FIELD INVESTIGATIONS OF SENSITIVE PLANT TAXA OCCURRING ON THE PRIEST LAKE RANGER DISTRICT, KANIKSU NATIONAL FOREST, IDAHO PANHANDLE NATIONAL FORESTS.

by

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ABSTRACT

Field investigation for Region One Forest Service sensitive plant species on the Priest Lake Ranger District of the Kaniksu National Forest were carried out June through October 1991 by the Idaho Conservation Data Center (CDC) of Idaho Fish and Game. Funding for this project was provided by Idaho Fish and Game and the Idaho Panhandle National Forests to survey habitats on the Priest Lake Ranger District for sensitive plant populations. This report concerns two Challenge Cost-share projects, one of which provided funds for a general survey of the Priest Lake Ranger District for all Region One Forest Service sensitive and watch plant species. The other Challenge Cost-share project provided funds for a survey of the Priest Lake Ranger District specifically for Maianthemum dilatatum (false lily-of-the-valley), a Region One watch species previously documented on lands controlled by the Idaho Department of Lands on the east side of Priest Lake, but which had not previously been documented on USFS lands in Region One.

No populations of false lily-of-the-valley were located during field surveys. Indeed, the population of false lily-of-the-valley from Indian Lake on the east side of Priest Lake could not be relocated. The status of this species in northern Idaho remains uncertain until a documented location can be found.

Populations of 23 Region One Forest Service sensitive species were located during 1991 or were previously documented on the Priest Lake Ranger District. Taxonomy, identification, distribution, abundance, habitat relationships, and management suggestions are discussed for each species. Recommendations concerning the conservation status for each species in Idaho and in Region One are also made.

Two species currently on the Region One FS sensitive list are recommended for removal from the list in this report. Five species known to occur on the Kaniksu National Forest are nominated for Region One sensitive status in this document, and two Region One watch species are recommended to be moved from the watch to the sensitive list due to documentation of these taxa on the Priest Lake Ranger District during 1991. Finally two species currently on the Region One sensitive list should be moved from the sensitive list to the watch list as they are not currently known from Region One USFS lands.

TABLE OF CONTENTS

TABLE OF CONTENTS cont.

LIST OF APPENDICES

INTRODUCTION

The National Forest Management Act and Forest Service policy require that Forest Service land be managed to maintain populations of all existing native animal and plant species at or above the minimum viable population level. A minimum viable population consists of the number of individuals, adequately distributed throughout their range, necessary to perpetuate the existence of the species in natural, genetically stable, self-sustaining populations.

The Forest Service, along with other Federal and State agencies, has recognized the need for special planning considerations in order to protect the flora and fauna on lands in public ownership. Species recognized by the Forest Service as needing such considerations are those that (1) are designated under the Endangered Species Act as endangered or threatened, (2) are under consideration for such designation, or (3) appear on a regional Forest Service Sensitive Species list.

This report constitutes a summary of findings of two Challenge Cost-share projects on the Priest Lake Ranger District of the Kaniksu National Forest. This project is a cooperative effort between the Idaho Department of Fish and Game's Conservation Data Center and the Idaho Panhandle National Forests through the Challenge Cost-share Program. Two previous Challenge Cost-share projects on the Priest Lake Ranger District focused on Sensitive Plant Species of wetland habitats (Caicco 1987; 1988).

The primary objectives of this investigation were to:

1) Survey habitats on the Priest Lake RD for rare plant taxa, concentrating on moist, forested habitats likely to support false lily-of-the-valley and other Sensitive Species of these habitats.

2) Determine the distribution, habitat and population levels for sensitive taxa encountered.

3) Assess population trends and threats to existing populations and make management recommendations to the Regional Forester and Idaho Panhandle NFs based on these assessments.

RESULTS

Between June and October, 1991, I surveyed numerous habitats on the Priest Lake Ranger District, including a wide range of forested habitats. Special attention was given to surveying old-growth and riparian habitats, however, many second growth forests were also visited. Also, a broad variety of wetland habitats were surveyed to reconfirm Sensitive Plant population locations previously documented and to search for new populations of Sensitive Species in previously surveyed wetlands as well as in some previously unsurveyed wetlands.

Populations of 23 plant taxa of concern (including Region One FS Sensitive and Watch Species, and species currently nominated for Region One Sensitive status) were located during these field surveys.

Several notable collections were made during 1991, including the rediscovery of Rubus spectabilis (salmonberry), a coastal disjunct species previously known from a turn-of-the-century collection by Piper from "Priest Lake", which was recently thought to be extirpated from Idaho. In fact, five populations of salmonberry were documented during 1991. Several populations of Rubus pubescens (swamp red blackberry), which was previously known from only one site in Idaho, MacArthur Lake, south of Bonners Ferry, were found in the Priest Lake RD. Additionally a population of Scirpus hudsonianus (Hudson's Bay bulrush) was located in Cow Creek Fen, near the Selkirk crest on the Bonners Ferry RD, Kaniksu NF. Hudson's bay bulrush was previously known from only one site in the Pacific Northwest (Glacier National Park). This species is described in detail in this report, as well, although no populations of Hudson's Bay bulrush were found on the Priest Lake RD.

SENSITIVE VASCULAR FLORA

Prior to 1991, 24 Region One Forest Service Sensitive Plant Species were thought to occur on the Priest Lake RD. Twenty of these species as well as five additional species known from the Priest Lake Ranger District are recommended to be kept on or are nominated for inclusion on the Region One Sensitive Plant List for 1992. Each of the five species nominated for sensitive status are treated in detail in this document. Additionally, two Region One Watch Species (Rubus pubescens, dwarf red blackberry, and Rubus spectabilis, salmonberry) were documented on the Priest Lake RD during 1991 and should be upgraded from Watch Species to Sensitive Species on the 1992 Region One Forest Service Sensitive Plant List.

The four remaining species listed as Sensitive on the 1991 Northern Region List of Sensitive Plant Species for Idaho that were thought to occur on the Priest Lake RD are as follows, with recommendations for their designations and/or status changes:

Adiantum pedatum var. nov. - The most recent taxonomic treatment of the genus Adiantum in North America (Paris 1990) indicates that all western North American populations of maidenhair fern are part of a common species, Adiantum aleuticum (Ruprecht) Paris that is distinct from the eastern North American true Adiantum pedatum, although there are some disjunct serpentine populations of A. aleuticum in eastern North America as well (Paris 1990). No subspecific taxa (varieties) have been recognized for A. aleuticum (Paris 1990). Therefore, it is the recommendation of the Idaho CDC that Adiantum pedatum var. nov. be removed from the Region One Sensitive Plant List for 1992 as this is not a valid taxon.

Carex chordorrhiza - This boreal disjunct species is one of the rarest in Idaho. It is known from only one site in Idaho; Chase Lake, approximately 2 miles southeast of Coolin, ID, near the southeast shore of Priest Lake, where it was discovered by Bursik (1990). Lands surrounding Chase Lake are owned mostly by the state of Idaho (Idaho Dept. of Lands) with some private holdings on the southern portion of the lake. No populations are known of this species from USFS lands in Region One. Therefore, I recommend that this species be moved from the Sensitive to the Watch List as a species suspected to occur on lands within Region One of the USFS in Idaho.

Eriophorum viridicarinatum - This is another boreal disjunct which was mistakenly reported by Bursik (1990) from Kaniksu Marsh Research Natural Area on the Priest Lake Ranger District. Reevaluation of the collected voucher specimen showed it to be an immature specimen of Eriophorum gracile

with uncharacteristically well-developed bracts subtending the inflorescence. Populations of E. viridicarinatum have subsequently been documented in Idaho by Jill Blake, botanist, Idaho Panhandle National Forests, at MacArthur Lake Wildlife Management Area, which is managed by Idaho Fish and Game, in 1990, and by Bob Moseley, Michael Mancuso, and Robert Bursik botanists for the Idaho CDC, along the southeastern shore of Henry's Lake in Fremont County, Idaho (Moseley et al. 1991). This species is also known from Halliday Fen on the Colville NF, where it was collected by Steve Brunsfeld and Fred Johnson of the University of Idaho in 1986. This species should therefore be moved from the Northern Region Sensitive Plant List for Idaho to the Watch Plant List as a species suspected to occur on FS lands in Idaho and Washington.

Juncus effusus var. pacificus - This variety of common reed was added to the Region One Sensitive Plant List in 1988 (USDA Forest Service 1988) when it came to the attention of the Idaho CDC (then the Natural Heritage Program) that this variety may not be particularly common in the state (Steele 1981). Since then, field surveys by botanists in northern Idaho, including myself, have revealed this taxon to be rather widespread, particularly on the Kaniksu National Forest, and consequently not in need of special protection. Therefore, it is the recommendation of the Idaho CDC that this taxon be removed from the Region One Forest Service List of Sensitive Species for Idaho.

Arnica alpina (L.) Olin var. tomentosa (Macoun.) Cronq.

CURRENT STATUS
USFS - R1 Sensitive
USFWS - None
Idaho Native Plant Society
Idaho CDC -

TAXONOMY

Family: Asteraceae (sunflower)

Common Name: alpine arnica

Citation: Diss. 11. 1799.

Technical Description: Stems solitary from a short, mostly ascending rhizome or mere caudex, 0.5-2 dm tall; herbage and involucre glandular and conspicuously long-villous-tomentose; leaves entire or nearly so, the basal 3- to 5-nerved, narrow, gradually tapering, up to 15 cm long and 1.5 cm wide; proper cauline leaves mostly 1-3 pairs, reduced; head solitary, campanulate; involucre 10-14 mm high; rays mostly 9-12, the apical teeth conspicuous; achenes densely hairy. Only the variety tomentosa occurs in the Pacific Northwest (Cronquist 1955). See Appendix 1 for a line drawing of alpine arnica.

Nontechnical Description: Stems solitary from short, underground rhizomes, 0.5-2 dm tall; leaves and bracts of the inflorescence glandular and have long, wooly hairs; leaves entire or nearly so, basal leaves 3 to 5-nerved, narrow, tapered, up to 15 cm long and 1.5 cm wide; stem leaves 1-3 pairs, reduced; head solitary; bracts of head 10-14 mm; ray flowers (petal-like) mostly 9-12, achenes densely hairy.

Distinguishing Features and Similar Species: The solitary, conspicuously hairy stems of alpine arnica set it apart from other alpine species of bare, rocky alpine slopes that may be found in the area.

DISTRIBUTION

Range: Alpine arnica is a circumboreal species whose range extends south in high mountains to Alberta and British Columbia in Canada, and into northern Idaho in the Selkirk Mountains and to Montana in Beaverhead County (Cronquist 1955).

Only one population of alpine arnica is known from Idaho in Snowy Top RNA 001 (this number refers to the population occurrence number of this species found in the Idaho CDC data base; these numbers will be used throughout the text to refer to specific sensitive plant species populations in Idaho) on the Priest Lake

RD where it was found by Steve Brunsfeld and Chuck Wellner in 1984. See Appendix 2 for the map location of alpine arnica.

Habitat and Associated Species: Throughout its range, alpine arnica is a species of bare, rocky alpine slopes (Cronquist 1955). In Snowy Top RNA 001, it occurs on a south-facing 10% slope on organic soil matter mixed with loam within cracks in and upon rocks with little other associated vegetation.

CONSERVATION STATUS

Conservation Status - Idaho: Alpine arnica became a species of conservation concern in Idaho when it was discovered by Steve Brunsfeld and Chuck Wellner in 1984. Since then, alpine arnica has been recognized as a Sensitive Species for the Northern Region of the Forest Service (USDA Forest Service 1991a).

The Idaho Native Plant Society considers alpine arnica a sensitive species (Idaho Native Plant Society 1991). The sensitive category includes taxa with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized without active management or removal of threats.

The Idaho CDC lists alpine arnica as G5 T5 S1 (G5 T5 = this variety or alpine arnica is globally secure, though it may be quite rare in parts of its range, especially at the periphery; S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere: Alpine arnica was considered for sensitive status in Montana, but was rejected because it was found to be common (Lesica and Shelly 1991).

Threats: The lone population of alpine arnica known from Idaho occurs in a Research Natural Area (Snowy Top RNA 001). No current threats are apparent.

Management Implications: Current management of Snowy Top RNA 001 is compatible with the long-term survival of this population.

ASSESSMENTS AND RECOMMENDATIONS

Summary: Alpine arnica was first discovered in Idaho in 1984 in Snowy Top RNA 001. It has not been found anywhere else in Idaho to date. Current management of this lone population of alpine arnica in Idaho is compatible with its long-term survival.

Recommendation to the Regional Forester: Alpine arnica is an extremely rare plant in Idaho. Only one population is known in the state; in the Snowy Top RNA on the Priest Lake RD of the Kaniksu NF. Based on the information reported here, I suggest that alpine arnica remain on the Region One List of Sensitive Species for Idaho.

Recommendation to the Idaho Panhandle NFs: Only one population of alpine arnica is known from Idaho in the Snowy Top RNA on the Priest Lake RD. Current management of this population is compatible with its long-term survival.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both mature fruits and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Blechnum spicant (L.) Roth.

CURRENT STATUS
USFS - R1 Sensitive
R4 Sensitive
USFWS - None
Idaho Native Plant Society - Sensitive
Idaho CDC - G5 S2

TAXONOMY

Family: Polypodiaceae (fern)

Common Name: deer fern

Citation: Bot. Arr. Veg. Brit. 3rd ed. 765. 1796.

Technical Description: Fronds arising from creeping rhizomes. Sterile fronds once pinnate with broadly sessile pinnae. Sterile leaves 2-8(10) dm, petioles 3-25 cm, reddish or purplish-brown. Pinnae 35-75 pairs per sterile frond, largest pinnae borne near or above middle of the frond (1.0-5.5 cm x 3-7[10] mm). Fertile leaves surpassing the sterile, petioles up to 50 cm long, pinnae as many and as long as on sterile leaves but only 1.5-2.0 mm wide (Cronquist 1969a). See Appendix 1 for a line drawing of deer fern.

Nontechnical Description: Leaves arising from creeping underground rhizomes. Plants with two types of leaves. Angled to spreading sterile (non-sporangia-bearing) leaves with sessile leaflets 1.0-5.5 cm long x 3-7(10) mm broad. Leaflets 35-75 pairs arranged oppositely along petiole. Petioles reddish to purplish-brown. Fertile (sporangia-bearing) leaves similar to sterile leaves but more erect and with same number of leaflets which are only 1.5-2.0 mm wide.

Distinguishing Features and Similar Species: Deer fern is a distinctive fern, unlike any other species of fern in Idaho. The dimorphic fronds, with the fertile fronds having narrower leaflets and being more erect than the sterile fronds which have broader leaflets and are prostrate or nearly parallel with the ground, are the most distinguishing features of deer fern.

DISTRIBUTION

Range: Deer fern is a wide ranging northern species that is interruptedly circumboreal and ranges south into northern California. Deer fern is chiefly found west of the Cascades in the Pacific Northwest where it is widespread, but disjunct populations are also known from Bonner, Clearwater, and Idaho Counties in Idaho.

Fifteen populations of deer fern are currently known in Idaho. Eleven of these populations are known from Clearwater and Idaho Counties. The other four populations are known from Bonner County. Three of the Bonner County populations are on the Priest Lake RD and one, discovered in 1991 is on the Sandpoint RD. The Priest Lake deer fern populations have also only recently been discovered (since 1988).

The populations of deer fern on the Priest Lake RD are all known from the northern part of the district (see Appendix 2 for mapped locations of deer fern). Bottle Lake RNA 005 consists of only one known plant on a very old logging road in the Bottle Lake Research Natural Area. Distillery Bay 011 is a population of more than 100 distinct individuals just west of Distillery Bay adjacent to the north end of Priest Lake. A portion of this population has been impacted by a recent clear-cutting operation. The forest canopy has been completely removed from nearly 60% of the population. The remaining portion of the population is located in an adjacent, uncut old-growth cedar, hemlock, and white pine forest.

Cedar Creek 012 is centered on an old fire access road along Cedar Creek. This population consists of approximately 150 individuals in an old-growth cedar/hemlock forest. The construction of this fire access road did not open the canopy and may have provided a suitable bed for spore germination of deer fern. Although the overall quality of the habitat occupied by this population has been described as excellent, the fact that it is centered on an old road makes its continued existence somewhat tenuous.

One additional population of deer fern was reported from the Sandpoint RD during 1991. Little is currently known of this population.

Habitat and Associated Species: Deer fern is a species of moist coniferous forests throughout its range. On the Priest Lake RD, this species is found exclusively in old-growth, or at least mature Thuja plicata (cedar) and Tsuga heterophylla (hemlock) forests. Understory species associated with deer fern include Clintonia uniflora and Asarum caudatum.

CONSERVATION STATUS

Conservation Status - Idaho: In his evaluation of deer fern for the Idaho rare plant project of the Idaho Natural Areas Council, Johnson (1981a) recommended State Watch List status due to its apparent rarity. It was placed on the Region One FS Sensitive Species List in 1988 (USDA Forest Service 1988). Deer fern was also listed as sensitive on the updated list for the Northern Region (USDA Forest Service 1991a). It is also a BLM sensitive species in Idaho (Moseley and Groves 1990).

The Idaho Native Plant Society considers deer fern a State Priority 2 species (Idaho Native Plant Society 1991). The State Priority 2 category refers to species likely to be classified as a Priority 1 species within the foreseeable future in Idaho, if factors contributing to its population decline or habitat degradation or loss continue. A State Priority 1 species is one which is in danger of becoming extinct or extirpated from Idaho in the foreseeable future if identifiable factors contributing to its decline continue to operate; these are species whose populations are present only at critically low levels or whose habitats have been degraded or depleted to a significant degree.

The Idaho CDC currently ranks deer fern as G5 S2 (G5 = demonstrably secure globally, though it might be quite rare in parts of its range, especially at the periphery, S2 = imperiled because of rarity or because of other factors, demonstrably making it very vulnerable to extinction [Moseley and Groves 1990]).

Threats: Two populations of deer fern on the Priest Lake RD occur on old logging or fire access roads (Bottle Lake RNA 005 and Cedar Creek 012). Bottle Lake 005 should not be impacted by future road use as the road is located within a Research Natural Area. This population consists of only one observed plant, however, making its long-term viability tenuous, at best.

Cedar Creek 012 is located on an old fire access road. This location may increase the chances of trampling, either by humans or wildlife. The potential also exists that future land management activities may call for the reopening of this road for fire-fighting or timber harvesting, which could devastate this population.

Approximately 60% of Distillery Bay 011 has been disturbed by clear-cutting which removed the canopy from this portion of the population. The effects of canopy removal on this species is currently unknown. Considering that it is only known from moist, forested habitats in nature, the prognosis for these individuals within the clearcut does not seem good.

Management Implications: Current management practices of Bottle Lake RNA 005 and Cedar Creek 012 seem compatible with the long term viability of these populations as long as road maintenance or use does not occur on the old roads on which these two deer fern populations are centered. The population dynamics and site quality of the deer fern population discovered on the Sandpoint RD during 1991 are unknown. Consequently it is impossible to evaluate management implications for this population.

Distillery Bay 011 is currently being monitored by Jill Blake, botanist, Idaho Panhandle NFs, and Dennis Reily, Priest Lake RD using timber KV funds. In 1991, they used an infrared survey instrument to map and track individuals in seven plots containing deer fern; three in the clear-cut, two in undisturbed control plots, and two on the edges of the clearcut. They will use this information to track individual plants in the following four categories: juveniles (without fertile fronds), vegetative (mature, without fertile fronds), fertile, and fertile plants with more than three fertile sporophylls.

In 1992, 37 ft diameter (one-tenth acre) Ecodata plots will be put into these same seven plots. In 1994, the infrared analysis will be redone, and in 1995, the Ecodata plots will be remeasured. This will provide immediate trends for this population following disturbance, however, it is not likely to elicit long-term population trends, which will only come to light with future analysis of these plots on a semi-annual basis.

ASSESSMENTS AND RECOMMENDATIONS

Summary: Deer fern is known from 15 sites in two widely disjunct areas of Idaho. Eleven populations are known from Clearwater and Idaho counties along the Clearwater and Lochsa rivers. One population of deer fern is known from the Sandpoint RD, Kaniksu NF, in Bonner Co. Three populations are known from the Priest Lake RD on the Kaniksu NF in Bonner Co. All three Priest Lake populations are at risk due to their locations or due to past management activities. Two populations are centered on old roads: Bottle Lake RNA 005, which consists of only one observed individual, and Cedar Creek 012, which consists of nearly 150 individuals, but is nonetheless centered on an old fire access road. Distillery Bay 011 is partially located in a recent clear-cut. This population is currently being monitored to ascertain the short-term effects of canopy removal on individuals of this species.

Recommendations to the Regional Forester: Deer fern is currently on the Region One List of Sensitive Species (USDA Forest Service 1991a). Only four populations are known of this species in northern Idaho, three of which occur on the Priest Lake RD, and one occurs on the Sandpoint RD. All of the Priest Lake RD populations are somewhat threatened due to their locations or due to recent management activities. Given the information presented here, I recommend that deer fern remain on the Region One List of Sensitive Species for Idaho.

Recommendations to the Idaho Panhandle NFs: Only four populations of deer fern are known from the Kaniksu NF, three of which are located on the Priest Lake RD. Two of these populations are not threatened by current management practices, but their locations,

wholly or partially on old roads make them vulnerable to trampling or to future development activities (at least Cedar Creek 012). These populations (Bottle Lake 005 and Cedar Creek 012) should be monitored on a biennial basis to ascertain population trends and to determine whether they are being threatened by trampling. Monitoring activities should continue on Distillery Bay 011 to determine the short-term effects of canopy removal on this species. I suggest continuing the monitoring beyond 1995 to ascertain the long-term effects of canopy removal on the viability of individuals of deer fern. This can be done using the same methods on a semi-annual basis. As soon as more is known about the deer fern population on the Sandpoint RD, a determination should be made whether current management activities are compatible with the long-term viability of this population.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both fertile and sterile fronds and rhizomes. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Carex buxbaumii Wahl.

CURRENT STATUS USFS - R1 - None
R4 - Sensitive
R6 - Sensitive
USFWS - None
Idaho Native Plant Society - Sensitive
Heritage Rank - G5 S2

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name: Buxbaum's sedge

Citation: Svenska Vet.-Akad. Handl. 24:163. 1803.

Technical Description: Culms arising singly or few together from well-developed creeping rhizomes, mostly 3-10 dm tall, strongly aphyllopodic, not surrounded by old sheaths from previous years; leaves glabrous, elongate, mostly 2-4 mm wide; spikes mostly 2-5, approximate or somewhat remote, erect or closely ascending, sessile or (especially the lower) with more or less well-developed peduncle, the terminal spike gynaecandrous, 1-3 cm long, the lateral ones pistillate, about the same length or somewhat shorter; bract subtending the lowest spike sheathless or nearly so, from distinctly shorter to somewhat longer than the inflorescence; pistillate scales lanceolate to lance-ovate, brown to purplish black with a usually paler midrib, surpassing the perigynia, tapering to an awn-tip 0.5-3 mm long; perigynia 2.7-4.3 mm long, beakless or very shortly beaked, rather narrowly elliptic to sometimes elliptic-obovate or elliptic-ovate, up to barely over half as wide as long, firm-walled, not strongly flattened, light gray-green, densely papillate all over, with prominent marginal nerves and 6-8 inconspicuous or obscure nerves on each face; stigmas 3; achene trigonous, 1.4-1.9 mm long, somewhat narrower and much shorter that the perigynial cavity (Cronquist 1969b).

Nontechnical Description: Stems arising singly or few together from well-developed creeping rhizomes, mostly 1-3 feet in height, lowest leaves strongly reduced to scales; new stems are not surrounded by old sheaths from previous years (though old sheaths can be found separately from the new stems). Leaves are smooth and 2-4 mm in width. Spikes mostly 2-5, borne erect or closely ascending, and loosely sessile on the stem. Terminal spike, pistillate; flowers are borne above the staminate flowers; the lateral spikes are entirely pistillate. Bract which subtends the spike is sheathless, and will sometimes exceed the inflorescence (Caicco 1988). See Appendix 1 for a line drawing of Buxbaum's sedge.

Distinguishing Features and Similar Species: Buxbaum's sedge is a well-marked and distinct species. The light-gray green, densely-papillate perigynia give the inflorescence a distinctive coloration that makes field inventory for flowering stems rather easy. The plants retain this distinctive aspect until the perigynia cure to a pale straw color, which makes them more difficult to spot at a distance.

DISTRIBUTION

Range: Buxbaum's sedge is distributed throughout the boreal regions of the Northern Hemisphere; although it is widespread it is relatively uncommon and infrequently collected. In the western United States it reaches as far south as Colorado, Utah, and central California, but is not recorded for Nevada. In western and south-central Montana, and Yellowstone National Park, it is common enough to be classified as a minor dominance type (Mattson 1984; Pierce and Johnson 1986; Hansen et al. 1988). In Washington, it is known from only seven recent sightings in widely scattered locations; three of these are from Pend Oreille Co. The Northern Region Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring within the Northern Region in Montana, Idaho, and North Dakota.

Buxbaum's sedge is known from four widely disjunct areas of Idaho: 1) Island Park (Fremont Co.), where seven populations are known (Moseley, et al. 1991); 2) the Sawtooth Valley (Blaine and Custer counties), where it is found along lake edges and associated wetlands; 3) Tule Lake (Valley Co.), where one stable population is known; and 4) Kaniksu NF (Bonner and Boundary counties) where eight populations are known from the Priest River valley and Selkirk Mountains. See Appendix 2 for the mapped location of Buxbaum's sedge on the Priest Lake RD.

Habitat and Associated Species: Throughout its range Buxbaum's sedge can be found in peat bogs, marshes, wet meadows, and other wet places (Cronquist 1969b). In Montana, it is typically found at mid-elevations in flat, wet meadows and forest openings (Hansen et al. 1988). Buxbaum's sedge has been classified as a minor community dominant in the Sawtooth Valley of Idaho (Tuhy 1981), as well as in adjacent Montana (Hansen et al. 1988), Utah (Padgett et al. 1989), and Wyoming (Mattson 1984). On the Priest Lake RD, Buxbaum's sedge is usually known from wet meadow habitats at low elevations (2380-2620 feet) with shallow to deep peat soils (peatlands). On the Bonners Ferry Ranger District, Buxbaum's sedge is known from two locations in peatland meadows at mid-elevations (ca. 4000 feet), near the Selkirk crest. Often, Buxbaum's sedge is found as a codominant in open sedge-dominated fens (mineral-rich peatland habitats) with Carex aquatilis, Carex lasiocarpa, and Deschampsia cespitosa. Usually these peatland meadows are a mosaic of vegetation types with the open fen habitats being interspersed with shrub-dominated carr wetlands on

woody-peat substrates. Shrubs species of these habitats include Alnus incana, Betula glandulosa, Salix bebbiana, Salix geyeriana, and Spiraea douglasii. The sedge-dominated fens where Buxbaum's sedge achieves its greatest prominence are usually the wettest portions of these meadows.

Buxbaum's sedge is currently found in four different parts of the Priest River Valley. Five populations are known wholly, or in part on lands administered by the USFS. One population in the Priest River Valley is known from Outlet Mountain Meadows 016, approximately three miles north of the Dickensheet Junction, just south of the southern end of Priest Lake, on lands administered by the Idaho Department of Lands.

One population is known from Hammond Ranch 020, which will soon be acquired by the Kaniksu NF. This is a small population that occurs in the understory of a unique Populus tremuloides swamp with Rhamnus alnifolia, Spiraea douglasii, and Calamagrostis canadensis.

Three populations are located in the vicinity of the Priest Lake Ranger Station in the Reynolds Creek Meadows 007, the Lamb Creek Meadows 017, and in Bismark Meadows near the Bismark Work Center 018.

Buxbaum's sedge was also located in Armstrong Meadows 019, near the southern end of Upper Priest Lake.

In all of these wetlands, except the Hammond Ranch swamp, Carex buxbaumii is noticeably prominent, at least in localized areas, usually with Carex lasiocarpa.

At all of these sites, Buxbaum's sedge is associated with one to several other populations of plants on the Region One Forest Service Sensitive Species List. See Appendix 2 for mapped locations of Buxbaum's sedge on the Priest Lake RD and Appendix 3 for a list of Sensitive Plant Species occurring with Buxbaum's sedge at these sites (except Lamb Creek Meadows 017).

CONSERVATION STATUS

Conservation Status - Idaho: In his evaluation of Buxbaum's sedge for the Idaho rare plant project of the Idaho Natural Areas Council, Henderson (1981a) recommended a State Watch List status, due to its apparent rarity; threats were unknown to him at the time. Buxbaum's sedge was listed as a Watch Species for Idaho on the Region One Sensitive Species List in 1988 (USDA Forest Service 1988), but does not appear on the updated list for some unknown reason (USDA Forest Service 1991a). Buxbaum's sedge is a Sensitive Species in the Intermountain Region (Four) of the Forest Service (Spahr et al. 1991) and in Region 6 of the Forest Service (USDA Forest Service 1991b). It is also a BLM sensitive species

in Idaho (Moseley and Groves 1990).

The Idaho Native Plant Society considers Buxbaum's sedge a Sensitive species (Idaho Native Plant Society 1991). The Sensitive category of the Idaho Native Plant Society list refers to species with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized if current land use practices continue.

The Idaho CDC currently ranks Buxbaum's sedge as G5 S3 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S3 = very rare and local in Idaho [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

MONTANA - Considered for listing but rejected (Lesica et al. 1984; Lesica and Shelly 1991).

WASHINGTON - Sensitive = Taxon that is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats (Washington Natural Heritage Program 1990).

WYOMING - Buxbaum's sedge is on the Wyoming Natural Diversity Database's Plant Species of Special Concern- List 2 (Wyoming Natural Diversity Data Base 1991). List 2 includes species on designated or recommended Watch Lists for Federal lands in Wyoming, or other species that are moderately rare and/or threatened globally or regionally.

Threats: Caicco (1988) reported that the Reynold's Creek 007 has been subjected to hydrologic modification through ditching and draining. This site also has a complex grazing history, with remnants of several old fences present; it is not currently heavily grazed, although there was some evidence of limited use by horses. Subsequently, I found more individuals farther downstream around some beaver ponds on USFS land. This area did not appear to have been grazed in the last couple of years, though the presence of old fences hints of past grazing activity. I also did not see the remnants of old drainage ditches, although attempts were probably made to ditch the meadow at one time or another. The resulting mosaic of old-field successional pathways in the portion of the meadows supporting Reynold's Creek 007 adjacent to Highway 57 is complex, and suggests that the meadow system may be undergoing dynamic changes in its species composition and structure. The implications of these changes for Carex buxbaumii are unknown. It is obvious, however, that hydrological conditions are suitable to support a healthy, rather vigorous population of Buxbaum's sedge around the beaver ponds.

Lamb Creek Meadows 017 is a particularly vigorous population of Buxbaum's sedge that has been subjected to past modifications of hydrological regimes due to ditching and draining, cutting for hay, and grazing as evidenced by old fences and drainage ditches. Bismark Meadows 018 has survived similar management activities as Lamb Creek 017. The long-term effects of these activities on the Buxbaum's sedge populations is unknown. If current status of these populations is any indication of long-term effects of these activities on the populations, it would appear that the ditching and draining of the meadows were insufficient to alter water regimes enough to make conditions unsuitable to the survival of Buxbaum's sedge.

Hammond Ranch 020 is a rather small population that has been subjected to recent grazing activity. The effects of this activity on the long-term viability of this population is unknown.

Armstrong Meadows 019 is the only pristine population of Buxbaum's sedge on the Priest Lake RD. No current or past management activities threaten the long-term viability of this population.

Management Implications: It is not possible at this time to determine what effect habitat disturbance by past drainage and ditching will have on Reynold's Creek 007, Lamb Creek 017, Bismark Meadows 018. Current indications are that water regimes were not altered significantly enough to prevent the growth of hydrophytic vegetation, including Buxbaum's sedge on these sites. Long-term, periodic monitoring of these populations should be implemented to detect any latent population impacts that may result from these past activities, particularly during periods of prolonged drought. Grazing activities should not be resumed on lands controlled by the Priest Lake RD in the Lamb Creek Meadows, the Reynolds Creek Meadows or in Bismark Meadows. Assuming Hammond Ranch is acquired by the USFS, careful consideration should be given to terminating grazing activities in this area. If not, a long-term monitoring project could be initiated as part of allotment management to determine the effects of grazing on the dynamics of this Buxbaum's sedge population, as well as the effects of grazing on populations of two other Region One Sensitive Species found sympatrically with Buxbaum's sedge in Hammond Ranch: Rubus pubescens 003 and Sanicula marilandica 008.

ASSESSMENT AND RECOMMENDATIONS

Summary: Only six populations of Buxbaum's sedge are known to exist in the Priest River Valley (eight populations total in the Northern Region of the USFS). Five of the Priest River Valley populations are located wholly or partially on lands administered by the Priest Lake Ranger District, Kaniksu NF. Four of the six populations have had modifications to the habitat in the past in the form of ditching, draining, grazing, and harvesting. Buxbaum's sedge is also considered rare in Washington.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that Buxbaum's sedge has a restricted distribution in Idaho, with only eight populations known in Region One of the USFS. In addition to Idaho, Washington also considers Buxbaum's sedge to be of conservation concern. Along with a narrow distribution in the state, the habitat it occupies is unique, characterized by several associated species that also have a limited distribution in Idaho. Based on information reported here, I recommend that Buxbaum's sedge be placed on the Regional Foresters Sensitive Species List for the Northern Region as a Sensitive Species for Idaho.

