARIS ARUNDINACEA	G4 S5
CAREX UTRICULATA	G5 S4
SCIRPUS ACUTUS	G5 S4
TYPHA LATIFOLIA	G5 S4
POPULUS TRICHOCARPA/POA PRATENSIS	SE

Rare plant occurrences:

EPILOBIUM PALUSTRE	G5 S3
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Rare animal occurrences:

HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N
CHLIDONIAS NIGER	G4 S2B,SZN

Author:

Mabel Jankovsky-Jones

LOST LAKE

Directions:

Lost Lake is located two miles due east of Garfield Bay and one mile north of Mineral Point on the south side of the Pend Orielle peninsula south and west of Lake Pend Orielle. From Sandpoint, ID travel south on Hwy 95 five miles to Sagle, ID. Take a left (head east) on the Garfield Bay road. This road goes into the Garfield Bay area. As you are leaving Garfield Bay, Forest Service Road 532 heads directly east. Take it 2.9 miles to a tank- trapped logging road that heads down slope to the north. Walk down the road approximately 1/4 mile to Lost Lake.

Richness:

Lost Lake is a small seepage lake nearly 30 acres in size, with no apparent inlet or outlet. Beavers have been active at this site in the past, but they were not active in 1994 and much of the lake was dried up during this very dry year. The lake appears to be shallow throughout, entirely lacking a limnetic zone (greater than two meters deep). Aquatic macrophytes growing in the lake include *Myriophyllum sibiricum*, *Nuphar polysepalum*, *Potamogeton natans*, *P. amplifolius*, *P. gramineus*, *P. berchtoldii*, *Callitriche heterophylla*, *Najas flexilis*, *Scirpus acutus*, *Utricularia minor*, *Lemna minor*, and the rare *Scirpus subterminalis* (water clubrush). Marginal floating mat communities are mostly intermediate fens characterized by *Typha latifolia*, *Carex lasiocarpa*, *Dulichium arundinaceum*, *Potentilla palustris*, *Equisetum fluviatile*, and at least three bryophytes: *Sphagnum teres*, *Aulacomnium palustre*, and *Calliergon stramineum*. The

fixed portions of the mat are hummocky with trees of *Thuja plicata* and *Tsuga heterophylla*, and the shrubs *Alnus incana*, *Cornus stolonifera*, *Rhamnus alnifolia*, and *Spiraea douglasii* occupying sphagnum-covered hummocks with *C. lasiocarpa*, *D. arundinaceum*, *P. palustris*, *Phalaris arundinacea*, *Bidens cernua*, *Menyanthes trifoliata*, *Scutellaria galericulata*, *Mentha arvensis*, *Lycopus uniflorus*, *Carex cusickii*, *C. retrorsa*, *Eriophorum gracile* and other species in the wet, moss-covered depressions in between. *Epilobium palustre* (swamp willow-weed) and *Cicuta bulbifera* (bulb-bearing waterhemlock) are rare species found scattered throughout the mat. The rare *Dryopteris cristata* (crested shield fern) is found on the tree and shrub-covered sphagnum hummocks. Some portions of the fixed and floating mats are rich fens dominated by *Typha latifolia*, *Scirpus acutus*, and various *Carex* spp.

Rarity:

Lost Lake is somewhat similar to the rest of the peatlands in the vicinity of Lake Pend Orielle (Gamlin Lake, Shepherd Lake, Beaver Lake South, and Kelso Lake). They have moderately high floristic diversity (over 50 species) thanks in part to the abundant aquatic and marsh communities at the sites, in addition to the rich fen peatland habitats. Lost Lake is unique in having abundant intermediate fen on floating and fixed mats in addition to rich fens. The floating rich fens are very interesting and diverse. They contain many species typically associated with marsh habitats (e.g., *Typha latifolia* and *Scirpus acutus*) along with species nearly restricted to peatlands (e.g., *Carex lasiocarpa*, *Dulichium arundinaceum*, *Potentilla palustris*, and *Drosera rotundifolia*). This type of rich fen is only of very scattered occurrence north of Lake Pend Orielle and the Pend Orielle River. This is perhaps due to differences in parent material. All five sites have diverse aquatic floras. Lost Lake, unlike the other four sites is a very shallow littoral lake without a deep limnetic zone. It does not support fish like the other peatland lakes in the Pend Orielle vicinity. Lost Lake contains four rare plant populations: *Scirpus subterminalis* (water clubrush), *Epilobium palustre* (swamp willow-weed), *Dryopteris cristata* (crested shield fern), and *Cicuta bulbifera* (bulb-bearing waterhemlock). Seven of the 12 critical habitat features of Panhandle peatlands were identified at Lost Lake: intermediate fen, rich fen, floating mat, vegetated littoral zones, shrub carr, a lake, and beaver activity (Bursik and Moseley 1994). Lacking are bog microsites, poor fen, paludified forest, a pond, and a stream.

Condition:

Current land use surrounding Lost Lake appears consistent with the long-term protection of the critical peatland and aquatic communities within the site. Logging, mining, and road building around Lost Lake are potential threats that could directly impact the site or indirectly cause enhanced eutrophication.

No exotic species threatening the stability of this site have been identified.

Viability:

Logging, road building, and mining could either directly degrade peatland and aquatic habitats at Lost Lake or enhance eutrophication which would lead to changes in the composition of plant communities at this site. Enhanced eutrophication could ultimately also threaten the viability of the four rare plant populations at Lost Lake.

