FIELD INVESTIGATIONS OF 16 RARE PLANT TAXA OCCURRING IN WETLANDS ON THE BONNERS FERRY RANGER DISTRICT, IDAHO PANHANDLE NATIONAL FORESTS.

by

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ABSTRACT

Field investigations of rare plant species occurring in wetlands of the Bonners Ferry RD of the Kaniksu NF were carried out during June and August 1989, by the Idaho Department of Fish and Game's Natural Heritage Program. These investigations constitute the second phase of a three phase cooperative Challenge Cost-share project between the Department and the Idaho Panhandle National Forests to survey habitats on the Kaniksu NF for sensitive plant taxa.

Sixteen rare species were encountered in 20 wetlands on or near the Bonners Ferry RD. The distribution, abundance, habitat relationships, and management recommendations are discussed for each species. Conservation status recommendations are also made; six species should remain Northern Region Sensitive Species for Idaho, seven species should be added to the Regional Sensitive Species List for Idaho, one species should be deleted from the Regional Sensitive Species List for Idaho, and two rare species encountered do not warrant Regional Sensitive Species status for Idaho, but should remain on the Idaho Native Plant Society's Monitor List.

Only rarely was one rare species encountered by itself, rather they occurred in ensembles of up to eight species. In almost every case, habitat supporting these ensembles had a sphagnum substrate. The sensitivity of these habitats to disturbance and possible conservation measures for these habitats are discussed.

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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 Phase 2 of a three phase project to conduct status inventories for rare plant taxa on the Kaniksu National Forest of the Idaho Panhandle National Forests. The project is a cooperative effort between the Idaho Department of Fish and Game's Natural Heritage Program and the Idaho Panhandle National Forests through the Challenge Cost-share Program. Phase 1, investigations of sensitive plants on the Priest Lake RD was completed in 1987 (Caicco 1987). This Phase 2 report covers the Bonners Ferry RD, while the third and final phase 3 covers the Sandpoint RD.

The primary objectives of these investigations were as follows:

1) Survey habitats on the Kaniksu NF for rare plant taxa, concentrating on wetlands.

2) Determine the distribution, habitat and population levels for 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

During June and August 1989, I surveyed 27 wetlands on the Bonners Ferry RD, or adjacent areas that generally lie within the administrative boundaries of the District. In addition, Craig Norris and Paul Seraki, of the Bonners Ferry RD, Rob Bursik, of the University of Idaho Herbarium, and Steve Brunsfeld and Fred Johnson, of the Department of Forest Resources, University of Idaho, provided me with recent information on rare plants occurring at six additional sites.

Twenty wetlands on or near land administered by the Bonners Ferry RD are known to contain at least one rare plant population. Most sites were found to contain more than one rare plant, with one outstanding area, Perkins Lake, containing eight rare plant populations (see Appendix 3 for a summary of wetlands containing rare plants on the Bonners Ferry RD). Thirteen of the areas I surveyed in 1989, did not contain any rare plants (see Appendix 4 for a list of areas on the Bonners Ferry RD searched unsuccessfully).

Sixteen rare plant taxa were encountered during the 1989 survey. Following is a detailed discussion of each species, including information on its taxonomy and identification, range and habitat, conservation status, and recommendations concerning its status in Idaho to the Regional Forester and Idaho Panhandle National Forests.

Betula pumila L. var. glandulifera Regel

CURRENT STATUS USFS -None
USFWS - None
Idaho Native Plant Society - Sensitive
Heritage Rank - G?/S2

TAXONOMY

Family: Betulaceae (Birch)

Common Name(s): Dwarf birch, low birch

Citation: Bull. Soc. Nat. Mosc. 38:410. 1865.

Alpha Code: BETPUM
Numeric Code: 0414

Nontechnical Description: Dwarf birch has many erect stems, up to 13 feet tall, emanating from the base. Leaves are dark green, 1 to 2 cm long, obovate (somewhat elliptical) with numerous teeth on the margin. The bark is reddish brown; the smaller stems copiously resinous with wartlike-crystalline glands on the bark. See Appendix 5 for slides of dwarf birch.

Distinguishing Features and Similar Species: Dwarf birch is closely related to bog birch (Betula glandulosa). They are distinguished as follows (Brunsfeld and Johnson 1986):

> Dwarf birch: Generally recognized by its broad samara (fruit) wings (> half as broad as the body), obovate leaves with more than 10 teeth on each side, and a stature up to 13 feet tall. Betula pumila is a tetraploid, 2n=56.
>
> Bog Birch: Narrow samara wings (< half as broad as the body), broadly ovate to orbicular leaves with less than 10 teeth on each side, and generally less than six feet tall. Betula glandulosa is a diploid, 2n=28.

Size is the easiest way to tell the two apart, with most individuals in a stand of dwarf birch being greater than eight feet tall. Dwarf birch also has obovate leaves versus the more orbicular leaves of bog birch. They apparently do not occur together in Idaho (Brunsfeld and Johnson 1986).

DISTRIBUTION

Range: Dwarf birch was only recently recognized as occurring in Idaho (Brunsfeld and Johnson 1986) and is not included in any regional flora. Betula pumila is a widespread, circumboreal species, with var. glandulifera being the North American representative. The Northern Region Ecosystem Classification Handbook (USDA Forest Service 1987) lists Idaho, South Dakota, and North Dakota as the distribution of dwarf birch in the Northern Region. Although none was seen in Montana, all Idaho populations occur within 3.5 miles of the Montana border (one is

less than 30 yards from the border) and it certainly occurs there also.

Brunsfeld and Johnson (1986) have thoroughly analyzed the distribution of Betula series Humiles (including B. pumila and B. glandulosa) in Idaho, and have determined that dwarf birch reaches the southern edge of its range here, being restricted to the southern end of the Purcell Mountains in Boundary County (see Appendix 2 for mapped locations of dwarf birch in Idaho). More specifically, six populations are known from the Skin Creek, Curley Creek and Sand Creek drainages between the Moyie River and the Montana - Idaho border. Five of these populations were visited during 1989.

Habitat and Associated Species: In Idaho, dwarf birch appears to occur in two types of habitats:

1. Bogs - characterized by a saturated sphagnum, in which dwarf birch dominates the overstory and Carex lasiocarpa is generally the understory dominant. Several rare plant species are associated with dwarf birch in this habitat, including Rhynchospora alba, Scheuchzeria palustris, Carex flava, Carex comosa, Epilobium palustre, and Cicuta bulbifera (Appendix 3). Other associates include Carex limosa, Carex rostrata, Potentilla palustris, and Menyanthes trifoliata. The extensive population surrounding Perkins Lake occurs in this type of habitat.

2. Fens - Carex-dominated peatlands, generally occurring in bottomland habitats along low-gradient streams. Dwarf birch is dominant or co-dominant with Alnus incana and/or tall Salix spp. here. Associated species include Spiraea douglasii, Amelanchier alnifolia, Rosa sp., Geum macrophyllum, Heracleum lantaum, and Cicuta douglasii. Several rare plants occur with dwarf birch in this habitat including Petasites sagittatus, Salix candida, and Carex flava (Appendix 3). The Kingsley Creek, Bonner Lake, Herman Lake and Herman Lake Road populations occupy this type of habitat.

CONSERVATION STATUS

Conservation Status - Idaho: As previously mentioned, dwarf birch was only recently discovered to occur in Idaho (Brunsfeld and Johnson 1986), who determined that it only occurs on the southern Purcell Mountains of Boundary County. Floristic studies of Idaho's peatlands by Rob Bursik, graduate student at the University of Idaho Herbarium, corroborated this finding. As a result of their work, dwarf birch was recommended for inclusion on the rare plant list for the state at the annual rare plant meeting in 1989.

It is currently considered a Sensitive species for Idaho by the Idaho Native Plant Society (Idaho Native Plant Society 1989). 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 Natural Heritage Program currently ranks dwarf birch as G? S2

(G? = global rank unknown to me, S2 = imperiled in Idaho because of rarity or because of other factors demonstrably making it very vulnerable to extirpation from the state).

Conservation Status - Elsewhere: Unknown.

Ownership: One population, Skin Creek, was not visited in 1989, but it probably occurs entirely on FS land. The population surrounding Perkins Lake occurs on both FS and adjacent private land. The remaining four populations are entirely on private land.

Threats: Part or all of two populations were grazed by domestic livestock in 1989. The private portion and possibly some of the FS portion of the Perkins Lake population (land lines were difficult to discern here so it was hard to accurately tell where the boundary lies) is grazed by horses, mostly on the drier areas at the southern and northern margins. The Kingsley Creek population was heavily grazed by sheep in 1989. The effect of grazing on population viability was not readily apparent, but few young individuals were observed at the Kingsley Creek site, possibly due to grazing. The Bonners Lake population abruptly ends at a fenceline on the up-valley end, the other side of which has been cleared, plowed and planted to pasture grasses. Only one individual was seen at the Herman Lake Road population, although this site was not thoroughly searched.

Management Implications: Only two populations occur on FS land. The Skin Creek site was not visited in 1989. Perkins Lake appears to used primarily for recreation and wildlife habitat. Several goose nesting platforms have been placed at either end of the lake within dwarf birch populations, but little disturbance was observed. Most fishing at the lake is from boats, with little evidence of disturbance of the sensitive habitats where dwarf birch occurs.

ASSESSMENT AND RECOMMENDATIONS

Summary: Betula pumila var. glandulifera, a wide-ranging boreal taxon, reaches its southern limit in northern Idaho. After considerable floristic work in the area, it appears restricted to several drainages in the southern Purcell Mountains. The habitats occupied by dwarf birch are unique for the state, each population being sympatric with from one to eight species considered rare in Idaho. Six populations are known in the state, most consisting of many individuals in vigorous populations. Only one population totally occurs on National Forest land and portion of another. The remaining are private. The only serious, immediate threat may be sheep grazing impacts on one privately-owned population, where age class distribution in the stand appeared skewed toward the larger, older individuals; recruitment of young may affect long-term viability.

Recommendations to the Regional Forester: Based on distribution and abundance data collected by Brunsfeld and Johnson (1986), Rob Bursik, and myself, it appears that Betula pumila var. glandulifera has a restricted distribution in Idaho. Along with a narrow distribution in the state, the habitats it occupies are unique, characterized by one to several associated species that also have a limited distribution in the state. Dwarf birch is presently not known to occur in Montana, and

therefore appears rare in the Northern Region. I recommend that it be considered for addition to the Regional Foresters Sensitive Species List.

Recommendations to the Idaho Panhandle National Forests: Dwarf birch has a limited distribution in Idaho and occurs in unique habitats. One population totally occurs on National Forest land as does a significant portion of another. Both populations should be carefully managed, with special attention given to the Perkins Lake population. Perkins Lake is the most extensive population in Idaho, occurring in a large sphagnum bog. Seven other plant species considered rare in Idaho (all treated in this report) occur with dwarf birch at Perkins Lake. A special management designation, such as Special Interest Botanical Area, may be appropriate for this unique ecological area.

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 (if the size of the population warrants collecting), and should include both mature fruits and leaves. Specimens should be sent to Steve Brunsfeld, at the College of Forestry, Wildlife and Range Sciences Herbarium (University of Idaho, Moscow, 83843), for verification of their identity. Confirmed sightings of this species should be reported to the Idaho Natural Heritage Program for entry into their permanent data base on sensitive species.

Carex buxbaumii Wahl.