Recommendation to the Idaho Panhandle NFs: Eight populations of Buxbaum's sedge are known from the Northern Region in Idaho. Seven, at least in part, occur on the Kaniksu NF (Priest Lake and Bonners Ferry RDs) and five (including Cow Creek Fen 009 on the Bonners Ferry RD [Moseley 1989]) have been subject to had past and/or current habitat modifications or grazing activity. The Allotment Management Plan for the allotment that will include Hammond Ranch 020 of Buxbaum's sedge on the Priest Lake RD should give special consideration to the habitat of Buxbaum's sedge and the two other Region One FS Sensitive Species that occur there. If the long-term viability of Buxbaum's sedge in Idaho is to be assured, some limited monitoring of this population is warranted in order to establish the current trend. The recommended protocol is an annual census of flowering culms within quadrats using a nested frequency approach. If an overall decline in the reproductive vigor of the population is indicated, further studies may be warranted. Additionally, grazing activity in Lamb Creek Meadows 017, Reynold's Creek Meadows 007, and Bismark Meadows 018, if it were to resume, could negatively impact the Buxbaum's sedge and other Region One Sensitive Species populations found there. Periodic monitoring of these three populations should also be initiated to assure there are no latent effects of past ditching and draining activities on these populations, particularly during periods of prolonged drought.

Land managers and field personnel on the Kaniksu NF should be informed of the possible occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both mature fruits and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Carex flava L.

CURRENT STATUS USFS - R1 - None
R4-sensitive
USFWS - None
Idaho Native Plant Society - Sensitive
Idaho CDC Rank - G5 S3

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name: Yellow sedge

Citation: Sp. Pl. 975. 1753.

Technical Description: Stems 1-8 dm tall, clustered, not at all rhizomatous, phyllopodic; leaves basal and cauline, flat, mostly 2-5.5 mm wide, the basal sheaths pale at the base; terminal spike slender, wholly staminate or with some distal perigynia, 6-24 mm long; lateral spikes pistillate, 2-5, short and stout, 6-17 mm long, all sessile or short-pedunculate and crowded close to each other and to the staminate spike, or one or more of the lower ones more or less remote and more evidently pedunculate; one or more bracts with conspicuous, elongate, spreading blade much surpassing the inflorescence, the bracts subtending the spikes in the terminal cluster sheathless or nearly so, those subtending the more remote spikes (when these are present) with more or less well-developed sheath as well as a long blade; perigynia mostly 3.7-6.2 mm long, most of them spreading and evidently falcate-recurved, relatively slender and tapering gradually to the poorly defined beak, which is 1.4-2.3 mm long, the perigynium strongly yellowish toward the base, usually more greenish (or evidently brownish) distally, prominently several-nerved on the upper surface, more obscurely so on the lower; stigmas 3; achenes 1.2-1.6 mm long (Cronquist 1969b).

Nontechnical Description: Stems clustered, not at all rhizomatous, 1-8 dm in height, with the lowest leaves not reduced to scales. Leaves at the base and along the stem are flat, 2-5.5 mm in width. The slender terminal spike usually has only staminate flowers, but some pistillate flowers may occur at the tip. Other spikes (2-5) are short (6-17 mm long) and stout, and nearly sessile. The spikes are usually crowded closely together. The bracts are conspicuous and spreading, and much surpass the inflorescence in length; those subtending lower spikes may have a sheath, but those subtending the terminal cluster are sheathless (Caicco 1988). See Appendix 1 for a line drawing of yellow sedge.

Distinguishing Features and Similar Species: Carex flava is an easily recognizable species. The perigynia, which become strongly yellow as they age, give the inflorescence a distinctive

coloration that makes field inventory for flowering plants rather easy.

DISTRIBUTION

Range: Yellow sedge is distributed throughout the boreal regions of the Northern Hemisphere. In the western part of the North American continent, it reaches south as far as northeastern Washington, central Idaho, and Montana. In western and north-central Montana it is common enough to be classified as a minor dominance type (Lesica 1986, Hansen et al. 1988). The Northern Region Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring within the Northern Region in Montana and Idaho.

In Idaho and Washington, yellow sedge is rare. It is currently known from 16 sites in six widely disjunct areas of Idaho: 1) East of Moyie Springs at Herman Lake 003, Perkins Lake 011, and Bonner Lake 002; 2) glacial valleys along the Canadian border in the Selkirk Mountains (Bog Creek 008 and 016 and Cow Creek 009); 3) Fleming Creek 010, in the Kootenai River valley north of Bonners Ferry, 4) Sand Lake 005 and Beaver Lake 012, south of Naples; 5) Hoodoo Lake 007, south-southeast of Priest River; 6) along the northwest shore of Priest Lake 015 just south of the mouth of Beaver Creek adjacent to Tule Bay, and 7) Sawtooth Range, Boise county 001 and near Stanley Lake in Custer County 013 (Moseley 1990). Only one population is currently known from the Priest Lake RD in Idaho. One population of yellow sedge is also known from Pend Oreille County, Washington on the Priest Lake RD northwest of Nordman, ID. See Appendix 2 for mapped locations of yellow sedge on the Priest Lake RD.

Habitat and Associated Species: Throughout its range, yellow sedge can be found in swampy or boggy places, and along the shores of streams and lakes. In Montana, it is typically found in low to high elevation wet meadows, along pond and lake margins, and in bogs and forest openings (Hansen et al. 1988). In Idaho, yellow sedge occurs on a wide range of habitats ranging from Carex lasiocarpa/sphagnum sites, Scirpus acutus-dominated seeps, shrub and sedge-dominated bottomlands and lake margins, and on muddy substrates along small streams. At most sites, yellow sedge is associated with one to several plants that are considered rare in Idaho, including Hypericum majus, Scirpus cyperinus, Betula pumila, Epipactis gigantea, Rhynchospora alba, Salix pedicellaris and others (this was the case at only one of the sites on the Priest Lake RD).

CONSERVATION STATUS

Conservation Status - Idaho: Prior to 1983, yellow sedge was only known from the Sawtooth Range in Boise County and thus was placed on the State Watch List (Henderson 1981b). In 1983, Johnson and Brunsfeld (1983) reported three new locations for the state in Boundary Co. Caicco (1988) reported three additional sites. Moseley (1989) surveyed many of these previously reported localities in 1989, and discovered four new populations. Yellow sedge is listed as a Sensitive Species in the Intermountain Region of the Forest Service (Spahr et al. 1991). It was excluded from the 1991 Northern Region List of Sensitive Species for unknown reasons (USDA Forest Service 1991a). Yellow sedge is also considered rare for Region 6 of the Forest Service in Washington (USDA Forest Service 1991b).

The Idaho Native Plant Society considers yellow sedge a Sensitive species (Idaho Native Plant Society 1991). The Sensitive category of the Idaho Native Plant Society list refers to taxa with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized if current land use practices continue.

The Idaho CDC currently ranks yellow sedge as G5 S3 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S3 = Either very rare and local Idaho, or found locally in a restricted range or rare because of other factors making it vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

WASHINGTON - Sensitive = Taxon that is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats (Washington Natural Heritage Program 1990).

Threats: The population of yellow sedge on the northwest shore of Priest Lake 015 occurs immediately adjacent to the lakeshore trail. The trail is probably 2 meters from the edge of Priest Lake at this point and the small population of yellow sedge that consists of no more than 15 individuals is in a narrow band of shrubby vegetation on mossy substrate between the trail and Priest Lake. It is particularly vulnerable to trampling due to its proximity to the trail and is also vulnerable to trampling because people staying at the campground like to moor their boats along this stretch of shore. Little is known of the population dynamics or site quality of the yellow sedge population 009 (Washington Natural Heritage Program occurrence number) located in the small peatland off of road 319, northwest of Nordman. It is unknown whether threats exist to this population or not.

Management Implications: It appeared that the yellow sedge population on the northwest shore of Priest Lake 015 had not recently been trampled. However, one major episode of trampling could easily wipe out this population. Therefore, I recommend that this population of yellow sedge be monitored periodically to assure that recreational activity is not adversely affecting it. If found to be impacted, the Priest Lake RD may consider rerouting the lakeshore trail away from the lake margin at this point to protect the population.

ASSESSMENT AND RECOMMENDATIONS

Summary: Carex flava, while common in Montana, is rare in the states of Idaho and Washington. It was first collected in northern Idaho in 1981; fourteen sites are now known from Bonner and Boundary Counties, although only seven are on lands administered by the Forest Service. Several types of human-related disturbance have been observed at several of the populations, however, the long-term effect of these perturbations on population viability is unknown (Moseley 1989). Little is known about one population of yellow sedge on the Priest Lake RD (in the peatland off of road 319, northwest of Nordman in Washington). Priest Lake 015, which occurs adjacent to the lakeshore trail just south of the mouth of Beaver Creek along Priest Lake is small and is threatened by hiker and boater trampling.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that Carex flava has a restricted distribution in Idaho. In addition to Idaho, Washington also considers yellow sedge to be of conservation concern. Along with a narrow distribution in the state, the habitat it occupies is unique, characterized by several associated species that also have a limited distribution in Idaho. Based on information reported here, I recommend that yellow sedge be placed on the Regional Foresters Sensitive Species List for the Northern Region as a Sensitive Species for Idaho and Washington.

Recommendation to the Idaho Panhandle NFs: I recommend monitoring the population of yellow sedge along the northwest shore of Priest Lake to assure that it is not trampled by hikers, boaters, or both. If found to be threatened, consideration should be given to rerouting the trail around this point to protect this sensitive plant population. Field reconnaissance should be made with the yellow sedge population in the bog just off of road 319, northwest of Nordman to determine population dynamics and to determine if management of the sight is compatible with the long-term survival of this population.

Land managers and field personnel on the Kaniksu National Forest should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens, and should include both mature fruits and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Carex leptalea Wahl.

CURRENT STATUS
USFS - R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Review
Idaho CDC Rank - G5 S1

TAXONOMY

Family: Cyperaceae (sedge)

Common Name: bristle-stalked sedge

Citation: Svenska Vet. -Akad. Handl. 24:139. 1803.

Technical Description: Stems densely clustered on slender, freely branched rhizomes, very slender, 1.5-6 dm tall, loosely erect; leaves shorter than the culms, flat or nearly so, but slender, only 0.7-1.2 mm wide; spikes solitary, 0.5-1.5 cm long, bractless, androgynous, staminate part usually short and inconspicuous; pistillate scales greenish to brownish, obtuse to acute or short-awned, distinctly shorter than the perigynia, or the lowest ones larger and more prominently awned, the scales persistent or sometimes deciduous; perigynia 1-10, appressed-ascending, often rather remote, mostly pale greenish, 2.5-4.5 mm long more or less elliptic or lance-elliptic with a narrow, often substipitate, spongy base 0.5-1.0 mm long; stigmas 3, achenes trigonous, 1.3-1.8 mm long (Cronquist 1969b).

Nontechnical Description: Stems densely clustered on slender rhizomes, stems very slender 1.5-6 dm tall, loosely erect, leaves shorter than culms, mostly flat 0.7-1.2 mm wide, spikes solitary, 0.5-1.5 cm long, male flowers at tip, perigynia 1-10, sometimes isolated from each other, pale greenish, 2.5-4.5 mm long with a much narrowed, spongy base 0.5-1.0 mm long, stigmas 3, achenes trigonous, 1.3-1.8 mm long.

Distinguishing Features and Similar Species: There are no Carex spp. similar to bristle-stalked sedge in its typical peatland habitat. No other sedge from these habitats has only one spike terminating the fertile shoots. The much narrowed base of the perigynium is also a distinguishing characteristic. Stems are often clustered with many emerging from a small area. This species is easily overlooked because it is growing in the understory of other sedge species. See Appendix 1 for a line drawing of bristle-stalked sedge.

DISTRIBUTION

Range: Throughout its range bristle-stalked sedge is a species of sphagnum bogs, swamps, lake shores, and wet, low ground, from

lowlands to moderate elevations in the mountains. It ranges from Labrador to Alaska, south to Florida, Texas, Colorado, Montana, Idaho, Oregon, and the northern coast of California.

In Idaho, bristle-stalked sedge is known from Bonner and Boundary counties in seven populations. Six of these populations are known from lands managed by the Kaniksu NF. One population is located at Perkins Lake on the Bonners Ferry RD. The remaining six populations occur in the Priest River Valley in Bonner Co., five of which are located on the Priest Lake RD. Blue Lake contains the only site not on FS lands in the Priest River Valley. This population is located on the lake margins on private land.

The only location for bristle stalked-sedge documented on the Priest Lake RD (and Idaho) before 1991 was at Potholes RNA 001. During 1991, four more populations of bristle-stalked sedge were discovered on the Priest Lake RD. All are rather large populations, indicating that it was likely overlooked by previous field investigators. The additional populations are located in the following areas:

- -Packer Meadows, 6 miles north of Nordman
- -East Fork of Packer Creek Peatland, 5.5 miles north of Nordman
- -Reeder Creek, 2 miles west of Nordman
- -Armstrong Meadows, 1 mile west of Upper Priest Lake.

See Appendix 2 for mapped locations of bristle-stalked sedge on the Priest Lake RD.

Carex leptalea was historically documented at Hager Lake (Rumely 1956) and at Huff Lake (Karg 1974) but is thought to be extirpated at these sites. This indicates that bristle-stalked sedge may be sensitive to changes in one or more environmental factors. Consequently, the long-term viability of populations of this species should not be taken for granted due to their size and relative vigor.

Habitat and Associated Species: Throughout its range, bristle-stalked sedge is a species of peatland habitats. It is not known from any bog or floating mat habitats on the Priest Lake RD. It seems to be a predictable member of peatland communities dominated by Carex lasiocarpa on stable substrates as described by Boggs et al. (1990). It also seems to be associated with two other communities described by Boggs et al., the Carex rostrata community, and the Spiraea douglasii community. It seems to be most common in ecotonal areas between two or more of these community types. Other associated species include Betula glandulosa, Carex limosa, C. canescens, C. cusickii, and Eriophorum polystachion. Without exception, bristle-stalked sedge occurs with one or more other Region One FS Sensitive Plant Species, including C. paupercula, Dryopteris cristata, Salix

pedicellaris, and Trientalis arctica. See Appendix 3 for list of Sensitive Plant Species and community types occurring in peatlands that support C. leptalea.

CONSERVATION STATUS

Conservation Status - Idaho: Bristle-stalked sedge has only recently become a species of conservation concern in Idaho. Intensive surveys of likely peatland habitats on the Kaniksu NF revealed only two populations of bristle-stalked sedge prior to 1991 (Potholes RNA 001 and Perkins Lake) (Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990). During 1991, five additional populations were located in the Priest River Valley, four of which are on the Priest Lake RD in low elevation peatland habitats that were overlooked during the previous surveys.

Bristle-stalked sedge is currently on the Northern Region, FS Sensitive Species List for Idaho (USDA Forest Service 1991a).

The Idaho Native Plant Society considers bristle-stalked sedge a review species; a species which may be of conservation concern, but for which insufficient data exists upon which to base a recommendation as to appropriate classification (Idaho Native Plant Society 1991).

The Idaho CDC currently ranks bristle-stalked sedge as G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

Bristle-stalked sedge was considered for sensitive status in Montana, but was rejected because it is common (Lesica and Shelly 1991).

Threats: No extrinsic threats apparently exist to the six extant populations of bristle-stalked sedge known from the Kaniksu NF. The building of more goose nesting platforms or floating docks at Perkins Lake could endanger this and the 10 other sensitive plant populations that occur there. Further management activities at Perkins Lake should proceed only after considering the impact on these sensitive plant populations. Additionally, bristle-stalked sedge is apparently extirpated at two historical sites on the Priest Lake RD, indicating that this species may be vulnerable to subtle changes in one or more environmental factors.

Management Implications: Current management practices appear to be compatible with the long-term survival of the six extant

populations of bristle-stalked sedge on the Kaniksu NF. However, any management activities planned for sites supporting this species should be carefully reviewed for their impact on this and other Region One Sensitive Plant Species found in these sites.

ASSESSMENTS AND RECOMMENDATIONS

Summary: Bristle-stalked sedge is known from seven sites in northern Idaho, including six sites on the Kaniksu NF. Only two sites were known prior to 1991. During 1991, bristle-stalked sedge was found in several peatland habitats that were overlooked during recent, intensive surveys of such habitats on the Kaniksu NF. All populations are large and vigorous, and are currently not threatened by management activities. The fact that two historical populations of bristle-stalked sedge are now thought to be extirpated raises some concern over this species' vulnerability to slight changes in one or more environmental factor.

Recommendations to the Regional Forester: Bristle-stalked sedge is currently on the Regional Forester's Sensitive Species List for Idaho. Based on information presented here, it is apparent that bristle-stalked sedge is a species of limited distribution in Idaho. Although indications are that it was largely overlooked during intensive surveys of peatland habitats on the Kaniksu NF in the recent past, it is apparent that its occurrence is not so wide to warrant rejecting it as a Sensitive Species. I, therefore, recommend that bristle-stalked sedge remain on the Regional Forester's Sensitive Species List for Idaho.

Recommendation to the Idaho Panhandle NFs: Six populations of bristle-stalked sedge are known from the Kaniksu NF. Five of these populations are located on the Priest Lake RD, one on the Bonners Ferry RD. Only one population (Perkins Lake on the Bonners Ferry RD) has been exposed to recent threats in the form of construction of a floating dock and goose nesting platforms adjacent to portions of this population. Future management activities such as these should be carefully evaluated for their effect on this and ten other Sensitive Plant populations that occur at this site.

Land managers and field personnel on the Kaniksu NF should be informed of the possible occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both mature fruits and rhizomes. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should also be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Carex paupercula Michx.

CURRENT STATUS USFS - R1 - Sensitive
R6 - Sensitive
USFWS - None
Idaho Native Plant Society - Priority 2
Idaho CDC Rank - G5 S2

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name: Poor sedge

Citation: Flora of Boreal America 2:172. 1803

Technical Description: Stems 1.5-7 dm tall, loosely clustered in small tufts on short or long rhizomes, phyllopodic, and with the remains of old leaves commonly persistent around the base; roots covered with a yellowish-brown, felty tomentum; leaves flat, 1-3 mm wide, glabrous; staminate spike solitary, terminal, 0.7-1.5 cm long; pistillate spikes 1-4, not crowded, nodding on slender peduncles, often with a few staminate flowers at the base, 7-15 mm long, the lowest one subtended by a leafy bract 2-10 cm long, this sheathless or with only a short sheath up to about 4 mm long; bracts of the other pistillate spikes more or less reduced; pistillate scales light to dark brown, often with green midstripe, generally longer and narrower than the perigynia and tapering to a long, narrow point, sometimes with a short (to 1 mm) awn; perigynia pale, commonly greenish or stramineous, glabrous but densely papillate, elliptic to ovate, somewhat compressed, with prominent marginal nerves and 3-6 evident to obscure nerves on each face, 2.2-3.1 (3.8) mm long, beakless or with a very short beak only 0.1 mm long; stigmas 3; achene trigonous, 1.4-1.9 mm long, rather loosely enveloped in the perigynium, the upper one-eighth to one-fifth of which is empty (Cronquist 1969b).

Nontechnical Description: Stems loosely clustered in small tufts on short or long rhizomes, mostly 0.5-2 feet tall, lowest leaves not strongly reduced to scales, and remains of old leaves commonly persistent around the base; the rhizomes are covered with a yellowish-brown felty covering of wooly hairs. Smooth and shiny leaves are flat, and 1-3 mm wide. A solitary terminal spike, 0.7-1.5 cm long, bears only staminate flowers. The 1-4 lateral spikes are mostly pistillate, 0.7-1.5 cm long, not crowded, and are nodding on slender peduncles; some staminate flowers are often present at the base of the spike. The lowest spike is subtended by a leafy bract 2-10 cm in length, which is more or less sheathless (Caicco 1988). See Appendix 1 for a line drawing of poor sedge.

Distinguishing Features and Similar Species: Poor sedge is similar

to the more common C. limosa, with which it can be found growing in northern Idaho. C. limosa differs in having its lowest leaves strongly reduced to scales, leaves which tend to be channeled, pistillate spikes 1-2.5 cm in length; and the pistillate flowers sometimes have a few staminate flowers at the tip, but never at the base.

DISTRIBUTION

Range: Poor sedge is distributed throughout the boreal regions of the Northern Hemisphere. In the western part of the North American continent, it occurs south at increasing elevations to Colorado, Utah, northern Idaho, and northeastern Washington. The Northern Region Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring within the Northern Region in Montana and Idaho. It is rare in Idaho, Washington, and Montana. Ten populations of poor sedge are known in Idaho, nine occur on the Kaniksu NF. Six populations of poor sedge are known from the Bonners Ferry RD. Three populations of poor sedge are known from the Priest Lake RD, including two that were discovered in 1991. The previously documented population of poor sedge is at Potholes RNA 002, which was discovered there in 1982. The two populations discovered during 1991 are at Reeder Creek 007 and at Kalispell Bay Carr 008. One additional population was discovered at Chipmunk Rapids Pothole, which is managed by Idaho Department of Lands, and is located adjacent to the Priest River approximately 1.5 miles south of the Dickensheet Junction. All three populations on the Priest Lake RD are quite small, consisting of no more than 100 individuals. See Appendix 2 for mapped locations of poor sedge on the Priest Lake RD.

Habitat and Associated Species: Throughout its range, poor sedge is restricted to sphagnum bogs or mossy, wet microhabitats in extensive shrub carr wetlands. All known Idaho sites are from sphagnum bogs where its associates include Carex scopulorum, C. limosa, C. muricata, Menyanthes trifoliata, Potentilla palustris, Drosera rotundifolia, Eriophorum chamissonis, and Kalmia microphylla. All Idaho populations of poor sedge are sympatric with one or more plants considered Sensitive in Idaho, including Carex leptalea, C. buxbaumii, C. flava, Trientalis arctica, and Gaultheria hispidula. See Appendix 3 for a list of Sensitive Species and wetland community types occurring at the three sites that support poor sedge on the Priest Lake RD.

CONSERVATION STATUS

Conservation Status - Idaho: Poor sedge was only recently considered of conservation concern in Idaho. Poor sedge is listed as a Sensitive Species on the Northern Region Sensitive Species List for Idaho and Washington (USDA Forest Service 1991a).

Despite rather intensive floristic surveys of suitable habitats on the Kaniksu NF in recent years, only 10 populations of poor sedge have been found (Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990).

The Idaho Native Plant Society considers poor sedge a Priority 2 species (Idaho Native Plant Society 1991). The Priority 2 category of the Idaho Native Plant Society list refers to taxa likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to its population decline or habitat degradation or loss continue.

The Idaho CDC currently ranks poor sedge as G5 S2 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S2 = Imperiled because of rarity or because of other factors demonstrably making it vulnerable to extirpation [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

MONTANA - Ranked S1 = Taxon critically imperiled in Montana because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction (Lesica and Shelly 1991). It is on the Northern Region Sensitive Species List as a Sensitive Species for Montana (USDA Forest Service 1991a).

WASHINGTON - Sensitive = Taxon that is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats (Washington Natural Heritage Program 1990). It is also a Region Six Forest Service Sensitive Plant Species for Washington (USDA Forest Service 1991b).

Threats: No apparent threats exist to the three populations of poor sedge on the Priest Lake RD. Potholes 002 is located within a Research Natural Area. The other two populations (Reeder Creek 007 and Kalispell Bay Carr 008) are located in rather extensive, shrub-dominated wetlands which are too inhospitable for most potential management activities. Two populations on the Bonners Ferry RD, along Cow Creek 004 and Grass Creek 003 continue to be threatened by trampling and grazing by cows due to the location of these populations within grazing allotments (Moseley 1989).

Management Implications: Current management practices of the three populations of poor sedge on the Priest Lake RD are compatible with their long-term viability. The effect of cattle grazing on the poor sedge population is unknown, but the Allotment Management Plans for Grass Creek and Cow Creek on the Bonners Ferry RD should give special consideration to the viability of poor sedge, and the four other FS Sensitive Species populations located within the meadows along Cow Creek. A proposed management plan and long-term monitoring project submitted by the Idaho CDC to the Bonners Ferry

RD for the Cow Creek could address some of the long-term viability questions of these populations in relation to cattle grazing and timber harvesting which was to occur in adjacent stands during the winter of 1991-92.

ASSESSMENT AND RECOMMENDATIONS

Summary: Poor sedge is known from only ten sites in Idaho; nine of which are administered by the Kaniksu NF. Three of these populations are located on the Priest Lake RD; six on the Bonners Ferry RD. The three populations on the Priest Lake RD are relatively small, however, the long-term viability prospects are good for these populations, as they are relatively undisturbed. Two of the six populations of poor sedge on the Bonners Ferry RD occur within cattle grazing allotments and are threatened by grazing and trampling by cows (Moseley 1989). Poor sedge is considered to be of conservation concern in both Montana and Washington.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that poor sedge has a restricted distribution in Idaho, with only ten populations known in the Northern Region, nine of which occur on the Kaniksu NF. In addition to Idaho, Washington and Montana also consider poor sedge to be of conservation concern. Along with a narrow distribution in the state, the habitat poor sedge occupies is unique, characterized by several associated species that also have a limited distribution in Idaho. Based on information reported here, I recommend that poor sedge remain on the Regional Foresters Sensitive Species List for the Northern Region in Idaho.

Recommendation to the Idaho Panhandle NFs: Current management practices are compatible with the long-term viability of the three populations of poor sedge on the Priest Lake RD. The Allotment Management Plan for the allotment that includes the Cow Creek population of poor sedge on the Bonners Ferry RD should give special consideration to the habitat of poor sedge and the four other FS Sensitive Plant Species populations and one Sensitive Animal Species population (the northern bog lemming) that occur there. Monitoring of these sensitive plant populations is warranted in order to establish the current trend. The management plan and long-term monitoring project proposed by the Idaho CDC to the Bonners Ferry RD for Cow Creek could ascertain the current trends of the Sensitive plant and animal populations found in the Cow Creek Meadows.

Land managers and field personnel on the Kaniksu NF should be informed of the possible occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens, and should include both mature fruits and roots. Specimens should be sent to the University of Idaho Herbarium for

verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Cicuta bulbifera L.

CURRENT STATUS USFS - R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Sensitive
Idaho CDC Rank - G5 S1

TAXONOMY

Family: Apiaceae [Umbelliferae (Celery)]

Common Name: Bulb-bearing waterhemlock

Citation: Sp. Pl. 255. 1753.

Technical Description: Plants generally single-stemmed, 3-10 dm tall, mostly relatively slender, not much thickened at the base and sometimes without thickened roots; leaves all cauline, the middle and lower ones more or less dissected, with narrowly linear, entire or obscurely few-toothed segments mostly 0.5-1.5 mm wide and 0.5-4 cm long, the upper ones more or less reduced, with fewer segments, or undivided, many of them bearing one or more axillary bulbils; umbels frequently wanting, or present but not maturing fruit, the rays mostly 1-2.5 cm long; fruit orbicular, 1.5-2 mm long, constricted at the commissure, the ribs broader than the narrow intervals (Cronquist 1961).

Nontechnical Description: Bulb-bearing waterhemlock has a wispy, easily overlooked habit. Its thin erect stems, to approximately 2 feet tall, have dissected leaves with very narrow segments. In a vegetative state, bulb-bearing waterhemlock blends in with the numerous graminoid species of its habitat, making field inventory before July difficult. The primary mode of propagation is by bulbils found in the axils of the upper, reduced leaves; the entire inflorescence may be lacking. If it is present, the light-colored flowers produce fruits that never mature and produce seeds. See Appendix 1 for a line drawing of bulb-bearing waterhemlock.

Distinguishing Features and Similar Species: Bulb-bearing waterhemlock is easily distinguished from all other members of the Apiaceae that occur in northern Idaho bogs. It has narrow leaf segments, the upper ones producing purplish bulbils.

DISTRIBUTION

Range: Bulb-bearing waterhemlock is distributed from Newfoundland to Virginia, west to Saskatchewan, northern Alberta, British Columbia, southern Oregon and Nebraska. In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987)

lists it as occurring in Idaho, Montana, North Dakota and South Dakota.

It is currently known from 10 sites in two areas of Idaho: one site on the Targhee National Forest along the Henrys Fork 004, and nine sites in Bonner and Boundary counties. Only seven of the nine panhandle populations have been seen in recent years and two are considered extirpated (Stampede Lake 001 and "Sandpoint" 007). The rest of the locations of bulb-bearing waterhemlock are as follows:

Lee Lake 002 - private land, east of Coolin
-three plants seen in 1987 (Caicco 1987), none seen since despite intensive surveys (Bursik 1990).
Kaniksu Marsh RNA 003 - Kaniksu NF, Priest Lake RD
-seen in 1985 but not seen since despite intensive surveys (Bursik 1990).
Perkins Lake 005 - Kaniksu NF, Bonners Ferry RD
-approximately 100 individuals seen in 1991, part of population recently destroyed by construction of floating dock through mat vegetation.
Lost Lake 006 - Kaniksu NF, Sandpoint RD
-two plants seen in 1989 (Moseley 1990).
Blue Lake 008 - private land, northeast of Priest River, ID
-200 or more individuals observed in 1991 growing on lake margins.
Dawson Lake 009 - Kaniksu NF, Bonners Ferry RD
-100 or more individuals observed in 1991 growing on floating mats within the lake, recent construction of goose nesting platforms on mats could threaten parts of this population.
Chase Lake 010 - Idaho Department of Lands/private
-approximately 25 individuals growing on lake margins.

See Appendix 2 for the mapped location of Kaniksu Marsh RNA and Perkins Lake on the Bonners Ferry RD.

Habitat and Associated Species: Throughout its range, bulb-bearing waterhemlock can be found in marshes, bogs, wet meadows and shallow standing water. In Idaho it is usually found on the very margins of floating sphagnum moss mats on lake edges. It can usually be found in the Carex lasiocarpa community described by Boggs et al. (1990), but usually only when this community occurs on a floating mat. Other associated species include Carex rostrata, C. cusickii, Carex limosa, Drosera rotundifolia, Dulichium arundinaceum and Potentilla palustris.

At Lost Lake 006 on the Sandpoint RD, it occurs in a Alnus incana/sphagnum community where the two individuals seen in 1989, occur on sphagnum-covered hummocks formed around the base of Alnus individuals in the Alnus incana wetland habitat type (Boggs et al.

1990). At Dawson Lake 009 it occurs in a floating Typha latifolia/Carex rostrata community that appears to be intermediate between the two community types dominated by the T. latifolia and C. rostrata alone (Boggs et al. 1990).

Although bulb-bearing waterhemlock seems to occur in a variety of wetland communities, its occurrence in northern Idaho in any wetland community is far from predictable. At most sites it occurs with several other Region One Forest Service Sensitive Plant Species. See Appendix 3 for a list of sensitive plants and community types occurring at Kaniksu Marsh RNA 003.

CONSERVATION STATUS

Conservation Status - Idaho: Caicco (1987) first mentioned that bulb-bearing waterhemlock may be of conservation concern in Idaho. Prior to 1991, six populations were known in Idaho, two of which are now thought to be extirpated (Moseley 1989; 1990). Four new populations were located during 1991 (listed above, including Henrys Fork 004).

Bulb-bearing waterhemlock is on the Northern Region Forest Service Sensitive Species List for Idaho (USDA Forest Service 1991a).

The Idaho Native Plant Society considers bulb-bearing waterhemlock a Priority 2 species (Idaho Native Plant Society 1991). The Priority 2 category refers to species likely to be classified as Priority 1 in the foreseeable future in Idaho, if factors contributing to their population decline or habitat degradation or loss continue.

The Idaho CDC currently ranks bulb-bearing waterhemlock as G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

BRITISH COLUMBIA - R3 = Taxa that have no distinct geographical range or distribution, usually scattered in the province, in isolated populations consisting of small numbers of plants (Straley et al. 1985).

MONTANA - Considered for listing but rejected (Lesica and Shelly 1991).

OREGON - Apparently extirpated from Oregon (Oregon Natural Heritage Data Base 1991).

WASHINGTON - Sensitive = Taxon that is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats (Washington Natural Heritage Program 1990).

Straley et al. (1985) also list bulb-bearing waterhemlock as rare in the Northwest Territories and the Yukon.

Threats: No extrinsic threats exist to the widely disjunct Henrys Fork 004 population. The two Bonners Ferry RD populations are threatened by current management practices that have included the construction of a floating dock through part of Perkins Lake 005 along with the erection of goose nesting platforms near other portions of this population (Moseley 1989). Dawson Lake 009 may also be threatened by the erection of goose nesting platforms on floating mats within the lake which support bulb-bearing waterhemlock. All populations are small, making any of these populations vulnerable to disturbance as a result of seemingly benign activities such as the construction of docks and goose platforms. No threats were apparent at any of the other populations, although several of these populations, including Lee Lake 002, Kaniksu Marsh 003, and Lost Lake 006, consist of precariously few individuals and only the Lost Lake population has been observed since 1989.