Other Values:

Lost Lake provides excellent waterfowl habitat due to the abundance of aquatic vegetation and the dense nature of the surrounding wetland vegetation. It is well-used by big game, including moose, deer, elk, and black bear. It is a secluded and picturesque site with little human traffic.

Conservation Intent:

If privately owned lands within the site are offered for sale, state and federal agencies, private conservation groups, and individuals interested in protecting critical habitats should consider purchase to incorporate the lands into a preserve. Due to mixed ownership, cooperation with the Forest Service would be required and there may be potential for designation as Special Interest Area - Botanical in recognition of the unique flora and plant communities that the sites support. This special designation will highlight the sensitive and rare nature of peatland and aquatic communities at Lost Lake to give them special consideration when management decisions are made in the drainage that may adversely affect them. Part of the SIA-B designation is to encourage public interpretation within the site. Because of the isolated nature and relatively small size of Lost Lake, interpretation is not recommended.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Monitoring of the plant communities, aquatic invertebrate populations, and water chemistries at Lost Lake should be initiated as soon as possible, particularly following the logging that was occurring in adjacent uplands in 1994.

Information needs:

Floristic inventory has been thorough at this site. Certain areas remain unsurveyed but most floristic diversity is accounted for. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of Lost Lake. All should be inventoried and monitored periodically. As with other priority Panhandle peatlands, Bursik and Moseley (1994) recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommended following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
CAREX LASIOCARPA	G4 S2
SCIRPUS ACUTUS	G5 S4
NUPHAR POLYSEPALUM	G5 S4
TYPHA LATIFOLIA	G5 S4

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
EPILOBIUM PALUSTRE	G5 S3
SCIRPUS SUBTERMINALIS	G4G5 S3
DRYOPTERIS CRISTATA	G5 S2

Author:

A. H. Pitner

MORTON SLOUGH

Directions:

Morton Slough is approximately 10 miles southwest of Sandpoint. From Sandpoint travel 3 miles south on Highway 95 to south shore road. Travel west then south on south shore road approximately 11 miles to Morton Slough Wildlife Management Area. Site is easiest to access by boat or canoe.

Richness:

Morton Slough is created by backwater from the Pend Oreille River. *Potamogeton crispus* is the dominant aquatic vegetation. The open water is surrounded by a near monoculture of *Phalaris arundinacea* with trace amounts of *Juncus ensifolius*, *Carex crawfordii*, and *Carex cusickii*. Small pockets of *Typha latifolia* and *Scirpus acutus* are also present. The transition to uplands is somewhat abrupt with a narrow band of *Alnus incana* leading to coniferous forests dominated by *Thuja plicata* and *Abies grandis*.

Rarity:

Red-necked grebes nest at Morton Slough. The site is also of general biodiversity interest and valuable open space.

Condition:

Livestock grazing occurs on the lake margins. It is unknown if this is authorized use.

Pasture grasses, *Chrysanthemum leucanthemum* and *Trifolium* species are present and abundant in drier microsites around the lake. These species pose minimal threat to the values associated with the site.

Viability:

The hydrology of Morton Slough is influenced by water level changes created by Albeni Falls Dam. Historically the slough contained less open water and a mosaic

of sedge- and sedge-like species.

Other Values:

Nine cormorants were observed at Morton Slough in July of 1995. There was no evidence supporting that these birds were nesting. Site also provides habitat for Osprey.

Conservation Intent:

Established WMA.

Management needs:

Current management is compatible with maintaining wetland values at the site.

Information needs:

Plant community occurrences:

PHALARIS ARUNDINACEA G4 S5

Rare animal occurrences:

PODICEPS GRISEGENA G5 S3B,SZN

Author:

Mabel Jankovsky-Jones

PACK RIVER

Directions:

Near the outlet of the Pack River which enters Lake Pend Oreille at the northernmost point of the lake. The site can be accessed by State Route 200, ca 6-7 miles E of Kootenai.

Richness:

The Pack River delta includes a highly sinuous reach of the Pack River where it flows into Lake Pend Oreille. The site has open water areas created by abandoned meanders with margins dominated by *Typha latifolia*. The graminoid, *Phalaris arundinacea*, is abundant on the floodplain. *Salix bebbiana* and *S. commutata* are the dominant shrubs with patches of *Alnus incana* and scattered *Populus trichocarpa* present.

Rarity:

Site is of general biodiversity interest and has high values for open space.

Condition:

Phalaris arundinacea is the understory dominant in shrublands and creates dense monocultures throughout the site.

Viability:

The backwater from Lake Pend Oreille creates high water levels and unnatural fluctuations within the site.

Other Values:

Site is designated as a moose viewing area. Significant amounts of open water provide waterfowl habitat.

Conservation Intent:

Site is partially within Pend Oreille WMA; there may be potential to acquire additional tracts or conservation easements upstream.

Management needs:

Information not available.

Information needs:

Plant community occurrences:

SPIRAEA DOUGLASII	G5 S4
ALNUS INCANA/MESIC GRAMINOID	G2G3?SE
SALIX BEBBIANA/MESIC GRAMINOID	G2G3 SE
PHALARIS ARUNDINACEA	G4 S5
TYPHA LATIFOLIA	G5 S4

Author:

L. Williams

SHEPHERD LAKE

Directions:

Shepherd Lake is located on the Pend Orielle peninsula south and west of Lake Pend Orielle; approximately six miles due south of Sandpoint, ID. From Sandpoint, ID travel south on Hwy 95 five miles to Sagle, ID. Take a left (head east) on the Garfield Bay Road. About two miles down this road it forks. Take the south fork (there should be a sign to Shepherd Lake at this junction). Follow the road approximately 1.5 miles. Access to the fen communities is best on the dirt road along the west side of the lake. A boat is easiest to land at the Idaho Fish and Game boat ramp on the east side of the lake.