CURRENT STATUS USFS - R1 Sensitive List - Watch Species (ID)
R4 Sensitive List
USFWS - None
Idaho Native Plant Society - Sensitive
Heritage Rank - G5 S2

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name(s): Buxbaum's sedge

Alpha Code: CARBUX
Numeric Code: 1050

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 1969a).

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 and Appendix 5 for slides of its habit.

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 only from 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 two populations are known; 2) the Sawtooth Valley (Blaine and Custer counties), where it is found in apparently stable populations 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 two populations are known from the Priest River valley and Selkirk Mountains. See Appendix 2 for the mapped location of Buxbaum's sedge on the Bonner Ferry 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 1969a). In Montana, it is typically found at mid-elevations in flat, wet meadows and forest openings (Hansen et al. 1988). On the Priest River Ranger District, the plant has been found in a flat, wet meadow on the edge of forested land at an elevation of about 2580 feet. Carex lasiocarpa and Deschampsia cespitosa are both common. Associated shrubs include Alnus incana, Betula glandulosa, Salix bebbiana?, and Spiraea douglasii. Carex rostrata is common on sites which are apparently too wet for Carex buxbaumii (Caicco 1987).

Craig Norris reported one site on the Bonners Ferry RD in 1988, from the Cow Creek Meadow area in the Selkirk Mountains. I was unable to visit this population in 1989. It occurs in a grass/sedge-dominated opening within the Abies lasiocarpa/Streptopus amplexicaulis habitat type, Ligusticum canbyi phase, on a saturated, nearly level substrate. Associated species include Picea engelmannii, Pinus contorta, Betula glandulosa, Salix sp., and Carex scopulorum. Plants appeared to be of normal vigor in 1988. At Cow Creek Meadows, Buxbaum's sedge is associated with three other FS sensitive plants, Carex flava, C. paupercula, and Trientalis arctica, and one rare animal, northern bog lemming (Synaptomys borealis) (Appendix 3).

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 is listed as a Watch Species for Idaho on the Northern Region Sensitive Species List (USDA Forest Service 1988a). Buxbaum's sedge is a Sensitive Species in the Intermountain Region of the Forest Service (USDA Forest Service 1988c).

The Idaho Native Plant Society considers Buxbaum's sedge a Sensitive species (Idaho Native Plant Society 1989). 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 Natural Heritage Program currently ranks Buxbaum's 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).

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 1987).

MONTANA - Considered for listing but rejected (Lesica et al. 1984).

Ownership: A majority of the one known Priest River population appears to be on private land, although several acres of potential and occupied habitat are present on the adjacent public land administered by the Priest River RD of the Kaniksu NF. The Cow Creek population is on land administered by the Bonners Ferry RD.

Threats: Caicco (1988) reported that the Priest River site has been subjected to hydrologic modification through ditching and draining. It 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. The resulting mosaic of old-field successional pathways is complex, and suggests that the meadow system is undergoing dynamic changes in its species composition and structure. The implications of these changes for Carex buxbaumii are unknown.

Craig Norris reported that the Cow Creek population on the Bonners Ferry RD may be impacted by cattle and anglers. He noted that plants had been trampled by cattle.

Management Implications: It is not possible at this time to determine what effect habitat disturbance by cattle and anglers has been. A gate has recently been erected along the Cow Creek Road, a mile or so below Cow Creek Meadow, limiting motorized access to upper Cow Creek. This may reduce some of the angler disturbance in the Meadow. The effect of cattle grazing on the Buxbaum's sedge population is unknown, but the Allotment Management Plan for Cow Creek should give special consideration to the viability of this, and the three other Sensitive Species that occur there. Long-term monitoring should be implemented as

part of allotment management to determine the effects of grazing on population dynamics.

ASSESSMENT AND RECOMMENDATIONS

Summary: Only two populations of Buxbaum's sedge are known to exist on the Region 1 forests of northern Idaho. Both sites have had modification to the habitat in the past and continue to be disturbed to some extent. It 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 two populations known in the Northern Region here. 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 remain on the Regional Foresters Sensitive Species List for the Northern Region as a Watch Species for Idaho.

Recommendation to the Idaho Panhandle National Forest: Two populations of Buxbaum's sedge are known from the Northern Region in Idaho. Both, at least in part, occur on National Forest Land (Priest Lake and Bonners Ferry RDs) and both have had past and have current habitat modifications taking place. The Allotment Management Plan for the allotment that includes the Cow Creek population on the Bonners Ferry RD should give special consideration to the habitat of Buxbaum's sedge and the three other FS Sensitive plants and one rare animal 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.

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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Carex comosa Boott

CURRENT STATUS USFS - None
USFWS - None
Idaho Native Plant Society - Priority 1
Heritage Rank - G5 S1

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name(s): Bristly sedge

Alpha Code: CARCOM
Numeric Code: 1064

Citation: Trans. Linn Soc. 20:117. 1846.

Technical Description: Stems coarse, mostly 5-10 dm tall, more or less densely clustered on a short, stout rhizome; leaves glabrous, tending to be septate-nodulose (especially the sheaths), the blade elongate, flat, 4-11 mm wide; leaf subtending the lowest pistillate spike sheathless or with a short sheath, the blade well developed, elongate, surpassing and several times as long as the inflorescence; pistillate spike several, mostly 3-5, 2-7 cm long and about 1.5 cm thick, loose and more or less nodding on slender peduncles, tending to be grouped rather closely together; staminate spike solitary, terminal, up to 6 cm long, or the terminal spike sometimes androgynous or gynaecandrous or with the perigynia in the middle; pistillate scales with a short, largely scarious or hyaline body only 1-2 mm long and a prominent, rough awn-tip 2-6 mm long; perigynia very numerous, densely crowded, spreading or retrose, usually pale greenish, 5-7.5 mm long, prominently 15- to 20-nerved, lanceolate or lance-ovate, tapering to a short-stipitate base, firm-textured and only slightly or scarcely inflated, prominently long-beaked, the beak conspicuously bidentate, with slender, firm, arcuate or divergent teeth 1.2-2.3 mm long; stigmas 3; achene trigonous, loose in the lower half of the perigynium, 1.2-1.8 mm long, continuous with the persistent, bony style, this straight or sometimes becoming flexuous or contorted (Cronquist 1969a).

Nontechnical Description: Bristly sedge has coarse, tall stems, up to 3 feet tall, that are loosely caespitose. Leaf blades are large and flat. Three to five, large inflorescences are nodding from the tall stems; the scales are prominently awned at the tip, 2-6 mm long. See Appendix 1 for a line drawing of bristly sedge and Appendix 5 for slides of its habit and habitat.

Distinguishing Features and Similar Species: Bristly sedge is readily distinguished from all other sedges in northern Idaho by its large, nodding inflorescence with scales terminated by a prominent awn. The entire plant is large, up to 3 feet, and unlike other tall sedges in the area, is somewhat caespitose, forming large tufts.

DISTRIBUTION

Range: Bristly sedge is distributed in eastern North America from Quebec and Minnesota, south to Florida and Louisiana. It is disjunct in the Pacific States from southern British Columbia to California, where it is rarely found. It is also disjunct in northern Idaho and northwestern Montana. The Northern Region Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring within the Northern Region in Montana, Idaho, and South Dakota.

The only known population of bristly sedge in Idaho, was discovered (rediscovered?) in 1987 by Rob Bursik, of the University of Idaho Herbarium, at Perkins Lake. No other sites were discovered in northern Idaho, despite the considerable amount of floristic inventory of wetlands that has taken place there recently. I observed approximately 30 tufts along north shore of Perkins Lake in 1989. Bursik found several along the eastern shore in 1987. See Appendix 2 for the mapped location of bristly sedge at Perkins Lake.

Habitat and Associated Species: At Perkins Lake, bristly sedge occurs at the outer edge of a thin, floating, sphagnum mat. Bristly sedge, along with several other tall sedges dominate the small area occupied by the population. Two other rare plant species are sympatric with bristly sedge on the sphagnum mat at Perkins Lake, Epilobium palustre and Cicuta bulbifera (Appendix 3). Other associated species include Carex rostrata, C. cusickii, C. lasiocarpa, Typha latifolia, and Potentilla palustre.

CONSERVATION STATUS

Conservation Status - Idaho: The rarity of bristly sedge in Idaho has recently brought to our attention as a result of floristic studies of Idaho's peatlands by Rob Bursik, of the University of Idaho Herbarium. Based on his data bristly sedge was recommended for inclusion on the rare plant list for the state at the annual rare plant meeting in 1989.

It is currently considered a Priority 1 species for Idaho by the Idaho Native Plant Society (Idaho Native Plant Society 1989). The Priority 1 category of the Idaho Native Plant Society list refers to taxa "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 Natural Heritage Program currently ranks bristly 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).

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).

CALIFORNIA - Considered, but rejected: Too common (Smith and Berg 1988)

MONTANA - Ranked S1 = Taxon critically imperiled because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction.

OREGON - Review List = Taxon for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range (Oregon Natural Heritage Data Base 1989).

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 1987).

Straley et al. (1985) list bristly sedge as also being rare in New Brunswick, Nova Scotia, Tennessee; endangered in South Dakota; and possibly extirpated in Texas.

Ownership: Idaho's only location occurs at Perkins Lake, where it appears to occur solely on National Forest land, although it was difficult to follow land lines at the north end of the lake; some of the population there may occur on private land.

Threats: No threats were readily apparent to the known population at Perkins Lake. Individuals occur on the lake margin, at the outer edge of a floating sphagnum mat, a habitat easily disturbed. Several goose nesting platforms have been erected along the lake margin, in the vicinity of the bristly sedge population. No bristly sedge individuals appear to have been destroyed.

Management Implications: Current management appears compatible with the long-term viability of the only known bristly sedge population in Idaho. Due to its extreme rarity and habitat sensitivity, however, it should be given special consideration in land management practices at the lake. Fishing appears largely to be from boats and shoreline trampling by anglers does not appear significant. Future plans for construction and maintenance of goose nesting platforms should carefully consider its vulnerability to extirpation.

ASSESSMENT AND RECOMMENDATIONS

Summary: A disjunct population of Carex comosa is known from Perkins Lake in Boundary County. This is the only known population in Idaho, despite considerable floristic exploration of wetlands in northern Idaho the last several years. The population consists of less than 50 individuals, occurring at the outer edge of a floating sphagnum mat. The entire population appears to occur on National Forest land. No threats were apparent in 1989, however, due to its vulnerability to extirpation it deserves special consideration when making land management decisions.

Recommendations to the Regional Forester: Based on distribution and abundance data collected by Rob Bursik and myself, it appears that Carex

comosa has a restricted distribution in Idaho. In addition to Idaho, four other western states and provinces consider it 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. Only one population is known in Montana, from non-National Forest land in Flathead County. Based on this information, I recommend that it be considered for addition to the Regional Foresters Sensitive Species List for the Northern Region.

Recommendations to the Idaho Panhandle National Forests: Bristly sedge has a limited distribution in Idaho and occurs in a unique habitat. The one population known occurs on National Forest along the north and east shore of Perkins Lake and consists of fewer than 50 individuals. This population, which occurs on a very unstable floating sphagnum mat, should be carefully managed, as this habitat is sensitive to disturbance. Seven other plant species considered rare in Idaho (all are treated in this report) occur in the vicinity of the bristly sedge population at Perkins Lake. A special management designation, such as Special Interest Botanical Area, may be appropriate for this unique ecological 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 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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Carex flava L.

CURRENT STATUS USFS - R1 Sensitive List - Watch Species (ID)
USFWS - None
Idaho Native Plant Society - Sensitive
Heritage Rank - G5 S3

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name(s): Yellow sedge

Alpha Code: CARFLA
Numeric Code: 1106

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 1969a).