Management Implications: Current management appears compatible with the long-term viability of the bulb-bearing waterhemlock populations on the Priest Lake and Sandpoint RDs. Reconnaissance should be made, however with the only known population on the Priest Lake RD (Kaniksu Marsh RNA 003) which has not been seen since 1985 despite intensive floristic surveys of this site since that time (Bursik 1990, Rabe et al. 1990). Census of flowering stems should be made to determine population trends at this site. Management practices at the two known sites of occurrence on the Bonners Ferry RD (Perkins Lake 005 and Dawson Lake 009) need to be reviewed for their potential impact on the Cicuta bulbifera and several other Sensitive Plant populations found at Perkins Lake.

ASSESSMENT AND RECOMMENDATIONS

Summary: Bulb-bearing waterhemlock, while apparently common in Montana, is rare in British Columbia, Idaho and Washington. It is apparently extirpated from Oregon. Of the ten populations known in Idaho, two are likely extirpated and three consist of precariously few individuals. Two of these populations have not been found despite recent, intensive floristic surveys at these sites (Lee Lake 002 and Kaniksu Marsh RNA 003). All populations are small, consisting of from two to approximately 200 individuals. Four populations are administered by the Kaniksu NF, one each by the Priest Lake and Sandpoint RDs and two by the

Bonners Ferry RD. Bulb-bearing waterhemlock occurs in a sensitive habitat and is sympatric with from one to ten other rare plant species (see Appendix 3, Kaniksu Marsh RNA). The construction of a floating dock and goose nesting platforms on the margins of Perkins Lake, and the erection of goose nesting platforms on floating mats within Dawson Lake may have destroyed some individuals in each of those populations.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that bulb-bearing waterhemlock has a restricted distribution in Idaho. Only ten populations are known despite considerable floristic inventory of wetlands in the northern part of the state recently (Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990; Moseley et al. 1991). In addition to Idaho, British Columbia and Washington also consider bulb-bearing waterhemlock to be of conservation concern, while it is apparently extirpated in Oregon. Along with a narrow distribution in the state, the habitat it occupies is unique, characterized by several associated species that also have a limited distribution in Idaho. Based on information reported here, I recommend that bulb-bearing waterhemlock remain on the Regional Foresters Sensitive Species List for the Northern Region as a Sensitive Species for Idaho.

Recommendation to the Idaho Panhandle NFs: Bulb-bearing waterhemlock has a limited distribution in Idaho and occurs in a unique habitat. Four populations occur on the Kaniksu NF, one each on the Priest Lake and Sandpoint RDs, and two on the Bonners Ferry RD. Perkins Lake 005 on the Bonners Ferry RD, is the one of the largest populations known in the state (approximately 100 individuals). This population, which occurs on a very unstable floating sphagnum mat, should be carefully managed, as this type of habitat is particularly sensitive to disturbance. Recent construction of a floating dock through the floating mat has destroyed part of Perkins Lake 005. Ten other Region One FS Sensitive Plant Species occur in the vicinity of the bulb-bearing waterhemlock population at Perkins Lake. Moseley (1989) recommended a special management designation, such as Special Interest Botanical Area, for Perkins Lake due to its botanical uniqueness. I suggest that his recommendation be again considered for Perkins Lake. The construction of the floating dock which has destroyed parts of several sensitive plant populations at this site could be used as an interpretive "trail" at this site to showcase the biodiversity value of Perkins Lake for the general public.

Reconnaissance should be made as soon as possible with Kaniksu Marsh RNA 003 to determine population trends and to assure that no management activities in adjacent areas are currently threatening this small population that has not been relocated since 1985.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas.

Possible sightings of this plant should be documented by specimens, and should include both flowers, leaves and roots. Specimens should be sent to the University of Idaho Herbarium for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Dryopteris cristata (L.) Gray

CURRENT STATUS USFS - R1 - Sensitive
R6 - Sensitive
USFWS - None
Idaho Native Plant Society - Sensitive
Idaho CDC Rank - G5 S2

TAXONOMY

Family: Dryopteridaceae (Wood Fern)

Common Name: Crested shield-fern

Citation: Gray Man. 631. 1848.

Technical Description: Leaves clustered on a short, horizontal or ascending rhizome, subdimorphic, the fertile ones deciduous, larger and tending to be erect, the sterile ones evergreen, smaller and more spreading; petiole shorter than the blade; sterile blades mostly 1.5-3 dm long, the fertile one mostly 2.5-6 dm, both sorts one quarter to half as wide as long, appearing much less dissected than other species of the genus in Idaho, the primary pinnae pinnatisect, with a broad, foliaceous midstripe commonly 2-5 mm wide; pinnae several or numerous, all approximate or the lower ones more remote, up to 10 cm long and 3.5 cm wide, the largest ones near or a little below the middle of the blade; pinnules evidently toothed, at least distally, relatively short and broad, the larger one often more than 5 mm wide (Cronquist 1969c).

Nontechnical Description: Crested shield-fern is a pale green fern with dimorphic leaves; the inner leaves of a rosette are fertile (bearing indusia on the underside), taller, deciduous, and more erect than the outer, evergreen, sterile leaves. See Appendix 1 for a line drawing of crested shield-fern.

Distinguishing Features and Similar Species: Crested shield-fern differs from other members of the genus in Idaho, by having leaf blades that are less dissected. It was seen growing in close proximity to lady-fern (Athyrium felix-femina) at several localities, including Lost Lake on the Sandpoint RD. Crested shield-fern can be distinguished from lady-fern by its narrower, dimorphic, leaf blades that are less dissected (Moseley 1990).

DISTRIBUTION

Range: Crested shield-fern is distributed from Newfoundland to southern British Columbia, south to North Carolina, Tennessee, West Virginia, Ohio, Indiana, northern Illinois, Iowa, Kansas, Minnesota, North Dakota, Manitoba, Saskatchewan, western Montana, and northern Idaho (Lellinger 1985). In the Northern Region, the

Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho, Montana, and North Dakota. Five populations (one is historical) are known in Montana, from Flathead, Lake, and Missoula counties.

In Idaho, crested shield-fern is known to occur at eleven sites in Bonner and Boundary counties. Nine populations of crested shield-fern occur in the Priest River drainage, with parts or all of six populations occurring on land administered by the Priest Lake RD. Three populations are known from state and/or private land in the Priest River Valley: Chase Lake 002, Blue Lake 010, and Chipmunk Rapids Pothole 012. One site is known from the Sandpoint RD at Lost Lake 008, and one from the Bonners Ferry RD at Perkins Lake 009.

Two populations of crested shield fern on the Priest Lake RD occur within Research Natural Areas (Kaniksu Marsh RNA 004 and Potholes RNA 005). The other four sites supporting crested shield-fern feature a mosaic of wetland vegetation featuring shrub-dominated carr wetlands intermixed with sedge and sphagnum-dominated habitats. These sites include Hager Lake 001, Reeder Creek 006, Armstrong Meadows 007, and Kalispell Creek Carr 011. Additionally one historical population was reported for Pend Oreille Co., WA on the Priest Lake RD at Granite Pass 005, 16 miles north of Nordman. See Appendix 2 for the mapped location of crested shield-fern on the Priest Lake RD.

Habitat and Associated Species: Most of the populations of crested shield-fern in Idaho occur on sphagnum at the base of Alnus incana or Spiraea douglasii individuals in the margins of communities dominated by those two species as described by Boggs et al. (1990). The ecotonal communities supporting crested shield-fern have been variously described as Alnus incana/Carex rostrata shrub carr or alder swamp/sphagnum bog (Moseley 1989). On the Priest Lake RD, crested shield-fern is usually associated with one to several Region One Sensitive Plant Species, including Carex leptalea (Potholes, Reeder Cr., Armstrong Meadows), Trientalis arctica (Potholes, Reeder Cr., Armstrong Meadows, Kaniksu Marsh), Gaultheria hispidula (Potholes, Reeder Cr., Armstrong Meadows, Kaniksu Marsh), and others (See Appendix 3). Other associates include Carex limosa, Carex cusickii, Athyrium felix-femina, Scutellaria galericulata, and Potentilla palustris.

CONSERVATION STATUS

Conservation Status - Idaho: When Johnson (1981b) first evaluated crested shield-fern for the Idaho rare plant project of the Idaho Natural Areas Council, he recommended it as State Threatened, based on four sites known. He later reevaluated it (Johnson 1983) and recommended a State Watch List status on the basis of several new sites, noting that it seemed predictably present in, or surrounding sphagnum bogs in the Priest and Kootenai river drainages. Caicco (1987) noted that he knew of seven sites in the

Priest Lake drainage, and agreed that it was of predictable occurrence. In the meantime, however, several studies, involving floristic inventory of a number of suitable sites on the Kaniksu NF have revealed the presence of only four more populations (Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990).

The Idaho Native Plant Society considers crested shield-fern a Sensitive species (Idaho Native Plant Society 1991). The Sensitive category of the Idaho Native Plant Society list refers to taxa with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized if current land use practices continue.

The Idaho CDC currently ranks crested shield-fern as G5 S2 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S2 = Imperiled in Idaho because of rarity or because of other factors demonstrably making it very vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

BRITISH COLUMBIA - R1 = Taxa that are represented by a single or few known populations, usually with only a few individuals in the populations (Straley et al. 1985).

MONTANA - Ranked S1 = Taxon critically imperiled in Montana because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction (Lesica and Shelly 1991).

WASHINGTON - Sensitive = Taxon that is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats (Washington Natural Heritage Program 1990).

Straley et al. (1985) also list crested shield-fern as rare in Alberta, Iowa, Illinois, and Tennessee; threatened in North Carolina; extirpated from Texas.

Threats: No threats are known for crested shield fern populations in Idaho. All crested shield-fern populations in Idaho, however, are relatively small and localized and occur in sensitive habitats.

Management Implications: Current management of crested shield fern populations on the Kaniksu NF, including the six populations on the Priest Lake RD, appears compatible with the long-term viability of these populations. All populations are small, however, consisting of very few individuals, occurring in sensitive habitats with one to several other FS sensitive plant species. Special management consideration should be given to

these habitats to assure their protection.

ASSESSMENT AND RECOMMENDATIONS

Summary: Crested shield-fern has a restricted distribution in Idaho, occurring mainly in sphagnum bogs. At almost all sites it is sympatric with one to several plant taxa considered rare in Idaho. Of the eleven populations known in Idaho, eight occur, at least partially, on the Kaniksu National Forest. No immediate threats to the Sandpoint and Bonners Ferry RDs populations were observed in 1989 (Moseley 1989), and none were observed in 1991 for the six populations on the Priest Lake RD. The populations of crested shield-fern are small and narrowly distributed, making them vulnerable to extirpation.

Recommendations to the Regional Forester: Based on distribution and abundance data presented here, it appears that crested shield-fern has a restricted distribution in Idaho. Only eleven populations are known, despite considerable floristic exploration of northern Idaho wetlands recently. Along with a narrow distribution in the state, the habitat it occupies is unique, characterized by several associated species that also have a limited distribution in Idaho. In addition to Idaho, every state or province in the region (British Columbia, Washington, Montana, and Alberta) considers crested shield-fern to be of conservation concern. Based on this information, I recommend that it remain on the Regional Foresters Sensitive Species List for the Northern Region.

Recommendation to the Idaho Panhandle NFs: Crested shield-fern has a limited distribution in Idaho and occurs in a unique habitat. One population is known from the Bonners Ferry RD at Perkins Lake, consisting of four individuals. The population at Lost Lake on the Sandpoint RD is larger, with 50 to 100 individuals in the population. The populations on the Priest Lake RD range in size from one individual to approximately 100 individuals. No immediate threats were observed at any of these sites, however, they should be periodically monitored to ensure that they remain viable.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both fertile and sterile leaves and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Epilobium palustre L.

CURRENT STATUS USFS - R1 - Sensitive
USFS - R4 - None (Recommended as Sensitive)
USFWS - None
Idaho Native Plant Society - Priority 2
Idaho CDC Rank - G5 S1

TAXONOMY

Family: Onagraceae (Evening-primrose)

Common Name: Swamp willow-weed

Citation: Sp. Pl. 348. 1753.

Technical Description: Simple to branched perennial 1-4 (8) dm tall, from slender rhizomes which often end in small turions, finely canescent-strigillose throughout or only sparsely so below; leaves mainly opposite, sessile or subsessile, entire to slightly denticulate, obtuse, linear to lanceolate or narrowly oblong, (1) 2-6 cm long, mostly 4 (8) mm broad; inflorescence loosely racemose to paniculate; pedicels slender, 1-4 cm long; free hypanthium 1-1.5 mm long, the sepals about twice as long; petals white to pinkish, notched, 3-5 mm long; styles shorter than the petals; stigma about 1 mm long, 4-lobed, but the lobes usually completely coalescent; capsule linear, 3-6 cm long, usually canescent; seeds minutely papillate, the coma white to tawny (Hitchcock 1961a).

Nontechnical Description: Swamp willow-weed has an erect, simple to few-branched stem that is approximately 1 to 1.5 feet tall. Turions (small white bulbs) are present at the lower stem/upper root interface. The flowers are small, generally light pink to white, and are borne on the end of the branches and stem. The leaves are narrow and somewhat revolute (margins rolled downward). The entire plant has a pale appearance due to a fine covering of small, straight, appressed hairs all pointing in the same direction. See Appendix 1 for a line drawing of swamp willow-weed.

Distinguishing Features and Similar Species: Swamp willow-weed is readily distinguished from other willow-weeds occurring in the bogs of northern Idaho (E. glandulosum, E. glaberrimum, E. alpinum, and E. watsonii) by its grayish-strigillose appearance. In addition, E. glaberrimum, E. alpinum, and E. watsonii lack turions.

DISTRIBUTION

Range: Swamp willow-weed is distributed from Alaska to the Cascades of central Washington, east to the Atlantic coast and south in the Rockies to Colorado. In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho, Montana, and South Dakota.

In Idaho, swamp willow-weed is known from eleven sites in three widely disjunct regions: seven populations in the panhandle in Bonner and Boundary counties, one population along the East Fork of the Salmon River in Custer Co., and from three populations in the Island Park and Henry's Lake areas in Fremont Co. Five of the populations in northern Idaho are located on the Kaniksu NF. One population is at Perkins Lake 003 on the Bonners Ferry RD and the remaining four populations are located in the following areas on the Priest Lake RD:

- -Kaniksu Marsh RNA 002
- -Hager Lake 004 (probably extirpated, not seen since 1956 despite intensive floristic inventory of area)
- -Reynolds Creek 010
- -Bismark Work Center 011.

Two additional populations are located in the Priest River Valley on land managed by the Idaho Department of Lands at Chase Lake 001 and at Chipmunk Rapids Pothole 009, just south of the Dickensheet Junction. All of these populations are rather small consisting of not more than 100 individuals distributed over a very small area within each wetland. See Appendix 2 for mapped locations of swamp willow-weed on the Priest Lake RD.

Habitat and Associated Species: All populations of swamp willow-weed in Idaho occur in open wetland communities with a saturated, organic substrate. On the Priest Lake RD, it is known from the Carex lasiocarpa-dominated community described by Boggs et al. (1990). Moseley et al. (1991) noted that it occurs in a Carex nebrascensis-dominated community (Youngblood et al. 1985) in the Island Park area. Other associated species include Carex rostrata, C. cusickii, C. buxbaumii, Carex limosa, Drosera rotundifolia, and Potentilla palustre. All populations of swamp willow-weed in Idaho are associated with several other Sensitive Plant Species (See Appendix 3).

CONSERVATION STATUS

Conservation Status - Idaho: The rarity of swamp willow-weed in Idaho was recently brought to our attention as a result of floristic studies of Idaho's peatlands (Bursik 1990). Based on his data swamp willow-weed was recommended for inclusion on the rare plant list for the state at the annual rare plant meeting in

1989. Swamp willow-weed is currently a Forest Service Sensitive Species in Region 1 in Idaho (USDA Forest Service 1991a).

It has been recommended for sensitive status in Region 4, due to the discovery of three populations of swamp willow-weed in the Island Park area on the Targhee NF. One population is on land managed by the Targhee NF (Moseley et al. 1991).

Swamp willow-weed is a Priority 2 species for Idaho (Idaho Native Plant Society 1991). Priority 2 includes those species that are likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to their population decline or habitat degradation or loss continue.

The Idaho CDC currently ranks swamp willow-weed as G5 S1 (G5 = Demonstrable secure globally, though it may be quite rare in parts of its range, especially at the periphery; S1 = critically imperiled in Idaho, because of extreme rarity and possibly because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Threats: No extrinsic threats currently exist to the three known populations of swamp willow-weed on the Priest Lake RD. The population at Hager Lake 004 has likely been extirpated for unknown reasons. The population at Perkins Lake 003 on the Bonners Ferry RD has been partially destroyed by the construction of a floating dock through a portion of this population. The erection of several goose nesting platforms adjacent to this population may also have threatened some individuals (Moseley 1989). Future consideration should be given to this and 10 other Sensitive Plant populations at Perkins Lake prior to wildlife habitat enhancement activities.

Management Implications: Current management appears compatible with the long-term viability of the swamp willow-weed populations on the Kaniksu NF. Due to its apparent rarity and habitat sensitivity, however, it should be given special consideration in land management practices. Future plans for construction and maintenance of goose nesting platforms and docks should carefully consider vulnerability of swamp willow-weed and other Sensitive Plant populations to extirpation.

ASSESSMENT AND RECOMMENDATIONS

Summary: In Idaho, swamp willow-weed is known from 11 sites (one apparently extirpated) in three widely disjunct areas of Idaho. Five populations are located on the Kaniksu NF. All of these populations are small, consisting of 200 or less individuals. Due to the vulnerability of its habitat, and because of its association at all sites with several other Sensitive Plant Species, it deserves special consideration when making land

management decisions.

Recommendations to the Regional Forester: Based on distribution and abundance data presented here, it appears that swamp willow-weed has a restricted distribution in Idaho. Along with a narrow distribution in the state, the habitat it occupies is unique, characterized by several associated species that also have a limited distribution in Idaho. Based on this information, swamp willow-weed should remain on the Regional Foresters Sensitive Species for the Northern Region for Idaho.

Recommendations to the Idaho Panhandle NFs: Swamp willow-weed has a limited distribution in Idaho and occurs in a unique habitat. Five populations are known from the Kaniksu NF, four on the Priest Lake RD and one on the Bonners Ferry RD. One population on the Priest Lake RD has not been seen since 1957 despite intensive floristic inventory of this site since then (Bursik 1990; Rabe et al. 1990), and is likely extirpated. This indicates that swamp willow-weed is sensitive to perhaps subtle changes in one or more environmental factors which can make it vulnerable to extirpation. Future management activities such as the building of docks and the erection of goose nesting platforms which has occurred within the last three years at Perkins Lake 003 should give careful consideration to the Sensitive Plant populations occurring there and the effect of such activities on these populations. Given that the floating dock has been constructed through portions of several sensitive plant populations at Perkins Lake, I suggest that the recommendation of Moseley (1989) be reconsidered to establish this exceptional site as a Botanical Area and to use the dock for a trail and plant-viewing platform to display interpretative material on the biodiversity value of this site.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both flowers and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Gaultheria hispidula (L.) Muhl.

CURRENT STATUS USFS - R1 Sensitive
R6 Sensitive
USFWS - None
Idaho Native Plant Society - Priority 2
Idaho CDC Rank - G5 S2

TAXONOMY

Family: Ericaceae (Heath)

Common Name: Creeping snowberry

Citation: Cat. Pl. 44. 1813

Technical Description: A creeping, slender-stemmed shrub, brownish-bristly with somewhat appressed hairs on the stems, calyces, and lower surfaces of the leaves; leaves elliptic to obovate, coriaceous, entire, revolute, 4-10 mm long, petioles 1.5-2.5 mm long; flowers mostly axillary and single, subtended by 2 ovate bracts that are longer than the calyx; corolla campanulate, deeply 4-lobed; stamens 8, filaments flattened, shorter than the anthers, anthers usually with 4 very short terminal points, opening by 2 large lateral pores; berry clear white, 3-5 mm thick, surrounded by the calyx, juicy, somewhat spicy, and aromatic (Hitchcock 1959a).

Nontechnical Description: A creeping, slender-stemmed shrub, brownish-bristly with somewhat appressed hairs on the stems, calyces, and the lower surface of the elliptic to obovate leaves (Caicco 1987). See Appendix 1 for a line drawing of creeping snowberry.

Distinguishing Features and Similar Species: Two other species of Gaultheria are found in northern Idaho, and are distinguished on general leaf size, flower length, and fruit color. Gaultheria humifusa has leaves 1-2 (2.5) cm in length, flowers 3-4 mm long, and reddish fruits; it occurs at higher elevations than creeping snowberry. The second species, G. ovatifolia, has ovate, acute leaves (1.5) 2-4 cm in length, flowers 3.5-5 mm long, and bright red fruits.

In addition to these species, creeping snowberry can be confused with Vaccinium oxycoccos if flowers and fruits are lacking. The stems of the latter species lack hairs, or have very fine hairs; the acute leaves of V. oxycoccos are deep green and shining on the upper surface and grayish beneath (Caicco 1987).

DISTRIBUTION

Range: Creeping snowberry is distributed in the boreal region of North America from Labrador, west to British Columbia, and south into northern Idaho and northeastern Washington. It is considered rare in both Idaho and Washington. The Northern Region Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring within the Northern Region only in Idaho.

Nine populations are known from two widely disjunct areas in northern Idaho; seven from the Priest River valley in Bonner Co., one on the east slope of the Selkirk Mountains in Boundary Co. on the Bonners Ferry RD, and one from Bear Lake 009 in Idaho county on the Nez Perce NF, more than 200 miles south of the next nearest population. The population on the Bonners Ferry RD occurs along Smith Creek 008 near Dirt Oven Campground. Six of the seven Priest River Valley locations of creeping snowberry occur on the Priest Lake RD. Additionally, four populations of creeping snowberry are known from Pend Oreille Co., Washington, also on the Priest Lake RD.

No new populations of creeping snowberry were discovered during 1991. I revisited three of the populations during 1991 (Reeder Creek 004, Armstrong Meadows 006, and Huff Lake s.n. in WA). I also revisited the population known from Chase Lake 002, administered by Idaho Department of Lands. The Idaho populations on the Priest Lake RD are as follows:

Potholes RNA 001
Kaniksu Marsh RNA 003
Reeder Creek, west of Nordman 004
Bottle Lake RNA 005
Granite Creek, 3 miles north of Nordman 006
Armstrong Meadows, south end Upper Priest Lake 007

With the exception of Granite Creek 004, all of these populations are closely associated with one to several (up to 10) populations of other Region One FS Sensitive Plant Species including Vaccinium oxycoccos, Carex leptalea, C. paupercula, and Trientalis arctica. See Appendix 2 for mapped locations of creeping snowberry and Appendix 3 for associated Sensitive Plant Species and wetland community types found in each area.

The four populations of creeping snowberry located in the Washington portion of the Priest Lake RD are as follows (with Washington Natural Heritage occurrence codes):

Huff Lake s.n.
Meadow off of trail 241 003
Sema Meadows 004
Mountain Meadows 006

Map locations of these populations are given in Appendix 2. See Appendix 3 for associated Sensitive Plant Species and communities at Huff Lake.

Habitat and Associated Species: In northern Idaho and adjacent Washington, creeping snowberry is found growing on a variety of substrates including downed logs, stumps, mud and bare ground. It is always associated with sphagnum. The most common habitat for creeping snowberry appears to be sphagnum moss hummocks growing up the bases of trees in paludified forests or in forested margins of meadows and beneath trees in scattered raised areas within meadows (Caicco 1987). These hummocks are subjected to seasonal fluctuations in the water table, and may seem dry during certain periods of the year, while seeming saturated others. Creeping snowberry is associated with Pinus monticola, P. contorta, Tsuga heterophylla, Thuja plicata, and Picea engelmannii, which are the coniferous species most often found in the hummocky transitional, sometimes paludified forests adjacent to peatland meadows. Other species of these transitional zones include Calamagrostis canadensis, Senecio triangularis, Athyrium felix-femina, and Lysichitum americanum.

CONSERVATION STATUS

Conservation Status - Idaho: In his evaluation of creeping snowberry for the Idaho rare plant project of the Idaho Natural Areas Council, Johnson (1981c) recommended that it be placed on the State Watch List, remarking that although there was no apparent threat, the fragility of the bogs in which it is found indicates that it should be monitored. Caicco (1987) recommended that creeping snowberry be designated a Northern Region sensitive species. Creeping snowberry is currently listed as a Sensitive Species on the Northern Region Sensitive Species List for Idaho (USDA Forest Service 1991a).

The Idaho Native Plant Society considers creeping snowberry a Priority 2 species (Idaho Native Plant Society 1991). The Priority 2 category of the Idaho Native Plant Society list refers to taxa that are most likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to its decline or habitat degradation or loss continue.

The Idaho Conservation Data Center currently ranks creeping snowberry as G5 S2 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S2 = Imperiled in Idaho because of rarity or because of other factors demonstrably making it very vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

WASHINGTON - Sensitive = Taxon that is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats (Washington Natural Heritage Program 1990).

Threats: There are no apparent threats to any of the populations on the Priest Lake RD.

Management Implications: Current management appears compatible with the long-term viability of creeping snowberry on the Priest Lake RD. Due to its rarity and due to the sensitivity of its habitat, it should be given special consideration in land management planning, and known populations should monitored periodically.

ASSESSMENT AND RECOMMENDATIONS

Summary: Creeping snowberry is known from only nine sites in two widely disjunct portions of northern Idaho, despite considerable floristic exploration of wetlands in this part of the state (Caicco 1987; Moseley 1989; 1990; Bursik 1990). It is also restricted to extreme northeastern Washington where it has been found in four sites on the Priest Lake RD. No immediate threats are apparent for the ten populations of creeping snowberry on the Priest Lake RD.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that creeping snowberry has a restricted distribution in Idaho, with only eight populations known from Bonner and Boundary counties and one population from Idaho Co. This despite considerable floristic research in the region, particularly in Bonner and Boundary counties. It also has a very limited distribution in Washington, being known from only four sites in Pend Oreille Co. on the Priest Lake RD. I recommend that creeping snowberry remain on the Regional Foresters Sensitive Species List for the Northern Region as a Sensitive Species for Idaho and Washington.

Recommendation to the Idaho Panhandle NFs: In all, 12 populations of creeping snowberry are known on the Kaniksu NF. Moseley (1989) recommended that due to its rarity, limited distribution in the western U.S., and the sensitivity of its habitat, a periodic monitoring program should be established for the populations on Smith Creek 008 (Bonners Ferry RD) to establish current trends. He also recommended that because creeping snowberry occurs with three other Region One FS Sensitive Plant Species at this site, establishment of the area as a Research Natural Area would be appropriate (Moseley 1989). On the Priest Lake RD, three of the known populations of Gaultheria hispidula occur within established RNAs (Potholes 001, Kaniksu Marsh 003, and Bottle Lake 005). However, these populations, as well as the three populations I

visited during 1991, are very small and localized within the wetlands. For this reason, I suggest that a periodic monitoring program be developed to assure that management practices do not directly or indirectly threaten these populations. After the intensive wetland surveys that have occurred during the last few years on the Kaniksu NF (Caicco 1987; Moseley 1989; 1990; Bursik 1990), it appears less and less likely that new populations of creeping snowberry will be discovered.

Land managers and field personnel on the Kaniksu NF should be informed of the possible occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both flowers and stems. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Hypericum majus (Gray) Britt.

CURRENT STATUS USFS R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Priority 2
Idaho CDC - G5 S1

TAXONOMY

Family: Hypericaceae (St. John's-wort)

Common Name: Large Canadian St. John's-wort

Citation: Mem. Torr. Bot. Club 5:225. 1894.

Technical Description: Perennial with short, leafy rhizomes, the upright stems 1-5 dm tall, simple or branched above; leaves 1-3.5 cm long, lanceolate to oblong, rounded, 5- to 7-nerved; cymes inconspicuously bracteate; flowers 4-7 mm long, the petals about equal to the lanceolate sepals; stamens (10?)15-35, the filaments almost capillary, distinct; capsule 1-celled, blunt; styles 3, short; seeds yellow, about 0.5 mm long, longitudinally striate and finely transversely corrugate (Hitchcock 1961b).

Nontechnical Description: Clump-forming perennial from short rhizomes; stem straight, erect, 1-2 feet tall; leaves light green, lanceolate, opposite on the stem; the yellow petals are less than 0.5 in., scarcely exceeding the sepals, not black-dotted along the margins (as in H. perforatum); stamens less than 50. See Appendix 1 for line drawing of large Canadian St. John's-wort.

Distinguishing Features and Similar Species: Large Canadian St. John's-wort is easily distinguished from other members of the northern Idaho wetland flora by the light-green color of the foliage and the loosely clumped habit of the plant. The numerous erect stems in each clump are topped by many small, yellow flowers.

DISTRIBUTION

Range: Large Canadian St. John's-wort is distributed from British Columbia, east to Nova Scotia, southward to Pennsylvania, New Jersey, Tennessee, Iowa, Colorado, Idaho, and Washington. In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho, Montana, South Dakota, and North Dakota.

Large Canadian St. John's-wort is currently known from six recently discovered sites in Idaho and three historical sites that have not been relocated, all in the vicinity of the Kaniksu NF. Three of the populations are managed in part or entirely by the

Priest Lake RD. These three populations are Hager Lake 004, 4 miles south of Nordman, on FS and private land; Kaniksu Marsh RNA 006, approximately 1.5 miles south of the Dickensheet Junction, south of Priest Lake; and Reynolds Creek 009, which was discovered during 1991 field surveys approximately 1.75 miles south of the Priest Lake Ranger Station. Two of these populations are rather large, consisting of 200 or more individuals. Reynolds Creek 009 is a rather small population of less than 50 individuals in one small location.

Two populations of Hypericum majus are known from the Sandpoint RD; Hoodoo Lake 007 and Sand Lake 008. One population is known from Lee Lake 005, on private land just east of Coolin, ID on the south end of Priest Lake.

See Appendix 2 for map locations of the three populations of large Canadian St. John's-wort on the Priest Lake RD.

Habitat and Associated Species: Throughout its range, large Canadian St. John's-wort can be found in marshes, bogs, and wet meadows. On the Priest Lake RD, large Canadian St. John's-wort occurs along the margins of ponds on peat substrate. At Reynolds Creek 009, it occurs on the edge of a Carex lasiocarpa community described by Boggs et al. (1990) beneath hummocks of Spiraea douglasii in the S. douglasii community described by the same authors. At Hager Lake 004, large Canadian St. John's-wort occurs in marginal peatland communities on moss-covered muck with other low-growing species, such as Lycopodium inundatum (another R1 FS Sensitive Species), Lycopus uniflorus, Drosera anglica, and D. rotundifolia. At Kaniksu Marsh 006, it occurs primarily on downed logs in the moat which are overgrown by sphagnum moss and other species, including Carex canescens, Drosera rotundifolia, Potentilla palustris, and Lycopus uniflorus. It also occurs on mucky moat margins at Kaniksu Marsh 006. At all three sites on the Priest Lake RD, large Canadian St. John's-wort occurs with one to several other Region One FS Sensitive Plant Species (Appendix 3).

CONSERVATION STATUS

Conservation Status - Idaho: When Johnson (1981d) first evaluated large Canadian St. John's-wort for the Idaho rare plant project of the Idaho Natural Areas Council, he recommended it as State Threatened, based on four known sites (one of these sites is historical and was likely wiped out by the impoundment of the Pend Oreille River) (Caicco 1987). Only three additional sites are known from northern Idaho, despite intensive floristic surveys of peatland habitats on the Kaniksu NF during the last several years (Caicco 1987; Moseley 1989; 1990; Bursik 1990). In addition to the Pend Oreille population, two other historic populations, at Granite Lake and Walsh Lake, have not been relocated and are

likely extirpated. This indicates that this taxon is vulnerable to extinction if habitat degradation occurs.

The Idaho Native Plant Society considers large Canadian St. John's-wort a Priority 2 species (Idaho Native Plant Society 1991). The Priority 2 category of the Idaho Native Plant Society list refers to taxa likely to be classified as Priority 1 species within the foreseeable future in Idaho, if factors contributing to its population decline or habitat degradation or loss continue.

The Idaho CDC currently ranks large Canadian St. John's-wort as G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

BRITISH COLUMBIA - R1 = plant taxa that are represented by a single or few known populations, usually with only a few individuals in the populations (Straley et al. 1985).

MONTANA - Considered for listing but rejected (Lesica and Shelly 1991).

Straley et al. (1985) also note that it is considered rare in Alberta, Nova Scotia, and Illinois, threatened in Pennsylvania and Colorado, and possibly extirpated from Tennessee.

Threats: No apparent threats exist to the three populations of large Canadian St. John's-wort that occur on the Priest Lake RD. Grazing has occurred in the past in Reynolds Creek 009. If this activity were to be reinitiated, it could threaten the long-term viability of this population, particularly given its small size and very limited distribution within the meadow.

Management Implications: Current management appears compatible with the long-term viability of the large Canadian St. John's-wort populations on the Priest Lake RD. Due to its apparent rarity and probable extirpation at three sites, this species should be given special consideration in land management planning.

