

FIELD INVESTIGATIONS OF EIGHT RARE PLANT TAXA  
OCCURRING IN WETLANDS  
ON THE SANDPOINT RANGER DISTRICT,  
IDAHO PANHANDLE NATIONAL FORESTS.

by

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## ABSTRACT

Field investigations of rare plant species occurring in wetlands of the Sandpoint 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 third phase of a three phase cooperative Challenge Cost-share project between the Department and the Idaho Panhandle National Forests to survey wetland habitats on the Kaniksu NF for sensitive plant taxa.

Eight rare species were encountered in nine wetlands on or near the Sandpoint RD. The distribution, abundance, habitat relationships, and management recommendations are discussed for each species. A summary of conservation status recommendations for rare wetland species of the Kaniksu NF is also presented.

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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 the summary of findings of Phase 3 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). Phase 2, investigations of sensitive plants of the Bonners Ferry RD was completed in 1989 (Moseley 1989). This Phase 3 report 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 19 wetlands on the Sandpoint RD, or adjacent areas that generally lie within the administrative boundaries of the District.

Nine wetlands on or near land administered by the Sandpoint RD were found to contain at least one rare plant population. Some sites were found to contain more than one (see Appendix 3 for a summary of wetlands containing rare plants on the Sandpoint RD). Ten of the areas I surveyed in 1989, did not contain any rare plants (see Appendix 4 for a list of areas on the Sandpoint RD searched unsuccessfully).

Eight 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.

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). In the Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho and Montana.

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 Sandpoint 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, and Lycopodium inundatum (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 1981). In 1983, Johnson and Brunfeldt (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 (Moseley 1989; and this report). 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 in 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 1990).

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: Current management at Beaver Lake and Hoodoo Lake, on the Sandpoint RD, 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.

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.

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: Current management of the Sandpoint RD populations appears compatible with their long-term viability, although angler trampling of the Beaver Lake population should be monitored.

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.

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 the mapped location of bulb-bearing waterhemlock on the Sandpoint RD.

Habitat and Associated Species: Throughout its range, bulb-bearing waterhemlock can be found in marshes, bogs, wet meadows and shallow standing water. 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.

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 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.

## 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 a new population of two individuals at Lost Lake, Sandpoint RD, 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 species 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 1990).

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). One population occurs on the Sandpoint RD at Lost Lake.

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 the Yukon, Northwest Territories, 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, the Yukon and Northwest territories, 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 on the Sandpoint 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 in Idaho 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 1990).

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

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.

Hypericum majus (Gray) Britt.

CURRENT STATUS      USFS - None  
                         USFWS - None  
                         Idaho Native Plant Society - Priority 2  
                         Heritage Rank - G5 S1

TAXONOMY

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

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

Alpha Code: HYPMAJ  
Numeric Code: 5202

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

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

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

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

DISTRIBUTION

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

It has been documented from seven sites, all in northern Idaho, two of which are considered extirpated:

- 1) Historical collection from the mouth of Trestle Creek, on Pend Oreille Lake, Bonner Co. It has not been seen since; considered extirpated by flooding when hydrology of lake was changed with the

building of Albeni Falls Dam.

2) Historical collection from Walsh Lake, ca. 10 miles north of Sandpoint, Bonner Co. It has not been seen since; Walsh Lake has been drained and is now used for agriculture. Population considered extirpated.

3) Hager Bog, ca. 4 miles south of Nordman, Bonner Co. Population on private and Priest Lake RD land. Few dozen plants observed in 1987.

4) Lee Lake, east of Coolin, Bonner Co., privately owned. Plants common in 1987.

5) Kaniksu Marsh RNA, Priest Lake RD, Bonner Co.; protected. Few scattered individuals seen in 1987.

6) Hoodoo Lake, Bonner Co., either private or Sandpoint RD or both. Large population of 50-100 clumps seen in 1988.