Nontechnical Description: Stems clustered, not at all rhizomatous, 1-8 dm in height, with the lowest leaves not reduced to scales. Leaves at both base and along 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 and Appendix 5 for slides of its habit.

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: The 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 11 sites in six widely disjunct areas of Idaho: 1) East of Moyie Springs in the vicinity of Herman, Perkins, and Bonner Lakes; 2) glacial valleys along the Canadian border in the Selkirk Mountains; 3) Fleming Creek, in the Kootenai River valley north of Bonners Ferry, 4) Sand Lake and Beaver Lake, south of Naples; 5) Hoodoo Lake, southsoutheast of Priest River; and 6) Sawtooth Range, Boise County. See Appendix 2 for mapped locations of yellow sedge on the Bonners Ferry 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, and shrub and sedge dominated bottomlands, and 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 candida, and others (Appendix 3).

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. I surveyed many of these previously reported localities in 1989, and discovered four new populations. Yellow sedge is listed as a Watch Species for Idaho on the Northern Region Sensitive Species List (USDA Forest Service 1988a).

The Idaho Native Plant Society considers yellow sedge a Sensitive species (Idaho Native Plant Society 1989). 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 Natural Heritage Program 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 because of other factors making it vulnerable to extinction).

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 1987).

Ownership: Six of Idaho's 11 known populations occur on National Forest land; two on the Sandpoint RD (Hoodoo Lake and Beaver Lake), three on the Bonners Ferry RD (Bog Creek, Perkins Lake, and Cow Creek), and one on the Boise NF. Four are on private land and one occurs at Sand Lake on lands now administered by the Idaho Department of Lands. Sand Lake, which was formerly Kaniksu NF before it was traded to the State in the early 1980's, has two FS Sensitive Species, yellow sedge and Scirpus cyperinus, and one state-rare species, Hypericum majus, along its shore.

Threats: Numerous human-related disturbances are taking place in yellow sedge populations on both private and Forest land. Trampling by anglers (Beaver Lake and Cow Creek), grazing by horses (Perkins Lake, Sand Lake) and cattle (Cow Creek), and mowing for hay (Herman Lake Road) were observed in several populations. While all populations observed in 1989 appeared vigorous, the long-term effects of these disturbances on population viability are unknown.

Management Implications: On the Bonners Ferry RD, Allotment Management Plans in Cow Creek and possibly Perkins Lake (exact land lines were difficult to discern here, so it is not known whether horses were grazing on FS land) should give special consideration to the viability of this species. Long-term monitoring should be implemented as part of allotment management to determine the effects of grazing on population dynamics.

Current management at Beaver Lake and Hoodoo Lake, on the Sandpoint Ranger District, appears compatible with long-term viability of the populations, although some trampling by anglers was observed at the Beaver Lake site and it should be monitored periodically.

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; ten sites are now known from Bonner and Boundary Counties, although only five are on lands administered by the Forest Service. Several types of human-related disturbance were observed at several of the populations, however, the long-term effect of these perturbations on population viability is unknown.

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 remain on the Regional Foresters Sensitive Species

List for the Northern Region as a Watch Species for Idaho.

Recommendation to the Idaho Panhandle National Forests: Allotment Management Plans for the allotments on the Bonners Ferry RD that include the Cow Creek and Perkins Lake (if applicable) populations should give special consideration to the habitat of yellow sedge (see Management Implications section) species.

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 (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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Carex paupercula Michx.

CURRENT STATUS USFS - R1 Sensitive List -Watch Species (ID)
Sensitive Species (MT)
USFWS - None
Idaho Native Plant Society - Priority 2
Heritage Rank - G5 S2

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name(s): Poor sedge

Alpha Code: CARPAU
Numeric Code: 1174

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 1969a).

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 and Appendix 5 for slides of its habit.

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; 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. Six populations of poor sedge are known in Idaho, all occur on the Kaniksu NF; one is at the Potholes proposed RNA on the Priest Lake RD; the remaining five occur on the Bonners Ferry RD. See Appendix 2 for mapped locations of poor sedge on the Bonners Ferry RD.

Habitat and Associated Species: Throughout its range, poor sedge is restricted to sphagnum bogs. 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 are sympatric with one or more plants considered rare in Idaho, including Carex leptalea, C. buxbaumii, C. flava, Trientalis arctica, Gaultheria hispidula, and Petasites sagittatus. At Cow Creek Meadow, poor sedge is also associated with northern bog lemming (Synaptomys borealis), the only known site for this species in Idaho (Appendix 3).

CONSERVATION STATUS

Conservation Status - Idaho: Poor sedge was only recently considered of conservation concern in Idaho. Poor sedge is listed as a Watch Species on the Northern Region Sensitive Species List for Idaho (USDA Forest Service 1988a). Rob Bursik, of the University of Idaho Herbarium only located two populations in 1987. Caicco (1988) recommended that poor sedge remain on the Forest Service Sensitive Species List.

The Idaho Native Plant Society considers poor sedge a Priority 2 species (Idaho Native Plant Society 1989). 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 Natural Heritage Program 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).

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. Considered rare by Lesica et al. (1984). It is on the Northern Region Sensitive Species List as a Sensitive Species (USDA Forest Service 1988b).

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 1987).

Ownership: All six known populations of poor sedge in Idaho occur on land administered by the Kaniksu NF. The Priest Lake RD manages one population at Potholes proposed RNA. The Bonners Ferry RD manages the remaining five at Smith Creek RNA, Grass Creek, Cow Creek, Smith Creek near Dirt Oven Campground, and near Two Mouth Lakes.

Threats: One population, Smith Creek RNA, is within an RNA and another, Potholes, is within a proposed RNA. No threats were seen to these populations. Similarly, no threats were observed to the Dirt Oven and Two Mouth Lakes populations on the Bonners Ferry RD. Both the Grass Creek and Cow Creek populations are in cattle allotments, however, it appears that only the Cow Creek population may be impacted by grazing livestock, and possibly anglers.

Management Implications: Smith Creek is a designated RNA. Designation the proposed Potholes RNA will probably enhance the long-term viability of this species in Idaho. It is not possible at this time to determine what effect habitat disturbance by cattle and anglers has been on the Cow Creek population. A gate has recently erected along the Cow Creek Road, a mile or so below Cow Creek Meadow, limiting motorized access to upper Cow Creek. This may reduce some of the angler disturbance in the meadow. The effect of cattle grazing on the poor sedge population is unknown, but the Allotment Management Plan in Cow Creek should give special consideration to the viability of this, and the three other FS Sensitive Species and one rare animal that occur there. Long-term monitoring should be implemented as part of allotment management to determine the effects grazing on population dynamics.

ASSESSMENT AND RECOMMENDATIONS

Summary: Poor sedge is known from only six sites in the state of Idaho; all are administered by the Kaniksu NF. One of these sites is within a designated RNA, while another site is proposed for RNA status. While three sites appear stable, one population has had modification to the habitat in the past and continues to be disturbed to some extent. 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 six populations known in the Northern Region here. 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 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 poor sedge remain on the Regional Foresters Sensitive Species List for the Northern Region, but be changed from a Watch Species to a Sensitive Species for Idaho, similar to Montana.

Recommendation to the Idaho Panhandle National Forest: The Potholes area of the Priest Lake RD should be established as a RNA. One population on the Bonners Ferry RD is protected in Smith Creek RNA and three others on the District did not appear to have any threats to population viability. The Allotment Management Plan for the allotment that includes the Cow Creek population on the Bonners Ferry RD should give special consideration to the habitat of poor sedge and the three other FS Sensitive plants and one rare animal that occur there. Monitoring of this and other populations 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.

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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Cicuta bulbifera L.

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

TAXONOMY

Family: Apiaceae [Umbelliferae (Celery)]

Common Name(s): Bulb-bearing waterhemlock

Alpha Code: CICBUL
Numeric Code: 3062

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 and Appendix 5 for slides of its habit and habitat.

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 6 sites in two areas of Idaho: one site south of Yellowstone National Park on the Targhee National Forest, and five

sites in Bonner and Boundary counties. The five northern Idaho sites are as follows:

1) Stampede Lake, southwest of Naples, Boundary Co - an historical collection from 1945, not seen since;

2) Lee Lake, east of Coolin, Bonner Co - privately owned; three plants seen in 1987 (Caicco 1987);

3) Kaniksu Marsh RNA, Priest Lake RD, Bonner Co - protected; seen there in 1985, but not seen since;

4) Perkins Lake, Bonner Ferry RD, Boundary Co - approximately 100 individuals seen in 1989;

5) Lost Lake, Sandpoint RD, Bonner Co - two plants seen in 1989.

See Appendix 2 for mapped locations of bulb-bearing waterhemlock 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. At Perkins Lake on the Bonners Ferry RD, bulb-bearing waterhemlock occurs at the extreme outer edge of a thin, floating, sphagnum mat. Several tall sedges dominate the small area it occupies. Two other rare plant species are sympatric with bulb-bearing waterhemlock on the sphagnum mat at Perkins Lake, Carex comosa and Epilobium palustre (Appendix 3). Other associated species include Carex rostrata, C. cusickii, C. lasiocarpa, Carex limosa, Drosera rotundifolia, and Potentilla palustre.

At Lost Lake 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. One rare species is sympatric with bulb-bearing waterhemlock there, Dryopteris cristata (Appendix 3). Other associated species include Carex lasiocarpa, Equisetum sp., Lycopsis uniflorus, Potentilla palustris, Cornus stolonifera, Spiraea douglasia, Scutellaria galericulata, and Carex cusickii.

CONSERVATION STATUS

Conservation Status - Idaho: Caicco (1987) first mentioned that bulb-bearing waterhemlock may be of conservation concern in Idaho. Prior to 1989, five populations were known in Idaho. I discovered two individuals at Lost Lake in 1989.

The Idaho Native Plant Society considers bulb-bearing waterhemlock a Sensitive species (Idaho Native Plant Society 1989). 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". I believe that this category does not properly reflect the conservation status of bulb-bearing waterhemlock in Idaho, and I will recommend that it be upgraded to at least a Priority 2 at the

1990 Rare Plant Conference.

The Idaho Natural Heritage Program 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).

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 et al. 1984).

OREGON - Apparently extirpated from Oregon (Oregon Natural Heritage Data Base 1989).

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 1987).

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

Ownership: Two of Idaho's known populations are on private land, one on the Targhee NF and the remaining three on the Kaniksu NF (see Range section).

Threats: No threats to the populations on the Sandpoint and Bonners Ferry RDs were apparent in 1989. All populations are small, however, and they occur in sensitive, floating sphagnum habitats. Several goose nesting platforms have been erected along the lake margin, in the vicinity of the bulb-bearing waterhemlock population at Perkins Lake. It is unknown whether any bulb-bearing hemlock individuals were destroyed during placement of the platforms.

Management Implications: Current management appears compatible with the long-term viability of the bulb-bearing waterhemlock populations on the Bonners Ferry and Sandpoint RDs. Due to its apparent rarity and habitat sensitivity, however, it should be given special consideration in land management planning. Little human disturbance occurs at Lost Lake. At Perkins Lake, fishing appears largely to be from boats and shoreline trampling by anglers does not appear significant. Future plans for construction and maintenance of goose nesting platforms should carefully consider its vulnerability to extirpation.