ASSESSMENTS AND RECOMMENDATIONS

Summary: With the exception of Montana, large Canadian St. John's wort is rare in all but the core of its range in eastern Canada. Nine populations of this species have been documented in Idaho, three have likely been extirpated due to development activities. Two populations are managed wholly by the Priest Lake RD and one occurs partially on the Priest Lake RD and partially on private

land (Hager Lake 003). No apparent threats exist to these three populations.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that large Canadian St. John's-wort has a restricted and declining distribution in Idaho. This is indicated despite considerable floristic inventory of probable habits for large Canadian St. John's-wort on the Kaniksu NF since 1987 (Caicco 1987; Moseley 1989; 1990; Bursik 1990). In addition to Idaho, many states and provinces in the U.S. and Canada also consider it to be of conservation concern. Along with a narrow distribution in the state, the habitat it occupies is unique, and is characterized by several associated species that also have a limited distribution in Idaho. Based on information reported here, I recommend that large Canadian St. John's-wort remain on the Region One Forest Service Sensitive Species List.

Recommendation to the Idaho Panhandle NFs: Large Canadian St. John's-wort has a limited distribution in Idaho and occurs in a unique habitat. Four of the six extant populations occur wholly or partially on lands administered by the Kaniksu NF. Three of these populations are located on the Priest Lake RD. Current management practices seem compatible with the long-term survival of the four populations of large Canadian St. John's-wort found on the Kaniksu NF (including Hoodoo Lake 007, partially on the Sandpoint RD). Given the fact that three historical populations are likely extirpated in northern Idaho and that at least one population is precariously small (Reynolds Creek 009), periodic monitoring of these populations is suggested.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho Conservation Data Center for entry into their permanent data base on sensitive species.

Lycopodium inundatum L.

CURRENT STATUS
USFS R1 - Sensitive
R4 - Sensitive
R6 - Sensitive
USFWS - None
Idaho Native Plant Society - Priority 1
Idaho CDC Rank - G5 S1

TAXONOMY

Family: Lycopodiaceae (clubmoss)

Common Name: northern bog clubmoss

Citation: Sp. Pl. 1102. 1753.

Technical Description: Main stems annual more or less elongate, prostrate, or arching, irregularly rooting, leafy, giving rise to scattered, erect, leafy branches, each of which is up to 1 dm tall and thin, narrow, mostly entire, 4-8 mm long and less than 1 mm wide, broadest near the base, tapering gradually to the soft acicular tip, the ones on the lower side of the main stem twisted into a more or less erect position, those of the erect stems loosely ascending sporophylls numerous, crowded, expanded at the base, otherwise resembling the vegetative leaves, the long, slender green tips loosely ascending; sporangia ellipsoid-globose, about 1 mm wide; spores 43 microns or more in diameter (Cronquist 1969d).

Nontechnical Description: Horizontal stems creeping along the ground surface, the growing tips extending only a few cm beyond the upright fertile stems, rooting at intervals and sparsely covered with narrow leaves. Erect stems 2-4 inches high, unbranched, and covered with scattered leaves. Erect stems terminated by a cone approximately 2 inches long (Lellinger 1985). See Appendix 1 for a line drawing of northern bog clubmoss.

Distinguishing Features and Similar Species: The elongate sporophylls are aggregated into sessile terminal cones, which are mostly several times as long as wide, green, and photosynthetic; they are not very different from the vegetative leaves. All but one other clubmoss in the Pacific Northwest have sporophylls that differ obviously from the vegetative leaves. Lycopodium selago resembles northern bog clubmoss in having sporophylls similar to the vegetative leaves, but the two types of leaves occur in alternating zones on the stem; the stem itself of L. selago is unlike that of northern bog clubmoss, which has perennial and evergreen stems that are all more or less erect (Caicco 1987). L. selago is not known from the study area.

DISTRIBUTION

Range: Northern bog clubmoss is distributed from Newfoundland to Alaska, south to Maryland, southwestern Virginia, Ohio, Indiana, northern Illinois, Wisconsin, Minnesota, Manitoba, Saskatchewan, Alberta, Montana, Idaho, and northern California (Lellinger 1985). In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho and Montana. Two populations (one is historical) are known from northwestern Montana. It is not treated by Dorn (1988) for Wyoming.

In Idaho, northern bog clubmoss is known from six sites in Bonner and Boundary counties (including three sites on the Priest Lake RD). No populations of northern bog clubmoss are known from adjacent Pend Oreille County in Washington. Two populations of northern bog clubmoss are also known from Yellowstone National Park in Idaho. No new populations of northern bog clubmoss were found on the Priest Lake RD during 1991. The three known populations from the Priest Lake RD are from the Bottle Lake RNA 003, near the northwest end of Priest Lake, Hager Lake 001, about 4 miles south of Nordman, which is managed in part by the Priest Lake RD, and is in part privately owned, and Kaniksu Marsh RNA 004 approximately two miles south of the Dickensheet Junction in an abandoned oxbow of the Priest River. This population was the only one revisited during 1991. Kaniksu Marsh RNA 004 is one of the largest populations of northern bog clubmoss known in the state. It consists of several hundred individuals scattered on the central floating sphagnum moss mat of Kaniksu Marsh. See Appendix 2 for mapped locations of northern bog clubmoss on the Priest Lake RD.

Habitat and Associated Species: All of the populations of northern bog clubmoss in Idaho are known from large peatlands found at relatively low elevations that are characterized by the presence of small to large floating sphagnum moss mats on the margins of or within lakes as described by Bursik (1990). Kaniksu Marsh 004 occurs in the Carex lasiocarpa community type (or in an as yet undescribed phase of this community) described by Padgett et al. (1989) and by Boggs et al. (1990). This community is dominated by slender sedge (Carex lasiocarpa) with a consistent understory cover of sphagnum moss. Associated species at Kaniksu Marsh 004 include other Sensitive Species such as Rhynchospora alba and Scheuchzeria palustris along with Drosera anglica, Drosera rotundifolia, Lycopus uniflorus, and Viola macloskeyi. See Appendix 3 for a list of Sensitive Plant Species and community types found at the three sites supporting bog clubmoss on the Priest Lake RD.

At Hager Lake 001, northern bog clubmoss is somewhat mat-forming on grounded (non-floating) mat margins with Lycopus uniflorus, Drosera rotundifolia, and Kalmia microphylla. Bottle Lake 003 is

a much smaller population, which consists of approximately 12 individuals growing on a fallen, moss-covered log in the shallow moat that surrounds the floating mat in the center of the lake. Vascular species associated with northern bog clubmoss in this habitat include Potentilla palustris, Lycopus uniflorus, and Viola macloskeyi (Caicco 1987).

CONSERVATION STATUS

Conservation Status - Idaho: When Johnson (1981e) first evaluated northern bog clubmoss for the Idaho rare plant project of the Idaho Natural Areas Council, he recommended placing it on the State Watch List. He noted that there were only four populations known and that the bog habitats supporting bog clubmoss are fragile, but that numerous bogs in the state remained unexplored botanically. Caicco (1987) reviewed the status of northern bog clubmoss on the Idaho Panhandle NFs and stated that despite considerable floristic inventory of wetlands in the Priest River drainage, only one new population had come to light in the intervening six years. He concluded that the rarity of northern bog clubmoss is more real than apparent, as suggested by Johnson. Recent, intensive studies of peatlands in Idaho have revealed the presence of only eight total populations in Idaho, five in the Priest River Valley (Caicco 1987; Bursik 1990), one on the Sandpoint RD, Kaniksu NF (Moseley 1990), and two in Yellowstone NP (Bursik 1990; Moseley et al. 1991).

The Idaho Native Plant Society considers northern bog clubmoss a Priority 1 species (Idaho Native Plant Society 1991). The priority 1 category of the Idaho Native Plant Society list refers to species in danger of becoming extinct or extirpated from Idaho in the foreseeable future if identifiable factors contributing to their decline continue to operate. These are taxa whose populations are present only at critically low levels or whose habitats have been degraded or depleted to a significant degree.

The Idaho CDC currently ranks northern bog clubmoss as G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some other factors of its biology, making it especially vulnerable to extinction).

Conservation Status - Elsewhere:

CALIFORNIA - List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere (Smith and Berg 1988).

MONTANA - Ranked S1 = Taxon critically imperiled in Montana because of extreme rarity or because of some factor of its biology, making it especially vulnerable to extinction (Lesica and

Shelly 1991).

OREGON - List 2 = species which are threatened, endangered, or extirpated in Oregon, but more stable or common elsewhere (Oregon Natural Heritage Program 1991).

WASHINGTON - Sensitive = Taxon that is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats (Washington Natural Heritage Program 1990).

Lesica and Shelly (1991) state that northern bog clubmoss is also rare in Alberta and Saskatchewan.

Threats: No apparent threats exist to the three populations of northern bog clubmoss on the Priest Lake RD, although two of the Idaho populations of this species are seriously threatened by development (Mosquito Bay 002, on the northeast end of Priest Lake [Caicco 1987]) and by fisherman traffic (Beaver Lake 006, on the Sandpoint RD [Moseley 1990]).

Management Implications: Current management appears compatible with long-term maintenance of the three populations of bog clubmoss on the Priest Lake RD. Measures should be taken, however, to protect Beaver Lake 006 from trampling by fishermen.

ASSESSMENT AND RECOMMENDATIONS

Summary: Northern bog clubmoss is known from eight populations in Idaho, six in the Idaho Panhandle, north of Coeur d'Alene, while two populations are disjunct by more than 300 miles in Yellowstone NP (Moseley et al. 1991). On the Priest Lake RD, two populations of northern bog clubmoss are large and apparently stable (Kaniksu Marsh RNA 004 and Hager Lake 001) while the third population (Bottle Lake RNA 003) is not threatened by management, but is so small in size (12 individuals) that its long-term viability is somewhat in question.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that northern bog clubmoss has a restricted distribution in Idaho. In addition to Idaho, California, Montana, Oregon, Washington, Saskatchewan, and Alberta also consider northern bog clubmoss to be of conservation concern. Based on information reported here, I recommend that northern bog clubmoss remain on the Regional Forester's Sensitive Species List for the Northern Region in Idaho.

Recommendations to the Idaho Panhandle NFs: Six populations of northern bog clubmoss are currently known from Bonner and Boundary counties, Idaho, with the Kaniksu NF managing four of these populations (one on the Sandpoint RD, three on the Priest Lake

RD). I suggest implementing protective measures and/or a monitoring program for the two imperiled populations of northern bog clubmoss located on the Kaniksu NF (Beaver Lake 006 and Bottle Lake 003). A periodic census of Kaniksu Marsh RNA 004 and Hager Lake 001 will detect any downward trends in these populations so that pertinent management responses can be made to protect these populations if needed.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens, and should include both fertile and sterile stems and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Maianthemum dilatatum (Wood) Nels. & Macbr.

CURRENT STATUS
USFS R1 - Watch
USFWS - None
Idaho Native Plant Society - Priority 1
Idaho CDC Rank - G4 S1

TAXONOMY

Family: Liliaceae (Lily)

Common Name: false lily-of-the-valley

Citation: Bot. Gaz. 61:30. 1916.

Technical Description: Stems 1-3.5 (4.5) dm tall, erect; leaves of flowering stems usually 2 (1-3), uppermost often considerably reduced, cordate to sagittate, 5-11 cm long, nearly as broad, with slender petioles (1)2-9 cm long; racemes 3-6 cm long, simple to sometimes compound, often several pedicels at one node; tepals ca. 2.5 mm long, 1.5 times as long as stamens, berry red, globose, apiculate by the persistent style, 5-6 mm long (Cronquist 1969e).

Distinguishing Features and Similar Species: False lily-of-the-valley is distinct from other native members of the lily family in having long-petiolate leaves with obviously heart-shaped blades. The racemose inflorescence and the red berries of the mature plant are also distinctive features that set apart this lily from all other native lily species. See Appendix 1 for a line drawing of false lily-of-the-valley.

DISTRIBUTION

Range: False lily-of-the-valley is known from moist streambanks and moist open to dense woods from near sea level to nearly 3500 feet in elevation from Alaska, south along the coast to the Cascade Mountains of British Columbia, Washington, and Oregon to Marin Co., California. It is also disjunct in eastern British Columbia and northern Idaho (Cronquist 1969e). These disjunct populations range from Revelstoke, British Columbia in the north to the Priest Lake area in the south (Lorain 1988).

False lily-of-the-valley proved an elusive species for me in 1991. No new populations of this species were located in northern Idaho, despite extensive surveys of seemingly appropriate riparian habitats on the Priest Lake RD. I also failed to relocate the only known population of this species in Idaho (Indian Creek 001).

False lily-of-the-valley was collected in 1901 by Piper around Priest Lake and again by Fred Johnson, of the University of Idaho, in 1967 near the mouth of Indian Creek, on the east side of Priest

Lake. Attempts to relocate this population in 1991 failed, although Indian Creek was searched rather thoroughly from the mouth, upstream approximately two miles. In discussing my failure with Fred Johnson, he indicated that the location of the false lily-of-the-valley population is in all likelihood in the vicinity of Indian Creek, but not necessarily in the riparian zone. He was also unable to relocate this population in 1988.

Doug Henderson, curator of the University of Idaho Herbarium, has also seen false lily-of-the-valley in the wild in Idaho, both in the Priest Lake area (perhaps around Chase Lake?) and in the Selway River drainage in north-central Idaho. Unfortunately, neither population has been relocated and collections were not made on the days they were observed. Nonetheless, this species most likely still occurs within the state, but it will take an extremely lucky field botanist to stumble onto it.

Consequently, there are no recently documented locations of false lily-of-the-valley in Idaho and its status remains a mystery.

Habitat and Associated Species: Johnson described the habitat associated with the population of false lily-of-the-valley that he observed in 1967 as a semi-bog in a Tsuga heterophylla/Oplopanax horridum habitat-type, growing with individuals of O. horridum and Thuja plicata on a gentle slope in a shaded area on alluvial soil.

CONSERVATION STATUS

Conservation Status - Idaho: In his review of false lily-of-the-valley for the Rare and Endangered Plants Committee of the Idaho Natural Areas Council, Johnson (1981f) recommended endangered status as only the Indian Creek population was known within the state, and Layser (1980) had failed to locate the species in his extensive surveys of adjacent Pend Oreille Co., Washington.

False lily-of-the-valley is currently on the Northern Region, FS Sensitive Species List as a Watch Species for Idaho, because it is not known from FS land within the northern Region in Idaho, but it has been documented on other public or private lands in the area (USDA Forest Service 1991a).

The Idaho Native Plant Society considers false lily-of-the-valley a Priority 1 species (Idaho Native Plant Society 1991). The Priority 1 category includes species that are in danger of becoming extinct or extirpated from Idaho in the foreseeable future if identifiable factors contributing to its decline continue to operate; these are taxa whose populations are present only at critically low levels or whose habitats have been degraded or depleted to a significant degree.

The Idaho CDC currently ranks false lily-of-the-valley as G4 S1

(G4 = apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Threats: It is currently impossible to evaluate threats as no well- documented populations exist of false lily-of-the-valley in Idaho.

Management Implications: Land managers on the Kaniksu NF, particularly on the Priest Lake RD should be aware of the possible occurrence of this species in their area.

ASSESSMENTS AND RECOMMENDATIONS

Summary: False lily-of-the-valley is likely to occur in the Priest River Valley of northern Idaho. Two collections have been made of this species in the Priest River Valley; in 1901 and in 1967, but the population(s) have not been relocated since. All efforts to relocate the Indian Creek population and new populations of false lily-of-the-valley on the Priest Lake RD failed in 1991. Doug Henderson, curator University of Idaho Herbarium is certain he has seen false lily-of-the-valley in the Priest Lake area (perhaps around Chase Lake) and along the Selway River in north-central Idaho. It is likely that one or more populations of this species still exist in the state.

Recommendations to the Regional Forester: Given that no locations are currently known for false lily-of-the-valley in northern Idaho, but given that it is likely to occur there, I recommend that false lily-of-the-valley remain on the Region One Forest Service List of Watch Species for Idaho.

Recommendations to the Idaho Panhandle NFs: No populations of false lily-of-the-valley are known from the Kaniksu NF or from the Priest Lake RD. Additionally, the precise location of the only documented population of false lily-of-the-valley in northern Idaho (Indian Creek 001) is unknown. The Priest Lake RD remains likely habitat for this species, however.

Land managers and field personnel on the Kaniksu NF should be informed of the possible occurrence of false lily-of-the-valley in their areas. Possible sightings of this species should be documented by specimens (if the size of the population warrants collecting), and should include inflorescence, leaves, stems and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of false lily-of-the-valley should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Muhlenbergia racemosa (Michx.) B.S.P.
(M. glomerata [Willd.] Trin. s.l.)

CURRENT STATUS USFS R1 - Sensitive (as M. glomerata)
USFS R6 - Sensitive (as M. glomerata)
Idaho Native Plant Society - Review
CDC Rank - G5 S1?

TAXONOMY

Family: Poaceae or Graminae (grass)

Common Name: green muhly

Citation: Preliminary Catalog of New York Plants 67. 1888.

Technical Description: Rhizomatous perennial up to 1 m tall, the culms terete to slightly flattened, hollow, often branching above, puberulent at and adjacent to the nodes; sheaths slightly keeled; ligules truncate, about 1(3) mm long, finely erose-ciliate; blades flat, 2-7 mm broad; panicle 2.5-10(14) cm long, contracted, the branches tightly appressed; glumes narrow, subequal, attenuate to slender awns equalling or longer than the body, (4)5-6.5 mm in overall length; lemma about 3(2.5-3.5) mm long, including the attenuate or shortly awned tip, pilose on the lower half; palea subequal to the lemma; anthers 0.5-1 mm long (Hitchcock 1969a).

Nontechnical Description: Rhizomatous perennial forming loose colonies of stems up to one meter in height. The cauline leaves have slightly keeled sheaths and the stem is slightly pubescent below the node. The inflorescence is a terminal panicle with tightly appressed branches, 2.5-10 cm long. Glumes are attenuate to a slender awn that is equal or longer than the body. See Appendix 1 for a line drawing of green muhly.

Distinguishing Features and Similar Species: Green muhly is a very distinctive, although somewhat diminutive, grass that could easily be overlooked. Green muhly is sometimes separated from Muhlenbergia glomerata, and both species were once considered rare in Idaho (Henderson 1981c). Pohl and Mitchell (1965) present evidence for the recognition of the diploid M. glomerata, found in wet meadows and bogs, as distinct from the tetraploid M. racemosa, of mesic to dry habitats. Hitchcock (1969a) could find no way to discern the two so lumped them in his treatment of the Northwest flora, stating that whatever the treatment chosen, it is a rare entity. In their ongoing treatment of the grasses of Idaho, Mike Curto and Doug Henderson, at the University of Idaho Herbarium, have also chosen to lump the two species and call it Muhlenbergia racemosa. This is how it will appear when their results are published.

DISTRIBUTION

Range: Hitchcock (1969a) gives the range of green muhly as being from British Columbia, southward on the east side of the Cascades to northeastern Oregon, Nevada, Arizona, and northern Mexico, east to Newfoundland, and in the U.S. to Oklahoma, Tennessee, and Maryland. In Idaho, it was known from Bonner, Bingham, and Fremont counties (Moseley and Groves 1990; Henderson 1981c), however, the Idaho CDC has no records for the Bingham and Bonner county populations. Two populations were documented in Fremont Co. during 1991 (Moseley et al. 1991). These are the only known and documented locations in the state.

In Washington, green muhly is known from Pend Oreille Co., including three sites on the Priest Lake RD. Green muhly is also documented on the Colville and Sullivan Lake RDs of the Colville NF in Region 6 (USDA Forest Service 1991b). All three Priest Lake RD populations occur in the area just northwest of Nordman, ID. All three populations were located by Norm Trigoboff, seasonal botanist on the Priest Lake RD, 1987.

Green muhly 005 (occurrence number in the Washington Natural Heritage Program data base as M. glomerata) is located in a bog wetland off of road 319, about 2 miles west of Sema Meadows. Another population is located in Sema Meadows 006, approximately one mile west of the ID/WA border. The third population of green muhly is located approximately 2 miles southwest of Sema Meadows 006 along Sema Creek 007, near where trail 241 crosses the creek. Sema Meadows 006 is described as a "good-sized population" and Sema Creek 007 is described by Trigoboff as consisting of more than 1000 individuals. Nothing is known of the dynamics of green muhly 005. See Appendix 2 for specific map locations of these populations.

Habitat and Associated Species: All three of the Priest Lake RD populations of green muhly occur in peatland habitats on sphagnum-covered organic substrates where it is associated with Carex spp., Eriophorum polystachion (?), and Juncus sp. Very little information was given by Trigoboff concerning the associated habitat. In Fremont Co., Idaho, green muhly occurs on both mineral and organic substrates with Carex spp., often on the margins of mossy birch and willow hummocks.

CONSERVATION STATUS

Conservation Status - Idaho: Henderson (1981c) evaluated green muhly, along with Muhlenbergia glomerata, as part of the rare plant project of the Idaho Natural Areas Council. He recommended that it be placed on the State Watch List due to its apparent rarity. In has evaluation, he noted that its Idaho distribution included Bingham, Bonner, and Fremont counties. The CDC has no records for the Bingham and Bonner county populations.

Green muhly is on the Idaho Native Plant Society Review List (Idaho Native Plant Society 1991). The Review List includes those species which may be of conservation concern in Idaho, but for which there is insufficient data upon which to base a recommendation regarding their appropriate classification.

The Idaho CDC currently ranks green muhly as G5 S1? (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery; S1? = possibly critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

BRITISH COLUMBIA - As Muhlenbergia glomerata it is on List R3, which includes plants with no distinct geographical range or distribution, usually scattered in the province, in isolated populations consisting of small numbers of plants (Straley et al. 1985).

WASHINGTON - Sensitive (as M. glomerata) = Taxon that is vulnerable or declining, and could become endangered or threatened in the state without active management or removal of threats (Washington Natural Heritage Program 1990).

MONTANA - Both M. glomerata and M. racemosa were considered but rejected for sensitive or watch status due to relative commonness of occurrence (Lesica and Shelly 1991).

Threats: For the most part, present threats to the three Priest Lake RD populations of green muhly are unknown. I did not revisit these populations during 1991 and Trigoboff left a paucity of information about site quality of these populations.

Management Implications: More information on abundance, habitat associations and general site qualities are needed for these three known populations of green muhly before management recommendations or evaluations are made. There is a considerable amount of potential habitat for green muhly on the Priest Lake RD in the form of peatlands along slow-moving streams, particularly in the northern portion of the district. These habitats should be searched for green muhly.

ASSESSMENT AND RECOMMENDATIONS

Summary: Muhlenbergia racemosa (green muhly) is the taxon that includes all of what was formerly M. racemosa and M. glomerata. Two populations of green muhly were discovered in 1991 in Fremont Co., Idaho (Moseley et al. 1991). These two populations represent the only documented occurrences of this species in Idaho. Three

populations of green muhly are known from the Priest Lake RD in Pend Oreille County, Washington, in the area just northwest of Nordman, Idaho. More data needs to be collected on these populations, including abundance, habitat, and site quality information. A more thorough search of peatland habitats in the northern portion of the Priest Lake RD is also warranted to get a more complete picture on the distribution of green muhly in this area.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that Muhlenbergia racemosa (M. glomerata s.l.) has a restricted distribution in Idaho and on USFS Region One lands in Idaho and Washington. In addition to Idaho and Washington, British Columbia also considers green muhly to be of conservation concern. Based on the information reported here, I recommend that Muhlenbergia racemosa replace M. glomerata on the Northern Region Sensitive Species for Idaho (Watch) and Washington (Sensitive).

Recommendations to the Idaho Panhandle NFs: Three populations of green muhly are known from the Priest Lake RD. Little is known about the size of the Road 319 Bog 005 population, and little is known about the associated habitat or site quality of any of the three populations of green muhly on the Priest Lake RD. These populations should be revisited as soon as possible during 1992 to insure that management activities in the general vicinity are compatible with the long-term viability of these populations.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrant collecting), and should include fertile stems and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Rhynchospora alba (L.) Vahl.

CURRENT STATUS USFS - R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Priority 2
Idaho CDC Rank - G? S1

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name: White beakrush

Citation: Enum. Pl. 2:236. 1806.

Technical Description: Culms densely tufted, (0.8) 1.5-5 dm tall, slender, with several cauline leaves, the lowest of these more or less reduced, often to mere scales, the others slender and elongate, up to 1 mm wide, channeled or triquetrous to thick and flat; inflorescence of 1-3 compact, head-like clusters mostly 5-15 mm wide, the terminal one larger than the others and subtended by an inconspicuous bract longer or shorter than the head, the lateral ones, when present, peduncled and arising from within the sheaths of more or less well-developed leaves; spikelets light brown, small, mostly 3.5-5 mm long, 2(3)-flowered, maturing 1 or 2 achenes; bristles 10-12, well-developed, stiffly connivent, retrorsely minutely barbellate, exceeding the body of the achene and sometimes also exceeding the tubercle; achene lenticular, the body biconvex, 1.5-2 mm long, faintly patterned, broadest above the middle, tapering to a narrow, often substipitate base, and capped by an elongate, narrow tubercle; style-branches elongate (Cronquist 1969f).

Nontechnical Description: White beakrush is a grass-like herb with narrow leaves growing in small, densely tufted clumps. The thin stems are triangular and solid, and less than 1 foot tall. The inflorescence has 1-3 compact, head-like clusters that are whitish in appearance, especially at anthesis. See Appendix 1 for a line drawing of white beakrush.

Distinguishing Features and Similar Species: White beakrush could be confused with a sedge (Carex spp.), however, the whitish, head-like inflorescence and fruits that have bristles but lack perigynia are distinctive characteristics that distinguish white beakrush from a sedge upon close examination.

DISTRIBUTION

Range: White beakrush is interruptedly circumboreal, but it is not found at the highest latitudes. In North America, it is distributed from Newfoundland to North Carolina, inland to the

Great Lakes region and occasionally to Saskatchewan. The range of white beak rush is continuous across southern Canada to the Pacific; where it is found from the Alaskan panhandle to central California, chiefly west of the Cascade-Sierra summits, but also inland in northern Idaho. In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring only in Idaho.

In Idaho, white beakrush is known from only five sites despite considerable recent floristic exploration in Idaho wetlands, especially in northern Idaho (Caicco 1987; Moseley 1989; 1990; Bursik 1990). No additional populations of white beakrush have been discovered since 1989. The five populations occur in two widely disjunct areas: at Tule Lake 004 in Valley County; at three sites in Bonner County (Kaniksu Marsh RNA 001, Bailey Bog 002, Chase Lake 003); and at one site in Boundary County (Perkins Lake 005). See Appendix 2 for the mapped location of white beakrush one the Kaniksu NF.

Habitat and Associated Species: At Perkins Lake 005, white beakrush is abundant in the understory of a Betula pumila var. glandulifera/ Carex lasiocarpa/sphagnum community. This community is likely ecotonal between an undescribed phase of the C. lasiocarpa habitat type (Boggs et al. 1990) and an entirely undescribed Betula pumila-dominated community. At Kaniksu Marsh 001 white beakrush occurs in one of two communities: in the C. lasiocarpa habitat type on the central floating sphagnum mat and in shallow, mucky depressions in persistent shallow standing water in an undescribed community where it is associated with Potentilla palustris and Drosera anglica. Eleven other Sensitive Plant Species occur with white beakrush at Kaniksu Marsh RNA, including Lycopodium inundatum, Scheuchzeria palustris, and Epilobium palustre. Other associated species include Carex rostrata, Drosera rotundifolia, and Menyanthes trifoliata. See Appendix 3 for a list of Sensitive Plant Species and wetland plant communities found at Kaniksu Marsh RNA and at Perkins Lake.

CONSERVATION STATUS

Conservation Status - Idaho: The rarity of white beakrush in Idaho has recently been brought to our attention as a result of floristic studies of Idaho's peatlands (Bursik 1990). Based on his data white beakrush was recommended for inclusion on the rare plant list for the state at the annual Rare Plant Meeting in 1989.

The Idaho Native Plant Society considers white beakrush a Priority 2 species (Idaho Native Plant Society 1991). The Priority 2 category of the Idaho Native Plant Society list refers to taxa that are most likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to its

decline or habitat degradation or loss continue.

The Idaho CDC currently ranks white beakrush as G? S1 (G? = global rank unknown, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

CALIFORNIA - List 4 - plants of limited distribution; a watch list (Smith and Berg 1988).

Threats: One of the private sites in the Priest River drainage has been illegally filled in the past, although the fill has recently been removed (Bailey Bog 002). Proposed development of this site still threatens this population, although permitting of this wetland for development by the Army Corp of Engineers seems unlikely. The effect of this past filling on the white beak rush population is unknown. Recent construction of a floating dock and the erection of several goose nesting platforms in the vicinity of the white beakrush population at Perkins Lake 005 may have impacted some individuals. When I visited Tule Lake 004 on the Boise NF in 1987, there were ATV tracks running through the marginal peatland community that supports white beak rush. The effect of this activity on the white beak rush population is unknown. No threats are apparent at Kaniksu Marsh RNA 001 or at Chase Lake 003 (mostly on Idaho Department of Lands holdings).

Management Implications: Current management appears compatible with the long-term viability of the only known white beakrush population on the Priest Lake RD (Kaniksu Marsh 001). Perkins Lake 005 may be threatened by the construction of goose nesting platforms and of a floating dock through the mat habitat. Due to its apparent rarity and habitat sensitivity, this and the eleven other Sensitive Plant populations known from Perkins Lake should be given special consideration in land management planning. Once again, the suggestion of Moseley (1989) to establish Perkins Lake as a Special Interest Botanical Area should be seriously considered, particularly now that the floating dock exists allowing access to view the floating mat vegetation for showcasing this unique vegetation and for doing interpretive presentations about it.

ASSESSMENT AND RECOMMENDATIONS

Summary: In Idaho, white beakrush is known from only five populations in two widely disjunct areas, despite considerable exploration of wetlands in Idaho the last several years (Caicco 1987; Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990; Moseley et al. 1991). On the Kaniksu NF it is known from Kaniksu Marsh

RNA 001 on the Priest Lake RD and from Perkins Lake 005 on the Bonners Ferry RD. The population at Perkins Lake occupies a small area, but is densely distributed within that area. Due to the vulnerability of its habitat, and its association at all sites with up to eleven other Sensitive Plant Species, white beakrush deserves special consideration when making land management decisions.

Recommendations to the Regional Forester: Based on distribution and abundance data presented here and by Moseley (1989), it appears that white beakrush has a restricted distribution in Idaho. Along with a narrow distribution in the state, the habitat it occupies is unique, characterized by several associated species that also have a limited distribution in Idaho. White beakrush is not known to occur in Montana. I recommend that white beakrush remain on the Regional Foresters Sensitive Species List for the Northern Region for Idaho.

Recommendations to the Idaho Panhandle NFs: White beakrush has a limited distribution in Idaho, and occurs in a unique habitat. Two populations are known from the Kaniksu NF. At Perkins Lake 005, the population consists of densely distributed clumps covering a small area. At Kaniksu Marsh RNA 001, white beakrush is found scattered in several small areas on the central, floating, sphagnum moss mat. Eleven other plant species considered Sensitive in Idaho occur in the vicinity of the white beakrush populations at Kaniksu Marsh and at Perkins Lake. A special management designation, such as Special Interest Botanical Area, may be appropriate for Perkins Lake, which is not currently protected in any way. This recommendation was previously made by Moseley (1989), prior to the construction of a floating dock for fisherman's access, which has destroyed portions of several Sensitive Plant populations. I suggest that this dock now be used as an interpretive trail for this ecologically unique area after it is designated as a Botanical Area.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both flowers and fruits. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Romanzoffia sitchensis Bong.

CURRENT STATUS
USFS R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Sensitive
Idaho CDC Rank - G4 S1

TAXONOMY

Family: Hydrophyllaceae (Waterleaf)

Common Names: Sitka mistmaiden

Citation: Mem. Acad. St. Petersb. VI. 2:158. 1833.

Technical Description: Plants slender, lax, (0.5)1-2(3) dm tall; basal leaves with reniform-orbicular blade (0.5)1-4 cm wide, palmately veined and rather shallowly lobed or coarsely toothed, the petioles well-developed (up to 15 cm long), their bases overlapping, conspicuously expanded, often thickened and commonly villous-ciliate; plants otherwise generally subglabrous, or finely stipitate-glandular in the inflorescence, rarely somewhat glandular-villous; cauline leaves few and mostly borne near the base, or none; inflorescence loose and elongate, well-surpassing the leaves, pedicels mostly 1-4 cm long in fruit; calyx seldom reaching the sinuses of the corolla; corolla 6-11 mm long and wide; style 2-5 mm long (Hitchcock 1959b).

Nontechnical Description: Plants slender, somewhat trailing, 0.5-3 dm tall; basal leaf blades kidney-shaped, 0.5-4 cm wide, palmately veined to shallowly lobed, or coarsely toothed, petioles long (up to 15 cm), bases overlapping and expanded, often thickened and hairy; plants otherwise mostly not hairy or finely glandular in the inflorescence to somewhat glandular-short-hairy; stem leaves few, mostly arising from the base, or none; inflorescence loose and elongate, well-surpassing the leaves, pedicels mostly 1-4 cm in fruit; calyx shorter than corolla; corolla 6-11 mm long and wide, styles 2-5 mm long. See Appendix 1 for a line drawing of sitka mistmaiden.