Richness:

Shepherd Lake is a 150-acre seepage lake with no apparent inlet or outlet. It is a eutrophic lake with extensive vegetated littoral (less than two meters deep) and limnetic zones (greater than two meters deep). The deep littoral and limnetic zones (1.5-3.5 meters deep) are dominated by Potamogeton amplifolius, P. richardsonii, P. robbinsii, Myriophyllum sibiricum, and Elodea canadensis. Shallow littoral zones are covered by patches of Brasenia schreberi, Nuphar polysepalum, Potamogeton natans, P. epihydrus, P. robbinsii, Utricularia

vulgaris, *Ceratophyllum demersum*, and the rare *Scirpus subterminalis* (water clubrush). The lake margins support extensive floating mats dominated by a rich fen community including *Typha latifolia*, *Scirpus acutus*, *Carex lasiocarpa*, *Agrostis scabra*, *Dulichium arundinaceum*, *Potentilla palustris*, and *Lycopus uniflorus*. *Calliergonella cuspidata*, a brown moss, forms a thick mat over some of the floating mats. No *Sphagnum* was seen on the rich fens at Shepherd Lake. Two rare species were found scattered throughout the floating mats: *Cicuta bulbifera* (bulb-bearing waterhemlock) and *Hypericum majus* (large Canadian St. John's-wort). Surrounding the floating mats are rich fens on fixed substrate dominated by *Carex utriculata*, *C. stipata*, *Potentilla palustris*, *Scirpus microcarpus*, *Scirpus cyperinus*, *Scutellaria galericulata*, and *Lycopus uniflorus*. A few scattered shrub carr habitats dominated by *Spiraea douglasii*, *Salix geyeriana*, and *S. bebbiana* are found on the fixed mats around the lake. Similar communities are found around the pond just northwest of Shepherd Lake.

Rarity:

Shepherd Lake is very similar to the rest of the peatlands in the vicinity of Lake Pend Orielle (Gamlin Lake, Beaver Lake South, Lost Lake, and Kelso Lake). They have moderately high floristic diversity (more than 50 species) thanks in part to the abundant aquatic and marsh communities at the sites, in addition to the rich fen peatland habitats. The floating rich fens are very interesting and diverse. They contain many species typically associated with marsh habitats (e.g., *Typha latifolia* and *Scirpus acutus*) along with species nearly restricted to peatlands (e.g., *Carex lasiocarpa*, *Dulichium arundinaceum*, *Potentilla palustris*, and *Drosera rotundifolia*). This type of rich fen is only of very scattered occurrence north of Lake Pend Orielle and the Pend Orielle River. This is perhaps due to differences in parent material. All five sites have diverse aquatic floras. Shepherd Lake contains three rare plant populations: *Scirpus subterminalis* (water clubrush), *Hypericum majus* (large Canadian St. John's wort), and *Cicuta bulbifera* (bulb-bearing waterhemlock). Seven of the 12 critical habitat features of Panhandle peatlands are found at Shepherd Lake: rich fen, floating mat, vegetated littoral and limnetic zones, shrub carr, a lake, a pond, and beaver activity (Bursik and Moseley 1994). Lacking are bog microsites, poor fen, intermediate fen, paludified forest, and a stream. Common goldeneyes, hooded mergansers, and red-necked grebes breed nearby and use the lake; three-toed woodpeckers also nest nearby.

Condition:

Current land use surrounding Shepherd Lake appears consistent with the long-term protection of the critical peatland and aquatic communities within the site. Road maintenance, grazing and logging around the lake margins could affect the site in the future. Likewise, more housing development within the drainage would also have an impact on incoming water quality.

No exotic species threatening the viability of this site have been identified.

Viability:

Logging, road building, grazing, and housing developments in the surrounding drainage basin, could enhance eutrophication and lead to changes in the composition of plant communities at this site. Enhanced eutrophication could ultimately also threaten the viability of the three rare plant populations at Shepherd Lake.

Other Values:

Shepherd Lake provides excellent waterfowl habitat due to the abundance of aquatic vegetation and the dense nature of the surrounding wetland vegetation. It is well-used by big game animals in spite of the houses in the vicinity of the lake. The lake is a popular warm water fishery with excellent bass, northern pike, and panfish populations. It is a very picturesque site and valuable for recreational canoeing as well.

Conservation Intent:

Opportunities for interpretive trails and wildlife viewing areas within the floating fens, fixed fens, and aquatic zones at Shepherd Lake are very good. The access to this site, current ownership (partially Idaho Fish and Game), and the relative size of the sensitive floating mat communities make this the most logical site for interpretation among the priority Panhandle peatlands in the vicinity of Lake Pend Orielle.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Monitoring of the plant communities, aquatic invertebrate populations, and water chemistries at Shepherd Lake should be initiated as soon as possible. If privately-owned lands around Shepherd Lake are offered for sale, state and federal agencies, private conservation groups, and individuals interested in preserving critical habitats should consider purchasing them to incorporate the lands into a Shepherd Lake preserve.