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 six populations known in Idaho, one has

not been seen since 1945, and another since 1985. All populations are small, consisting of from two to approximately 100 individuals. Three populations are administered by the Kaniksu NF, one each by the Priest Lake, Bonners Ferry, and Sandpoint RDs. Bulb-bearing waterhemlock occurs in a sensitive habitat and is sympatric with from one to seven rare plants (Appendix 3). No threats were apparent in 1989, although goose nesting platforms placed on the margin of Perkins Lake may have destroyed some individuals.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that bulb-bearing waterhemlock has a restricted distribution in Idaho, despite considerable floristic inventory of wetlands in the northern part of the state recently. In addition to Idaho, British Columbia and Washington also consider it 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 be considered for addition to the Regional Foresters Sensitive Species List for the Northern Region as a Sensitive Species for Idaho.

Recommendation to the Idaho Panhandle National Forests: Bulb-bearing waterhemlock has a limited distribution in Idaho and occurs in a unique habitat. Three populations occur on the Kaniksu NF, one each on the Priest River, Sandpoint, and Bonners Ferry RDs. The population at Perkins Lake, Bonners Ferry RD, is the largest known in the state (approximately 100 individuals).
This population, which occurs on a very unstable floating sphagnum mat, should be carefully managed, as this habitat is sensitive to disturbance. Seven other plant species considered rare in Idaho (all are treated in this report) occur in the vicinity of the bulb-bearing waterhemlock population at Perkins Lake. A special management designation, such as Special Interest Botanical Area, may be appropriate for this unique ecological area. On the Sandpoint RD, current management of the Lost Lake area appears compatible with the long-term viability the 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 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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Dryopteris cristata (L.) Gray

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

TAXONOMY

Family: Dryopteridaceae (Wood Fern)

Common Name(s): Crested shield-fern

Alpha Code: DRYCRI
Numeric Code: 9054

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 of 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 1969b).

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 and Appendix 5 for slides of its habit.

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.

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 nine sites in Bonner

and Boundary counties. Seven occur in the Priest River drainage, with parts or all of six populations occurring on land administered by the Priest Lake RD. One site is known from the Sandpoint RD at Lost Lake, and one from the Bonners Ferry RD at Perkins Lake. See Appendix 2 for the mapped location of crested shield-fern the Bonner Ferry RD.

Habitat and Associated Species: Most of the populations of crested shield-fern in Idaho occur on sphagnum at the base of Alnus incana. Communities have been variously described as Alnus incana/Carex rostrata shrub carr or alder swamp/sphagnum bog. At Perkins Lake on the Bonners Ferry RD, it occurs in an Alnus incana/Spiraea douglasii/sphagnum community, while at Lost Lake on the Sandpoint RD, it occurs in an Alnus incana/Carex lasiocarpa/sphagnum community. At the known Idaho locations, crested shield-fern is usually associated with one to several plants that are considered rare in Idaho. For instance, at Perkins Lake on the Bonners Ferry RD, crested shield-fern is sympatric with seven rare taxa (Appendix 3) including, Rhynchospora alba and Betula pumila var. glandulifera. At Lost Lake, on the Sandpoint RD, it occurs with Cicuta bulbifera. Other associates include Carex limosa, Carex cusickii, Athyrium felix-femina, Scutellaria galericulata, and Potentilla palustris.

CONSERVATION STATUS

Conservation Status - Idaho: When Johnson (1981a) 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. Floristic studies of Idaho's peatlands by Rob Bursik, of the University of Idaho Herbarium, revealed one new site at Perkins Lake in 1987. In a thorough search of wetlands on the Bonners Ferry and Sandpoint RDs, I discovered only one additional, small population at Lost Lake.

The Idaho Native Plant Society considers crested shield-fern a Sensitive species (Idaho Native Plant Society 1989). 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 Natural Heritage Program 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 because of rarity or because of other factors demonstrably making it very vulnerable to extinction).

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. It is listed in Lesica et al. (1984) as a taxon of rare status in Montana.

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 1987).

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

Ownership: Eight of Idaho's nine known populations of crested shield-fern occur on National Forest land (two have partial private ownership); six on the Priest Lake RD, and one each on the Sandpoint and Bonners Ferry RDs. The remaining population occurs on land that is both State Department of Lands and private.

Threats: No threats were observed in 1989. All crested shield-fern populations in Idaho, however, are relatively small and/or localized, occurring in sensitive habitats.

Management Implications: Current management of both the Perkins Lake population on the Bonners Ferry RD and the Lost Lake population on the Sandpoint RD appears compatible with long-term viability of the population. Both populations are small, however, consisting of very few individuals, occurring in sensitive habitats. Special management consideration should be given to these habitats.

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 nine populations known in Idaho, only one is entirely private; the remaining 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, but the populations were small and narrowly distributed, making them vulnerable to extirpation.

Recommendations to the Regional Forester: Based on distribution and abundance data collected by Forest personnel, the Idaho Natural Heritage Program, and Rob Bursik of the University of Idaho Herbarium, it appears that crested shield-fern has a restricted distribution in Idaho. Only nine 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) consider crested

shield-fern to be of conservation concern. Based on this information, I recommend that it be considered for addition to the Regional Foresters Sensitive Species List for the Northern Region.

Recommendation to the Idaho Panhandle National Forests: 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. No immediate threats were observed at either of these sites, however, they should be periodically monitored to ensure that they remain viable. Seven other plant species considered rare in Idaho (all are treated in this report) occur in the vicinity of the crested shield-fern population at Perkins Lake. A special management designation, such as Special Interest Botanical Area, may be appropriate for this unique ecological 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 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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Epilobium palustre L.

CURRENT STATUS USFS - None
USFWS - None
Idaho Native Plant Society - Review
Heritage Rank - G? S1

TAXONOMY

Family: Onagraceae (Evening-primrose)

Common Name(s): Swamp willow-weed

Alpha Code: EPIPAL
Numeric Code: 6460

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 1961).

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 and Appendix 5 for slides of its habit.

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 four sites: Kaniksu Marsh RNA,

Chase Lake, and Hager Lake in the Priest River drainage, and Perkins Lake on the Bonners Ferry RD. All sites were discovered by in 1987 and 1988 by Rob Bursik, of the University of Idaho Herbarium. No other sites were discovered in northern Idaho, despite the considerable amount of floristic inventory of wetlands that has taken place there recently. At Perkins Lake, I observed several hundred individuals along the lake margin on the north, east, and south sides. See Appendix 2 for the mapped location of swamp willow-weed at Perkins Lake.

Swamp willow-weed is regularly distributed in fen and bog habitats in western Montana (Peter Lesica, personal communication).

Habitat and Associated Species: At Perkins Lake, swamp willow-weed occurs at the outer edge of a thin, floating, sphagnum mat. Several tall sedges dominate the small area. Three other rare plant species are sympatric with swamp willow-weed on the sphagnum mat at Perkins Lake, Carex comosa, Betula pumila var. glandulifera, and Cicuta bulbifera (Appendix 3). Other associated species include Carex rostrata, C. cusickii, C. lasiocarpa, Carex limosa, Drosera rotundifolia, and Potentilla palustre.

CONSERVATION STATUS

Conservation Status - Idaho: The rarity of swamp willow-weed in Idaho has recently been brought to our attention as a result of floristic studies of Idaho's peatlands by Rob Bursik, of the University of Idaho Herbarium. 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.

It is currently on the Review list of taxa for Idaho by the Idaho Native Plant Society (Idaho Native Plant Society 1989). The Review category of the Idaho Native Plant Society list refers to taxa "which may be of conservation concern, but for which we have insufficient data upon which to base a recommendation regarding their appropriate classification".

The Idaho Natural Heritage Program currently ranks swamp willow-weed as G? S1 (G? = global rank unknown to me, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction).

Conservation Status - Elsewhere: None in Washington, California, British Columbia, Oregon or Montana.

Ownership: Two populations in the Priest River valley are on National Forest land, one is a Research Natural Area. The other Priest River site occurs on both State and private land. The Perkins Lake population occurs on National Forest land.

Threats: No threats were readily apparent to the Perkins Lake population. Individuals occur on the lake margin, at the outer edge of a floating sphagnum mat, a habitat easily disturbed. Several goose nesting platforms have been erected along the lake margin, in the vicinity of the bristly sedge population. Swamp willow-weed individuals may have been destroyed during placement of the platforms.

Management Implications: Current management appears compatible with the long-term viability of the swamp willow-weed population on the Bonners Ferry RD. Due to its apparent rarity and habitat sensitivity, however, it should be given special consideration in land management practices at the lake. Fishing appears largely to be from boats and shoreline trampling by anglers does not appear significant. Future plans for construction and maintenance of goose nesting platforms should carefully consider its vulnerability to extirpation.

ASSESSMENT AND RECOMMENDATIONS

Summary: In Idaho, swamp willow-weed appears to be restricted to the Priest River drainage and the Kootenai River valley east of Moyie Springs. Only four populations are known in Idaho, despite considerable floristic exploration of wetlands in Idaho the last several years. The population on the Bonners Ferry RD consists of several hundred individuals, occurring at the outer edge of a floating sphagnum mat. The entire population appears to occur on National Forest land. No threats were apparent in 1989, however, due to the vulnerability of its habitat, and its association at all sites with several sensitive plant taxa, it deserves special consideration when making land management decisions.

Recommendations to the Regional Forester: Based on distribution and abundance data collected by Rob Bursik and myself, 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. Swamp willow-weed is regularly distributed in fen and bog habitats in western Montana (Peter Lesica, personal communication). Based on this information, swamp willow-weed may warrant inclusion on the Regional Foresters Sensitive Species for the Northern Region for Idaho.

Recommendations to the Idaho Panhandle National Forests: Swamp willow-weed has a limited distribution in Idaho and occurs in a unique habitat. One population is known from the Bonners Ferry RD on the shore of Perkins Lake, consisting of several hundred plants. This population, which occurs on a very unstable floating sphagnum mat, should be carefully managed, as this habitat is sensitive to disturbance. Seven other plant species considered rare in Idaho occur in the vicinity of the swamp willow-weed population at Perkins Lake. A special management designation, such as Special Interest Botanical Area, may be appropriate for this unique ecological 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 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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Epipactis gigantea Dougl. ex Hook.

CURRENT STATUS USFS - R1 Sensitive List -Watch Species (ID)
Sensitive Species (MT)
R4 Sensitive List
USFWS - None
Idaho Native Plant Society - Priority 2
Heritage Rank - G4 S3

TAXONOMY

Family: Orchidaceae (Orchid)

Common Name(s): Giant helleborine

Alpha Code: EPIGIG
Numeric Code: 6548

Citation: Fl. Bor. Am. 2:202. 1839.

Technical Description: Stems 1 to many from short rhizomes, mostly 3-7 (up to 12) dm tall; leaves numerous, sheathing, the lowest blades almost lacking, but gradually enlarged upward, almost glabrous to scabridulous-puberulent, broadly elliptic-lanceolate, mostly 7-14 (19) cm long and 1.5-5 (7) cm broad; flowers 3-15, rather showy, the raceme usually secund, the bracts gradually reduced upward, but even the uppermost one usually exceeding the ovary; sepals coppery-green, lightly brownish-veined, 12-16 mm long; petals similar to the sepals, but thinner, and (at least the venation) more brownish-purple; lip 15-20 mm long, the sac with prominent, raised, purplish lines leading to the base, 3-lobed, the outer (basal) lobe prominent, the blade (central lobe) about as long as the basal lobes, curved downward somewhat, triangular-ovate, the tip flattened but with uprolled margins, greenish-yellow, the basal portion much thickened, yellow, the margins thickened and erect, with numerous linear callosites leading to the sac; column 6-9 mm long; anther 4-5 mm long; capsule reflexed, 2-3.5 cm long (Hitchcock 1969a).