Distinguishing Features and Similar Species: Sitka mistmaiden is difficult to confuse with other species in its subalpine to alpine habitat in mossy seeps. Its long-petiolate, toothed to slightly lobed, kidney-shaped leaves, which mostly arise from the base of the plant are distinctive. A showy corolla with fused petals that are notched at the sutures is also characteristic of this species. No similar species exist in this habitat.

DISTRIBUTION

Range: Sitka mistmaiden is a cordilleran species ranging from

southern Alaska to northern Oregon and northern California along the coast and inland to Alberta, northwestern Montana, and northern Idaho (Hitchcock 1959b).

In Idaho, sitka mistmaiden is known from four sites in the Selkirk Mountains in Bonner and Boundary counties, all of which are on the Kaniksu NF. Two populations (001 and 002) are located in Snowy Top RNA on the Priest Lake RD. Two populations are located on the Bonners Ferry RD at Twin Peaks 003 and at Harrison Peak 004. Little is known about the population size of Snowy Top 001 and 002, but both are likely quite small. Twin Peaks 003 consists of only one observed plant, though others may exist in the area. Harrison Peak 004 consists of only three observed individuals with more likely exist on moist, north-facing ledges in the area. All of the populations are known from high subalpine elevations to above timberline (6200-7400 feet). See Appendix 2 for a map location of Snowy Top RNA.

Habitat and Associated Species: At the lower elevation location in Snowy Top RNA 002, sitka mistmaiden occurs on mossy substrate in a Abies lasiocarpa/Rhododendron albiflorum habitat type forest at 6200 feet. Snowy Top RNA 001 is near the summit in a vertical crack on a steep northwest facing slope. No associated species are known for these two populations. The two populations on the Bonners Ferry RD occur on moist, steep north-facing slopes on moss-covered substrate with Saxifraga debilis, S. ferruginea, Deschampsia cespitosa, Penstemon lyallii, and Oxyria digyna.

CONSERVATION STATUS

Conservation Status - Idaho: The concern over the conservation status of sitka mistmaiden arose when Bob Moseley discovered two populations in Snowy Top RNA during a field survey of the area in 1986. Since then only two additional populations have been located on the Bonners Ferry RD, near the Selkirk crest.

In 1991, sitka mistmaiden was placed on the Northern Region List of Sensitive Species (USDA Forest Service 1991a).

The Idaho Native Plant Society considers sitka mistmaiden a sensitive species (Idaho Native Plant Society 1991). Sensitive species are those species known from small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized without active management or removal of threats.

The Idaho CDC currently lists sitka mistmaiden as G4 S1 (G4 = apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of other

factors demonstrably making it very vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

MONTANA - Considered for sensitive status, but rejected; common (Lesica and Shelly 1991).

Threats: No apparent threats exist to the four populations of sitka mistmaiden on the Kaniksu NF. Indeed, two of the populations are protected within the Snowy Top RNA.

Management Implications: Current management practices are compatible with the long-term survival of these populations on the Kaniksu NF.

ASSESSMENTS AND RECOMMENDATIONS

Summary: Sitka mistmaiden is known from four populations in Bonner and Boundary counties in northern Idaho, all of which are located on the Kaniksu NF; Snowy Top 001 and 002 are on the Priest Lake RD, Twin Peaks 003 and Harrison Peak 004 are on the Bonners Ferry RD. All populations are quite small and their subalpine to alpine rocky, moist, north-facing habitat is unique. No apparent threats exist to these populations.

Recommendations to the Regional Forester: Based on distribution and abundance data presented here, sitka mistmaiden appears to be a species of limited distribution in Idaho and in Region One forests in Idaho. Given this, I recommend that sitka mistmaiden remain on the Regional Foresters List of Sensitive Plant Species of the Northern Region for Idaho.

Recommendations to the Idaho Panhandle NFs: Only four populations of sitka mistmaiden are known from Idaho, all of which are on lands managed by the Kaniksu NF. All of these populations are very small and warrant consideration when management activities are planned in their areas. The two populations on the Priest Lake RD are protected within the Snowy Top RNA.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this species should be documented by specimens (if the size of the population warrants collecting), and should include both flowers, fruits, and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Rubus pubescens Raf.

CURRENT STATUS
USFS - R1 - Watch
USFWS - None
Idaho Native Plant Society - Priority 1
Idaho CDC Rank - G5 S2

TAXONOMY

Family: Rosaceae (Rose)

Common Names: dwarf red blackberry, swamp raspberry

Citation: Med. Rep. III, 2:333. 1811.

Technical Description: Stems unarmed, perennial with rootstocks and herbaceous, leafy flowering stems up to 1 m long, these sometimes erect at first but ultimately trailing, nodally rooting; leaves with oblanceolate, entire stipules up to 1 cm long, the blades trifoliate or 5-foliate (personal observation), leaflets short-petiolate, ovate to deltoid, 2-6 cm long, doubly dentate-serrate; flowers 1-2 (seldom more) on short, erect leafy shoots; calyx pilose-pubescent and often glandular, the lobes lanceolate, 3-5(6) mm long, entire, reflexed; petals white or greenish-white, usually erect (4)5-8 mm long; stamens numerous, the filaments broad and flattened, narrowed abruptly and with a nearly square shoulder near the tip; pistils 20-30; glabrous; style slender; stigma discoid; drupelets deep red, weakly coherent into a blackberry-like aggregate up to 1 cm broad (Hitchcock 1961c).

Nontechnical Description: Trailing stems creeping along ground, fully unarmed; stipules of leaves up to one cm long, entire; leaves 3- or 5-foliate, leaflets short-petiolate, ovate 2-6 cm long, twice toothed, flowers usually 1 or 2 per short, erect, leafy flowering shoot; calyx pubescent and often glandular, lobes lanceolate 3-6 mm long, entire, reflexed, petals white or greenish white, 4-8 mm long, stamens numerous, pistils 20-30, style slender, stigma discoid; drupelets usually few, deep red forming a small blackberry-like aggregate up to 1 cm broad. See Appendix 1 for a line drawing of R. pubescens.

Distinguishing Features and Similar Species: Dwarf red blackberry is not to be confused with more common, woody, erect native Rubus spp. because it has weak, trailing stems. The erect, woody species would include the thimbleberry (Rubus parviflorus), the black raspberry (R. leucodermis), the red raspberry (R. idaeus), and the salmonberry (R. spectabilis). Dwarf red blackberry differs from the far more common trailing dewberry (R. ursinus) in that it is unarmed and dewberry is stiffly armed. The only northern Idaho native species that could be confused with dwarf red blackberry is five-leaved bramble (R. pedatus), which is also unarmed and trailing. The two species differ in several respects

as follows:

	R. pubescens	R. pedatus
1. Number of leaflets	usually 3 or 5	usually 5
2. size of leaflets	2-6 cm	1-3 cm
3. Number of pistils	20-30	3-6
4. Calyx	pubescent	glabrous or sparsely pilose

DISTRIBUTION

Range: Dwarf red blackberry is a boreal species that ranges from northern British Columbia, eastward through all the Canadian provinces, to Newfoundland and Labrador. It ranges south in the US from east of the Cascades in Stevens and Ferry counties, in Washington and in northern Idaho. It is apparently disjunct in the northern Colorado Rocky Mountains and occurs south in the Great Lakes region throughout Wisconsin and south into Iowa and Indiana (Hitchcock 1961c).

Hitchcock (1961c) reported that it was likely to occur in northern Idaho, however, dwarf red blackberry was not discovered in Idaho until 1990 when Jill Blake, botanist for the Idaho Panhandle Nfs, collected it at MacArthur Lake 001, a Wildlife Management Area managed by Idaho Fish and Game.

In 1991 I discovered four populations of dwarf red blackberry on the Priest Lake RD, three in Bonner Co., Idaho and one in Pend Oreille Co., Washington. These populations occur in two areas on the district. Murray Creek 002 is approximately 4.5 miles south of the Dickensheet Junction. Hammond Ranch 003 is about six miles west and slightly south of Murray Creek 002 near the Idaho/Washington border. Part of Hammond Ranch 003 is located within Hammond Ranch, a privately-owned ranch, which is being acquired by the FS. Most of the population is on land already managed by the Priest Lake RD. A small population of dwarf red blackberry was also discovered in Pend Oreille Co. in the area south of the crossing of FS road 305 over the Lower West Branch of the Priest River, in the general vicinity of Hammond Ranch 003. Reynolds Creek 004 is located 1.75 miles south of the Priest Lake Ranger Station. See Appendix 2 for map locations of all populations of dwarf red blackberry on the Priest Lake RD and see Appendix 3 for a list of Sensitive Species and wetland plant community types occurring at Reynolds Creek 004.

All of the populations of dwarf red blackberry in Idaho are rather large and range over a minimum of 0.5 acre. Murray Creek 002 is the smallest occurring on approximately 0.5 acre and consisting of perhaps 150 individuals. Reynolds Creek 004 contains more than

200 individuals in an area greater than one acre. Hammond Ranch 003 is the largest population with individuals occurring scattered in an area in excess of 100 acres along Hammond Creek, its tributaries, and the adjacent lowland, wet forests, all the way to the mouth of Hammond Creek and along the Lower West Branch of the Priest River.

The lone population in Washington along the Lower West Branch consists of only 10 individuals and it covers an area no greater than 100 ft^2.

Habitat and Associated Species: Dwarf red blackberry is a species of stream banks and deep, moist forests throughout its range. It is also known from swamps and bogs in Wisconsin (Fassett 1976). Hitchcock (1961c) also noted that it occurs in open burned or cleared areas where it is moderately dry.

In northern Idaho dwarf red blackberry is known from two types of habitats. Most commonly (i.e., at three of the populations) it occurs in mixed coniferous wet to mesic forests where it is particularly common in moist tracts within the forest that are semi-open and characterized by Spiraea douglasii, Symphoricarpos albus, and a variety of moisture-indicating herbaceous understory species, including Athyrium felix-femina and Cornus canadensis. This is the habitat at Murray Creek 002, Hammond Ranch 003, and the Lower West Branch population in Pend Oreille Co.

The other habitat that dwarf red blackberry is known from in northern Idaho is a tall shrub-dominated carr wetland habitat which is typically dominated by Salix bebbiana, Spiraea douglasii, Betula glandulosa, Calamagrostis canadensis, and Carex spp. At Reynolds Creek 004 (and at MacArthur Lake 001), this is the typical habitat that supports dwarf red blackberry. At Reynolds Creek 004, the population also extends into an adjacent Pinus contorta swamp with some of the above species in the understory. I did not observe dwarf red blackberry growing in a naturally open or burned-over habitat in northern Idaho, although portions of Hammond Ranch 003 are located within a clear-cut no more than three years old on FS land.

CONSERVATION STATUS

Conservation Status - Idaho: Dwarf red blackberry was first brought to our attention as a species of conservation concern in Idaho by Jill Blake, botanist for the Idaho Panhandle NFs, after she collected it at MacArthur Lake in 1990. She recommended listing it as a Watch Species for the Northern Region of the Forest Service as a species likely to occur on FS lands in Idaho, but not currently documented there (USDA Forest Service 1991a).

The Idaho Native Plant Society considers dwarf red blackberry a

Priority 1 species (Idaho Native Plant Society 1991). State Priority 1 species are those in danger of becoming extinct or extirpated from Idaho in the foreseeable future if identifiable factors contributing to their decline continue to operate; these are taxa whose populations are present only at critically low levels or whose habitats have been degraded or depleted to a significant degree.

The Idaho CDC currently ranks dwarf red blackberry as G5 S2 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S2 = imperiled in Idaho because of extreme rarity or because of other factors demonstrably making it very vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

MONTANA - considered for sensitive status, but rejected; common (Lesica and Shelly 1991).

Threats: No apparent threats exist to Murray Creek 002 or Reynolds Creek 004, although the Reynolds Creek meadows have been grazed in the past as evidenced by the presence of several old fences in the area. A portion of Hammond Ranch 004 is in a recent clear-cut area and much of the rest of this population could be threatened by proposed logging in the area. The Idaho CDC did a Sensitive Plant survey of the Hammond Analysis Area and has made recommendation to avoid impacting this and other Sensitive Plant populations in the area (Bursik 1991a). The small population of dwarf red blackberry along the Lower West Branch is also in the Hammond Analysis Area and could be impacted by logging activities.

Management Implications: Current management of Murray Creek 002 and Reynolds Creek 004 is compatible with the long-term viability of these populations as long as grazing does not again occur in the Reynolds Creek meadows. Hammond Ranch 004 will warrant special consideration while cutting units are laid out in the Hammond Analysis Area. No portion of this dwarf red blackberry population nor any portion of two other Sensitive Plant populations (Carex buxbaumii 020 and Sanicula marilandica 008) found within the Analysis Area should be impacted by tree harvest activity. Recommendations for avoiding this conflict have been given by the Idaho CDC in their sensitive plant survey report for the Hammond Analysis Area (Bursik 1991a). Although seemingly common in the vicinity of Hammond Ranch, land managers should bear in mind that this is one of only four known populations of dwarf red blackberry in Idaho. The portion of dwarf red blackberry 003 located in the recent clearcut in the Hammond Ranch area will be monitored by the wildlife biology staff at the Priest Lake RD beginning in the summer of 1992 to ascertain the short and long-term effects of canopy removal on this species (Tim Layser, pers. comm.).

ASSESSMENTS AND RECOMMENDATIONS

Summary: Dwarf red blackberry was first discovered in Idaho in 1990 at MacArthur Lake Wildlife Management Area. Since then three additional populations have been located on the Priest Lake RD in Idaho, and one population in Pend Oreille Co., Washington, was also found. No apparent threats exist to two of the populations while the other two (the WA pop. and Hammond Ranch 003) could be impacted by logging activity planned for this area. Recommendations have been given to avoid impacting this and other Sensitive Plant populations located within the Hammond Analysis Area by the Idaho CDC (Bursik 1991a). Indeed, a portion of Hammond Ranch 003 is in an area clear-cut within the last three years. The wildlife staff at the Priest Lake RD will be monitoring this portion of the population during the next several years to ascertain the short and long-term effects of canopy removal on this species.

Recommendations to the Regional Forester: Dwarf red blackberry is currently a Watch Species for Region One of the Forest Service in Idaho (USDA Forest Service 1991a). Given the limited distribution of this species in Idaho and the fact that only four populations are known (three on the Priest Lake RD), I suggest adding this species to the Region One List of Sensitive Plant Species for Idaho and for Washington, where one population is known on the Priest Lake RD.

Recommendations to the Idaho Panhandle NFs: Four populations of dwarf red blackberry are known on the Priest Lake RD, two of which may be impacted by proposed logging activity in the Hammond Ranch area. Care must be taken to lay out cutting units in this area to avoid impacting these populations and populations of two other Sensitive Plant Species found in the Hammond Analysis Area. Current management practices are compatible with the long-term survival of Murray Creek 002 and Reynolds Creek 004 as long as grazing activity is not resumed in the Reynolds Creek meadows.

Field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting). The collection should include roots, stems, and flowers or fruits to insure proper identification. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Rubus spectabilis Pursh

CURRENT STATUS
USFS R1 - Watch
USFWS - None
Idaho Native Plant Society - Possibly Extirpated
Idaho CDC - G5 SH

TAXONOMY

Family: Rosaceae (Rose)

Common Name: salmonberry

Citation: Fl. Am. Sept. 348, pl. 16. 1814.

Technical Description: Strongly rhizomatous thicket-forming perennial usually 1-3(5) m tall, the stems erect to arching, usually strongly bristly below, less so (or even unarmed) above, the prickles acicular, the brownish bark eventually shredding; leaves pinnately 3(5)-foliate; leaflets ovate, acute to acuminate, glabrous or very sparsely appressed-pubescent above, usually pubescent along the veins beneath, the terminal one (3)4-9(11) cm long, the lateral pair(s) smaller, often unequally lobed or divided; flowers 1-2 on short leafy branches; calyx pubescent, the lobes spreading, 9-15(20) mm long; petals red to reddish-purple, showy, obovate-elliptic, up to half again as long as the sepals; stamens 75-100; pistils numerous; style glabrous, about 2mm long. Drupelets separating from the semi-fleshy receptacle and forming a somewhat raspberry-like, yellow to salmon to reddish-colored, insipid fruit (Hitchcock 1961c).

Nontechnical Description: Strongly rhizomatous, thicket-forming perennial shrub 1-3 m tall, the stems erect to arching, usually bristly below, unarmed above, brownish bark shredding; leaves compound, 3- or 5-foliate, leaflets ovate, acute to acuminate, mostly glabrous with pubescence only along the vein on the underside of the leaf. Terminal leaflet 3-11 cm long, lateral pair(s) smaller, often unequally lobed or divided; flowers one to two on short, leafy branches; sepals pubescent, spreading 9-15(20) mm long; petals red to reddish-purple, showy, up to 1.5 times as long as the sepals; stamens 75-100; pistils numerous; style glabrous, about 2 mm long. Drupelets separating from the semi-fleshy receptacle and forming a yellow to salmon to reddish-colored, tart fruit. See Appendix 1 for a line drawing of salmonberry.

Distinguishing Features and Similar Species: Superficially, salmonberry resembles its close relatives the red raspberry (Rubus idaeus) and the black raspberry (Rubus leucodermis). The following chart compares key features of each species and would allow one to separate the three easily in the field.

Species	Stem Prickles	Leaf Prickles	Flower Color	Fruit
R. spectabilis	few, only near base	absent	pink to reddish	yellow to salmon
R. idaeus	many, all over	present, weak straight	white	red
R. leucodermis	many, all over	present, many	white	black

DISTRIBUTION

Range: Salmonberry occurs from near sea level to medium elevations on mountain slopes from Alaska southward to northwestern California from the coast to the Cascades and only rarely east of the Cascades. Two areas have documented sightings of salmonberry east of the Cascades: Priest Lake, Bonner Co., Idaho and the Smithers area from Hudson Bay Mountain at Glacier Gulch in north-central British Columbia (Lorain 1988).

Previous to 1991, salmonberry was known from the Priest Lake area only by a historic collection by Piper in 1901. This collection was accompanied by the vague location of "Priest Lake".

In 1991, five populations of salmonberry were located on the Priest Lake RD on the north end of Priest Lake. Three of these populations were found on Beaver Creek and two of its main tributaries. One small population was located on Tepee Creek 005, which consists of only approximately 20 individuals between the west side road (FS 2512) and the Lakeshore Trail. The other population was located just west of FS 2512 on Tango Creek 003. This population consists of more than 200 individuals along a 0.5 mile stretch of Tango Creek beginning 0.25 mile upstream from the crossing of road 2512 to 0.25 mile east of the crossing of an old logging road that goes north toward Bottle Lake.

Beaver Creek 004 extends along Beaver Creek from near the mouth in the Beaver Creek campground, upstream at least 2.5 miles to where trail 324 crosses Beaver Creek. It is not known how consistent the occurrence of salmonberry is along this stretch of Beaver Creek west the bridge over Beaver Creek on FS road 1341. Downstream from the bridge, salmonberry occurs consistently to within 200 meters of the mouth on Priest Lake. The only stretch of Beaver Creek observed upstream was near the crossing of trail 324 where approximately 50 more individuals occurred in a 0.25 mile stretch of the creek.

Two populations were located along road 1341 on the two largest northern tributaries to Beaver Creek. Beaver Creek tributary 002

is located near the trail 295 trailhead approximately 2.5 miles west of Priest Lake. Beaver Creek tributary 001 crosses road 1341 approximately 3.5 miles west of Priest Lake. Both of these populations extend up and downstream approximately 0.25 mile on the tributaries. It is assumed that the Beaver Creek population extends up Beaver Creek at least as far as the mouth of Beaver Creek tributary 001, however, I did not survey Beaver Creek that far upstream. If individuals of salmonberry do extend upstream that far it would indicate that all of the "populations" of salmonberry that I have chosen to recognize in the Beaver Creek drainage actually make up one very large and extensive single population with a fairly wide range within the drainage. Both Beaver Creek tributary populations contain individuals growing in road cuts where the canopy was removed during construction of FS Road 1341. These portions of these populations should be considered when planning further road construction, road maintenance, and herbicide spraying.

See Appendix 2 for mapped locations for each of these five populations of salmonberry on the Priest Lake RD.

Habitat and Associated Species: On the Priest Lake RD, salmonberry is a species of riparian zones in mature cedar/hemlock forests. It is commonly associated with other species of well-developed riparian zones, including Oplopanax horridum, Athyrium felix-femina, Alnus incana, Cornus stolonifera, Acer glabrum, Streptopus amplexifolius, Vaccinium globulare, and Rubus parviflorus. It was observed on moist soils with deep organic horizons as well as on river cobble bars growing within the streambed.

CONSERVATION STATUS

Conservation Status - Idaho: In his review of salmonberry for the Idaho rare plant project of the Idaho Natural Areas Council, Johnson (1981g) recommended that it be placed on the State Watch List, noting that it was only known from one historical collection from 1901 in Idaho. He also noted that salmonberry may have been extirpated by logging, fire, or development around the lake as attempts to relocate it, which included putting up "wanted" posters, had all failed.

Salmonberry is currently listed as a Watch Species for the Northern Region of the Forest Service in Idaho (USDA Forest Service 1991a).

The Idaho Native Plant Society lists salmonberry among species likely extirpated from Idaho, known only from historical occurrences (Idaho Native Plant Society 1991).

The Idaho CDC currently lists salmonberry as G5 SH (G5 = demonstrably secure globally, though it may be quite rare in parts

of its range, especially at the periphery, SH = taxon known only from an historical occurrence, formerly part of the native biota with the implied expectation that it may be rediscovered [Moseley and Groves 1990]).

Threats: Threats exist to portions of the three populations of salmonberry on Beaver Creek and its tributaries. Recent construction of the group campsite adjacent to Beaver Creek 004 in the Beaver Creek Campground has resulted in tree removal in part of this population. Also, recent upgrading and paving of the road through the Beaver Creek Campground to the Navigator Trailhead has impacted several individuals of salmonberry in this area. The portions of Beaver Creek tributaries 001 and 002 that occur in the road cut of FS Road 1341 are threatened by future road construction, road maintenance, and potential herbicide spraying.

Management Implications: Current management of populations of salmonberry on the Priest Lake RD, for the most part, appears compatible with their long-term viability. The portions of populations 001,002, and 004 that occur along FS road 1341 and in the Beaver Creek Campground should be considered if management activities such as road construction, road maintenance, campground construction, or herbicide spraying is to occur in these areas.

ASSESSMENTS AND RECOMMENDATIONS

Summary: Salmonberry was rediscovered in 1991 in three drainages in the northwestern portion of the Priest Lake RD in a total of five populations on Tango, Tepee, and Beaver creeks. Four of the populations consist of more than 200 individuals and occur over a minimum of 0.5 mile along these creeks or their tributaries. All occur in mature cedar/hemlock forests in well-developed riparian zones. Portions of the three populations along Beaver Creek and its tributaries could be threatened by road or campground construction or by herbicide spraying. These populations should be considered when such activities are planned.

Recommendations to the Regional Forester: Salmonberry is a coastal disjunct species rediscovered in northern Idaho on the Priest Lake RD in 1991. It has a limited distribution in Idaho, having been found in three drainages on the northwest end of Priest Lake in five populations. Based on this information, I recommend that salmonberry be moved from the Northern Region Watch List for species suspected to occur on the Kaniksu NF, to the Northern Region List of Sensitive Species for species known to occur on the Kaniksu NF, and for which population viability is a concern.

Recommendations to the Idaho Panhandle NFs: Current management of the five known populations of salmonberry on the Priest Lake RD appears to be, for the most part, compatible with the long-term viability of these populations. The three populations on Beaver

Creek and its tributaries warrant special consideration when potentially destructive management activities such as road construction, road maintenance, campground construction, or herbicide spraying are undertaken in this area, particularly within the Beaver Creek Campground and along FS road 1341.

Recommendation to the Idaho CDC: Given the rediscovery of five populations of salmonberry on three drainages in the Priest Lake area, I recommend this species be changed from G5 SH to G5 S1 (S1 = taxon critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction).

Recommendation to the Idaho Native Plant Society: Given the rediscovery of salmonberry in five populations in three drainages in the Priest Lake area, I recommend this species be moved from the list of taxa likely extirpated from Idaho to the State Priority 2 list (Priority 2 = taxa likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to their population decline or habitat degradation or loss continues).

Field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting). Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Salix pedicellaris Pursh

CURRENT STATUS
USFS - R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Priority 2
Idaho CDC Rank - G5 S1

TAXONOMY

Family: Salicaceae (Willow)

Common Name: bog willow

Citation: Fl. Am. Sept. 2:611. 1814.

Technical Description: Slender, sparingly branched shrub 4-12 dm tall with glabrous, dark twigs; stipules apparently none; petioles short, mostly 2-7 mm,; leaf blades at first silky, but soon glabrous, commonly very pale and glaucous beneath, entire, narrow or broadly elliptic to oblanceolate or obovate, broadest at or above the middle, acute to obtuse or broadly rounded at the tip, mostly (2)3.5-6(8) cm long and 0.5-2(3) cm wide, 2-5 times as long as wide; aments coetaneous on short, lateral branches whose leaves are usually reduced; scales persistent, yellowish or somewhat anthocyanic, staminate aments lax and slender, 1-2 cm; filaments 2, glabrous; pistillate aments 1-3 cm at maturity, ovaries and capsules glabrous, the mature capsule 4-6.5 mm long on a slender pedicel 1-3 mm; style very short and stout, or almost obsolete, 0.1-0.3 mm and the bifid stigmas together not over 0.5 mm (Cronquist 1964).

Nontechnical Description: Slender, sparingly branched shrub 4-12 dm (usually no more than 6 dm in Idaho); glabrous, dark twigs; stipules absent, petioles short, 2-7 mm; leaf blades silky at first, soon losing hairs, very pale, glaucous beneath, entire narrow to broadly elliptic or oblanceolate, broadest in middle 2-8 cm long and 0.5-3 cm wide, 2-5 times as long as wide; aments borne on short, lateral branches with reduced leaves; scales of flowers persistent, reddish, staminate aments nodding or spreading, 1-2 cm; filaments 2, glabrous; pistillate aments 1-3 cm at maturity, ovaries and capsules glabrous, the mature capsule 4-6.5 mm long on a slender pedicel 1-3 mm. See Appendix 1 for a line drawing of bog willow.

Distinguishing Features and Similar Species: Bog willow can be identified by its size and by its habitat. It seems to rarely grow more than perhaps 6 dm tall in Idaho, whereas most willows that occur in peatland habitats are considerably taller at maturity; 1.5 meters or taller. These other peatland willow species would include S. geyeriana, S. drummondiana, and S. bebbiana. Bog willow tends to also look anthocyanic (reddish) with dark-veined leaves and reddish to brown, shiny bark. It is

also the only willow species truly at home in bog habitats on saturated, sphagnum-covered substrate.

DISTRIBUTION

Range: Bog willow is a boreal species which occurs across southern Canada and the northern U.S., from Quebec to New Jersey, west to the Yukon, northern Idaho, British Columbia, Washington, and Oregon (south to the Rogue River Valley). In the Pacific Northwest, it is chiefly west of the Cascades range (Cronquist 1964).

In Idaho, bog willow is known from seven populations in Bonner and Boundary counties, including five sites on the Kaniksu NF. Their locations and ownership are as follows:

- -Kaniksu Marsh RNA 001 - Priest Lake RD
- -Bailey Bog 002 - northeast end of Priest Lake in Mosquito Bay, privately owned
- -Potholes RNA 003 - Priest Lake RD
- -Perkins Lake 004 - Bonners Ferry RD
- -Herman Lake 005 - north of Moyie Springs, ID, privately owned
- -Armstrong Meadows 006 - Priest Lake RD
- -Packer Meadows 007 - Priest Lake RD.

See Appendix 2 for map locations of the populations of bog willow on the Kaniksu NF. See Appendix 3 for list of Sensitive Species occurring with bog willow and the wetland plant communities characterizing these sites.

Habitat and Associated Species: Throughout its range, bog willow is a species of bogs and boggy meadows (Cronquist 1964). In Idaho, bog willow is a species of open, non-floating sphagnum mats in peatlands. It seems to be closely associated with Betula glandulosa, and at least one site, Armstrong Meadows 006, bog willow is a community codominant with bog birch. At all known locations it is also closely associated with Carex lasiocarpa, and C. rostrata. This community seems to most closely fit the B. glandulosa/C. rostrata habitat type described by Boggs et al. (1990) for northwestern Montana. Other associated species include Salix bebbiana, Calamagrostis canadensis, and Potentilla palustris.

CONSERVATION STATUS

Conservation Status - Idaho: Bog willow was only recently discovered in northern Idaho (1986) and has since been a species of conservation concern. It is a species of bog (peatland) habitats throughout its range. Despite considerable floristic

inventory of such habitats in the state in recent years, particularly on the Kaniksu NF (Caicco 1987; Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990; Moseley et al. 1991), only seven populations have been found.

Bog willow is considered a Sensitive Species in the Northern Region of the Forest Service in Idaho (USDA Forest Service 1991a).

The Idaho Native Plant Society considers bog willow a Priority 2 species (Idaho Native Plant Society 1991). Priority 2 species include taxa likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to their population decline or habitat degradation or loss continue.

The Idaho CDC lists bog willow as G5 S1 (G5 = demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Threats: No threats apparently exist to the four populations of bog willow on the Priest Lake RD. Perkins Lake 004, on the Bonners Ferry RD, may have been threatened by recent construction of a floating dock through a portion of the population and by the erection of goose nesting platforms adjacent to the population on the north end of the lake. Bailey Bog 002 has been partially filled in the past, although the fill has been recently removed. Future development activity has been proposed for this site. It is unknown, however, whether the Army Corp of Engineers will permit this activity.

Management Implications: Current management practices at the four sites known to harbor bog willow on the Priest Lake RD are compatible with the long-term viability of these populations. I recommend following the suggestion of Moseley (1989) to establish Perkins Lake as a Special Interest Botanical Area. The floating dock, the construction of which destroyed parts of several Sensitive Plant populations, could be used as an interpretive trail through the unique floating mat that supports the Sensitive Plant populations known at Perkins Lake.

ASSESSMENTS AND RECOMMENDATIONS

Summary: Bog willow is a species restricted to peatland habitats that is known from only seven sites in northern Idaho, five of which are on the Kaniksu NF. Current management practices of the four populations on the Priest Lake RD are compatible with the long-term survival of these populations. Special consideration should be given to the population of bog willow and the eleven additional Sensitive Plant populations known to occur at Perkins Lake on the Bonners Ferry RD when future developments are planned.

I also recommend giving serious consideration to the suggestion of Moseley (1989) to establish this site as a Special Interest Botanical Area.

Recommendations to the Regional Forester: Bog willow is a species of limited distribution in Idaho. It is known from only seven populations in Bonner and Boundary counties, despite extensive floristic surveys of suitable habitats on the Kaniksu NF in recent years (Caicco 1987; Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990). Given this information, I recommend that bog willow remain on the Regional Foresters Northern Region List of Sensitive Species for Idaho.

Recommendations to the Idaho Panhandle NFs: Bog willow is currently known from seven sites in northern Idaho, including five sites on the Kaniksu NF. No threats exist to the four populations known from the Priest Lake RD. Perkins Lake 004 on the Bonners Ferry RD has been threatened by the recent construction of a floating dock and by the erection of goose nesting platforms in the floating mats surrounding the lake that support bog willow and eleven other Region One Sensitive Plant Species. Future development at this site should give careful consideration to these populations. I also recommend giving serious consideration to the recommendation of Moseley (1989) to establish this area as a Special Interest Botanical Area. The dock, the construction of which destroyed portions of several Sensitive Plant populations, could be used as an interpretive trail through these otherwise inaccessible floating mat habitats.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both flowers or fruits as well as branches. Specimens should be sent to Steve Brunsfeld, at the College of Forestry, Wildlife, and Range Sciences Herbarium (University of Idaho, Moscow, ID 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Sanicula marilandica L.

CURRENT STATUS
USFS - R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Sensitive
Idaho CDC Rank - G5 S1

TAXONOMY

Family: Apiaceae (umbel)

Common Name: black snake-root

Citation: Sp. Pl. 235. 1753.

Technical Description: Perennial plant with a cluster of fibrous roots from a short, simple caudex; stems solitary, erect, mostly 4-12 dm, generally branched only above; basal and lowermost cauline leaves long-petiolate, the blade 6-15 cm wide, palmately 5- to 7-parted or palmately compound (usually compound in Idaho), the segments or leaflets sharply toothed and sometimes shallowly lobed, or some of them often more or less deeply bifid (lower two); cauline leaves usually several, gradually reduced upwards and becoming sessile; ultimate umbels about 1 cm wide or less at anthesis, greenish-white, subtended by a few minute, narrow bractlets, mostly 15- to 25-flowered, staminate flowers more numerous than the perfect ones, style elongate, often persistent, longer than bristles of fruit; fruit ovoid, 4-6 mm long, 3-5 mm wide, covered with numerous uncinate, basally thickened prickles (Hitchcock 1961d).

Nontechnical Description: Perennial plant with cluster of fibrous roots from a short crown; stems solitary, erect, mostly 4-12 cm, generally branched only above; basal leaves long petiolate and usually compound, blades 6-15 cm wide with 5-7 leaflets, lower most two often deeply bifid; stem leaves several but obviously reduced upwards, becoming sessile, umbels about 1 cm wide or less, 15-25 flowers each, subtended by minute bracts; fruit ovoid 4-6 mm long, 3-5 mm wide, covered with numerous, basally thickened prickles. See Appendix 1 for a line drawing of black snake-root.