Information needs:

Floristic inventory has been thorough at this site. Certain areas remain unsurveyed but most floristic diversity is accounted for. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of Shepherd Lake. All should be inventoried and monitored periodically. As with other priority Panhandle peatlands, Bursik and Moseley (1994) recommend placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommend following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII

G5 S4

CAREX UTRICULATA	G5 S4
CAREX LASIOCARPA	G4 S2
SCIRPUS ACUTUS	G5 S4
NUPHAR POLYSEPALUM	G5 S4
TYPHA LATIFOLIA	G5 S4

Rare plant occurrences:

CICUTA BULBIFERA	G5 S2
HYPERICUM MAJUS	G5 S3
SCIRPUS SUBTERMINALIS	G4G5 S3

Rare animal occurrences:

PODICEPS GRISEGENA	G5 S3B,SZN
BUCEPHALA CLANGULA	G5 S3B,S3N
LOPHODYTES CUCULLATUS	G5 S2B,S3N
GLAUCIDIUM GNOMA	G5 S4
PICOIDES TRIDACTYLUS	G5 S3?

Author:

A. H. Pitner

WALSH LAKE

Directions:

Walsh Lake is a 50 acre seepage lake located approximately 10 miles north of Sandpoint, ID and 2.5 miles north of Colburn, ID. From Sandpoint, ID, travel approximately 11 miles north on US Hwy 2. Just after the junction of Rd 47 (which heads to the northwest) and Hwy 2, Walsh Lake should be visible to the west through some trees. The entire lake is privately owned, contact Pat Cole in the Panhandle regional office of Idaho Fish and Game to get access to this site through one of the private owners.

Richness:

Walsh Lake is a small seepage lake with less than 50 acres of open water. It has no apparent inlet or outlet. It is located in a glacial depression (probably a kettle) left behind by the continental ice sheet that occupied this portion of northern Idaho which created the Purcell Trench. Walsh Lake is a very clear-water mesotrophic to slightly eutrophic lake with. It is one of few small lakes in northern Idaho that have vegetated limnetic zones as deep as 4.0 meters. The vegetated limnetic zones and the deep littoral zones (1.5-4.0 meters deep) are characterized by *Potamogeton amplifolius*, *P. praegracilis*, *P. robbinsii*, *P. berchtoldii*, and *Myriophyllum sibiricum*. Shallow littoral zones contain dense stands of *Brasenia schreberi* with *Potamogeton natans*, *Scirpus subterminalis* (the rare water clubrush) and *Najas flexilis* being common. The entire lake is surrounded by a rich fen with distinct hydrologic zonation. The lakeward zone is dominated by *Scirpus acutus*, *Eleocharis palustris*, *Dulichium*

arundinaceum, *Glyceria borealis*, *Typha latifolia*, *Carex lasiocarpa*, and other emergent fen species. Further toward upland in zones only seasonally inundated, many of the same species are common along with *Carex utriculata*, *Potentilla palustris*, *Phalaris arundinacea*, *Carex vesicaria*, and *Glyceria grandis*. *Hypericum majus* (the rare large Canadian St. John's-wort) is found scattered throughout the marginal fen. Patches of *Spiraea douglasii* and *Salix* spp. are found in the uppermost portions of the fen that are rarely flooded.

Rarity:

The floristic diversity of this site is moderate (approximately 40 species have been identified). The aquatic communities are exceptional, though not particularly diverse. Because there has been no public boat access to this lake, it is not likely that these communities have not been affected by human introductions of aquatic plants. The rich fen community is interesting and tending toward marsh conditions. It is not unlike rich fen communities found elsewhere, however. Only two rare plant species are found at Walsh Lake: *Hypericum majus* and *Scirpus subterminalis*. Four of the 12 critical habitat features of Panhandle peatlands are found at Walsh Lake: rich fen, vegetated littoral and limnetic zones, shrub carr, and a lake (Bursik and Moseley 1994). Lacking are bog microsites, poor fen, intermediate fen, floating mats, paludified forest, a pond, a stream, and beaver activity.

Condition:

Current land use surrounding Walsh Lake appears consistent with the long-term protection of the critical peatland and aquatic communities around the lake. Grazing, logging, poor- septic effluent, and perhaps lawn chemicals used near houses around the lake margins could affect the site in the future. Likewise, more housing developments would also have an impact on incoming water quality. All of these activities could lead to enhanced eutrophication which could lead to changes in the plant communities.

No exotic species threatening the stability of this site have been identified.

Viability:

Logging, road building, grazing, the use of lawn chemicals, and housing developments in the surrounding drainage basin, could enhance eutrophication leading to changes in the composition of plant communities at this site. Enhanced eutrophication could ultimately also threaten the viability of the two rare plant populations.

Other Values:

This site is probably good waterfowl habitat due to the abundance of aquatic vegetation and the relatively dense nature of the surrounding wetland vegetation. It is probably used by big game animals in spite of the houses around the lake. The lake is a minor fishery for panfish and bass but there is no public access so it is only the homeowners that live on the lake who use it much.

Conservation Intent:

If private lands are offered for sale around the lake, state and federal agencies, private conservation groups, and individuals interested in preserving critical habitats should consider acquisitions at Walsh Lake.

Management needs:

This site, like other peatland sites in northern Idaho should be left alone as much as possible. Ground disturbance within the site boundaries should not occur or should be minimized. Monitoring of the plant communities, aquatic invertebrate populations, and water chemistries at Walsh Lake should be initiated as soon as possible.