7) Sand Lake, Bonner Co., State Department of Lands. Several hundred clumps seen in 1989.

See Appendix 2 for mapped locations of large Canadian St. John's-wort on the Sandpoint RD.

Habitat and Associated Species: Throughout its range, large Canadian St. John's-wort can be found in marshes, bogs, and wet meadows. At Sand Lake, north of Sandpoint, it occurs in a Carex lasiocarpa community on a peat substrate. Associates include Potentilla palustris, Mentha arvensis, and the FS Watch Species Carex flava. At Hoodoo Lake, on the Sandpoint RD, it occurs on mud flats along the outlet stream south of the lake. Carex flava is an associate there also.

#### CONSERVATION STATUS

Conservation Status - Idaho: When Johnson (1981b) first evaluated large Canadian St. John's-wort for the Idaho rare plant project of the Idaho Natural Areas Council, he recommended it as State Threatened, based on four sites known. Caicco (1987) noted that at least one of the four sites (probably the Trestle Creek site) was flooded by water impoundment. Three new populations have been discovered since 1987, this despite relatively intensive floristic studies of Idaho's peatlands by Rob Bursik, of the University of Idaho Herbarium, and the three phase project to survey wetlands of the Kaniksu NF by the Idaho Natural Heritage Program. Two populations are considered destroyed.

The Idaho Native Plant Society considers large Canadian St. John's-wort 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 large Canadian St. John's-wort as G5 S1 (G5 = demonstrably secure globally, though it may

be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction).

Conservation Status - Elsewhere:

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

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

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

Ownership: Of the five populations known to be extant, only one entirely occurs on National Forest land (Kaniksu Marsh, Priest Lake RD). Two populations occur on private and/or Forest Service land (Hager Bog, Priest lake RD and Hoodoo Lake, Sandpoint RD). One population occurs on private and/or state land (Lee Lake) and one population occurs entirely on State Department of Lands ownership (Sand Lake, which is indicated as FS land on some maps, but was traded to the state in the early 1980's).

Threats: No threats to the extant populations of the Sandpoint and Priest Lake RDs were apparent in 1987, 1988, and 1989.

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

## ASSESSMENT AND RECOMMENDATIONS

Summary: With the exception of Montana, Large Canadian St. John's-wort is rare in all but the core of its range in eastern Canada. Seven populations have been documented in Idaho, two of which are now considered destroyed. Three of the extant populations are large, while two consist of few individuals.

Three populations are administered, at least partially, by the Kaniksu NF, two by the Priest Lake RD and one by the Sandpoint RD. Large Canadian St. John's-wort occurs in a sensitive habitat and is sympatric with from one to several rare plants (see Appendix 3 for list of rare species occurring with it on the Sandpoint RD). No threats were apparent to any of the extant populations in 1987-1989.

Recommendations to the Regional Forester: Based on distribution and abundance data, it appears that large Canadian St. John's-wort has a restricted and declining distribution in Idaho. This despite considerable floristic inventory of wetlands in the northern part of the state recently. In addition to Idaho, many states and provinces in the U.S. and Canada also consider it to be of conservation concern. Along with a narrow distribution in the state, the habitat it occupies is unique, characterized by several associated species that also have a limited distribution in Idaho. Based on information reported here, I recommend that large Canadian St. John's-wort 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: Large Canadian St. John's-wort has a limited distribution in Idaho and occurs in a unique habitat. Three of the five extant populations, at least partially, occur on the Kaniksu NF, two on the Priest Lake RD and one on the Sandpoint RD. On the Sandpoint RD, current management of the Hoodoo Lake area appears compatible with the long-term viability the population. The population should be monitored periodically, however.

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.

Lycopodium inundatum L. var. inundatum

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

TAXONOMY

Family: Lycopodiaceae (Clubmoss)

Common Name(s): Northern bog clubmoss

Alpha Code: LYCINU

Numeric Code: 9146

Citation: Sp. Pl. 1102. 1753.