Distinguishing Features and Similar Species: Black snake-root is a very distinctive species, difficult to confuse with other species of forested riparian areas in northern Idaho. The basal, palmately compound leaves which are always present, with the lower most leaflets often deeply bifid, are the most distinguishing features that separate black snake-root from other species in this habitat. The umbel inflorescence and the presence of numerous prickles on the fruits are also distinctive. Only Trautvetteria caroliniensis occupies similar habitats and looks remotely like black snake-root. It, however, has palmately lobed (not compound) basal leaves, a cymose inflorescence, and its fruits lack the

basally thickened prickles of black snake-root fruits.

DISTRIBUTION

Range: Black snake-root is a wide-ranging North American species whose range extends from Newfoundland to Florida in the east, west to British Columbia, northern Idaho, northeastern Washington, southwestern Montana, Wyoming, Colorado, and northern New Mexico (Hitchcock 1961d).

In Idaho, black snake-root is known from nine populations in Bonner and Boundary counties, including five populations on the Kaniksu NF:

- Priest River Experimental Forest 002, Priest Lake RD
- Moyie River, Copper Creek Campground 003, Bonners Ferry RD
- Gillon Creek, Robinson Lake Campground 005, Bonners Ferry RD
- Hammond Ranch 008, Priest Lake RD
- South End Upper Priest River 009, Priest Lake RD.

One population is also known from the Priest Lake RD in Pend Oreille Co., Washington, at the point where FS road 305 crosses the Lower West Branch of the Priest River. See Appendix 2 for map locations of the above populations on the Priest Lake RD.

Habitat and Associated Species: Black snake-root is a species of low, moist ground, which is less often found on moist, wooded slopes (Hitchcock 1961d).

In Idaho, black snake-root is most common in the wooded margins of broad riparian zones in areas that are periodically flooded. The forests supporting black snake-root are generally dominated by cedar and hemlock, although I observed it in mixed, seral stands as well. In all cases, it occurs on very moist to wet soils. It is often associated with thicket-forming shrub species such as Spiraea douglasii, Symphoricarpos albus, and Alnus incana, although it usually occurs in the margins of dense shrub communities. Other associated species include Clintonia uniflora, Viola glabella, Linnaea borealis, Cornus canadensis, Rosa gymnocarpa, and Asarum caudatum. On the south end of Upper Priest River 009, black snake-root occurs in a moist, old-growth forest of cedar and hemlock with Oplopanax horridum, Athyrium felix-femina, Streptopus amplexifolius, Trautvetteria caroliniensis, and Equisetum arvense.

CONSERVATION STATUS

Conservation Status - Idaho: In his review of black snake-root for

the rare plants project of the Idaho Natural Areas Council, Brunsfeld (1981) noted that it was known from five locations in northern Idaho and that it may be threatened by alterations to its moist habitat, although no immediate threats were identifiable. For this reason, he suggested it be placed on the state Watch List. Today, only nine populations of black snake-root are known to occur in northern Idaho, indicating that it is perhaps more rare than originally suspected.

Black snake-root is currently listed as a Sensitive Plant for Idaho and Washington on the Region One List of Sensitive Species (USDA Forest Service 1991a).

The Idaho Native Plant Society considers black snake-root a Sensitive species (Idaho Native Plant Society 1991). A sensitive species is a taxon with small populations or localized distributions within Idaho that presently does not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized without active management or removal of threats.

The Idaho CDC currently ranks black snake-root G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho, because of rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

WASHINGTON - Sensitive - species vulnerable and declining which could become endangered or threatened in the state without active management or removal of threats (Washington Natural Heritage Program 1990).

Threats: No apparent threats exist to Priest River Experimental Forest 002, although this population has not been relocated recently. Upper Priest River 009 occurs adjacent to Trail 302, and trail maintenance and rebuilding during the summer of 1991 may have impacted a portion of this population. Trampling by hikers is also an ongoing threat to this population. The three other populations on the Kaniksu NF may be threatened by proposed logging activities in their areas.

Management Implications: Management of Priest River Experimental Forest 002 is compatible with its long term survival. Upper Priest River 009 should be mapped out again in 1992 to assess potential threats posed to this population by hiker traffic and trail maintenance activities. If found to be unacceptably threatened, action should be taken to protect this population. In the future, sensitive plant clearances should be done prior to trail building or major maintenance work. Proposed logging

activities for 1992 could impact Copper Creek Campground 003 (Bonners Ferry RD), Gillon Creek 005 (Bonners Ferry RD), and Hammond Ranch 008 (Priest Lake RD) and the Lower West Branch population in Pend Oreille Co., Washington. Sensitive plant surveys were done for all of these areas by the Idaho CDC (Bursik 1991a; 1991b; 1991c). Recommendations for project modifications were given in these reports that will result in the protect these populations from disturbance. These recommendations should be followed so that the management of these four populations continues to be compatible with their long-term viability. Additionally, Hammond Ranch 008 is also threatened by livestock grazing. All of the flowering shoots in portions of this population had been grazed off in 1991. I suggest establishing some monitoring plots in this and other sensitive plant populations (Rubus pubescens 003 and Carex buxbaumii 020) to ascertain the effects of grazing on their long-term viability in the Hammond Ranch area.

ASSESSMENT AND RECOMMENDATIONS

Summary: Black snake-root is known from nine populations in Bonner and Boundary counties in Idaho. Five of these populations are located on the Kaniksu NF. One additional population is known from Pend Oreille Co., Washington, on the Priest Lake RD. Black snake-root is a species of broad riparian zones and their forested margins. Four of the populations of black snake-root are threatened by proposed management activities. Three of these populations are threatened by logging activities proposed for 1992. The Idaho CDC has done sensitive plant surveys at all of these sites and has provided recommendations for project modifications that will protect these populations. I recommend following these suggestions.

Recommendations to the Regional Forester: In 1981, when Steve Brunsfeld reviewed black snake-root as part of the rare plants project of the Idaho Natural Areas Council, he noted that only five populations were known from northern Idaho. Since then, only four additional populations have been located, despite an increasing amount of floristic inventory of appropriate habitats during the last several years by botanists of the Idaho CDC. This may indicate that black snake-root is indeed quite rare in Idaho. Based on this information, I recommend keeping black snake-root on the Regional Forester's List of Sensitive Species for the Northern Region in Idaho.

Recommendations to the Idaho Panhandle NFs: Several threats have been identified for five of the six populations of black snake-root known from the Kaniksu NF. See Management Implications, above, for a recommended course of action to assure the long-term viability of these populations.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include flowers or fruits, stems, and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, ID 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Scheuchzeria palustris L.

CURRENT STATUS USFS - None
USFWS - None
Idaho Native Plant Society - Monitor
Idaho CDC Rank - G5 S3

TAXONOMY

Family: Scheuchzeriaceae (Pod grass)

Common Name: Pod grass

Citation: Sp. Pl. 338. 1753.

Technical Description: Flowering stems (1) 2-4 dm tall, covered with marcescent leaves at base; basal leaves 1-4 dm long, the cauline gradually reduced upward, the ligule (1) 2-10 mm long, the blade erect, 1-3 mm broad; racemes 3- to 12-flowered; pedicels up to 25 mm long in fruit, axillary to well-developed bracts; perianth greenish-white, the segments oblong, 1-nerved, about 3 mm long; follicles 5-8 (10) mm long, compressed, divergent, light greenish-brown, connate only at the base, the stylar beak 0.5-1 mm long; seeds 4-5 mm long (Hitchcock 1969b).

Nontechnical Description: Pod grass is a trailing, strongly rhizomatous graminoid. Each erect stem has three or four stiff, alternate leaves arranged on opposite sides of the stem (two-ranked). Stems are about one foot tall. The obscure flowers produce three, compressed fruits arranged in a spreading, triangular cluster. The entire plant has a greenish-brown appearance. See Appendix 1 for a line drawing of pod grass.

Distinguishing Features and Similar Species: Pod grass could be confused with a sedge (Carex) or rush (Juncus), however, upon close examination many differences can be seen, most notably in the fruits. It may be confused with an arrow-grass (Triglochin), which has mostly basal leaves and very different fruits.

DISTRIBUTION

Range: Pod grass is distributed from southern Alaska to Labrador and Newfoundland, south in British Columbia and Washington to northern California, and to Idaho, Wisconsin, Iowa, Indiana, and New Jersey; it also occurs in Eurasia. In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho, Montana, and North Dakota.

Pod grass is currently known from ten sites in three widely disjunct areas of Idaho: 1) the northern panhandle in Bonner and Boundary counties; 2) Tule Lake, east of Cascade on the Boise NF;

and 3) Robinson Lake and the Bechler Ranger Station area of Yellowstone NP. The seven northern Idaho populations occur at the following sites. Ownership of each population is also given.

-Hager Lake 001 - Priest Lake RD and private.
-Chase Lake 003 - State and private.
-Bailey Bog 004 - north end Priest Lake; private.
-Kaniksu Marsh RNA 005 - Priest Lake RD.
-Bottle Lake RNA 006 - Priest Lake RD.
-Perkins Lake 007 - Bonners Ferry RD and private.
-Sinclair Lake 009 - Moyie River valley; private.

One population of pod grass is also known from the Priest Lake RD in Pend Oreille Co., Washington at Huff Lake.

See Appendix 2 for mapped locations of pod grass on the Priest Lake RD and at Perkins Lake.

Habitat and Associated Species: Throughout its range, pod grass can be found in bogs, where it usually occurs with sphagnum, or on lake margins, where it is usually associated with Carex lasiocarpa on floating mats. It is usually found in an undescribed phase of the C. lasiocarpa-dominated community described by Boggs et al. (1990). At the known Idaho locations, pod grass is associated with one to several populations of other Northern Region Forest Service Sensitive Plant Species. At Hager Lake 001 pod grass occurs with five other Sensitive Plant Species. At Kaniksu Marsh RNA 005, pod grass is sympatric with eleven other Sensitive Plant Species, including Rhynchospora alba, Dryopteris cristata, Epilobium palustre, Hypericum majus, Lycopodium inundatum, Salix pedicellaris, Scirpus subterminalis, Trientalis arctica, and Vaccinium oxycoccos. See Appendix 3 for a list of Sensitive Plant Species and wetland plant communities occurring with pod grass on the Priest Lake RD. Others associated species include Carex limosa, Carex rostrata, Potentilla palustris, Menyanthes trifoliata.

CONSERVATION STATUS

Conservation Status - Idaho: Johnson (1981h) reviewed pod grass for the Idaho rare plant project of the Idaho Natural Areas Council. He placed it on the State Watch List explaining that at that time only two sites were known, but many bogs in the region remained to be searched. Now that many bogs and peatlands in the state have been inventoried (Tuhy 1981; Caicco 1987; Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990; Moseley et al. 1991), pod grass still appears to be a rare species in Idaho with just 10 populations known.

The Idaho Native Plant Society places pod grass on the Monitor list (Idaho Native Plant Society 1991). The Monitor category of

the Idaho Native Plant Society list refers to taxa that are common within a limited range as well as those taxa which are uncommon, but have no identifiable threats.

The Idaho CDC currently ranks pod grass as G5 S2 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S2 = imperiled in Idaho, because of rarity or because of other factors demonstrably making it vulnerable to extirpation [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

CALIFORNIA - List 1A - plants considered extinct in California (Smith and Berg 1988).

OREGON - A taxon threatened in Oregon but more common or stable elsewhere (Oregon Natural Heritage Data Base 1991).

Threats: Threats to two private populations are known: Bailey Bog 004 has been illegally filled in the past, though the fill has since been removed and Sinclair Lake 009 population has been largely buried by gravel underlying adjacent train tracks. Perkins Lake 007, on the Bonners Ferry RD, appears little disturbed, despite the recent construction of a floating dock and the erection of goose nesting platforms adjacent to this population. Fisherman traffic is an ongoing threat to the Huff Lake population in Pend Oreille Co., WA. Fisherman often take boards with them and place them on the mat so they can stand and fish without sinking into oblivion. These boards are usually left on the mat, killing plants growing underneath. No extrinsic threats are apparent to the other populations of pod grass in the Priest River Valley.

Management Implications: With the exception of the potential impact on Perkins Lake 007 that floating dock and goose platform construction could potentially have on the pod grass population found there, and the potential impact of anglers on the Huff Lake population of pod grass, management of the populations of pod grass on the Kaniksu National Forest seem to be compatible with the long-term viability of these populations. Due to the sensitivity of this and other species of limited distribution within the region that occur in habitats very sensitive to disturbance, careful consideration should be given to the effect of any management activities planned for these peatland habitats on these populations of plants.

ASSESSMENT AND RECOMMENDATIONS

Summary: Pod grass has a restricted distribution in Idaho, occurring in sphagnum bogs. In all cases except one (Sinclair Lake) it is sympatric with one to several plant taxa considered

rare in Idaho. While two privately-owned populations are threatened, all populations on the Kaniksu NF appeared vigorous and stable; two are protected in RNAs.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that pod grass has a restricted distribution in Idaho. Recent intensive floristic inventories of peatland habitats in several parts of the state, and in particular, on the Kaniksu NF have revealed the presence of only ten populations of pod grass in Idaho (Caicco 1987; Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990; Moseley et al. 1991). Moseley (1989) concurred with Caicco (1987) in stating that pod grass appeared to occur in sufficiently large populations where it did occur that it didn't appear worthy of Sensitive status in the Northern Region of the Forest Service in Idaho. However, as more peatlands have been surveyed, and the prospects for finding more populations of pod grass diminishes, it is apparent that there are sufficiently few populations of this species present in Idaho to add it to the Northern Region List of Sensitive Species for Idaho. This recommendation has also been made to the Intermountain Region of the FS as well (Moseley et al. 1991).

Recommendations to the Idaho Panhandle NFs: Pod grass has a limited distribution in Idaho and occurs in a unique habitat. Seven populations of this species are known from Bonner and Boundary counties in Idaho, and one population is known from Pend Oreille Co. in Washington (at Huff Lake). Six of these populations (including Huff Lake) occur on the Kaniksu NF, with five occurring on the Priest Lake RD. Two of the populations on the Priest Lake RD are protected in Research Natural Areas (Kaniksu Marsh 005 and Bottle Lake 006). The pod grass population at Huff Lake has been impacted by angler traffic and their habit of carrying boards onto the mat to stand on to prevent sinking in. If stocking of trout still occurs in Huff Lake, serious consideration should be given to ceasing this activity to protect this and several other Sensitive Plant populations known from this site.

The lone population of pod grass known from the Bonners Ferry RD is at Perkins Lake 007. Pod grass occurs with eleven other Region One FS Sensitive Plant Species at Perkins Lake. These populations have been threatened by recent construction of a floating dock through the floating mat habitat near the boat launch that is known to harbor at least six of the Sensitive Plant Species. Moseley (1989) recommended establishing Perkins Lake as a Special Interest Botanical Area to showcase its unique botanical attributes. I suggest this designation now be implemented as the dock can serve as a plant viewing platform and interpretive trail through this mat that was otherwise inaccessible to the public.

Land managers and field personnel on the Kaniksu National Forest should be informed of the occurrence of this species in their

areas. Possible sightings of this plant should be documented by specimens, and should include both flowers/fruits and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Scirpus hudsonianus (Michx.) Fern.

CURRENT STATUS
USFS - None
USFWS - None
Idaho Native Plant Society - Priority 1 (recom.)
Idaho CDC Rank - G5 S1 (recommended)

TAXONOMY

Family: Cyperaceae (sedge)

Common Name: Hudson's Bay bulrush

Citation: Rhodora 8:161. 1906.

Technical Description: Culms more or less densely clustered on a rather short, freely rooting rhizome, 0.5-4 dm tall, bearing several more or less reduced scale leaves at the base and one or sometimes two more-normally developed leaves above the base with a normal sheath and blade, blade narrow, 5-12 mm long; spikelet solitary, terminal, medium or rather light brown, 5-7 mm long, many-flowered, involucre consists of only 2 or 3 empty scales at the base of the spikelet which are often deciduous as the spike approaches maturity, lowermost scale with prominent, thickened midrib that extends as a broad, blunt awn 0.5-2 mm long; bristles of fruit 6, white, flattened, elongate, much surpassing the scales, at maturity forming a silky white tuft extending 1-2 cm beyond the end of the spikelet; achenes trigonous, brown, about 1.5 mm long, minutely apiculate (Cronquist 1969g).

Nontechnical Description: Culms densely clustered from creeping rhizomes, 0.5-4 dm tall, bearing several scale-like leaves and sometimes two normal leaves with blades and sheaths, blade narrow 5-12 mm long; spikelets solitary, many-flowered, bristles at the base of the fruit 6, elongate, much surpassing the scales at maturity, forming a silky white tuft, extending 1-2 cm beyond the end of the spikelet; achenes trigonous, brown, about 1.5 mm long, with a minute pointed tip.

Distinguishing Features and Similar Species: The clustered stems from creeping rhizomes and the presence of 6 bristles at the base of each fruit set Hudson's Bay bulrush apart from most other sedge species. It does resemble a "balding" cotton grass (Eriophorum spp.), but, upon close scrutiny you will see only 6 bristles at the base of each fruit of Hudson's Bay bulrush while there are many at the base of each fruit of cotton grass (all species). Without the long bristles, Hudson's Bay bulrush would very closely resemble Eleocharis pauciflora whose stems do not arise so dense from creeping underground rhizomes. See Appendix 1 for a line drawing of Hudson's Bay bulrush.

DISTRIBUTION

Range: Hudson's Bay bulrush is a circumboreal species that extends south to Connecticut, Michigan, Wisconsin, Saskatchewan, and Southern British Columbia (Cronquist 1969g). More recently it has also been discovered in Glacier National Park in Montana (Lesica and Shelly 1991) and in 1991 in the Cow Creek Meadows on the Bonners Ferry RD.

Jill Blake, botanist for the Idaho Panhandle NFs, and I found this population in July 1991. The population is very localized in the meadows, though much habitat remains to be surveyed upstream. It consists of slightly more than 100 individual clumps and covers approximately 0.25 acre adjacent to and just north of Cow Creek. See Appendix 2 for the mapped location of Hudson's Bay bulrush in Cow Creek Meadows.

Habitat and Associated Species: Throughout its range, Hudson's Bay bulrush is a species of sphagnum bogs and other very wet places (Cronquist 1969g). In the Cow Creek Meadows it occurs on slightly sloped sphagnum-covered fen habitats, some of which are floating above a subterranean source of flowing water. Associated species include Carex scopulorum, C. paupercula, Calamagrostis canadensis, Eriophorum polystachion, Kalmia microphylla, and Pedicularis groenlandica. Several Sensitive Plants occur sympatrically with Hudson's Bay bulrush at this site, including Carex paupercula, C. flava, C. buxbaumii, and Trientalis arctica. See Appendix 3 for a list of Sensitive Species and wetland plant communities known from the Cow Creek Meadows.

CONSERVATION STATUS

Conservation Status - Idaho: Because it was not known from Idaho prior to 1991 and because it was not expected to occur in Idaho, Hudson's Bay bulrush currently has no conservation status in Idaho. See ASSESSMENT AND RECOMMENDATIONS section for conservation status recommendations for the US Forest Service in Region One.

The Idaho Native Plant Society should rank Hudson's Bay bulrush as a state Priority 1 species. Priority 1 species are those in danger of becoming extinct or extirpated from Idaho in the foreseeable future if identifiable factors contributing to their decline continue to operate; these are taxa whose populations are present only at critically low levels or whose habitats have been degraded or depleted to a significant degree.

The Idaho CDC should rank Hudson's Bay bulrush G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery; S1 = critically imperiled in Idaho because of extreme rarity or because of some

factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

MONTANA - Hudson's Bay bulrush is considered sensitive in Montana and has been assigned a state rank of S1 by the Nature Conservancy (Lesica and Shelly 1991). S1 species are critically imperiled in Montana because of extreme rarity (5 or fewer occurrences, or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extirpation from the state.

Threats: The Hudson's Bay bulrush population in Cow Creek Meadows occurs entirely within a grazing allotment. Grazing and trampling by cows is an ongoing threat to this and several other Sensitive Plant populations found in the meadows. Although the sphagnum fen habitats occupied by Hudson's Bay bulrush had not apparently been directly impacted by cows in 1991, adjacent very wet areas dominated by Carex rostrata, C. scopulorum, and Calamagrostis canadensis had been severely trampled and partially grazed by cattle, indicating that the prevailing moisture level of these habitats alone is not enough to prevent cows from entering them and causing damage to Sensitive Plant populations.

Management Implications: The current threat posed to the only known population of Hudson's Bay bulrush in Idaho by cattle grazing carries with it significant management implications. Along with Hudson's Bay bulrush, four other Sensitive Plant populations occur in the grazing allotment. Additionally, Cow Creek Meadows contain the only documented location of the northern bog lemming, a Region One and state Species of Special Concern, in Idaho. Moseley (1989) recommended that a long-term monitoring program should be established in Cow Creek Meadows to ascertain the effects of cows on the Sensitive Plant populations found there. Now that Hudson's Bay bulrush has been discovered in the Cow Creek allotment, this lends a new urgency to this suggestion.

The Idaho CDC in cooperation with the Bonners Ferry RD has proposed writing a management plan and implementing a long-term monitoring project in the Cow Creek Meadows to monitor Sensitive Species population trends there. A consortium of environmental groups, including the local (Bonners Ferry) chapter of the Audubon Society have recommended establishing the area as a Special Interest Botanical Area. If the management plan and monitoring proposal for the Cow Creek Meadows is funded, the Idaho CDC will establish permanent vegetative plots in various wetland community types within Cow Creek Meadows as well as control plots in similar communities for comparison in the Smith Creek RNA to the south and in Grass Creek Meadows to the north. Permanent photographic points will be established throughout the meadows as will points at which to sample water chemistries. The vegetation in the Cow

Creek Meadows and Sensitive Plant populations will be thoroughly mapped as well. Live trapping of bog lemmings along transects will be initiated to learn more about the trends of this population as well. Exclosures will also be constructed in the various wetland communities to ascertain direct effects of cattle on them. All of this information will provide the basis for evaluating and establishing the Cow Creek Meadows as a Special Interest Botanical Area.

Given my strong concerns over the potential effect of cows on Sensitive Species populations in Cow Creek Meadows, particularly on Hudson's Bay bulrush and the northern bog lemming, both of which are known from no other sites in the state, I can offer the Idaho Panhandle NFs two possible alternative for this area: 1) cease grazing in the Cow Creek drainage completely, or 2) fund the proposal of the Idaho CDC to do short- and long-term monitoring of these sensitive communities and Sensitive Species populations in order to evaluate the impact of this and other management activities (e.g., past and present logging) on these Sensitive Species populations.

ASSESSMENT AND RECOMMENDATIONS

Summary: Hudson's Bay bulrush was discovered in the Cow Creek Meadows on the Bonners Ferry RD in 1991. This is only the second location of this species in the western U.S. and the first in Idaho. This population occurs in wet sphagnum-covered fen habitats along the creek and covers an area of no more than 0.25 acre. Four other Sensitive Plant populations occur sympatrically with Hudson's Bay bulrush in the Meadows along with the Sensitive Animal Species, the northern bog lemming. All of these populations occur within the Cow Creek Meadows grazing allotment. Grazing and trampling by cattle is a threat to the long-term viability of all of these populations. This site has been nominated for recognition as a Special Interest Botanical Area. The Idaho CDC in cooperation with the Bonners Ferry RD has proposed doing a management plant and a short- and long-term monitoring project to ascertain the effect of cattle grazing on sensitive species populations and to evaluate the area as a potential Botanical Area.

Recommendations to the Regional Forester: Given that Hudson's Bay bulrush is known from only two widely separated areas of the western U.S. (Cow Creek Meadows, Bonners Ferry RD, Kaniksu NF and Glacier NP in Montana), and the fact that recent intensive floristic surveys of potential habitat of this species on the Kaniksu NF (Caicco 1987; Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990) have failed to locate additional populations, it is apparent that Hudson's Bay bulrush is quite rare in Idaho. I recommend that it be placed on the Regional Foresters List of Sensitive Species for the Northern Region of the Forest Service.

Recommendations to the Idaho Panhandle NFs: See Management Implications above for a recommended course of action to assure that management activities do not threaten the long-term viability of the only known population of Hudson's Bay bulrush in Idaho.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens, and should include flowers or fruits, stems, and rhizomes. Specimens should be sent to the University of Idaho Herbarium for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Scirpus subterminalis Torr.

CURRENT STATUS
USFS R1 - Sensitive
USFS R4 - None
USFWS - None
Idaho Native Plant Society - Monitor
Idaho CDC Rank - G5 S1

TAXONOMY

Family: Cyperaceae (sedge)

Common Name: water clubrush

Citation: Fl. N. & Mid. U.S. 47. 1824.

Technical Description: Rhizomatous, aquatic perennial with slender, subterete, flaccid stems 20-80 cm long, and elongate, slender, flaccid leaves from near the base, the leaves and stems usually floating distally rather than emergent, or the plant seldom more or less terrestrial with erect or emergent stems and leaves (not seen in Idaho); spikelets solitary, light brown, 7-12 mm long, subtended by a prominent bract (1)1.5-6 cm long which appears like a continuation of the stem; scales 4-6 mm long, very thin and almost hyaline except for the somewhat firmer midrib, which may be minutely exerted; hypogynous bristles retrorsely barbellate, shorter than to occasionally equaling or slightly exceeding the achene; achene trigonous, 2.5-3.8 mm long, including the prominent (0.5 mm), slender beak apiculate (Cronquist 1969g).

Nontechnical Description: Rhizomatous aquatic perennial with flaccid stems and leaves, the leaves floating on the surface of the water. The stems are slightly erect above the surface of the water 4-7 cm (unlike the drawing in Appendix 1), and are terminated by a small, solitary spikelet, which is subtended by a prominent bract. See Appendix 1 for a line drawing of water clubrush.

Distinguishing Features and Similar Species: The flaccid stems and leaves and aquatic habit distinguish this species from all other Scirpus spp. in our area. Superficially it may resemble one or two of the fine-leaved species of Potamogeton, particularly if found in dense stands in shallow water. In this case look for the basal leaves of water clubrush and single emergent flowering shoot as compared with the leafy stems and floating to slightly emergent flowering stems of the Potamogeton spp.

DISTRIBUTION

Range: According to Cronquist (1969g), water clubrush is distributed in western North America, from southern Alaska to

southern Oregon, chiefly west of the Cascade summits, but it also extends inland to northern Idaho and northwestern Montana. In eastern North America water clubrush occurs from Newfoundland to Ontario, south to South Carolina, Georgia, and Missouri. Cronquist (1969g; 1977) states that there may be an isolated station in Utah, although it is not treated in Welsh et al. (1987).

Ten populations of water clubrush have been recorded from two widely disjunct regions of Idaho. Eight occur in the panhandle, where only six have been seen in recent years. The other two were only recently discovered in the southwestern corner of Yellowstone NP, Fremont County (Moseley et al. 1991).

Three of the known panhandle populations of water clubrush are located wholly or partially on the Priest Lake RD. One historical population (001) was vaguely documented from wetland/bog areas along Kalispell Creek in a peat bog that sounds suspiciously like Hager Lake. The known populations are from small bog lakes, including Hager Lake 003, Kaniksu Marsh RNA, and Bottle Lake RNA. See Appendix 2 for map locations of these populations.

One other population is known from the Kaniksu NF in Perkins Lake on the Bonners Ferry Ranger District (see Appendix 2). Two populations are known from the Priest Lake vicinity, just southeast of Coolin at Chase Lake and east of Coolin at Lee Lake. Water clubrush was reported by Karg (1974) in the flora of Huff Lake, Pend Oreille county, Washington on the Priest Lake RD. This population was not relocated during a field survey during 1991, and may be extirpated from this site.

The Kaniksu Marsh population is rather large (several thousand individuals) and covers more than one acre. Hager Lake 003 is a smaller population of perhaps 200 individuals that seems, nonetheless to be quite stable. Less is known about the Bottle Lake population which I noticed when I was there in 1987. I failed to make a collection or take note of population size. Current management practices appear to be compatible with the long-term viability of these water clubrush populations on the Priest Lake RD.

Habitat and Associated Species: Water clubrush occurs in quiet, shallow water 2-8 dm deep. At Kaniksu Marsh it occurs in rather dense rhizomatous patches as do associated species Brasenia schreberi, Nuphar polysepalum, and Potamogeton natans. Utricularia vulgaris is also associated with water clubrush. At Hager Lake, water clubrush is found in a loose rhizomatous patch with no other species. The floating sphagnum moss mats found on the margins of or within lakes supporting populations of water clubrush support several other Region One Forest Service Sensitive Plant populations at all sites on the Kaniksu NF (see Appendix 3).

CONSERVATION STATUS

Conservation Status - Idaho: Water clubrush has only recently been recognized as a species of conservation concern, as a result of an extensive peatland floristic study in Idaho, which revealed the presence of only a few populations in two widely scattered areas in Idaho (Bursik 1990). It is a Sensitive Species in the Northern Region of the FS for Montana and Idaho (USDA Forest Service 1991a).

The Idaho Native Plant Society places water clubrush in their Sensitive category (Idaho Native Plant Society 1991). The Sensitive category of the Idaho Native Plant Society list refers to species with small populations or localized distribution within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized without active management or removal of threats.

The Idaho CDC currently ranks water clubrush as G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho, because of rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

CALIFORNIA - List 2 = plants rare, threatened, or endangered in California, but more common elsewhere (Smith and Berg 1988).

MONTANA - Sensitive = Known from a limited number of populations in Montana, or it occurs principally in restricted habitat considered vulnerable to man-caused disturbances (Lesica and Shelly 1991).

Lesica and Shelly (1991) also list water clubrush as rare in Wyoming.

Threats: Current management practices appear compatible with the long-term survival of the three populations of water clubrush on the Priest Lake RD. Little is known about the Bottle Lake RNA population. This population should be surveyed as soon as possible to determine whether any threats exist to this population.

Management Implications: Present management appears to be compatible with the long-term maintenance of these populations.

ASSESSMENT AND RECOMMENDATIONS

Summary: Water clubrush is known from 10 populations in two widely

disjunct areas of Idaho. Three populations occur on the Priest Lake RD. These three populations appear to be protected from any activities that would threaten their long-term survival, although little is known about the Bottle Lake RNA population.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that water clubrush has a restricted distribution in Idaho. In addition to Idaho, California, Montana, and Wyoming also consider water clubrush to be of conservation concern. Based on information reported here, I recommend that water clubrush remain on the Regional Foresters Sensitive Species List for the Northern Region in Idaho.

Recommendations to the Idaho Panhandle NFs: Eight populations of water clubrush are known from the panhandle region of Idaho. Four of these populations are known from the Kaniksu NF. Management activities are not seemingly threatening these populations, although little is known about the Bottle Lake population, and the Perkins Lake population is located in a popular fishing lake where recent construction of a fishing dock destroyed portions of several Sensitive Plant populations, including portions of the water clubrush population found there. The Bottle Lake RNA population should be surveyed as soon as possible to determine current population trends. The Perkins Lake population should be monitored periodically, and any proposed development activities for this lake should be carefully evaluated for their impacts on Sensitive Plant populations there.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this species should be documented by specimens (if the size of the population warrants collecting), and should include both flowers, leaves, and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Streptopus streptopoides (Ledeb.) Frye & Rigg

CURRENT STATUS
USFS - None
USFWS - None
Idaho Native Plant Society - Sensitive
Idaho CDC Rank - G5 S1

TAXONOMY

Family: Liliaceae (lily)

Common Name: dwarf twisted-stalk

Citation: Fl. Ross. 4:128. 1853.

Technical Description: Stem simple, usually 10-20 cm, coarsely fringed-ciliate at the nodes opposite the leaf blades; leaves ovate-lanceolate to oblong-lanceolate, mostly 3-5 cm long and 1/3 to 1/2 as broad, acute or acuminate; flowers single, the peduncle slender, 3-10 mm long, usually recurved; perianth greenish, often strongly purple-tinged, spreading and saucer-shaped, the tepals oblong-lanceolate, 3-4 mm long, slightly recurved at the acute to acuminate tip; stamens not much more than half as long as the perianth segments; anthers scarcely 1 mm long; style bulbous-conical, scarcely 0.5 mm long, stigma unlobed, berry red, 5-6 mm long, few-seeded, the seeds about 2.5 mm long (Cronquist 1969h).

Nontechnical Description: Stems unbranched, 10-20 cm; leaves opposite, lanceolate, 3-5 cm long, 1/3 to 1/2 as wide; flowers single, 1-3 per stem, borne in leaf axils, peduncles slender 3-10 mm long, flowers and fruits nodding; perianth greenish, often purple-tinged, spreading and saucer-shaped, individual tepals 3-4 mm long, slightly recurved at pointed tip; stamens not much more than half as long as the perianth segments, anthers scarcely 1 mm long; berry red, 5-6 mm long, few-seeded, seeds ca. 2.5 mm long.