Nontechnical Description: Giant helleborine is a large perennial herb, with leafy stems, 1-3 feet tall from short rhizomes. The leaves are without petioles and up to 8 inches long. The herbage is rough to the touch or smooth and glabrous. The numerous flowers are borne singly in a long, narrow, one-sided, leafy-bracted inflorescence at the top of the stems. The brownish flowers have two upper petals that are shorter and broader than the sepals. The lower petal is sac-like. See Appendix 1 for a line drawing of giant helleborine and Appendix 5 for slides of its habit and habitat.

Distinguishing Features and Similar Species: Giant helleborine is one of our most distinctive orchids, and is not easily confused with any other species in the family. In a vegetative state, it can easily be confused with Smilacina stellata, with which it grows at some sites (not the Boundary Co population, however). The leaf arrangement and appearance is quite similar, although giant helleborine has leaves that are prominently clasping at the base, a trait lacking in Smilacina stellata. Giant helleborine is also a taller plant.

DISTRIBUTION

Range: Giant helleborine is distributed from southern British Columbia, south to Baja California, and in most of the western U.S. to the Rocky Mountains and south to northern Mexico. In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho, Montana, and South Dakota.

In Idaho, giant helleborine is known from 23 sites, with all except one occurring south of the Salmon River. Giant helleborine was discovered by Fred Johnson in 1980, in a seep along Fleming Creek, about 10 miles northwest of Bonners Ferry. The Fleming Creek population is approximately 210 miles north of the next nearest population in Idaho, at Lucile Caves along the lower Salmon River. Several populations are known from the upper Kootenai River valley (Radium and Fairmont hot springs) and Kootenay Lake area of British Columbia (Straley et al. 1985). In a thorough search of wetlands on the Bonners Ferry and Sandpoint RDs in 1989, I did not locate any additional populations. See Appendix 2 for the mapped location of giant helleborine at Fleming Creek.

Habitat and Associated Species: The Fleming Creek population is unlike any other population of giant helleborine that I have visited in Idaho. All southern Idaho populations are associated with hot or cold springs; a clear, constant flow of water is always present. The Fleming Creek site is a relatively large, gently sloping seep, dominated by Scirpus acutus. No running water was present near the population, as Fleming Creek flows along the opposite side of the valley bottom several feet lower than the seep. Giant helleborine is growing in between the tall Scirpus stems. Another FS Sensitive Species, Carex flava, is a common associate at Fleming Creek (Appendix 3). Other associates include Cicuta douglasii, Mimulus guttatus, Carex rostrata, and C. cusickii.

CONSERVATION STATUS

Conservation Status - Idaho: The sensitivity of giant helleborine in Idaho was first recognized in the mid-1960's when it was included on a list of protected plants in the state wildflower protection act (Idaho Code, chapter 18-3911). In his treatment of giant helleborine for the Idaho rare plant project of the Idaho Natural Areas Council, Henderson (1981c) recommended a status of State Threatened, due to numerous and varied threats to its habitat. Giant helleborine is listed as a Watch Species for Idaho on the Northern Region Sensitive Species List (USDA Forest Service 1988), because no populations are known to occur on Northern Region Forests here. It is a Sensitive Species in the Intermountain Region of the Forest Service (USDA Forest Service 1988c).

The Idaho Native Plant Society considers giant helleborine a Priority 2 species (Idaho Native Plant Society 1989). 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 Natural Heritage Program currently ranks giant helleborine 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).

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; designated as threatened by the Committee on the Status of Endangered Wildlife in Canada; extirpated from many sites (Straley et al. 1985).

MONTANA - Ranked S1 = Taxon critically imperiled because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction. Included on the Northern Region Sensitive Species List as a Sensitive Species (USDA Forest Service 1988b).

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 1987).

WYOMING - Ranked S1 = Taxon critically imperiled because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction.

Straley et al. (1985) also list it as rare in Colorado.

Ownership: The Idaho populations of giant helleborine occur in private, state and federal land (several agencies). The Fleming Creek population in Boundary Co is on private land.

Threats: Numerous and varied threats exists to most populations in Idaho. Several are considered extirpated. No identifiable threats were observed at the Fleming Creek site.

Management Implications: The Fleming Creek population is entirely private, lying approximately four miles west of the Kaniksu NF boundary. National Forest management does not appear to affect this site.

ASSESSMENT AND RECOMMENDATIONS

Summary: Giant helleborine is presently known from 23 sites in Idaho. Numerous and varied threats are present at most sites. The Boundary Co site at Fleming Creek, is disjunct by over 200 miles from the next nearest known site in Idaho. The Fleming Creek population is private and no threats were observed in 1989.

Recommendations to the Regional Forester: Although no giant helleborine was found on National Forest land in northern Idaho, there is still a possibility that it does occur there. For that reason, I recommend that it remain on the Regional Foresters Sensitive Species List for the Northern Region as a Watch Species.

Recommendation to the Idaho Panhandle National Forests: No giant

helleborine was found on National Forest land on the Bonners Ferry RD. The Fleming Creek population lies approximately four miles east of the Kaniksu NF boundary near Smith Lake. There is still a possibility that it does occur 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 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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Gaultheria hispidula (L.) Muhl.

CURRENT STATUS USFS - R1 Sensitive List -Sensitive Species (ID)
USFWS - None
Idaho Native Plant Society - Priority 2
Heritage Rank - G5 S2

TAXONOMY

Family: Ericaceae (Heath)

Common Name(s): Creeping snowberry

Alpha Code: GAUHIS
Numeric Code: 0532

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 and Appendix 5 for slides of its habit and habitat.

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, or only have very fine hairs; the acute leaves 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.

Eight populations are known from northern Idaho; seven from the Priest River valley in Bonner Co, and one on the west slope of the Selkirk Mountains in Boundary Co. See Caicco (1987) for a complete description of the known distribution of creeping snowberry in the Priest River valley. The Selkirk population occurs along Smith Creek near Dirt Oven Campground. See Appendix 2 for the mapped location of creeping snowberry on the Bonners Ferry RD.

Habitat and Associated Species: In northern Idaho and adjacent Washington, creeping snowberry is found growing in a variety of substrates including downed logs, stumps, mud and bare ground. It is always associated with sphagnum. See Caicco (1987) for a complete description of habitats occupied by creeping snowberry in the Priest River valley.

On the Bonners Ferry RD, two small populations of creeping snowberry occur in two small sphagnum bogs on benches adjacent to Smith Creek. It occurs on old, downed logs and raised tree mounds within the bogs. Associated species include Picea engelmannii, Tsuga heterophylla, Calamagrostis canadensis, Kalmia microphylla, Viola canadensis, Pedicularis groenlandica, Drosera rotundifolia, Eriophorum chamissonis, Menziesia ferruginea, Thuja plicata, and Lysichitum americanum. In addition, Carex paupercula, a FS Sensitive Species, occurs with creeping snowberry in these two bogs. Trientalis arctica and Scirpus cyperinus, two other FS Sensitive Species, occur in another bog in the vicinity (Appendix 3). These two bogs are surrounded by a moderately-sized stand of old-growth Tsuga heterophylla and Thuja plicata.

CONSERVATION STATUS

Conservation Status - Idaho: In his evaluation of creeping snowberry for the Idaho rare plant project of the Idaho Natural Areas Council, Johnson (1981b) 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 largely because the area of northeastern Washington and northern Idaho which generally lies within the administrative boundaries of the Kaniksu NF is the only place in the conterminous U.S. in which the species is found. Creeping snowberry is listed as a Sensitive Species on the Northern Region Sensitive Species List for Idaho (USDA Forest Service 1988a).

The Idaho Native Plant Society considers creeping snowberry a Priority 2 species (Idaho Native Plant Society 1989). 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 Natural Heritage Program 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 because of rarity or because of other factors demonstrably making it very vulnerable to extinction).

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 1987).

Ownership: The Smith Creek population near Dirt Oven Campground is on land administered by the Bonners Ferry RD, Kaniksu NF. Most of the populations in the Priest River valley are also administered by the Forest Service.

Threats: No threat was apparent to the two small populations at Dirt Oven.

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

ASSESSMENT AND RECOMMENDATIONS

Summary: Creeping snowberry is highly restricted in the state, known from eight sites in northern Idaho, despite considerable floristic exploration of wetlands in this part of the state.
One site occurs on land administered by the Bonners Ferry RD of the Kaniksu NF; the rest occur in the Priest River drainage. No immediate threats were observed to the Bonners Ferry RD population.

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. This despite considerable floristic research in the region. The area of northeastern Washington and northern Idaho, which generally lies within the administrative boundaries of the Kaniksu NF, is the only place in the conterminous U.S. in which the species is found. I recommend that creeping snowberry remain on the Regional Foresters Sensitive Species List for the Northern Region as a Sensitive Species for Idaho.

Recommendation to the Idaho Panhandle National Forest: One population occurs on the Bonners Ferry RD. No threats were observed to population viability during 1989. Due to its rarity, limited distribution in the conterminous U.S., and the
sensitivity of its habitat, a periodic monitoring program should be established for the populations at Dirt Oven to establish current trends. The bogs containing creeping snowberry there are small and very sensitive to hydrologic changes brought on by incompatible land-use of the adjacent slopes. In addition, three other FS Sensitive Species occur with creeping snowberry here or in the vicinity. For these

reasons, a special designation, such as a Research Natural Area may be appropriate for the area.

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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Petasites sagittatus (Banks) Gray

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

TAXONOMY

Family: Asteraceae (Aster)

Common Name(s): Arrowleaf coltsfoot

Alpha Code: PETSAG
Numeric Code: 4026

Arrowleaf coltsfoot is a distinctive plant of wetlands in Bonner and Boundary counties It has large, arrow-shaped leaves, with denticulate margins, that occur intermittently in groups of from two to five along a rhizome. The upper surface of the leaf is dark green, while the lower surface is white, covered with a dense layer of tangled hairs. It is rarely seen flowering (see Appendix 5 for a slide of arrowleaf coltsfoot. It occurs sporadically (12 documented sites) in a wide variety of bottomland/wetland habitats, from about the latitude of Granite (four miles north of Athol), north. Many sites are known from the Kaniksu NF.

Of all the rare species occurring in wetlands in Bonner and Boundary counties, arrowleaf coltsfoot has the widest ecological amplitude, not being restricted to a very narrow set of habitat requirements. It is often, however, a member of the ensemble of rare plants that occur in restricted habitats, such as sphagnum bogs. It also appears to tolerate frequent perturbations to its habitat; vigorous populations were observed in pastures that are grazed season long. Due to these factors, I concur with Caicco's (1987) recommendation that there seems to be no reason to list it as a Northern Region Sensitive Species. It is, however, sufficiently rare to warrant inclusion on the Idaho Native Plant Society's Monitor List.

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 stems and roots. Confirmed sightings of this species should be reported to the Idaho Natural Heritage Program for entry into their permanent data base on rare species for the state.

Rhynchospora alba (L.) Vahl.

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

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name(s): White beakrush

Alpha Code: RHYALB
Numeric Code: 2388

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 1969c).

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, 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 and Appendix 5 for slides of its habit and habitat.

Distinguishing Features and Similar Species: White beakrush could be confused with a sedge (Carex), however, the whitish, head-like inflorescence and fruits that have bristles but lack perigynia is quite distinctive on close examination.