Information needs:

Floristic inventory has been cursory at this site, but it probably accounted for most of the diversity. Bursik did not survey the fen on the west or north sides of the lake in 1994. It is possible that more species and perhaps more rare species reside in those areas. No work has been done on the aquatic or terrestrial invertebrate populations, the small vertebrate populations, or the water chemistry of Walsh Lake. All should be inventoried and monitored periodically. As with other priority Panhandle peatlands, Bursik and Moseley (1994) recommended placing two or more 10x10 meter permanent vegetation monitoring plots in the various plant communities at this site to detect changes that may occur over time due to human activities or natural phenomena. They recommend following methods established for peatland monitoring in the Sawtooth Valley of Idaho (Moseley et al. 1994).

Plant community occurrences:

SPIRAEA DOUGLASII	G5	S4
PHALARIS ARUNDINACEA	G4	S5
CAREX UTRICULATA	G5	S4
GLYCERIA BOREALIS	G4	S1
CAREX LASIOCARPA	G4	S2
SCIRPUS ACUTUS	G5	S4
TYPHA LATIFOLIA	G5	S4

Rare plant occurrences:

HYPERICUM MAJUS	G5	S3
SCIRPUS SUBTERMINALIS	G4G5	S3

Author:

A. H. Pitner

Appendix E.
Wetland and deepwater habitat data for Hydrologic Units and counties

Wetland and deepwater habitat data for Hydrologic Unit 17010104 (Kootenai River drainage) E-2

Wetland and deepwater habitat data for Hydrologic Unit 17010105 (Moyie River drainage) E-3

Wetland and deepwater habitat data for Hydrologic Unit 17010213 (Clark Fork drainage) E-4

Wetland and deepwater habitat data for Hydrologic Unit 17010214 (Pend Oreille drainage) E-4

Wetland and deepwater habitat data for Hydrologic Unit 17010215 (Priest River drainage) E-6

Wetland and deepwater habitat data for Hydrologic Unit 17010216 E-7

Wetland and deepwater habitat data for Hydrologic Unit 17010308 E-8

Wetland and deepwater habitat data for Bonner County, Idaho E-10

Wetland and deepwater habitat data for Boundary County, Idaho E-11

Wetland and deepwater habitat data for Hydrologic Unit 17010104 (Kootenai River drainage).			
COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	41	196.29	1.41
L1UBHh	6	187.52	1.35
L2AB3/4H	2	30.57	0.22
L2AB3/4Hh	1	231.70	1.67
L2AB3H	3	95.88	0.69
L2AB4H	20	41.75	0.30
L2AB4Hh	1	28.17	0.20
PAB3/4H	1	8.06	0.06
PAB3H	50	106.37	0.77
PAB3Hb	2	0.62	0.00
PAB3Hh	7	11.66	0.08
PAB3Hx	5	12.19	0.09
PAB4/3H	1	7.13	0.05
PAB4F	1	0.13	0.00
PAB4H	17	28.39	0.20
PAB4Hh	3	15.35	0.11
PAB4Hx	1	0.16	0.00
PABHx	1	0.46	0.00
PEM1A	112	626.01	4.51
PEM1Ad	4	147.64	1.06
PEM1C	377	2624.84	18.92
PEM1Cd	8	113.13	0.82
PEM1Ch	16	54.13	0.39
PEM1Cx	1	6.67	0.05
PEM1F	122	467.06	3.37
PEM1Fb	1	0.76	0.01
PEM1Fh	34	356.92	2.57
PEM1Fx	1	4.92	0.04
PFO1/4C	2	152.12	1.10
PFO1/EM1A	1	181.52	1.31
PFO1A	187	905.36	6.52
PFO1C	136	762.96	5.50
PFO4C	6	33.57	0.24
PFO5Hb	1	1.21	0.01
PSS1A	18	219.66	1.58
PSS1C	219	1243.98	8.96
PSS1F	6	8.05	0.06
PSS4/1C	1	8.23	0.06
PSS4B	2	7.06	0.05
PSS4C	4	48.84	0.35
PUB/AB4H	1	0.75	0.01

PUBH	100	140.20	1.01
PUBHb	8	8.96	0.06
PUBHh	42	63.11	0.45
PUBHx	45	101.03	0.73
PUSC	1	0.44	0.00
R3UBH	426	4391.41	31.65
R3USA	2	9.28	0.07
R3USC	111	183.84	1.32
TOTAL	2158	13876.04	100.00

Wetland and deepwater habitat data for Hydrologic Unit 17010105 (Moyie River drainage)

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	1	12.32	0.52
L1UBHh	9	55.74	2.33
L2AB3Hh	6	27.19	1.14
L2USCh	2	5.07	0.21
PAB3H	3	11.02	0.46
PAB3Hb	1	3.89	0.16
PAB4H	2	3.37	0.14
PAB4Hb	1	0.63	0.03
PABH	2	1.85	0.08
PEM1A	5	34.08	1.43
PEM1C	113	967.78	40.53
PEM1F	11	63.45	2.66
PFO1/4A	1	16.28	0.68
PFO1A	9	42.86	1.79
PFO1C	22	81.77	3.42
PFO4A	5	20.75	0.87
PFO4C	14	121.66	5.09
PSS1/4C	3	3.56	0.15
PSS1A	2	1.20	0.05
PSS1C	106	430.73	18.04
PSS1F	1	0.99	0.04
PSS4C	10	47.32	1.98
PUBFb	3	1.10	0.05
PUBH	20	32.00	1.34
PUBHb	6	11.66	0.49
PUBHh	1	1.19	0.05
R3UBH	28	375.60	15.73
R3USA	1	2.92	0.12
R3USC	10	10.99	0.46
TOTAL	398	2388.96	100.04