Distinguishing Features and Similar Species: Dwarf twisted-stalk bears a strong familial resemblance to several other more common lilies in northern Idaho, including Disporum hookeri, Streptopus amplexifolius, and Smilacina stellata. Dwarf twisted-stalk has 1-3, (usually 2) flowers per stem that occur one per node and the stem is unbranched. Disporum has two flowers per node and the stems are branched. S. amplexifolius is branched and grows to more than 1 meter tall, whereas dwarf twisted-stalk is only 10-20 cm tall and is unbranched. S. stellata has a terminal racemose inflorescence compared with single, axillary flowers for dwarf twisted-stalk. See Appendix 1 for a line drawing of dwarf twisted-stalk.

DISTRIBUTION

Range: Dwarf twisted-stalk is a wide-ranging species that occurs from Alaska south to the Cascade Mountains in Washington, east to eastern British Columbia and northern Idaho in North America and it also occurs in Asia (Cronquist 1969h).

Four rather small populations of dwarf twisted-stalk are known from Bonner and Boundary counties in northern Idaho. All of these populations occur on the Kaniksu NF. Three populations are on the Bonners Ferry RD, two in the Blue Joe Creek drainage 001 and 003, and one along Beaver Creek 004. The lone population known from the Priest Lake RD occurs along Gold Creek 002, northwest of Upper Priest Lake. See Appendix 2 for mapped location of the Gold Creek 002 population of dwarf twisted-stalk on the Priest Lake RD.

Habitat and Associated Species: Dwarf twisted-stalk is a species of dense, coniferous, midmontane forests in our area (Cronquist 1969h). In Idaho it is a species of low- (elev. 2840 ft, Gold Creek 002) to mid-elevation (4400 ft, Blue Joe Creek 003 and Beaver Creek 004) riparian zones. It occurs in mature to old-growth Tsuga heterophylla forests. The only population I visited during 1991 was Blue Joe Creek 003 where it occurs along a small, permanent tributary to Blue Joe Creek in an old-growth cedar and hemlock forest with Oplopanax horridum, Taxus brevifolia, Gymnocarpium dryopteris, Vaccinium membranaceum, Rubus pedatus, and Clintonia uniflora. Gold Creek 002 occurs with G. dryopteris, C. uniflora, T. brevifolia, and V. membranaceum, along with Linnaea borealis, Tiarella trifoliata, and Pachistima myrsinites in a hemlock/oak fern habitat type on a 30 degree slope.

CONSERVATION STATUS

Conservation Status - Idaho: Dwarf twisted-stalk was reviewed by Fred Johnson (1981i) as part of the rare plants project of the Idaho Natural Areas Council. At that time, he noted, only one collection had been made in 1925 on the east side of Priest Lake in a mature cedar/hemlock forest. Although there is ample habitat of this type in the Priest Lake area, he noted that the plant appears to be very rare and its successional status is thought to be near climax. Based on this information, he recommended Watch status for dwarf twisted-stalk. Since 1981 only four documented locations of dwarf twisted stalk have been located on the Kaniksu NF, despite considerable recent work by researchers in seemingly appropriate habitat in the area. It seems to indeed be a species of limited distribution in Idaho.

Dwarf twisted stalk was recommended for Sensitive status in the Northern Region of the Forest Service in 1991 by the Idaho CDC and by Jill Blake, botanist for the Idaho Panhandle NFs. It however, did not appear on the official list for unknown reasons.

The Idaho Native Plant Society considers dwarf twisted-stalk a sensitive species in Idaho (Idaho Native Plant Society 1991). Sensitive species are those with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized without active management or removal of threats.

The Idaho CDC currently ranks dwarf twisted-stalk G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Threats: No extrinsic threats are apparent to Blue Joe Creek 001 and 003, however, timber harvesting is planned for this area in the near future. The Idaho CDC has prepared a sensitive plant report for this area for the Bonners Ferry RD (Bursik 1991d), noting the presence of this and several other Sensitive Plant population in the Blue Joe IRA. It is noted that portions of these populations of dwarf twisted-stalk could occur throughout much of this IRA and that careful planning and survey of proposed tree harvesting units must be carried out to assure protection of these populations. Beaver Creek 004 was discovered in a proposed timber harvest unit along Beaver Creek by Heidi Rich, botanist, Bonners Ferry RD during field survey of this unit. This population was then buffered by 75 feet on all sides, apparently protecting it from harvesting activities. No apparent threats are known for Gold Creek 002, however, this population was not visited during 1991 and has not been seen since its discovery in 1982.

Management Implications: Care should be taken to assure the protection of Blue Joe Creek 001 and 003 from timber harvesting activities in the near future. Much of the IRA is suitable habitat for this and other Sensitive Plant Species of moist forests and riparian areas. Reconnaissance should be made with Beaver Creek 004 during 1992 to assure that it was indeed protected from timber harvesting activities. Personnel on the Priest Lake RD should make reconnaissance with Gold Creek 004 to verify its existence and get a better idea of population dynamics and whether current management of this population is compatible with its long-term viability.

ASSESSMENT AND RECOMMENDATIONS

Summary: Dwarf twisted-stalk is a species of limited distribution in Idaho. It occurs in mature cedar and hemlock forests, usually along riparian zones. It is known from only four populations in Bonner and Boundary counties. Three of the four populations could be threatened by present or near-future logging activities if active management is not undertaken to assure their survival. Dwarf twisted-stalk was nominated for sensitive status for Region One of the Forest Service in 1991, but for unknown reasons, it did not appear on the revised list (USDA Forest Service 1991a).

Recommendations to the Regional Forester: Dwarf twisted-stalk is a species of limited distribution in Idaho. It is currently known from only four populations in Bonner and Boundary counties, all of which are on lands managed by the Kaniksu NF. This species was nominated for sensitive status for Region One of the Forest Service in Idaho in 1991, but for unknown reasons, did not appear on the revised list (USDA Forest Service 1991a). Given its limited distribution in the state and the fact that only four populations are currently known, I recommend that dwarf twisted-stalk be placed on the Regional Forester's List of Sensitive Plant Species for the Northern Region in Idaho.

Recommendations to the Idaho Panhandle NFs: Potential threats exist to the three populations of dwarf twisted-stalk on the Bonners Ferry RD. See Threats and Management Implications sections above for recommendations to assure the long-term viability of these populations. Additionally, Gold Creek 002 on the Priest Lake RD has not been revisited since 1982 when it was first discovered. This population should be revisited during 1992 to determine population dynamics and whether current management of this population is compatible with its long-term viability.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include flowers or fruits, stems and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, ID 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Tellima grandiflora (Pursh) Dougl.

CURRENT STATUS USFS R1 - None
USFWS - None
Idaho Native Plant Society - Priority 2
Idaho CDC Rank - G5 S2

TAXONOMY

Family: Saxifragaceae (Saxifrage)

Common Name: fringe-cup

Citation: Lindl. Bot. Reg. 14: pl 1178. 1828.

Technical Description: Flowering stems up to 8 dm tall, from a decumbent and somewhat rhizomatous base, sparingly leafy, copiously hirsute petioles 5-20 cm long, the blades cordate-triangular or cordate-ovate to more nearly reniform, 3-8(10) cm broad and about as long, shallowly (3) 5- to 7-lobed and irregularly once or twice crenate-dentate; cauline leaves 1-3, reduced; racemes loosely 10- to 35-flowered; pedicels much shorter than the flowers; calyx greenish, (5) 6-8 mm long at anthesis and up to 11 mm in fruit; petals greenish-white to deep reddish, often coloring with age; filaments 1-2.5 times as long as the anthers; capsule about equaling the calyx; seeds brown, narrowly ellipsoid-ovoid, 0.8-1.0 mm long, prominently wrinkled, warty in longitudinal rows (Hitchcock 1961e).

Nontechnical Description: Flowering stems up to 2.5 ft tall from a short, creeping rhizome, leaves few per stem, petioles hairy, 2-8 inches long, blades heart-shaped, triangular, to somewhat round, 3-8 (10) cm broad and about has long, 5- to 7-lobed and irregularly once to twice toothed, cauline leaves 1-3, reduced, racemes loosely 10-35-flowered, sepals greenish, (5) 6-8 mm long at anthesis, up to 11 mm in fruit, petals greenish-white to reddish, often coloring with age, filaments 1-2.5 times as long as anthers.

Distinguishing Features and Similar Species: Fringe cup is similar to two more common woodland species in northern Idaho, Mitella breweri and Tiarella trifoliata. Fringe cup is distinguished from M. breweri in having more pointed and deeper leaf lobes, and in having cauline leaves versus the strictly basal leaves of M. breweri. Fringe cup can be distinguished from T. trifoliata which has distinctly three-lobed leaves versus the more obscurely 5- to 7-lobed leaves of fringe cup. Also the flowering stems of T. trifoliata tend to be shorter (2-5.5 dm) with fewer flowers than the flowering stems of fringe cup. See Appendix 1 for a line drawing of fringe cup.

DISTRIBUTION

Range: Hitchcock (1961e) notes that fringe cup is common along streams and in woods from sea level to moderately high elevations in the mountains from southern Alaska, south along the coast to south of San Francisco Bay. Inland it is found in British Columbia to the Selkirk Mountains and to the Selkirk Mountains (west range) in northern Idaho and northeastern Washington, but it otherwise is restricted to areas west of the Cascades, except in the Columbia River Gorge.

Fringe cup is currently documented from two areas in northern Idaho. Three historical collections exist for fringe cup around Hope, ID, near the northeastern shore of Pend Oreille Lake, in deeply shaded, moist forests. Two of these populations are likely from Strong Creek (probably on USFS land, Sandpoint RD). The other historical collection from this area is at Trestle Creek, the drainage immediately east of Strong Creek on Pend Oreille Lake, which may or may not be on USFS land.

The only recently documented population of fringe cup in northern Idaho is on the Priest Lake RD, on Beaver Creek 001, approximately 1.5 miles west of the mouth of Beaver Creek on Priest Lake. Only one vigorous individual was found here, although more likely exist. Several other Priest Lake drainages were surveyed in this area, including portions of Granite Cr., Tango Cr., Bottle Cr. and Tepee Cr., and no more fringe cup was found, indicating that it may be a highly localized and rare species.

One historical collection exists for fringe cup in the Washington State University Herbarium from Bonner Co. with the vague location of "southeast of Sullivan Divide, northwest of Coolin, elev. 4050 ft"- G. Hedgecock 7/20/33. This information is too vague to be of much use in relocating this population.

Two collections exist of fringe cup in Pend Oreille Co., WA, including one from the Priest Lake RD, near Muskegon Lake. This is a fairly recent collection (1967) by Earle Layser, who reported this as the only site for Tellima grandiflora in Pend Oreille Co. (Layser 1980). See the two mapped locations of fringe cup on the Priest Lake RD in Appendix 2.

Habitat and Associated Species: In Beaver Creek, the lone individual of fringe cup was found growing on a mossy gravel bar in the creek with Alnus incana, Acer glabrum, Cornus stolonifera, Heracleum lanatum, Galium sp., Circaea alpina, and Viola glabella. Hitchcock (1961e) states that fringe cup usually occurs on deep, rich soils. This is the case with all of the historical and recently documented populations of fringe cup in northern Idaho and northeastern Washington.

CONSERVATION STATUS

Conservation Status - Idaho: The rarity of *Tellima grandiflora* was recently brought to light by Christine Lorain, former botanist for the Idaho CDC, at the 1991 rare plant meeting of the Idaho Native Plant Society. At the meeting, it was agreed to list fringe cup as a Priority 2 category species in Idaho. Category 2 of the Idaho Native Plant Society refers to species likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to its population decline or habitat degradation or loss continue.

Fringe cup currently has no status as a Northern Region Sensitive Species.

Fringe cup is currently ranked as G5 S2 by the Idaho CDC. (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S2 = imperiled in Idaho because of extreme rarity or because of some factor of its biology making it vulnerable to extinction [Moseley and Groves 1990]).

Threats: There are no current threats to the Beaver Creek 001 population of fringe cup, and no threats are known to the Muskegon Lake population. If a portion of the population occurs near the lake, trampling by fishermen could threaten this portion of the population.

Management Implications: Only one population of fringe cup was located during 1991 despite the fact that a number of riparian areas were surveyed for Sensitive Plant populations on the Priest Lake RD. Current management practices seem to be compatible with the long-term viability of these populations. The Muskegon Lake population should be relocated as soon as possible to assure that fisherman traffic presents no threat to this population.

ASSESSMENT AND RECOMMENDATIONS

Summary: Fringe cup is known from only one recently documented site in northern Idaho. Four additional historical collections of fringe cup exist from areas in northern Idaho, but none of them has been recently reconfirmed. All four of these populations are likely from lands administered by the Kaniksu NF. Layser (1980) reported Muskegon Lake as the only known location of fringe cup in Pend Oreille Co., Washington.

Recommendations to the Regional Forester: Only two populations of fringe cup are known from recent documentation to exist on the Priest Lake RD. Given its rarity in Idaho and in northeastern Washington, fringe cup should be added to the Northern Region Sensitive Species List for Idaho.

Recommendations to the Idaho Panhandle NFs: Only two populations of fringe cup are known from recent collections from northern Idaho and northeastern Washington. Three historical locations near Hope, ID on the Sandpoint RD on Strong Creek and Trestle Creek should be relocated as soon as possible. The Priest Lake RD population at Muskegon Lake has not been seen since 1967. Reconnaissance should be made with this population as soon as possible to assess population size and dynamics and whether extrinsic factors such as fisherman traffic are having an effect on this population. Beaver Creek 001 needs further survey work to assess its full range of occurrence in this drainage, and whether more populations are located in adjacent drainages. The proposed Challenge Cost-share project between Idaho Fish and Game (CDC) and the Idaho Panhandle NFs to survey Beaver Creek and adjacent drainages for the full extent of Rubus spectabilis (salmonberry) populations, if funded, will also elicit further information on the status of fringe cup in this part of the Priest Lake RD.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include both fertile and sterile stems and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Thelypteris phegopteris (L.) Slosson in Rydb.

CURRENT STATUS
USFS - R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Priority 1
Idaho CDC Rank - G5 S1 (recommended)

TAXONOMY

Family: Polypodiaceae (fern)

Common Name: northern beech-fern

Citation: Fl. Rocky Mts. 1043. 1917.

Technical Description: Leaves scattered along slender rhizomes, mostly 1-5.5 dm long, the slender petiole equal or usually longer than the broad blade, blade (4)10-20(25) cm long, 1-2 times as long as wide, ciliate-margined, hairy along the rachis, pinnate-pinnatifid with toothed or entire, often revolute-margined segments; pinnae mostly 10-25 opposite or offset pairs, sessile (all but the lowest ones broadly so), the lowest several pairs the largest (the lowest pair often retrorsely divergent but not markedly reduced), the upper ones reduced and confluent; sori borne just within the margins of the pinnules; indusium none (Cronquist 1969i).

Nontechnical Description: Leaves scattered along slender, underground rhizomes, mostly 1-5.5 dm long, slender petiole equal or usually longer than the broad blade, blade 4-25 cm long, 1-2 times as long as wide, petiole hairy, particularly between leaflets; leaflets (or segments of leaf) 10-25 pairs, opposite, opposite leaflets sessile, lower several pairs largest, reduced toward the tip of the leaf, lowermost pair reflexed back, divergent from the rest, sori borne within the margins of the leaflets, indusium absent.

Distinguishing Features and Similar Species: Northern beech-fern is distinct among native fern species on the Kaniksu NF because of its relatively short leaves with their opposite leaflets which are attached by the base. The tips of the leaflets all point forward, except for the bottom pair which are much reflexed in the opposite direction. This characteristic was observed in all of the Idaho populations of northern beech-fern and is highly distinctive. See Appendix 1 for a line drawing of this species.

DISTRIBUTION

Range: Northern beech-fern is a circumboreal species that ranges south in North America to North Carolina in the east, Iowa in the midwest, and to northern Oregon, and southeastern British Columbia

in the west (Cronquist 1969i). It has also recently been discovered in northern Idaho in Bonner and Boundary counties.

Five populations of northern beech-fern are known from northern Idaho. One population is located on the Bonners Ferry RD along Gillon Creek 001 in the Robinson Lake Campground. This population ranges upstream from the campground at least one mile along Gillon Creek. This was the first population discovered in Idaho. It was located by Chris Lorain, former botanist for the Idaho CDC, in 1990.

Four additional populations of northern beech-fern were discovered in 1991 on the Priest Lake RD during field surveys. The locations of these populations are as follows:

-Dusty Creek 002
-Hanna Flats Natural Area 003
-South End Upper Priest River 004
-Cedar Creek 005.

See Appendix 2 for map locations of these populations. With the exception of Upper Priest River 004, these populations on the Priest Lake RD are very small and localized. More than 100 rhizomatous clumps were observed in the Upper Priest River area along trail 302 and more are likely to exist in the area. Gillon Creek 001 is the largest and most extensive of the populations, occurring over a stretch of more than one mile in the riparian zone of Gillon Creek. It consists of 200 or more individual clumps.

Habitat and Associated Species: In northern Idaho northern beech-fern is a species of relatively low-elevation, mature and old-growth cedar and hemlock forests, although one population (Cedar Creek 005) occurs on an old logging road in a mixed coniferous forest of hemlock, subalpine fir, and Engelmann spruce at an elevation of 3100 feet. It occurs at relatively low elevations (2300-3100 ft) on moist to wet substrates, usually on deep duff. Associated understory species include Athyrium felix-femina, Tiarella trifoliata, Lycopodium annotinum, Cornus canadensis, Gymnocarpium dryopteris, Oplopanax horridum, Smilacina stellata, Circaea alpina, and Viola glabella.

CONSERVATION STATUS

Conservation Status - Idaho: Northern beech-fern first became a species of conservation concern when it was discovered by Chris Lorain along Gillon Creek in the Robinson Lake Campground in 1990. In 1991 I found three additional populations on the Priest Lake RD and one population was discovered by Dennis Riley (Priest Lake RD) and Jill Blake, botanist for the Idaho Panhandle NFs, on Cedar Creek.

Northern beech-fern is currently considered a Sensitive Species for Northern Region Forests in Idaho (USDA Forest Service 1991a).

The Idaho Native Plant Society considers northern beech-fern a Priority 1 species (Idaho Native Plant Society 1991). A Priority 1 species is one in danger of becoming extinct or extirpated from Idaho in the foreseeable future if identifiable factors contributing to its decline continue to operate; these are species whose populations are present only at critically low levels or whose habitats have been degraded or depleted to a significant degree.

I recommend that the Idaho CDC rank northern beech-fern G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, particularly on the periphery; S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Threats: No apparent threats exist to the four populations of northern beech-fern on the Priest Lake RD. Part of Upper Priest River 004 occurs very close to Trail 302 and could be impacted by hiker traffic. This population should be monitored periodically to assure that no significant impacts occur. Gillon Creek 001 could be impacted by proposed logging in units immediately adjacent to this population along Gillon Creek.

Management Implications: Current management of the four populations of northern beech-fern on the Priest Lake RD are compatible with their long-term viability. A sensitive plant report has been prepared by the Idaho CDC for the proposed cutting units in the Robinson Cruseo EA on the Bonners Ferry RD in which several units have been laid out immediately adjacent to a portion of Gillon Creek 001 (Bursik 1991b). Recommendations have been given in this report to adequately buffer this population from logging activity. I suggest following these recommendations to insure the long-term viability of this population. At the time of preparing this report, these recommendations have already been carried out.

ASSESSMENTS AND RECOMMENDATIONS

Summary: Five populations of northern beech-fern are known to occur in Bonner and Boundary counties in Idaho. All of these populations are located on the Kaniksu NF. Current management practices appear compatible with the long-term survival of these populations.

Recommendations to the Regional Forester: Northern beech-fern is a recently discovered species of limited distribution in Idaho. It is currently known from five populations, all of which occur on

the Kaniksu NF. Given this species' limited distribution in Idaho, I recommend that it remain on the Regional Forester's List of Sensitive Plant Species for Region One in Idaho.

Recommendations to the Idaho Panhandle NFs: Current management practices appear compatible with the long term survival of the five populations of northern beech-fern on the Kaniksu NF. Potential threats to Gillon Creek 001 existed with initial cutting unit boundaries being laid out too close to this population of beech fern and to Sanicula marilandica 005, both of which occur in the riparian zone along the creek. These boundaries, however, have apparently been changed to adequately buffer the Sensitive Plant populations from logging activities.

Land managers and field personnel on the Kaniksu NF should be informed of the occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting) and should include fertile fronds and rhizomes. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University Of Idaho, Moscow, ID 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Trientalis arctica Fisch. ex Hook.

CURRENT STATUS USFS - R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Sensitive
Heritage Rank - G4 S3

TAXONOMY

Family: Primulaceae (Primrose)

Common Name: Northern starflower

Citation: Flora of Boreal America 2:121. 1838

Technical Description: Tubers short, horizontal, not conspicuously enlarged; aerial stems erect, 5-20 cm tall; leaves reduced near the base of the stem, sessile, oval to obovate, enlarged upward, the main leaves 3-8, elliptic to obovate, 1.5-5 cm long, petiolate; corolla usually white, 12-12 mm broad (Hitchcock 1959c).

Nontechnical Description: Perennial herb from slender rootstock and short, thickened tuber; aerial stems erect, 4 to 10 inches tall; leaves entire, reduced below but enlarged upward with 3-8 main leaves, usually less than 5 inches long, crowded or whorled at or near the top of the stem; flowers usually white (Caicco 1987). See Appendix 1 for a line drawing of northern starflower.

Distinguishing Features and Similar Species: Only one other species of this genus is represented in the flora of the Pacific Northwest, T. latifolia. It has pinkish flowers and is found in forested, terrestrial habitats (Caicco 1987).

DISTRIBUTION

Range: Northern starflower is distributed from southern Alaska, south through the Cascades and Olympic Peninsula to northern Oregon, and further south along the coast to California. It ranges as far east as Alberta, but in our area it is known only from northeastern Washington and northern Idaho; it is not known from Montana. The Northern Region Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring within the Northern Region only in Idaho.

Twenty-two populations are known from northern Idaho; 14 from the Priest River valley in Bonner Co., including nine on the Priest Lake RD, and eight populations are known from the Selkirk Crest and drainages on the east slope of the Selkirk Mountains in Boundary Co., all of which occur on the Bonners Ferry RD. See Appendix 2 for mapped locations of northern starflower on the Priest Lake RD. See Moseley (1989) for a full discussion of populations on the Bonners Ferry RD.

Two populations of northern starflower were also located in Pend Oreille Co., Washington on the Priest Lake RD in the Roosevelt Cedar Grove Peatland and at Huff Lake. Northern starflower is not considered rare, however, in Washington.

Habitat and Associated Species: In northern Idaho, northern starflower is always found in sphagnum bogs, where its associates include Carex scopulorum, C. limosa, Pedicularis groenlandica, Pinus contorta, P. monticola, Picea engelmannii, Kalmia microphylla, Vaccinium caespitosum, Menyanthes trifoliata, Potentilla palustris, and Drosera rotundifolia. All Idaho populations are sympatric with one or more plants considered Sensitive in Idaho, including Carex leptalea, C. buxbaumii, C. flava, C. paupercula, Gaultheria hispidula, and Vaccinium oxycoccos. See Appendix 3 for a list of Sensitive Plant Species and wetland plant communities occurring in areas supporting northern starflower on the Priest Lake RD. At Cow Creek Meadow on the Bonners Ferry RD, northern starflower is also associated with the northern bog lemming (Synaptomys borealis), the only known site for this Sensitive Animal Species in Idaho (Moseley 1989).

CONSERVATION STATUS

Conservation Status - Idaho: In his evaluation of northern starflower for the Idaho rare plant project of the Idaho Natural Areas Council, Johnson (1981j) recommended that it be placed on the State Watch List, remarking that it was "known from very few locations in Idaho, and possibly less in Washington and Montana" (it is currently not known to occur in Montana, and its status is not of concern in Washington). He recommended that it be monitored based on its rarity and due to the fact that it occurs in a very fragile habitat. Northern starflower is listed as a Sensitive Species on the Northern Region Sensitive Species List for Idaho (USDA Forest Service 1991a).

The Idaho Native Plant Society considers northern starflower a Sensitive species (Idaho Native Plant Society 1991). The Sensitive category of the Idaho Native Plant Society list refers to taxa with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized if current land use practices continue.

The Idaho CDC currently ranks northern starflower as G4 S3 (G4 = apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery, S3 = Either very rare and local throughout Idaho, or found locally in a restricted range or because of other factors making it vulnerable to extinction [Moseley and Groves 1990]).

Conservation Status - Elsewhere:

CALIFORNIA - List 2 - plants rare, threatened, or endangered in California, but more common elsewhere (Smith and Berg 1988).

Threats: Three populations of northern starflower, Smith Creek RNA 011, Potholes RNA 004, and Kaniksu Marsh RNA 003, are within established Research Natural Areas. No threats are known to these populations, although trampling by hikers has been noted as a potential threat at Smith Creek RNA on the Bonners Ferry RD. Cattle trampling has been noted as a potential threat to the bogs at the Cow Creek Meadows 013 (see Threats and Management Implications for Scirpus hudsonianus), Grass Creek 015, Upper Smith Creek 016, and Saddle Creek Pass 017 on the Bonners Ferry RD (Moseley 1989). No threats are apparent to the eleven populations of northern starflower on the Priest Lake RD (including the two in Pend Oreille Co.).

Management Implications: Current management practices on the Priest Lake RD are compatible with the long-term survival of the eleven populations of northern starflower found there. Although its occurrence is somewhat predictable in the appropriate peatland habitat in the region, the populations are usually small in size and localized in certain microsites within the peatlands. These habitats are also highly susceptible to disturbance. Despite the marked increase in the number of known locations for this species, I concur with the recommendations of Johnson (1981j), Caicco (1987), and Moseley (1989) that monitoring is warranted for several of the northern starflower populations on the Kaniksu NF, especially for those populations possibly affected by cattle grazing on the Bonners Ferry RD. It is not possible at this time to determine the effect of habitat disturbance by cattle on these populations. Allotment Management Plans for allotments containing these populations should give special consideration to the viability of this, and other Sensitive Species that occur there (Moseley 1989). Long-term monitoring should be implemented as part of allotment management to determine the effects of grazing on population dynamics (see Management Implications for Scirpus hudsonianus for discussion of a management plant and long-term monitoring project proposed for Cow Creek Meadows by the Idaho CDC in cooperation with the Bonners Ferry RD).

ASSESSMENT AND RECOMMENDATIONS

Summary: Northern starflower is known from twenty-two sites in northern Idaho, nine of which occur on lands administered by the Priest Lake RD of the Kaniksu NF. Eight populations are also known from the Bonners Ferry RD. Three populations are within designated RNAs. Northern starflower occurs in a sensitive habitat and is sympatric with from one to several other Northern Region Sensitive Plant Species. Cattle grazing has been noted as a potential threat to four populations of northern starflower (all on the Bonners Ferry RD), but the effect on population viability is presently unknown. The Idaho CDC has currently proposed to do

a comprehensive management plan for the Cow Creek Meadows and to implement a long-term monitoring program on wetland communities and Sensitive Plant populations found there.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that northern starflower has a relatively restricted distribution in Idaho, with 22 populations known from Bonner and Boundary counties. This is a marked increase in sites from a few years ago due to the considerable floristic inventory of appropriate peatland habitats during the last several years on the Kaniksu NF (Caicco 1987; Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990). The habitat northern starflower occupies, however, is unique, characterized by several associated species that also have a limited distribution in Idaho. Based on information reported here, I recommend that northern starflower remain on the Regional Foresters Sensitive Species List for the Northern Region for Idaho.

Recommendation to the Idaho Panhandle NFs: Three populations of northern starflower are located within RNAs on the Kaniksu NF. No apparent threats to the seven additional populations on the Priest Lake RD and to three of the populations of northern starflower on the Bonners Ferry RD are currently known. Cattle grazing has been noted as a possible threat at four Bonners Ferry RD populations of northern starflower. Allotment Management Plans for allotments that include these populations should give special consideration to the habitat of northern starflower and the other Northern Region Sensitive Plant Species and one Sensitive Animal Species (the northern bog lemming) that occur there. Monitoring of these and other populations is warranted in order to establish the current population trends. The Idaho CDC has proposed doing a comprehensive management plant and implementing a long-term monitoring program for the Cow Creek Meadows, which contains five Sensitive Plant populations and the only occurrence of the northern bog lemming in the state. This study could elicit long-term population trends of these populations and whether cattle grazing is negatively impacting them.

Land managers and field personnel on the Kaniksu NF should be informed of the possible occurrence of this species in their areas. Possible sightings of this plant should be documented by specimens, and should include both flowers and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

Vaccinium oxycoccos L.

CURRENT STATUS
USFS - R1 - Sensitive
USFWS - None
Idaho Native Plant Society - Priority 2
Idaho CDC Rank - G5 S1

TAXONOMY

Family: Ericaceae (heath)

Common Name: bog cranberry

Citation: Sp. Pl. 351. 1753.

Technical Description: Creeping shrub with very slender, glabrous to finely pubescent stems; leaves persistent, acute, 5-15 mm long, deep green and shiny on the upper surface and grayish beneath; bracts of pedicels linear-lanceolate, not foliaceous, 1-2.5 mm, borne near or below midlength of glabrous or pubescent pedicels, corolla polypetalous, petals 4, reflexed, 5-8 mm, pink, stamens well-exerted, anthers unawned, filaments generally at least equal to the anthers; fruits 5-10 mm, red (Hitchcock and Cronquist 1973).

Nontechnical Description: Same as above. See Appendix 1 for a line drawing of this species.

Distinguishing Features and Similar Species: The small size of the leaves, the creeping habit, the bright pink, reflexed (nonfused) petals of the flowers, the red berries, and the habitat of bog cranberry all make it a very distinctive species difficult to confuse with other Vaccinium species. It can, however be confused with Gaultheria hispidula, another Northern Region Sensitive Plant Species, which occurs sympatrically with bog cranberry at several sites, particularly if flowers or fruits are lacking. If the urn-shaped sympetalous flowers or white berries are present, creeping snowberry (G. hispidula) is easily distinguished from bog cranberry. If not, the creeping stems of creeping snowberry are brownish-bristly with somewhat appressed hairs, while the leaves are elliptic to ovate and more pointed than those of bog cranberry (Caicco 1987).

DISTRIBUTION

Range: Bog cranberry is a circumboreal species which crosses the North American continent in Canada and ranges south into North Carolina in the eastern United States and into the north-central tier of states in the U.S. In Idaho, eight populations of bog cranberry are known from the Priest River Valley. These populations are as follows with current ownership:

-Chase Lake 001 Idaho Department of Lands/private
-Hager Lake 002 Priest Lake RD/private
-Bailey Bog 004 private
-Lee Lake 005 private
-Kaniksu Marsh RNA 006 Priest Lake RD
-Potholes RNA 007 Priest Lake RD
-Bottle Lake RNA 008 Priest Lake RD
-Armstrong Meadows 013 Priest Lake RD

One population of bog cranberry is also known from Pend Oreille Co., Washington, on the Priest Lake RD at Huff Lake. See Appendix 2 for map locations of these populations on the Priest Lake RD.

Habitat and Associated Species: Bog cranberry is a species of peatland habitats that is usually found in an undescribed phase of the Carex lasiocarpa community type described by Boggs et al. (1990). It almost always occurs on floating mats around lakes and ponds but occasionally occurs on grounded mats on sphagnum hummocks growing up shrubs or trees. It is always associated with sphagnum moss. Other species associated with bog cranberry include Carex limosa, Potentilla palustris, Menyanthes trifoliata, Drosera rotundifolia, D. anglica, and Kalmia microphylla. Bog cranberry occurs sympatrically with several other Region One Sensitive Plant Species at all known sites. See Appendix 3 for the list of Sensitive Plant Species associated with bog cranberry at each site and a list of wetland plant communities found at each site.

CONSERVATION STATUS

Conservation Status - Idaho: Johnson (1981k) reviewed bog cranberry for the Idaho rare plant project of the Idaho Natural Areas Council. He placed it on the State Watch List. He recommended monitoring the populations as the habitat in which all populations exist is very fragile and susceptible to disturbance. He also noted that only nine locations were known and that five were very vague. Since this time, botanists for the Idaho CDC have searched for all of the historic populations. The eight populations listed above are the only ones that have been recently documented. The only population of bog cranberry known from the Priest Lake RD in Pend Oreille Co., Washington, is at Huff Lake. Given the intensity of recent floristic surveys in appropriate habitats on the Kaniksu NF (Caicco 1987; Moseley 1989; 1990; Bursik 1990; Rabe et al. 1990) it is becoming increasingly less likely that more populations will be found. Indeed only one new population was located during 1991 field surveys (Armstrong Meadows 013).

Bog cranberry is currently on the Northern Region List of Sensitive Species for Idaho (USDA Forest Service 1991a).

The Idaho Native Plant Society considers bog cranberry a Priority 2 species (Idaho Native Plant Society 1991). Priority 2 species are taxa likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to their population declines or habitat degradation or loss continue to operate.

Bog cranberry is currently listed as G5 S1 by the Idaho CDC (G5 = demonstrably secure globally, though it may by quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction [Moseley and Groves 1990]).

Threats: Two populations of bog cranberry located on private land have been threatened by recent disturbances. Bailey Bog 004 in Mosquito Bay on the northeast end of Priest Lake was partially illegally filled in 1986. Although this fill has been removed, permits have been applied for to develop this wetland. It is unknown, however, whether the development will occur. The fen surrounding Lee Lake 005 on the southeast end of Priest Lake has been ditched and partially drained, although the floating mat immediately adjacent to the lake that supports bog cranberry has been unaffected by this activity. No threats apparently exist to the five populations of bog cranberry on the Priest Lake RD.