DISTRIBUTION

Range: White beakrush is interruptedly circumboreal, but not 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 perhaps continuous across southern Canada to the Pacific; where it is found from the Alaska panhandle to central California, chiefly west of he Cascade-Sierran 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 only from five sites despite the fact that considerable floristic exploration has taken place recently in Idaho wetlands, especially in northern Idaho. The five populations occur in two widely disjunct areas: at Tule Lake in Valley County; and four sites in Bonner (Kaniksu Marsh RNA, Bailey Bog, Chase Lake) and Boundary (Perkins Lake) counties. The Tule Lake population was discovered by Rob Bursik of the University of Idaho Herbarium in 1987, and represents a significant rare extension for this rare species. I discovered a small but dense population at Perkins Lake in 1989, at the north end of the lake. See Appendix 2 for the mapped location of white beakrush at Perkins Lake.

White beakrush is not known to occur in Montana, although Perkins lake is less than two miles from the border.

Habitat and Associated Species: At Perkins Lake, white beakrush is abundant in the understory of a Betula pumila var. glandulifera/Carex lasiocarpa/sphagnum community. In addition to Betula pumila, six other rare plant species occur with white beakrush on the sphagnum mat at Perkins Lake,including Carex comosa, Carex flava, and Cicuta bulbifera (Appendix 3). Other associated species include Carex rostrata, C. limosa, Drosera rotundifolia, Menyanthes trifoliata, and Potentilla palustre.

CONSERVATION STATUS

Conservation Status - Idaho: The rarity of white beakrush in Idaho has recently brought to our attention as a result of floristic studies of Idaho's peatlands by Rob Bursik, of the University of Idaho Herbarium. 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 1989). 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 Natural Heritage Program currently ranks white beakrush as G? S1 (G? = global rank unknown to me, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction).

Conservation Status - Elsewhere:

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

Ownership: The Tule Lake population in Valley Co is on the Boise NF; In the Priest River drainage, one site is on the Kaniksu NF (Kaniksu Marsh RNA) and two are on state and/or private land. The Perkins Lake population is on land managed by the Bonner Ferry RD and possibly some adjacent private land (land lines are difficult to discern in this area,

so I was not exactly sure where the FS - private boundary was).

Threats: One of the private sites in the Priest River drainage has been illegally filled. The effect of this filling on the white beak rush population is unknown. No threats were observed to the Perkins Lake population in 1989.

Management Implications: Current management appears compatible with the long-term viability of the only known white beakrush population on the Bonners Ferry RD. Due to its apparent rarity and habitat sensitivity, however, it should be given special consideration in land management practices at the lake. Fishing appears largely to be from boats and shoreline trampling by anglers does not appear significant.

ASSESSMENT AND RECOMMENDATIONS

Summary: In Idaho, white beakrush is known from five populations in two widely disjunct areas, despite considerable exploration of wetlands in Idaho the last several years. On the Kaniksu NF it is known from Kaniksu Marsh RNA on the Priest Lake RD and from Perkins Lake on the Bonners Ferry RD. The population at Perkins Lake occupies a small area, but is densely distributed within that area. No threats were apparent in 1989, however, due to the vulnerability of its habitat, and its association at all sites with several sensitive plant taxa, it deserves special consideration when making land management decisions.

Recommendations to the Regional Forester: Based on distribution and abundance data collected by Rob Bursik and myself, 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. Based on this information, I recommend that it be considered for addition to the Regional Foresters Sensitive Species List for the Northern Region as a Sensitive Species for Idaho.

Recommendations to the Idaho Panhandle National Forests: White beakrush 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 densely distributed clumps covering a small area. Seven other plant species considered rare in Idaho occur in the vicinity of the white beakrush population at Perkins Lake. A special management designation, such as Special Interest Botanical Area, may be appropriate for this unique ecological 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 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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Salix candida Fluegge ex Willd.

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

TAXONOMY

Family: Salicaceae (Willow)

Common Name(s): Hoary willow

Alpha Code: SALCAN
Numeric Code: 0820

Citation: Sp. Pl. 4:708. 1806.

Technical Description: Freely branched low shrub (O.6) 5-12 (15) dm tall; twigs densely and closely white-tomentose when young, some of the tomentum generally persistent into the second year; stipules usually small and caducous, or larger and more persistent on vigorous young shoots; petioles mostly 5-10 mm long; leaves narrow, mostly oblanceolate to narrowly oblong or less often lanceolate, the better-developed ones mostly 4.5-8.5 (15) cm long and 0.7-1.5 (2.3) cm wide, 3.5-10 times as long as wide, the margins revolute and entire, the lower surface densely and usually permanently white-tomentose with very fine, tangled hairs, the upper surface rugose and glabrate or only thinly tomentose, dark green under the tomentum; aments coetaneous, nearly sessile, but the short peduncle generally with some leafy-textured bracts 5-15 mm long; scales brown, persistent, woolly-villous; staminate catkins (1) 1.5-2.5 cm long, about 1 cm thick or a little less; stamens 2, with purple anthers and glabrous, free filaments; pistillate catkins (2) 3-5 (6) cm long at maturity, the fruits often rather loosely arranged, though the pedicel is very short (up to about 1 mm long); ovaries and capsules tomentose, the capsule 5-7.5 mm long; style and stigmas red or reddish, the style 0.8-1.7 mm long, sometimes divided; stigmas bifid, 0.2-0.5 mm long (Cronquist 1964).

Nontechnical Description: Hoary willow is a low- to medium-sized willow, generally to 4 feet tall. The lower surfaces of the leaves are covered with a dense, white, felt-like tomentum, comprised of fine, tangled hairs. The catkins are nearly sessile, but may have several, small leafy bracts. See Appendix 1 for a line drawing of hoary willow and Appendix 5 for slides of its habit and habitat.

Distinguishing Features and Similar Species: Hoary willow is one of most distinctive willows, due largely to leaf characteristics. In their study area, Brunsfeld and Johnson (1985) report that the thinly tomentose early leaves are evidently glaucous beneath, and so, early in the season these plants somewhat resemble Salix brachycarpa, which is similar in its habitat, stature and floral morphology. Hoary willow, however, has notably longer and narrower leaves. This situation was not seen in northern Idaho, as S. brachycarpa was not seen on the Bonners Ferry RD.

DISTRIBUTION

Range: Hoary willow is distributed from Labrador to Alaska, south to New Jersey, Iowa, South Dakota, and in the Rocky Mountains to Colorado, Idaho, and southern British Columbia. Cronquist (1964) notes that it is seldom collected in our range. In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho, Montana, North Dakota, and South Dakota.

Until 1983, the only known populations of hoary willow in Idaho were in Lemhi and Fremont counties. Johnson and Brunsfeld (1983) reported the discovery of two populations in Boundary Co. Hoary willow is now known from only five populations in Idaho, despite considerable floristic exploration of Idaho's wetlands by Brunsfeld and Johnson (1985), Rob Bursik of the University of Idaho Herbarium, and others. A thorough inventory of wetlands on the Bonners Ferry and Sandpoint RDs were unsuccessful at locating any new populations in northern Idaho in 1989. The two Boundary Co. populations occur on private land as follows:

1. Above inlet (north) of Bonner Lake, about two miles east of Moyie Springs. Only one, 6 foot individual was seen in 1989.

2. Off Herman Lake Road, over three miles northwest of Herman Lake. I observed a vigorous population here in 1989.

See Appendix 2 for the mapped locations of hoary willow in Boundary Co.

Habitat and Associated Species: Throughout its range, hoary willow occurs in bogs and swampy places (Cronquist 1964). All known Idaho sites lack sphagnum. Both Boundary Co. populations were growing in a shrub/sedge-dominated bottomland community. At the Bonner Lake site, Betula pumila var. glandulifera was the community dominant, with Alnus incana, Cornus stolonifera, Crataegus douglasii, and Lonicera involucrata also present. Carex lasiocarpa was the understory dominant along with Senecio indecorus, Scutellaria galericulata, and Lysimachia thrysifolia. A similar association is present at the Herman Lake Road site, although both Betula pumila and Carex lasiocarpa were less common. In addition to Betula pumila, two other rare plants in Idaho occur with hoary willow at these two sites, Carex flava and Petasites sagittatus (Appendix 3).

CONSERVATION STATUS

Conservation Status - Idaho: The rarity of hoary willow in Idaho has recently reviewed by Brunsfeld (1983 as part of the Idaho rare plant project of the Idaho Natural Areas Council. He recommended that it be placed on the State Watch List, noting that only four populations were known (then), but that no threats were apparent. Hoary willow is a Sensitive Species in the Intermountain Region of the Forest Service, where it is known from the Targhee NF (USDA Forest Service 1988c).

The Idaho Native Plant Society considers hoary willow a Sensitive species (Idaho Native Plant Society 1989). 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 Natural Heritage Program currently ranks hoary willow 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).

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 1987).

Ownership: Both Boundary Co populations are on private land, however, the Herman Lake Road population is less than one mile south of the Kaniksu NF boundary.

Threats: A portion of the bottomland at the Herman Lake Road site has been cleared of shrubs and the native sedge meadow is (regularly?) mowed for hay. Native, shrub-dominated, bottomland habitats at the Bonner Lake population abruptly end at a fenceline on the up-valley end, the other side of which has been cleared, plowed and planted to pasture grasses. It is unknown if the hoary willow individuals were destroyed by these activities.

Management Implications: Neither Boundary Co population occurs on land administered by the Forest Service. Forest Service management of surrounding lands does not appear to affect these populations.

ASSESSMENT AND RECOMMENDATIONS

Summary: Hoary willow is only known from five sites in Idaho, two occur on private land in Boundary Co. Both populations occur adjacent to land that has been cleared for pasture or hay crops, however, the impacts of these activities on hoary willow populations is unknown.

Recommendations to the Regional Forester: Although no hoary willow populations were found on National Forest land in northern Idaho, there is still a possibility that it does occur there. Hoary willow is a Sensitive Species for Intermountain Region Forests in Idaho. For these reasons, I recommend that hoary willow be considered for addition to the Regional Foresters Sensitive Species List for the Northern Region as a Watch Species for Idaho.

Recommendation to the Idaho Panhandle National Forests: No hoary willow was found on National Forest land in Boundary Co, however, the Herman Lake Road population is less than one mile from the boundary. There is still a possibility that it does occur on the Forest.

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 inflorescences, leaves, and stems. Specimens should be sent to Steve Brunsfeld, at the College of Forestry, Wildlife and Ranges Sciences Herbarium (University of Idaho, Moscow, 83843) for verification of their identity. Confirmed sightings of this species should be reported to the Idaho Natural Heritage Program for entry into their permanent data base on sensitive species.

Scheuchzeria palustris L.

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

TAXONOMY

Family: Scheuchzeriaceae (Pod grass)

Common Name(s): Pod grass

Alpha Code: SCHPAL
Numeric Code: 5942

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 1969).

Nontechnical Description: Pod grass is a trailing, strongly rhizomatous graminoid, with each erect stem having 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; also 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 nine sites in three widely disjunct areas of Idaho: 1) Priest River valley around Priest Lake; 2) Kootenai River valley north and east of Moyie Springs; and 3) Tule Lake, east of Cascade on the Boise NF. The eight northern Idaho populations occur at the following sites:

1) Hager Lake - Priest Lake RD and private.
2) Kalispell Creek - Priest Lake RD or private.
3) Chase Lake - State and private.
4) Bailey Bog - N end Priest Lake; Private.
5) Kaniksu Marsh RNA - Priest Lake RD.
6) Bottle Lake RNA - Priest Lake RD.
7) Perkins Lake - Bonners Ferry RD and private.
8) Sinclair Lake - Moyie River valley; private.