Wetland and deepwater habitat data for Hydrologic Unit 17010213 (Clark Fork drainage)

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
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L1UBH	13	66.56	1.18
L2AB3H	15	96.88	1.71
L2AB4/3H	1	19.29	0.34
L2AB4H	2	2.85	0.05
L2UBF	1	1.63	0.03
L2USC	4	2.00	0.04
PAB3H	15	25.03	0.44
PAB4H	1	0.25	0.00
PEM1/SS1C	14	37.97	0.67
PEM1A	10	79.33	1.40
PEM1Ad	2	139.89	2.48
PEM1C	204	1565.61	27.71
PEM1F	97	255.25	4.52
PFO1A	64	679.14	12.02
PFO1C	121	477.90	8.46
PFO1Ch	1	0.66	0.01
PFO4/1C	1	18.50	0.33
PFO5Hh	1	0.25	0.00
PSS1/FO1C	2	1.31	0.02
PSS1A	4	16.58	0.29
PSS1C	89	295.35	5.23
PUBF	2	0.16	0.00
PUBH	51	87.40	1.55
PUBHb	10	13.41	0.24
PUBHh	7	3.71	0.07
PUBHx	2	0.62	0.01
PUSC	2	1.37	0.02
PUSCh	1	3.60	0.06
R3UBH	122	1475.55	26.11
R3USA	1	1.43	0.03
R3USC	48	282.13	4.99
TOTAL	908	5651.63	100.01

Wetland and deepwater habitat data for Hydrologic Unit 17010214 (Pend Oreille drainage).

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1AB4H	2	8.71	0.01
L1UBH	718	76692.68	73.76
L2AB3H	46	170.08	0.16
L2AB4/3H	3	8.97	0.01
L2AB4C	12	58.67	0.06
L2AB4H	32	145.84	0.14
L2UBF	3	8.34	0.01
L2UBH	141	6730.44	6.47
L2USC	147	3591.03	3.45

PAB3/4H	1	5.28	0.01
PAB3H	132	295.08	0.28
PAB3Hh	1	3.78	0.00
PAB4/3H	2	3.72	0.00
PAB4H	28	72.14	0.07
PAB4Hx	1	0.48	0.00
PEM1/SS1C	1	0.69	0.00
PEM1A	35	147.37	0.14
PEM1Ad	6	515.15	0.50
PEM1B	3	2.86	0.00
PEM1C	1094	6619.68	6.37
PEM1Cd	13	593.61	0.57
PEM1Ch	1	3.00	0.00
PEM1F	403	1039.93	1.00
PEM1Fb	6	9.57	0.01
PEM1Fh	1	1.47	0.00
PEM1Fx	1	0.27	0.00
PEM1H	1	5.96	0.01
PFO1A	59	407.85	0.39
PFO1B	1	0.70	0.00
PFO1C	577	2546.88	2.45
PFO1J	1	5.67	0.01
PFO5F	1	2.68	0.00
PFO5Hb	1	1.59	0.00
PFO5Hh	1	0.76	0.00
PSS1/4A	2	6.56	0.01
PSS1/EM1B	1	16.92	0.02
PSS1A	13	16.55	0.02
PSS1B	5	6.34	0.01
PSS1C	515	3029.03	2.91
PSS1Cb	3	20.49	0.02
PSS1Ch	2	6.17	0.01
PSS1F	2	19.59	0.02
PSS1Fb	2	1.91	0.00
PSS4C	1	9.79	0.01
PUB/EM1Fb	1	4.16	0.00
PUBF	2	0.57	0.00
PUBFh	2	0.73	0.00
PUBFx	2	0.91	0.00
PUBH	196	246.88	0.24
PUBHb	67	58.12	0.06
PUBHh	63	88.02	0.08
PUBHx	73	37.03	0.04

PUSC	4	2.96	0.00
PUSCh	1	0.18	0.00
PUSC _x	2	2.83	0.00
R3UBH	58	592.87	0.57
R3USC	102	102.35	0.10
TOTAL	4594	103971.87	100.00
Wetland and deepwater habitat data for Hydrologic Unit 17010215 (Priest River drainage)			
COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1AB4H	11	123.63	0.31
L1UBH	376	25049.67	62.67
L2AB3H	31	99.33	0.25
L2UB/AB4H	8	22.07	0.06
L2UBF	5	6.87	0.02
L2UBH _x	2	2.45	0.01
L2USC	3	3.04	0.01
PAB3H	11	26.86	0.07
PEM1/FO1A	1	6.00	0.02
PEM1/FO4C	15	165.41	0.41
PEM1/SS1C	14	70.17	0.18
PEM1/SS1Fb	1	13.97	0.03
PEM1A	79	716.71	1.79
PEM1Ad	3	9.15	0.02
PEM1B	14	170.62	0.43
PEM1C	620	4522.47	11.32
PEM1Cd	29	619.47	1.55
PEM1F	167	538.89	1.35
PEM1FB	6	6.83	0.02
PEM1Fb	12	12.00	0.03
PEM1Fh	2	1.28	0.00
PFO1/EM1C	1	8.68	0.02
PFO1/EM1F	3	7.07	0.02
PFO1A	140	496.83	1.24
PFO1C	139	502.33	1.26
PFO4A	48	252.87	0.63
PFO4B	3	13.17	0.03
PFO4C	53	461.10	1.15
PFO5F	3	18.88	0.05
PSS1/4C	8	34.48	0.09
PSS1/EM1C	3	36.16	0.09
PSS1/EM1F	3	15.61	0.04
PSS1/FO1C	1	37.41	0.09
PSS1A	61	199.07	0.50
PSS1B	5	11.94	0.03