Management Implications: Current management of the five populations of bog cranberry on the Priest Lake RD appears compatible with the long-term survival of these populations, indeed, three of the populations (Kaniksu Marsh 006, Potholes 007, and Bottle Lake 008) are located in Research Natural Areas.

ASSESSMENTS AND RECOMMENDATIONS

Summary: Bog cranberry is known from eight recently documented populations in Bonner Co., Idaho, and from one population in Pend Oreille Co., Washington. Six of these populations are managed by the Priest Lake RD. Bog cranberry is known mainly from floating sphagnum mat habitats surrounding small lakes. These habitats are highly sensitive to disturbance. Two populations of bog cranberry, both located on private land have been threatened by recent disturbances. No apparent threats however exist to the six populations located on the Priest Lake RD. Given the extensive surveys of likely habitats of bog cranberry that have occurred on the Kaniksu NF in recent years, it is unlikely that more populations of this species will be discovered.

Recommendations to the Regional Forester: Bog cranberry is known from only eight recently documented populations in Bonner Co. Idaho, all in the vicinity of Priest Lake. One population is known from Pend Oreille Co., Washington, at Huff Lake on the

Priest Lake RD. Five of the populations in Idaho are located on the Priest Lake RD. Despite the intensive surveys of potential habitats for bog cranberry that have occurred in recent years on the Kaniksu NF, only one "new" population has been discovered (Armstrong Meadows 013). The habitat that supports bog cranberry is unique and highly susceptible to disturbance. Based on this information, I recommend that bog cranberry remain on the Regional Foresters List of Sensitive Species for Idaho.

Recommendations to the Idaho Panhandle NFs: Five populations of bog cranberry are known from the Priest Lake RD in Idaho and one population is known from Huff Lake in Pend Oreille Co., Washington, also on the Priest Lake RD. No apparent threats currently exist to these populations, though the habitats supporting bog cranberry are fragile and are highly susceptible to disturbance. For this reason a periodic census of existing populations on the Priest Lake RD will help to assure their continued survival.

Land managers and field personnel on the Kaniksu NF should be informed of the possible occurrence of this species in their areas. Possible sightings of this species should be documented by specimens (if the size of the population warrants collecting), and should include both flowers and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, ID 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho CDC for entry into their permanent data base on sensitive species.

DISCUSSION AND OVERALL RECOMMENDATIONS

Results of my 1991 surveys, and floristic inventories and research by personnel of the Idaho Panhandle National Forests, have provided a relatively complete picture of the distribution, abundance, and habitat relationships of Sensitive Plant Species on the Priest Lake RD and the Kaniksu NF. Additional populations of some of these species will certainly be discovered, especially in the inaccessible portions of the Priest Lake RD. It is also apparent that populations of the most rare of the Region One Sensitive Plant Species may by found in accessible regions that have yet to be floristically inventoried. The discovery of Rubus pubescens and the rediscovery of R. spectabilis in highly accessible and well-traveled areas attests to this. Data from this survey, previous surveys (Caicco 1987; 1988; Moseley 1989; 1990), and from Idaho Fish and Game's CDC database on Sensitive Species provide the basis for what I believe are informed recommendations on the status and management of the Northern Region Sensitive Plant Species found on the Priest Lake RD (and the Kaniksu NF).

Summary of Conservation Status Recommendations

1. Currently Northern Region Sensitive - Remain as Sensitive for the states indicated.

1. Arnica alpina - Idaho
2. Blechnum spicant - Idaho
3. Carex leptalea - Idaho
4. Carex paupercula - Idaho and Washington
5. Cicuta bulbifera - Idaho
6. Dryopteris cristata - Idaho and Washington
7. Epilobium palustre - Idaho
8. Gaultheria hispidula - Idaho and Washington
9. Hypericum majus - Idaho
10. Lycopodium inundatum - Idaho
11. Muhlenbergia racemosa (M. glomerata s.l.) - Washington (Watch Species for Idaho)
12. Rhynchospora alba - Idaho
13. Romanzoffia sitchensis - Idaho
14. Salix pedicellaris - Idaho
15. Sanicula marilandica - Idaho
16. Scirpus subterminalis - Idaho
17. Thelypteris phegopteris - Idaho
18. Trientalis arctica - Idaho
19. Vaccinium oxycoccos - Idaho

2. Recommended additions to Northern Region Sensitive List for Idaho.

1. Carex buxbaumii - no current status
2. Carex flava - no current status
3. Rubus pubescens - currently on the Watch List
4. Rubus spectabilis - currently on the Watch List
5. Scheuchzeria palustris - no current status
6. Scirpus hudsonianus - no current status
7. Streptopus streptopoides - no current status
8. Tellima grandiflora - no current status

3. Delete from Northern Region Sensitive List for Idaho.

1. Adiantum pedatum var. nov. - no longer a valid taxon
2. Carex chordorrhiza - place on Watch List
3. Eriophorum viridicarinatum - place on Watch List
4. Juncus effusus var. pacificus - remove, too common

Summary of Habitats

There are two general types of Sensitive Plant Species known from the Priest Lake RD and the Kaniksu NF. Several species such as Rubus spectabilis, Sanicula marilandica, and Thelypteris phegopteris are, for the most part, restricted to mature and old-growth forests along well-developed riparian zones. The occurrence of these species is far from predictable, but the chance of occurrence seems to increase with increasing age of the stand and degree of development of the riparian zone. These species seem most common in the northern portion of the Kaniksu NF, however, southern areas should not be written off. If appropriate habitat exists in areas where potentially harmful management activities are planned, then these habitats should be surveyed for any of the above Sensitive Species. If populations are found, they should be protected accordingly to maintain their long-term viability.

The other large group of Sensitive Species on the Kaniksu NF includes those found in peatland (bog and fen wetland) habitats. As was mentioned throughout the discussions on the Sensitive Species, I rarely found just one Sensitive Species in a particular peatland habitat on the Priest Lake RD, rather they occurred as ensembles of up to twelve species. In almost every case, the habitat supporting these ensembles had a sphagnum substrate, although there were several biotic communities expressed on this substrate. There are several reasons why sphagnum habitats on the Kaniksu NF should be of concern to Forest management:

1. Ensembles of Sensitive Species occurring sympatrically are thought to indicate unique environmental conditions. Indeed, most of the Sensitive Species that occur in peatlands on the Kaniksu NF are of boreal origin and are at or near the southern edge of their distribution here. The communities in which they occur are also at or near their southern limits.

2. Sensitive peatland plant species on the Kaniksu NF occur in highly specialized habitats within the bogs and have a very narrow ecological amplitude. This, combined with the fact that peatland habitats are generally few and far between on the Kaniksu NF, makes the preservation of these habitats vital for the protection of these Sensitive Species.

3. The sphagnum habitat is sensitive to disturbance and has a low recovery potential; the recovery rate is also slow (peat forms at a rate of about 1-2 cm/ per 100 years in the inland Pacific Northwest).

4. Peat mining constitutes a potential threat of uncertain magnitude. Some peat mining does take place in northern Idaho, and there have been recent proposals to mine sphagnum bogs for uranium (which apparently concentrates in bogs overlying certain

geologies) in northeastern Washington.

5. Because of the highly specialized habitats that rare plants occupy in bogs, unnatural hydrologic fluctuation can be expected to affect the species.

Recommended Conservation Measures

1. Population monitoring will have to form the basis for any informed decisions concerning the effect(s) of Forest management on the viability of Sensitive Species populations occupying peatlands and moist, forested riparian zones. Methodologies should be developed for monitoring all Sensitive Species, particularly those such as Vaccinium oxycoccos, Lycopodium inundatum, Rubus spectabilis, and Thelypteris phegopteris, which are currently most rare.

2. Currently, little information exists in the literature concerning the classification of peatland, other wetland, and riparian communities in northern Idaho. The wetland vegetation classification done by Boggs et al. (1990) for northwestern Montana only marginally accounts for many of the wetland plant communities, particularly peatland communities, that occur on the Kaniksu NF. As with population monitoring, classification of habitats for Sensitive Species will be essential for making informed management decisions. A project should be initiated to quantitatively describe plant communities occurring in wetlands (particularly peatlands) and riparian areas on the Kaniksu NF. This effort should compliment the aquatic habitat classification initiated by Fred Rabe of the University of Idaho, for northern Idaho and northwestern Montana, a project partly funded by the Northern Region of the Forest Service (Rabe et al. 1990).

3. Outstanding sites, containing high quality examples of peatland plant communities and an ensemble of Sensitive Plant Species, should be protected via a special management designation, such as Research Natural Area or Special Interest Botanical Area. Outstanding bog habitats in the West Fork of Smith Creek on the Bonners Ferry RD and at Kaniksu Marsh, the Kalispell Potholes, and at Bottle Lake on the Priest Lake RD are already protected in Research Natural Areas. Several additional outstanding areas on the Kaniksu NF worthy of designation as Special Interest Botanical Areas (or RNAs) are Perkins Lake and Cow Creek Meadows on the Bonners Ferry RD and Hager Lake, Huff Lake, Reynolds Creek Meadows, Packer Meadows, and Armstrong Meadows on the Priest Lake RD. Other sites may also qualify for special designations.

REFERENCES

Boggs, K., P. Hansen, R. Pfister, and J. Joy. 1990. Classification and management of riparian and wetland sites in northwestern Montana. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, MT. 217 pp.

Brunsfeld, S. 1981. Sanicula marilandica. Page 132 in: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife, and Range Experiment Station, University of Idaho, Moscow.

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

Bursik, R.J. 1991a. Field survey for Region One Forest Service Sensitive Plant Species in the Hammond Analysis Area. Unpublished report prepared for the Priest Lake RD; on file at Idaho Department of Fish and Game, Conservation Data Center, Boise.

Bursik, R.J. 1991b. Field survey for Region One Forest Service Sensitive Plant Species in the Robinson Cruseo environmental assessment area. Unpublished report prepared for the Bonners Ferry RD; on file at Idaho Department of Fish and Game, Conservation Data Center, Boise.

Bursik, R.J. 1991c. Field survey for Region One Forest Service Sensitive Plant Species in the East Moyie environmental assessment area. Unpublished report prepared for the Bonners Ferry RD; on file at Idaho Department of Fish and Game, Conservation Data Center, Boise.

Bursik, R.J. 1991d. Field survey for Region One Forest Service Sensitive Plant Species in the Blue Joe IRA. Unpublished report prepared for the Bonners Ferry RD; on file at Idaho Department of Fish and Game, Conservation Data Center, Boise.

Caicco, S.L. 1987. Field investigations of selected sensitive plant species on the Idaho Panhandle National Forest. Idaho Natural Heritage Program, Idaho Department of Fish and Game, Boise, ID. 44 pp., plus appendices.

Caicco, S.L. 1988. Studies in the genus Carex on the Idaho Panhandle National Forests. Idaho Natural Heritage Program, Idaho Department of Fish and Game, Boise, ID. 44 pp., plus appendices.

Cronquist, A. 1955. Arnica. Pages 45-54 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 5; University of Washington Press, Seattle.

Cronquist, A. 1961. Cicuta. Pages 522-523 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 3; University of Washington Press, Seattle.

Cronquist, A. 1964. Salix. Pages 37-70 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 2; University of Washington Press, Seattle.

Cronquist, A. 1969a. Blechnum. Pages 64-65. in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Cronquist, A. 1969b. Carex. Pages 220-345 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Cronquist, A. 1969c. Dryopteris. Pages 71-76 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Cronquist, A. 1969d. Lycopodium. Pages 23-29 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Cronquist, A. 1969e. Maianthemum. Pages 796-798 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Cronquist, A. 1969f. Rhynchospora. Pages 367-369 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Cronquist, A. 1969g. Scirpus. Pages 369-383 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Cronquist, A. 1969h. Streptopus. Pages 801-804 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Cronquist, A. 1969i. Thelypteris. Pages 93-97 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Cronquist, A. 1977. Scirpus. Pages 68-80 in: A. Cronquist, A.H. Holmgren, N.H. Holmgren, J.L. Reveal, and P.K. Holmgren; Intermountain Flora. Vascular Plants of the intermountain west, U.S.A. Vol.6; Columbia University Press, New York.

Dorn, R.D. 1988. Vascular plants of Wyoming. Mountain West Publishing, Cheyenne, WY. 340 pp.

Fassett, N.C. 1976. Spring Flora of Wisconsin. 4th Edition, University of Wisconsin Press, Madison, WI. 413 pp.

Hansen, P.L., S.W. Chadde, and R.D. Pfister. 1988. Riparian dominance types of Montana. Miscellaneous Publication No. 49, Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, MT. 411 pp.

Henderson, D.M. 1981a. Carex buxbaumii. Page 96 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Henderson, D.M. 1981b. Carex flava. Page 97 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Henderson, D.M. 1981c. Muhlenbergia glomerata and Muhlenbergia racemosa. Page 121 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Hitchcock, C.L. 1959a. Gaultheria. Pages 11-12 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 4; University of Washington Press, Seattle.

Hitchcock, C.L. 1959b. Romanzoffia. Pages 173-175 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 4; University of Washington Press, Seattle.

Hitchcock, C.L. 1959c. Trientalis. Page 54 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 4; University of Washington Press, Seattle.

Hitchcock, C.L. 1961a. Epilobium. Pages 473-485 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 3; University of Washington Press, Seattle.

Hitchcock, C.L. 1961b. Hypericum. Pages 433-434 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 3; University of Washington Press, Seattle.

Hitchcock, C.L. 1961c. Rubus. Pages 171-185 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 3; University of Washington Press, Seattle.

Hitchcock, C.L. 1961d. Sanicula. Pages 578-583 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 3; University of Washington Press, Seattle.

Hitchcock, C.L. 1961e. Tellima. Pages 59-61 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 3; University of Washington Press, Seattle.

Hitchcock, C.L. 1969a. Muhlenbergia. Pages 623-629 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 3; University of Washington Press, Seattle.

Hitchcock, C.L. 1969b. Scheuchzeria. Page 153 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.

Hitchcock, C.L. and A. Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle. 730 pp.

Idaho Native Plant Society. 1991. Results of the seventh annual Idaho Rare Plant Conference. Unpublished manuscript; on file at Idaho Department of Fish and Game, Conservation Data Center, Boise. 7 pp.

Johnson, F.D. 1981a. Blechnum spicant. Page 93 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981b. Dryopteris cristata. Page 71 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981c. Gaultheria hispidula. Page 71 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981d. Hypericum majus. Page 75 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981e. Lycopodium inundatum. Page 119 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981f. Maianthemum dilatatum. Page 78 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981g. Rubus spectabilis. Page 130 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981h. Scheuchzeria palustris. Page 134 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981i. Streptopus streptopoides. Page 138 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981j. Trientalis arctica. Page 140 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1981k. Vaccinium oxycoccos. Page 143 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D. 1983. Dryopteris cristata. Page 20 In: 1983 status changes and additions to: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Johnson, F.D., and S.J. Brunsfeld. 1983. Noteworthy collections: Idaho. Madrono 33:259.

Karg, K. 1974. Huff Lake bog. Unpublished Report for the Kaniksu National Forest, Coeur d'Alene, ID; on file at Idaho Department of Fish and Game, Conservation Data Center, Boise, ID.

Layser, E.F. 1980. Flora of Pend Oreille County, Washington. Washington State University Cooperative Extension, Pullman, WA. 146 pp.

Lellinger, D.B. 1985. A field manual of the ferns and fern-allies of the United States and Canada. Smithsonian Institution Press, Washington, D.C. 389 pp.

Lesica, P. 1986. Vegetation and flora of Pine Butte fen, Teton County, Montana. Great Basin Naturalist:46:22-32.

Lesica, P., G. Moore, K.M. Peterson, and J.H. Rumely. 1984. Vascular plants of limited distribution in Montana. Monograph No. 2, Montana Academy of Sciences, Supplement to the Proceedings, Vol 43. 61 pp.

Lesica, P. and J.S. Shelly. 1991. Sensitive, threatened, and endangered plants of Montana. Montana Natural Heritage Program, Occasional Publication No. 1. Helena, MT. 88 pp.

Lorain, C.C. 1988. Floristic history and distribution of coastal disjunct plants of the northern Rocky Mountains. Unpublished M.S. Thesis. University of Idaho, Moscow, ID. 221 pp.

Mattson, D.J. 1984. Classification and environmental relationships of wetland vegetation in central Yellowstone National Park, Wyoming. M.S. thesis, University of Idaho, Moscow, ID. 326 pp.

Moseley, R.K. 1989. Field investigations of 16 rare plant taxa occurring in wetlands on the Bonners Ferry Ranger District, Idaho Panhandle National Forests. Unpublished report prepared for the Idaho Panhandle National Forests; on file at Idaho Department of Fish and Game, Conservation Data Center, Boise. 75 pp., plus appendices.

Moseley, R.K. 1990. Field investigations of eight rare plant taxa occurring in wetlands on the Sandpoint Ranger District, Idaho Panhandle National Forests. Unpublished report prepared for the Idaho Panhandle National Forests; on file at Idaho Department of Fish and Game, Conservation Data Center, Boise. 42 pp., plus appendices.

Moseley, R.K., and C.G. Groves. 1990. Rare, threatened and endangered plants and animals of Idaho. Idaho Department of Fish and Game, Natural Heritage Section, Boise. 33pp.

Moseley, R.K., R. Bursik, and M. Mancuso. 1991. Floristic inventory of wetlands in Fremont and Teton counties, Idaho. Unpublished report prepared for the Targhee National Forest; on file at Idaho Department of Fish and Game, Conservation Data Center, Boise. 60 pp., plus appendices.

Oregon Natural Heritage Data Base. 1991. Rare, threatened and endangered plants and animals of Oregon. Oregon Natural Heritage Data Base, Portland, OR. 64 pp.

Paris, Cathy. 1990. [Title not stated] Unpublished manuscript. [Adiantum manuscript for Flora of North America] on file at: Idaho Department of Fish and Game, Conservation Data Center, Boise.

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

Pierce, J. and J. Johnson. 1986. Wetland community type classification of west-central Montana. Review draft on file with the Ecosystem Management Program, Northern Region USDA Forest Service, Missoula, MT. 157 pp.

Pohl, R.W., and W.W. Mitchell. 1965. Cytogeography of the rhizomatous American species of Muhlenbergia. Brittonia 17:107-112.

Rabe, F.W., R.J. Bursik, and E.B. Cantor. 1990. Classification and monitoring or wetlands in established and proposed Natural Areas. Unpublished report prepared by the University of Idaho: on file at Idaho Department of Fish and Game, Conservation Data Center, Boise. 209pp.

Rumely, J.H. 1956. Plant ecology of a bog in northern Idaho. Ph. D. Thesis, Washington State University, Pullman, WA.

Smith, J.P., and K. Berg, eds. 1988. Inventory of rare and endangered vascular plants of California. California Native Plant Society, Sacramento, CA. 168 p.

Spahr, R., L. Armstrong, D. Atwood, and M. Rath. 1991. Threatened, endangered, and sensitive species of the Intermountain Region. USDA Forest Service, Intermountain Region, Ogden, UT.

Steele, R. 1981. Juncus effusus. Page 120 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Straley, G.B., R.L. Taylor, G.W. Douglas. 1985. The rare vascular plants of British Columbia. Syllogeus No. 59. National Museums of Canada, Ottawa, Ontario. 165 p.

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

USDA Forest Service 1987. Ecosystem Classification Handbook; Appendix K. FSH 12/87 R-1 Supp1. Northern Region, Missoula, MT.

USDA Forest Service. 1988. Sensitive Plant Field Guide: R-1 (Idaho). Northern Region, Missoula, MT.

USDA Forest Service. 1991a. Sensitive Plant List Update: R-1 (Idaho). Northern Region, Missoula, MT.

USDA Forest Service. 1991b. Sensitive Plant List Update: R-6. Northwestern Region, Portland, OR.

Washington Natural Heritage Program. 1990. Endangered, threatened and sensitive vascular plants of Washington. Department of Natural Resources, Olympia, WA.

Welsh, S.L., N.D. Atwood, L.C. Higgins, and S. Goodrich. 1987. A Utah flora. Great Basin Naturalist Memoir No. 9. 894 pp.

Wyoming Natural Diversity Data Base. 1991. Plant species of special concern. Unpublished manuscript on file at Idaho Department of Fish and Game, Conservation Data Center, Boise, ID.

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

Appendix 1

Line drawings of Sensitive Plant Species
of the Priest Lake Ranger District.*

1. Arnica alpina var. tomentosa
2. Blechnum spicant
3. Carex buxbaumii
4. Carex flava
5. Carex leptalea
6. Carex paupercula
7. Cicuta bulbifera
8. Dryopteris cristata
9. Epilobium palustre
10. Gaultheria hispidula
11. Hypericum majus
12. Lycopodium inundatum
13. Maianthemum dilatatum
14. Muhlenbergia racemosa
15. Rhynchospora alba
16. Romanzoffia sitchensis
17. Rubus pubescens
18. Rubus spectabilis
21. Salix pedicellaris
20. Sanicula marilandica
21. Scheuchzeria palustris
22. Scirpus hudsonianus
23. Scirpus subterminalis
24. Streptopus streptopoides
25. Tellima grandiflora
26. Thelypteris phegopteris
27. Trientalis arctica
28. Vaccinium oxycoccos

*All drawings from: C.L. Hitchcock, A. Cronquist, M. Ownbey, and J.W. Thompson. 1959-1969. Vascular Plants of the Pacific Northwest: Parts 1-4. University of Washington Press, Seattle.

Appendix 2

Mapped locations of Sensitive Plant Populations on the Priest Lake Ranger District.

Map 1. Portion of 1968 Continental Mountain 7.5' quadrangle
Map 2. Portion of 1967 Priest Lake NW 7.5' quadrangle
Map 3. Portion of 1967 Priest Lake NW 7.5 quadrangle
Map 4. Portion of 1968 Continental Mountain 7.5' quadrangle
Map 5. Portion of 1967 Priest Lake SW 7.5' quadrangle
Map 6. Portion of 1967 Priest Lake SW 7.5' quadrangle
Map 7. Portion of 1967 Priest Lake SW 7.5' quadrangle
Map 8. Portion of 1967 Priest Lake NE 7.5' quadrangle
Map 9. Portion of 1968 Bead Lake 7.5' quadrangle
Map 10. Portion of 1967 Priest Lake NE 7.5' quadrangle
Map 11. Portion of 1967 Orwig Hump 7.5' quadrangle
Map 12. Portion of 1967 Gleason Mountain 7.5' quadrangle
Map 13. Portion of 1967 Orwig Hump 7.5' quadrangle
Map 14. Portion of 1967 Priest Lake NW 7.5' quadrangle
Map 15. Portion of 1967 Outlet Bay 7.5' quadrangle
Map 16. Portion of 1967 Priest Lake NE 7.5' quadrangle
Map 17. Portion of 1969 Upper Priest Lake 7.5' quadrangle
Map 18. Portion of 1967 Priest Lake NW 7.5' quadrangle
Map 19. Portion of 1967 Priest Lake NE 7.5' quadrangle
Map 20. Portion of 1967 Priest Lake NE 7.5' quadrangle
Map 21. Portion of 1967 Prater Mountain 7.5' quadrangle
Map 22. Portion of 1969 Upper Priest Lake 7.5' quadrangle
Map 23. Portion of 1969 Upper Priest Lake 7.5' quadrangle
Map 24. Portion of 1967 Priest Lake NE 7.5' quadrangle
Map 25. Portion of 1967 Priest Lake NW 7.5' quadrangle
Map 26. Portion of 1967 Priest Lake SW 7.5' quadrangle
Map 27. Portion of 1967 Outlet Bay 7.5' quadrangle
Map 28. Portion of 1967 Priest Lake SW 7.5' quadrangle
Map 29. Portion of 1967 Priest Lake NE 7.5' quadrangle
Map 30. Portion of 1969 Grass Mountain 7.5' quadrangle
Map 31. Portion of 1967 Priest Lake NW 7.5' quadrangle
Map 32. Portion of 1967 Priest Lake SW 7.5' quadrangle
Map 33. Portion of 1968 Continental Mountain 7.5' quadrangle
Map 34. Portion of 1967 Orwig Hump 7.5' quadrangle
Map 35. Portion of 1967 Orwig Hump 7.5' quadrangle
Map 36. Portion of 1967 Orwig Hump 7.5' quadrangle
Map 37. Portion of 1967 Orwig Hump 7.5' quadrangle
Map 38. Portion of 1967 Orwig Hump 7.5' quadrangle
Map 39. Portion of 1965 Line Point quadrangle
Map 40. Portion of 1968 Bead Lake 7.5' quadrangle

Appendix 3

Selected wetlands with high concentrations of Sensitive Plant populations and a list of wetland plant communities occurring in each wetland on the Priest Lake and Bonners Ferry Ranger Districts*.

* All wetland communities except those listed as "undescribed" are described by: Boggs, K., P. Hansen, R. Pfister, and J. Joy. 1990. Classification and management of riparian and wetland sites in northwestern Montana. Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, MT. 217 pp.

SITE: Cow Creek Meadows

RANGER DISTRICT: Bonners Ferry

WETLAND PLANT COMMUNITY DOMINANTS:

1. Carex rostrata

2. Carex scopulorum (undescribed)

   SENSITIVE PLANTS:

   - Carex paupercula
   - Trientalis arctica

3. Eriophorum polystachion (undescribed)

   SENSITIVE PLANTS:

   - Carex buxbaumii
   - Carex flava
   - Scirpus hudsonianus

4. Betula glandulosa / Carex rostrata

5. Calamagrostis canadensis

6. Deschampsia cespitosa

7. Picea engelmannii / Abies lasiocarpa

SITE: Armstrong Meadows

RANGER DISTRICT: Priest Lake

WETLAND PLANT COMMUNITY DOMINANTS:

1. Spiraea douglasii

   SENSITIVE PLANT:

   - Dryopteris cristata

2. Betula glandulosa

   SENSITIVE PLANT:

   - Salix pedicellaris

3. mixed coniferous swamp (undescribed)

   SENSITIVE PLANTS:

   - Gaultheria hispidula
   - Vaccinium oxycoccos

4. Carex rostrata

5. Alnus incana

6. Carex lasiocarpa

   SENSITIVE PLANTS:

   - Carex buxbaumii
   - Carex leptalea

7. Spiraea douglasii

SITE: Packer Meadows

WETLAND PLANT COMMUNITY DOMINANTS:

1. Spiraea douglasii

2. Betula glandulosa / Carex rostrata

   SENSITIVE PLANTS:

   - Carex leptalea
   - Salix pedicellaris
   - Trientalis arctica

3. Senecio triangularis

4. Carex aperta (undescribed)

5. Carex limosa

   SENSITIVE PLANTS:

   - Carex leptalea
   - Trientalis arctica

6. Eriophorum polystachion

7. Picea engelmannii

8. Carex lasiocarpa

SITE: Reeder Creek

RANGER DISTRICT: Priest Lake

WETLAND PLANT COMMUNITY DOMINANTS:

1. Spiraea douglasii

   SENSITIVE PLANTS:

   - Trientalis arctica
   - Dryopteris cristata

2. Alnus incana

3. Phalaris arundinacea

4. Carex rostrata

   SENSITIVE PLANTS:

   - Carex leptalea
   - Carex paupercula

5. Picea engelmannii

   SENSITIVE PLANT:

   - Gaultheria hispidula

SITE: Reynolds Creek

RANGER DISTRICT: Priest Lake

WETLAND PLANT COMMUNITY DOMINANTS:

1. Salix geyeriana / Carex rostrata

2. Alnus incana

3. Betula glandulosa / Carex rostrata

4. Spiraea douglasii

   SENSITIVE PLANTS:

   - Trientalis arctica
   - Rubus pubescens

5. Carex lasiocarpa

   SENSITIVE PLANTS:

   - Carex buxbaumii
   - Epilobium palustre
   - Hypericum majus

6. Pinus contorta / Calamagrostis canadensis (undescribed)

   SENSITIVE PLANT:

   - Rubus pubescens

7. submerged aquatic macrophyte (undescribed)

SITE: Hager Lake

RANGER DISTRICT: Priest Lake

WETLAND PLANT COMMUNITY DOMINANTS:

1. Carex lasiocarpa / Sphagnum spp. (undescribed)

   SENSITIVE PLANTS:

   - Epilobium palustre
   - Hypericum majus
   - Lycopodium inundatum
   - Scheuchzeria palustris
   - Trientalis arctica

2. Carex lasiocarpa

3. Carex rostrata / C. vesicaria (undescribed)

4. Pinus contorta / Calamagrostis canadensis (undescribed)

   SENSITIVE PLANT:

   - Dryopteris cristata

5. Spiraea douglasii

6. submerged aquatic macrophyte (undescribed)

   SENSITIVE PLANT:

   - Scirpus subterminalis

SITE: Huff Lake (Washington)

RANGER DISTRICT: Priest Lake

WETLAND PLANT COMMUNITY DOMINANTS:

1. Carex lasiocarpa / Sphagnum spp. (undescribed)

   SENSITIVE PLANTS:

   - Vaccinium oxycoccos
   - Gaultheria hispidula
   - Trientalis arctica
   - Scheuchzeria palustris

2. mixed coniferous swamp (undescribed)

   SENSITIVE PLANT:

   -Gaultheria hispidula

3. Carex rostrata

4. Spiraea douglasii

SITE: Kalispell Bay

RANGER DISTRICT: Priest Lake

WETLAND PLANT COMMUNITY DOMINANTS:

1. Betula glandulosa / Carex rostrata

   SENSITIVE PLANT:

   - Carex paupercula

2. Alnus incana

   SENSITIVE PLANT:

   - Dryopteris cristata

3. Salix geyeriana / Carex rostrata

4. Spiraea douglasii

5. Carex lasiocarpa

SITE: Bottle Lake RNA

RANGER DISTRICT: Priest Lake

WETLAND PLANT COMMUNITY DOMINANTS:

1. Carex lasiocarpa / Sphagnum spp. (undescribed)

   SENSITIVE PLANTS:

   - Gaultheria hispidula
   - Lycopodium inundatum
   - Scheuchzeria palustris
   - Trientalis arctica
   - Vaccinium oxycoccos

2. Carex rostrata

3. Calamagrostis canadensis

4. submerged aquatic macrophyte (undescribed)

   SENSITIVE PLANTS:

   - Scirpus subterminalis

5. floating aquatic macrophyte (undescribed)

SITE: Kaniksu Marsh RNA

RANGER DISTRICT: Priest Lake

WETLAND PLANT COMMUNITY DOMINANTS:

1. Carex lasiocarpa / Sphagnum spp. (undescribed)

   SENSITIVE PLANTS:

   - Cicuta bulbifera
   - Epilobium palustre
   - Hypericum majus
   - Lycopodium inundatum
   - Rhynchospora alba
   - Scheuchzeria palustris
   - Trientalis arctica
   - Vaccinium oxycoccos

2. Carex rostrata

3. Scirpus acutus

4. Betula glandulosa / Carex rostrata

   SENSITIVE PLANT:

   - Salix pedicellaris

5. Typha latifolia

   SENSITIVE PLANT:

   - Dryopteris cristata

6. Spiraea douglasii

7. mixed coniferous swamp (undescribed)

   SENSITIVE PLANT:

   - Gaultheria hispidula

8. submerged aquatic macrophyte (undescribed)

   SENSITIVE PLANT:

   - Scirpus subterminalis

9. floating aquatic macrophyte (undescribed)

SITE: Potholes RNA

RANGER DISTRICT: Priest Lake

WETLAND PLANT COMMUNITY DOMINANTS:

1. Carex lasiocarpa / Sphagnum spp. (undescribed)

   SENSITIVE PLANTS:

   - Carex leptalea
   - Carex paupercula

2. Carex rostrata

   SENSITIVE PLANTS:

   - Trientalis arctica
   - Vaccinium oxycoccos

3. Betula glandulosa / Carex rostrata

   SENSITIVE PLANTS:

   - Dryopteris cristata
   - Salix pedicellaris
   - Gaultheria hispidula

4. Alnus incana

5. Carex aquatilis

6. Salix geyeriana / Carex rostrata

7. submerged aquatic macrophyte (undescribed)

8. floating aquatic macrophyte (undescribed)

SITE: Perkins Lake

RANGER DISTRICT: Bonners Ferry

WETLAND PLANT COMMUNITY DOMINANTS:

1. Carex lasiocarpa / Sphagnum spp. (undescribed)

   SENSITIVE PLANTS:

   - Carex comosa
   - Epilobium palustre
   - Scheuchzeria palustris

2. Betula pumila (undescribed)

   SENSITIVE PLANTS:

   - Betula pumila
   - Carex leptalea
   - Carex flava
   - Cicuta bulbifera
   - Rhynchospora alba
   - Salix pedicellaris

3. Typha latifolia

   SENSITIVE PLANT:

   - Cicuta bulbifera

4. Alnus incana

5. Spiraea douglasii

   SENSITIVE PLANT:

   - Dryopteris cristata

6. Floating aquatic macrophyte (undescribed)

7. Submergent aquatic macrophyte (undescribed)

   SENSITIVE PLANT:

   - Scirpus subterminalis