See Appendix 2 for mapped locations of pod grass at Perkins Lake and Sinclair 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 often with Carex. In Idaho, both of these statements hold true. At the known Idaho locations, pod grass is usually associated with one to several plants that are considered rare in Idaho. For instance, at Perkins Lake on the Bonners Ferry RD, pod grass is sympatric with seven rare taxa (Appendix 3) including, Rhynchospora alba and Betula pumila var. glandulifera. Betula is the overstory dominant here with Carex lasiocarpa the understory dominant. Other associates include Carex limosa, Carex rostrata, Potentilla palustris, Menyanthes trifoliata.

CONSERVATION STATUS

Conservation Status - Idaho: Johnson (1981c) 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 sties were known, but many bogs in the region remained to be searched. Caicco (1987) reported three additional sites. Rob Bursik, of the University of Idaho Herbarium, discovered a population at Perkins Lake in the Kootenai River valley in 1987. I discovered one additional, small population on private land along the Moyie River in 1989.

The Idaho Native Plant Society places pod grass on the Monitor list (Idaho Native Plant Society 1989). 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 Natural Heritage Program currently ranks pod grass 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 throughout Idaho, or found locally in a restricted range or because of other factors making it vulnerable to extinction).

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 1989).

Ownership: Six of Idaho's nine known populations occur, at least in part, on National Forest land. Two are protected in Research Natural Areas on the Priest Lake RD. Most of the Perkins Lake population occurs on the Bonners Ferry RD.

Threats: Threats to two private populations are known: the Bailey Bog population has been illegally filled and the Sinclair Lake population has been largely buried by gravel underlying adjacent train tracks. The Perkins Lake population appears little disturbed.

Management Implications: Current management of the Perkins Lake population appears compatible with long-term viability of the population.

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 National Forest populations 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, however, it is usually common where it occurs and is protected in two RNAs. I concur with Caicco (1987) that pod grass does not warrant designation as a Northern Region Sensitive Species.

Recommendation to the Idaho Panhandle National Forests: Pod grass 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 an extensive colony. Seven other plant species considered rare in Idaho occur in the vicinity of the pod grass population at Perkins Lake. A special management designation, such as Special Interest Botanical Area, may be appropriate for this unique ecological area.

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 (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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Scirpus cyperinus (L.) Kunth

CURRENT STATUS USFS - R1 Sensitive List -Sensitive Species (ID)
Watch Species (MT)
USFWS - None
Idaho Native Plant Society - Priority 2
Heritage Rank - G5 S3

TAXONOMY

Family: Cyperaceae (Sedge)

Common Name(s): Wool-grass

Alpha Code: SCICYP
Numeric Code: 1316

Citation: Enum. Pl. 2:170. 1837

Technical Description: Perennial without rhizomes, the culms tufted, commonly 8-15 dm tall, subterete, leafy-stemmed, the leaves elongate, flat and grasslike, mostly 2-6 mm wide; spikes 3-8 mm long, very numerous in a compound terminal cyme, usually most of hem shortly slender-pedunculate, although the inflorescence is sometimes much condensed; inflorescence subtended by several conspicuous, unequal, leaf-like, blackish-based, sheathless bracts, the largest of these bracts seldom much less than 1 dm long; scales numerous, about 1.5 mm long, blunt, finely red-brown-striate on a pale to often blackish-green background; bristles 6, well-developed, slender, flexuous, tawny, surpassing the scales, especially in fruit, the spikelet then appearing shortly woolly; achenes trigonous, pale, a little under 1 mm long (Cronquist 1969d).

Nontechnical Description: Wool-grass is a tufted Scirpus, with stems to almost six feet tall. The spikes are very numerous in a terminal cyme, subtended by several, conspicuous, unequal, leaf-like bracts. The fruits have relatively long, brownish, wooly hairs (bristles) that give the entire inflorescence a tawny look, especially in advanced stages of maturity. See Appendix 1 for a line drawing of wool-grass and Appendix 5 for slides of its habit.

Distinguishing Features and Similar Species: The tufted habit of wool-grass, combined with the brown, wooly appearance of the inflorescence make this species easily distinguished from other Scirpus in the area.

DISTRIBUTION

Range: Wool-grass is distributed throughout the boreal regions of the Northern Hemisphere, extending south in North America to Connecticut, Michigan, Saskatchewan, and northwest Montana and northern Idaho. In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho, Montana, and South Dakota.

In Idaho, wool-grass is currently known from 14 sites in Latah, Kootenai, Benewah, Bonner, and Boundary counties. Prior to 1989, it was only known from eight sites; I found six populations in 1989. See

Appendix 2 for mapped locations of wool-grass on the Bonners Ferry RD.

Habitat and Associated Species: Wool-grass occurs in wetlands that have a peat or mineral substrate. It is rarely found on sphagnum substrates, and when it does occur there, the populations are small. It is often associated with wetlands that experience seasonal water-level fluctuations, such as at Three Ponds RNA on the Bonners Ferry RD, and Pack River Flats, Livermore Lake, and Trout Creek in the Sandpoint area. Associated species include Carex lenticularis, C. lasiocarpa, Alnus incana, Cicuta douglasii, Mentha arvensis, Scirpus acutus, Potentilla palustris, and Phalaris arundinacea. At Sand Lake, north of Sandpoint, wool-grass occurs with two other plants considered rare in Idaho, Hypericum majus and Carex flava.

CONSERVATION STATUS

Conservation Status - Idaho: In his review of wool-grass for the Idaho rare plant project of the Idaho Natural Areas Council, Steele (1981) recommended that it be placed on the State Watch List, noting that it is rarely collected in Idaho. Wool-grass is listed as a Sensitive Species on the Northern Region Sensitive Species List for Idaho (USDA Forest Service 1988a).

The Idaho Native Plant Society considers wool-grass a Priority 2 species (Idaho Native Plant Society 1989). 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". I believe that this category does not properly reflect the conservation status of wool-grass in Idaho, and will recommend that it be downgraded to the Monitor category at the 1990 Rare Plant Conference.

The Idaho Natural Heritage Program currently ranks wool-grass 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 throughout Idaho, or found locally in a restricted range or because of other factors making it vulnerable to extinction).

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. It is on the Northern Region Sensitive Species List as a Watch Species for Montana (USDA Forest Service 1988b).

OREGON - Review List (Oregon Natural Heritage Data Base 1989).

Ownership: Throughout its known range in Idaho, wool-grass occurs on many ownerships, including Kaniksu NF (Sandpoint and Bonners Ferry RDs), and possibly the Clearwater NF, private, State Department of Lands, and State Department of Fish and Game.

Threats: No threats were observed to any populations. It appeared that wool-grass was able to occupy newly created habitat (e.g., small pool

area behind an old dam at the Trout Creek population, Sandpoint RD) and both natural (Three Ponds RNA, Bonners Ferry RD) and unnatural (Pack River Flats) fluctuations in water levels. It was also observed in a roadside ditch (Grass Creek, Bonners Ferry RD) and next to a boat dock area (Livermore Lake).

Management Implications: Current management of populations on the Sandpoint and Bonners Ferry RDs appears compatible with long-term viability of the populations.

ASSESSMENT AND RECOMMENDATIONS

Summary: Wool-grass is widely distributed, albeit seldom encountered, in northern Idaho. It has a relative wide ecological amplitude, not being restricted to a very narrow set of habitat requirements (i.e., sphagnum bogs). At only one site is it associated with other rare plants. It also appears to be able to tolerate and persist in disturbed areas.

Recommendations to the Regional Forester: Based on distribution, abundance, and habitat data reported here, I recommend that wool-grass be taken off the Northern Region Sensitive Species List for Idaho. It is, however, sufficiently rare in Idaho to warrant inclusion on the Idaho Native Plant Society's Monitor List.

Recommendation to the Idaho Panhandle National Forests: Current management appears compatible with long-term viability of wool-grass populations on the Kaniksu NF. Wool-grass is known from the Coeur d'Alene and St. Joe river drainages, and it is likely that populations will be found on National Forest land there. 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. 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 Natural Heritage Program for entry into their permanent data base on sensitive species.

Trientalis arctica Fisch. ex Hook.

CURRENT STATUS USFS - R1 Sensitive List -Sensitive Species (ID)
USFWS - None
Idaho Native Plant Society - Sensitive
Heritage Rank - G5 S3

TAXONOMY

Family: Primulaceae (Primrose)

Common Name(s): Northern starflower

Alpha Code: TRIARC
Numeric Code: 7096

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 below, 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 1959b).

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 and Appendix 5 for slides of its habit.

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. Northern starflower is rare in Idaho and California.

Nineteen populations are known from northern Idaho; 11 from the Priest River valley in Bonner Co and eight from the Selkirk Crest and drainages on the west slope of the Selkirk Mountains in Boundary Co. See Appendix 2 for mapped locations of northern starflower on the Bonners Ferry RD.

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 rare in Idaho, including Carex leptalea, C. buxbaumii, C. flava, C. paupercula, Gaultheria hispidula, and Petasites sagittatus. At Cow Creek Meadow, northern starflower is also associated with the northern bog lemming (Synaptomys borealis), the only known site for this species in Idaho (Appendix 3). See Caicco (1987) for a complete description and evaluation of northern starflower populations on the Priest Lake RD.

CONSERVATION STATUS

Conservation Status - Idaho: In his evaluation of northern starflower for the Idaho rare plant project of the Idaho Natural Areas Council, Johnson (1981d) 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 a very fragile habitat.
Northern starflower is listed as a Sensitive Species on the Northern Region Sensitive Species List for Idaho (USDA Forest Service 1988a).

The Idaho Native Plant Society considers northern starflower a Sensitive species (Idaho Native Plant Society 1989). 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 Natural Heritage Program currently ranks northern starflower 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 throughout Idaho, or found locally in a restricted range or because of other factors making it vulnerable to extinction).

Conservation Status - Elsewhere:

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

Ownership: Of the 11 populations known from the Priest Lake valley, six are at least partially on land administered by the Priest Lake RD of the Kaniksu NF, including one established and one proposed RNA. All but one of the eight Selkirk populations occur on the Bonners Ferry RD.

Threats: Two populations, Smith Creek RNA and Kaniksu Marsh RNA, are within established protected areas, and another, Potholes, is within a proposed RNA. No threats were seen to these populations, although trampling by hikers has been noted as a potential threat at Smith Creek RNA. Cattle trampling has been noted as a potential threat to the bogs at the Cow Creek Meadows, Grass Creek, Upper Smith Creek, and Saddle Creek Pass populations in the Selkirks. For a complete discussion of management of the Priest River valley populations see Caicco (1987).

Management Implications: Despite the marked increase in the number of known locations for this species, I concur with Johnson's (1981d) and Caicco's (1987) recommendations that monitoring is warranted, especially those populations possibly affected by cattle grazing. It is not possible at this time to determine the effect of habitat disturbance by cattle on the Selkirk populations. Allotment Management Plans for allotment containing these populations should give special consideration to the viability of this, and other Sensitive Species that occur there. Long-term monitoring should be implemented as part of allotment management to determine the effects grazing on population dynamics.

ASSESSMENT AND RECOMMENDATIONS

Summary: Northern starflower is known from nineteen sites in northern Idaho, seven of which occur on lands administered by the Bonners Ferry RD of the Kaniksu NF. One of the Bonners Ferry RD populations is within a designated RNA. Northern starflower occurs in a sensitive habitat and is sympatric with from one to several rare plants. Cattle grazing has been noted as a potential threat to four Selkirk populations, but the effect on population viability is presently unknown.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that northern starflower has a relatively restricted distribution in Idaho, with 19 populations known from Bonner and Boundary counties. This is a marked increase in sites from just a couple of years ago. The habitat it 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, but be changed from a Sensitive Species to a Watch Species for Idaho.