PSS1C	958	4369.52	10.93
PSS1CH	2	1.31	0.00
PSS1Cb	1	1.32	0.00
PSS1F	8	48.21	0.12
PSS1FH	2	2.43	0.01
PSS1Fb	1	1.99	0.00
PSS3B	5	3.71	0.01
PSS4/1C	2	7.83	0.02
PSS4A	4	3.74	0.01
PSS4C	11	69.72	0.17
PSS5/1Hb	1	5.58	0.01
PSS5Hb	4	10.33	0.03
PUBF	3	2.79	0.01
PUBFb	1	0.23	0.00
PUBFh	2	0.64	0.00
PUBFx	1	0.16	0.00
PUBH	123	118.59	0.30
PUBHB	15	18.96	0.05
PUBHH	1	0.55	0.00
PUBHX	1	0.25	0.00
PUBHb	57	67.63	0.17
PUBHh	6	2.86	0.01
PUBHrx	2	1.26	0.00
PUBHx	8	4.42	0.01
PUBKHrx	2	1.55	0.00
PUBKHx	1	0.97	0.00
R3UBH	120	837.20	2.09
R3USA	2	1.51	0.00
R3USC	144	100.88	0.25
TOTAL	3369	39968.63	100.00

Wetland and deepwater habitat data for Hydrologic Unit 17010216.

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	2	29.37	21.28
L2AB4H	3	32.96	23.88
L2USCH	1	1.62	1.18
PAB4H	3	6.18	4.48
PEM1A	4	10.64	7.71
PEM1C	12	29.61	21.46
PEM1F	5	9.53	6.91
PFO1AH	1	0.56	0.41
PSS1A	1	5.48	3.97
PSS1C	4	6.03	4.37
PSS1CH	2	1.95	1.41

PUBF	1	0.38	0.28
PUBH	3	1.25	0.90
PUBHX	4	1.43	1.04
PUSC	1	1.10	0.80
TOTAL	47	138.10	100.07

Wetland and deepwater habitat data for Hydrologic Unit 17010308.

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	14	263.28	59.57
L1UBHh	1	7.22	1.63
L2USCH	2	4.05	0.92
PAB4H	3	3.68	0.83
PEM1A	6	9.78	2.21
PEM1C	21	122.11	27.63
PEM1F	4	2.11	0.48
PEM1Fh	1	0.96	0.22
PFO1A	3	11.37	2.57
PFO1C	1	3.85	0.87
PSS1C	2	6.21	1.40
PUBF	1	0.30	0.07
PUBH	1	1.51	0.34
PUBHH	1	0.37	0.08
PUBHX	5	4.27	0.97
PUBHb	1	0.48	0.11
PUBHh	2	0.46	0.10
PUBHx	2	0.45	0.10
TOTAL	71	442.45	100.10

Wetland and deepwater habitat data for Bonner County.

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1AB4H	13	132.35	0.09
L1UBH	1050	100546.37	67.63
L1UBHh	1	7.22	0.00
L2AB3H	86	356.83	0.24
L2AB4/3H	4	28.26	0.02
L2AB4C	12	58.67	0.04
L2AB4H	35	181.15	0.12
L2UB/AB4H	8	22.07	0.01
L2UBF	9	16.85	0.01
L2UBH	141	6730.45	4.53
L2UBHx	2	2.45	0.00
L2USC	154	3596.07	2.42
L2USCH	3	5.67	0.00
PAB3/4H	1	5.28	0.00
PAB3H	158	352.59	0.24

PAB3Hh	1	3.78	0.00
PAB4/3H	2	3.72	0.00
PAB4H	33	81.64	0.05
PAB4Hx	1	0.48	0.00
PEM1/FO1A	1	6.00	0.00
PEM1/FO4C	15	165.41	0.11
PEM1/SS1C	29	108.83	0.07
PEM1/SS1Fb	1	13.97	0.01
PEM1A	132	909.55	0.61
PEM1Ad	13	735.80	0.49
PEM1B	16	173.29	0.12
PEM1C	1929	12734.35	8.57
PEM1Cd	42	1213.08	0.82
PEM1Ch	1	3.00	0.00
PEM1F	662	1771.76	1.19
PEM1FB	6	6.83	0.00
PEM1Fb	19	22.34	0.02
PEM1Fh	8	22.09	0.01
PEM1Fx	1	0.27	0.00
PEM1H	1	5.96	0.00
PFO1/4C	2	152.12	0.10
PFO1/EM1C	1	8.68	0.01
PFO1/EM1F	3	7.07	0.00
PFO1A	263	1580.95	1.06
PFO1AH	1	0.56	0.00
PFO1B	1	0.70	0.00
PFO1C	827	3521.56	2.37
PFO1Ch	1	0.66	0.00
PFO4/1C	1	18.50	0.01
PFO4A	47	245.93	0.17
PFO4B	3	13.17	0.01
PFO4C	51	456.44	0.31
PFO5F	4	21.57	0.01
PFO5Hb	1	1.59	0.00
PFO5Hh	2	1.01	0.00
PSS1/4A	2	6.56	0.00
PSS1/4C	8	34.48	0.02
PSS1/EM1B	1	16.92	0.01
PSS1/EM1C	3	36.16	0.02
PSS1/EM1F	3	15.61	0.01
PSS1/FO1C	3	38.72	0.03
PSS1A	73	233.69	0.16
PSS1B	9	17.32	0.01

PSS1C	1552	7881.50	5.30
PSS1CH	4	3.26	0.00
PSS1Cb	3	20.69	0.01
PSS1Ch	2	6.17	0.00
PSS1F	12	70.86	0.05
PSS1FH	2	2.43	0.00
PSS1Fb	3	3.90	0.00
PSS3B	5	3.71	0.00
PSS4/1C	2	7.83	0.01
PSS4A	4	3.74	0.00
PSS4C	10	76.76	0.05
PSS5/1Hb	1	5.58	0.00
PSS5Hb	4	10.33	0.01
PUB/EM1Fb	1	4.16	0.00
PUBF	9	4.20	0.00
PUBFb	1	0.23	0.00
PUBFh	4	1.37	0.00
PUBFx	3	1.07	0.00
PUBH	346	426.89	0.29
PUBHB	13	18.26	0.01
PUBHH	2	0.92	0.00
PUBHX	10	5.95	0.00
PUBHb	125	124.30	0.08
PUBHh	78	95.05	0.06
PUBHrx	2	1.26	0.00
PUBHx	83	40.16	0.03
PUBKHrx	2	1.55	0.00
PUBKHx	1	0.97	0.00
PUSC	7	5.43	0.00
PUSCh	2	3.78	0.00
PUSCx	2	2.83	0.00
R3UBH	298	2897.53	1.95
R3USA	3	2.93	0.00
R3USC	293	484.28	0.33
TOTAL	8789	148674.28	100.00

Wetland and deepwater habitat data for Boundary County.

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	48	224.89	1.42
L1UBHh	15	243.26	1.54
L2AB3/4H	2	30.57	0.19
L2AB3/4Hh	1	231.70	1.46
L2AB3H	3	95.88	0.61
L2AB3Hh	6	27.19	0.17

L2AB4H	22	42.24	0.27
L2AB4Hh	1	28.17	0.18
L2USCh	2	5.07	0.03
PAB3/4H	1	8.06	0.05
PAB3H	52	111.39	0.70
PAB3Hb	3	4.51	0.03
PAB3Hh	7	11.66	0.07
PAB3Hx	5	12.19	0.08
PAB4/3H	1	7.13	0.05
PAB4F	1	0.13	0.00
PAB4H	21	32.37	0.20
PAB4Hb	1	0.63	0.00
PAB4Hh	3	15.35	0.10
PAB4Hx	1	0.16	0.00
PABH	2	1.85	0.01
PABHx	1	0.46	0.00
PEM1A	119	714.37	4.51
PEM1Ad	2	76.03	0.48
PEM1B	1	0.19	0.00
PEM1C	506	3606.53	22.79
PEM1Cd	8	113.13	0.71
PEM1Ch	16	54.13	0.34
PEM1Cx	1	6.67	0.04
PEM1F	144	543.32	3.43
PEM1Fh	34	338.53	2.14
PEM1Fx	1	4.92	0.03
PFO1/4A	1	16.28	0.10
PFO1/EM1A	1	181.52	1.15
PFO1A	197	952.96	6.02
PFO1C	138	662.65	4.19
PFO4A	6	27.69	0.17
PFO4C	22	159.89	1.01
PFO5Hb	1	1.21	0.01
PSS1/4C	3	3.56	0.02
PSS1A	21	221.22	1.40
PSS1B	1	0.97	0.01
PSS1C	344	1496.22	9.45
PSS1F	5	5.98	0.04
PSS4/1C	1	8.23	0.05
PSS4B	2	7.06	0.04
PSS4C	16	98.91	0.62
PUB/AB4H	1	0.75	0.00
PUBFb	3	1.10	0.01

PUBH	148	200.94	1.27
PUBHB	2	0.71	0.00
PUBHb	24	35.95	0.23
PUBHh	43	64.30	0.41
PUBHx	47	103.38	0.65
PUSC	1	0.44	0.00
R3UBH	457	4775.12	30.17
R3USA	3	12.19	0.08
R3USC	122	195.91	1.24
TOTAL	2641	15827.79	100.00

Appendix F.

Taxonomy, range, status and management of rare animal species in northern Idaho (from Groves et al. in press). APPENDIX NOT INCLUDED IN IDAHO CDC HOME PAGE VERSION.
(APPENDIX NOT INCLUDED IN CDC HOMEPAGE VERSION)

Birds

Glaucidium gnoma
Strix nebulosa
Strix varia
Haliaeetus leucocephalus
Falco peregrinus anatum
Histrionicus histrionicus
Bucephala clangula
Bucephala islandica
Lophodytes cucullatus
Gavia immer
Numenius americanus
Podiceps grisegena
Aechmophoris occidentalis
Chlidonias niger
Picoides arcticus
Picoides tridactylus
Parus hudsonicus

Reptiles

Bufo boreas
Plethodon idahoensis
Rana pipiens
Rana pretiosa
Rana sylvatica

Mammals

Sorex hoyi
Synaptomys borealis
Ursus arctos
Martes pennanti