Recommendation to the Idaho Panhandle National Forest: One population on the Bonners Ferry RD is protected in Smith Creek RNA and three others on the District did not appear to have any threats to population viability. Cattle grazing has been noted as a possible threat at four Selkirk populations. Allotment Management Plans for allotments that include these populations
should give special consideration to the habitat of northern starflower and the other FS Sensitive plants and one rare animal that occur with it. Monitoring of these and other populations is warranted in order to establish the current trend. The recommended protocol is an annual census of flowering stems 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.

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 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 Natural Heritage Program for entry into their permanent data base on sensitive species.

DISCUSSION AND OVERALL RECOMMENDATIONS

Results of my 1989 survey, and floristic inventories and research by personnel of the Idaho Panhandle National Forests and the University of Idaho, have provided a relatively complete picture of the distribution, abundance, and habitat relationships of rare plants on the Bonners Ferry RD and vicinity. Additional populations will certainly be discovered, especially in the inaccessible portions of the Selkirk Mountains, but existing data provide the basis for, what I believe are informed recommendations on the status and management of the species and their habitats.

Summary of Conservation Status Recommendations

1. Currently Northern Region Sensitive - No Change.

    a. *Carex buxbaumii* - remain as Watch
    b. *Carex flava* - remain as Watch
    c. *Carex paupercula* - change from Watch to Sensitive

    d. *Epipactis gigantea* - remain as Watch
    e. *Gaultheria hispidula* - remain as Sensitive
    f. *Trientalis arctica* - change from Sensitive to Watch

2. Recommended additions to Northern Region Sensitive List.

    a. *Betula pumila* var. *glandulifera*
    b. *Carex comosa*
    c. *Cicuta bulbifera*
    d. *Dryopteris cristata*
    e. *Epilobium palustre*
    f. *Rhynchospora alba*
    g. *Salix candida*

3. Delete from Northern Region Sensitive List for Idaho.

    a. *Scirpus cyperinus*

4. Currently no FS Status; remain on Idaho Native Plant Society Monitor List.

    a. *Petasites sagittatus*
    b. *Scheuchzeria palustris*

Summary of Habitats

As was mentioned throughout the species discussions, I rarely found just one sensitive species in a particular habitat on the Bonners Ferry RD, rather they occurred as ensembles of up to eight 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 rare plants occurring sympatrically are thought to indicate unique environmental conditions. Indeed, most of the rare species that occur in sphagnum bogs of the Kaniksu NF are of boreal origin that 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 bog plants on the Kaniksu NF occur in highly specialized habitats within the bogs and have a very narrow ecological amplitude.

3. The sphagnum habitat is sensitive to disturbance and has a low recovery potential; the recovery rate is also slow (peat forms at rate of about 1-2 cm/ per year in the 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 from any informed decisions concerning the effect(s) of Forest management on the viability of Sensitive species occupying bogs. Methodologies should be developed for monitoring these species, which display a wide variety of growth and reproductive characteristics.

2. Currently, little information exists in the literature concerning the classification of bog communities in the northern Rocky Mountains. As with population monitoring, classification of habitats for Sensitive bog species will also be essential for making informed management decisions. A project should be initiated to quantitatively describe plant communities occurring in bogs of the Kaniksu NF. This effort should compliment the aquatic habitat classification currently being prepared by Fred Rabe of the University of Idaho, for northern Idaho and northwestern Montana, a project partly funded by the Northern Region.

3. Almost nothing is known about the distribution, abundance, and habitat relationships of moss and fungus species occurring in bogs of the Kaniksu NF, and the effect of Forest management on their habitats.

Some of these species probably exhibit similar distribution patterns as the vascular plants, and therefore may be worthy for consideration as FS Sensitive Species.

4. Outstanding sites, containing high quality examples of bog communities and an ensemble of rare plants, should be protected via a special management designation, such as Research Natural Area or Special Interest Area. Outstanding bog habitats in the West Fork of Smith Creek are currently protected in the Smith Creek RNA. Two outstanding areas worthy of this sort of protection are Perkins Lake and the small bogs and adjacent forest communities near the old Dirt Oven Campground on Smith Creek. Other sites may also qualify for special designations.

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Appendix 1

Line drawings of rare plants found in wetlands* of the Bonners Ferry Ranger District.

Page 1. Carex buxbaumii
Page 2. Carex comosa
Page 3. Carex flava
Page 4. Carex paupercula
Page 5. Cicuta bulbifera
Page 6. Dryopteris cristata
Page 7. Epilobium palustre
Page 8. Epipactis gigantea
Page 9. Gaultheria hispidula
Page 10. Rhynchospora alba
Page 11. Salix candida
Page 12. Scheuchzeria palustris
Page 13. Scirpus cyperinus
Page 14. Trientalis arctica

*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 rare plants
on the Bonner Ferry Ranger District.

Map 1. Portion of 1969 Grass Mountain 7.5' quadrangle - Bog Creek
Map 2. Portion of 1969 Grass Mountain 7.5' quadrangle - Grass Creek
Map 3. Portion of 1969 Grass Mountain and Shorty Peak 7.5' quadrangles - Cow Creek Meadows
Map 4. Portion of 1969 Grass Mountain 7.5' quadrangle - Upper Cow Creek
Map 5. Portion of 1969 Shorty Peak 7.5' quadrangle - Saddle Creek Pass
Map 6. Portion of 1969 Shorty Peak 7.5' quadrangle - Dirt Oven
Map 7. Portion of 1969 Smith Peak and Caribou Creek 7.5' quadrangles - Smith Creek RNA
Map 8. Portion of 1969 Smith Peak 7.5' quadrangle - Upper Smith Creek
Map 9. Portion of 1967 The Wigwams 7.5' quadrangle - Tow Mouth Lakes
Map 10. Portion of 1965 Moravia 7.5' quadrangle - Three Ponds RNA and Deep Creek
Map 11. Portion of 1965 Ritz 7.5' quadrangle - Fleming Creek
Map 12. Portion of 1965 Naples 7.5' quadrangle - Stampede Lake
Map 13. Portion of 1965 Line Point 7.5' quadrangle - Skin Creek and Perkins Lake
Map 14. Portion of 1965 Curley Creek 7.5' quadrangle - Herman Lake Road and Bonner Lake
Map 15. Portion of 1965 Curley Creek 7.5' quadrangle - Herman Lake and Kingsley Creek
Map 16. Portion of 1965 Eastport 7.5' quadrangle - Sinclair Lake

APPENDIX 3

Locality summary for sensitive plants
on the Bonners Ferry Ranger District
(see Appendix 2 for maps of the following sites)

Selkirk Mountains

1. Bog Creek -(Forest Service)

   Carex flava

2. Grass Creek -(Forest Service)

   Carex paupercula
   Scirpus cyperinus
   Trientalis arctica

3. Upper Cow Creek - (Forest Service)

   Trientalis arctica

4. Cow Creek Meadows - (Forest Service)

   Carex buxbaumii
   Carex flava
   Carex paupercula
   Trientalis arctica
   Synaptomys borealis (northern bog lemming)

5. Saddle Creek Pass -(Forest Service)

   Trientalis arctica

6. Dirt Oven (Smith Creek) -(Forest Service)

   Carex paupercula
   Gaultheria hispidula
   Scirpus cyperinus
   Trientalis arctica

7. Smith Creek RNA - (Forest Service)

   Carex paupercula
   Trientalis arctica

8. Upper Smith Creek -(private)

   Trientalis arctica

9. Two Mouth Lakes - (Forest Service)

Carex paupercula
Trientalis arctica

10. Three Ponds RNA -(Forest Service)

Scirpus cyperinus

Purcell Trench/Kootenai Valley

11. Fleming Creek - (private)

Epipactis gigantea
Carex flava

12. Deep Creek near Moravia - (private)

Petasites sagittatus

13. Stampede Lake - (private)

Cicuta bulbifera

14. Skin Creek -(Forest Service)

Betula pumila var. glandulifera

15. Perkins Lake -(Forest Service and private)

Betula pumila var. glandulifera
Carex comosa
Carex flava
Cicuta bulbifera
Dryopteris cristata
Epilobium palustre
Rhynchospora alba
Scheuchzeria palustris

16. Herman Lake Road - (private)

Betula pumila var. glandulifera
Carex flava
Petasites sagittatus
Salix candida

17. Bonner Lake -(private)

Betula pumila var. glandulifera
Carex flava
Salix candida

18. Herman Lake -(private)

Betula pumila var. glandulifera
Carex flava

19. Kingsley Creek - (private)

Betula pumila var. glandulifera
Petasites sagittatus

Moyie River Valley

20. Sinclair Lake - (private)

Scheuchzeria palustris

APPENDIX 4

List of wetlands unsuccessfully searched for sensitive plants in the vicinity of the Bonners Ferry Ranger District.

1. Copper Lake - T65N R3E S8

2. Spruce Lake - T64N R3E S8

3. Bradley Lake - T60N R1W S14

4. Kootenai Orchards - T60N R1W S16

5. Moyie River Meanders - along river from Eastport to mouth of Meadow Creek.

6. Dawson Lake area - T63N R2E S29,30,31,32

7. Brush Lake area - T64N R1E S9,10,16,15,21,22

8. Robinson Lake - T65N R2E S21

9. Solomon Lake - T63N R3E S20

10. Smith Lake - T63N R1E S36; T63N R2E S30

11. Meadow Creek - T63N R2E S16,17

12. Cooks Lake - T62N R2W S27

13. Bond Lake - T60N R1W S22

APPENDIX 5

Slides of rare plants and their habitats.

1. Betula pumila var. glandulifera - close-up of fruits and leaves.
2. Carex buxbaumii - close-up of spikes.
3. Carex comosa - close-up of spikes; note nodding habit.
4. Carex comosa - plant (in center of photo) at edge of floating sphagnum mat at Perkins Lake.
5. Carex flava - close-up of spike.
6. Carex flava - overall habit; note yellowish spikes and bract that is divergent at a sharp angle to spikes.
7. Carex paupercula - close-up of whole plant; note lack of remains of last year's leaves at base.
8. Cicuta bulbifera - whole plant at edge of Perkins Lake; note purplish bulbils on upper branches.
9. Dryopteris cristata - whole plant; note sterile, evergreen leaves in basal rosette, and fertile, deciduous leaves erect in middle.
10. Epilobium palustre - close-up of upper stem; note grayish appearance and narrow, revolute leaves.
11. Epipactis gigantea - close-up of flowers.
12. Epipactis gigantea - Scirpus acutus habitat at Fleming Creek; note vegetative Epipactis stems at base of Scirpus.
13. Gaultheria hispidula - close-up of plants; note creeping stem and white berry.
14. Petasites sagittatus - whole plant; plants about 2 feet tall.
15. Rhynchospora alba - close-up of plant; note white inflorescence.
16. Rhynchospora alba - habitat; occurs in dense Betula pumila/ Carex lasiocarpa/sphagnum community at Perkins Lake.
17. Salix candida - close-up of upper stem; note leaves that are dark green above and woolly-white below.
18. Salix candida - habitat at Herman Lake Road; note individuals in Carex rostrata stand in foreground.
19. Scirpus cyperinus - close-up of inflorescence; note tawny appearance resulting from long bristles.
20. Scirpus cyperinus - whole plant; plant pictured is about 4 feet tall.
21. Trientalis arctica - close-up of plant; note white flower and small leaves at base of stem, gradually becoming larger above.