Technical Description: Main stems annual, more or less elongate, prostrate or arching, irregularly rooting, leafy, giving rise to scattered, erect, leafy branches, each of which is up to 1 dm tall and terminates in a cone 1.5-4 cm long; plant perennating by a winter bud; leaves crowded, in 8-10 ranks, thin, narrow, mostly entire, 4-8 mm long and less than 1 mm wide, broadest near the base, tapering gradually to the soft acicular tip, the ones on the lower side of the main stem twisted into a more or less erect position, those of the erect stems loosely ascending; sporophylls numerous, crowded, expanded at the base, otherwise resembling the vegetative leaves, the long, slender, green tips loosely ascending; sporangia ellipsoid-globose, about 1 mm wide; spores 43 microns or more in diameter (Cronquist 1969c).

Nontechnical Description: Horizontal stems creeping along the ground surface, the growing tips extending only a few cm beyond the upright fertile stems, rooting at intervals, and sparsely covered with narrow leaves. Erect stems 2-4 inches high, unbranched, and covered with scattered leaves. Erect stems terminated by a cone approximately 2 inches long (Lellinger 1985). See Appendix 1 for a line drawing of northern bog clubmoss and Appendix 5 for slides of its habit and habitat.

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

DISTRIBUTION

Range: Northern bog clubmoss is distributed from Newfoundland to Alaska, south to Maryland, southwestern Virginia, Ohio, Indiana, northern Illinois, Wisconsin, Minnesota, Manitoba, Saskatchewan, Alberta, Montana, Idaho, and northern California (Lellinger 1985). In the

Northern Region, the Ecosystem Classification Handbook (USDA Forest Service 1987) lists it as occurring in Idaho and Montana. Two populations (one is historical) are known in Montana.

In Idaho, northern bog clubmoss is known to occur at six sites in Bonner and Boundary Cos. Five occur in the Priest River drainage, with parts or all of three populations occurring on land administered by the Priest Lake RD. Only one site is known east of the Selkirk crest in Idaho, that from Beaver Lake on the Sandpoint RD. See Appendix 2 for the mapped location of northern bog clubmoss on the Sandpoint RD.

Habitat and Associated Species: Cronquist (1969c) indicates that northern bog clubmoss occurs mostly in sphagnum bogs, seldom in other very wet places. In Idaho, northern bog clubmoss appears to be restricted to floating sphagnum mats on the edges of small ponds. Carex lasiocarpa is usually the dominant vascular plant on the site. At Beaver Lake on the Sandpoint RD, other associated species include Potentilla palustris, Drosera rotundifolia, Viola palustris, and Lycopsis uniflorus. Carex flava, a FS Watch Species is also present at Beaver Lake, but occurs in a different, adjacent community, not on the floating sphagnum mat.

#### CONSERVATION STATUS

Conservation Status - Idaho: When Johnson (1981c) first evaluated northern bog clubmoss for the Idaho rare plant project of the Idaho Natural Areas Council, he recommended placing it on the State Watch List. He noted that there were only four populations known and the bog habitats are fragile, but that numerous bogs in the area remained unexplored botanically. Caicco (1987) reviewed the status of northern bog clubmoss on the Priest Lake RD and stated that despite considerable floristic inventory of wetlands in the Priest River drainage, only one new population had come to light in the intervening six years. He concluded that the rarity of northern bog clubmoss is more real than apparent, as suggested by Johnson. Recent studies of Idaho's peatlands by Rob Bursik, of the University of Idaho Herbarium, and wetland surveys by the Idaho Natural Heritage Program on the Bonners Ferry (Moseley 1989) and Sandpoint RDs, substantiate these findings; only one new population was discovered. Northern bog clubmoss is listed as a Sensitive Species for Idaho on the Northern Region Sensitive Species List (USDA Forest Service 1988a).

The Idaho Native Plant Society considers northern bog clubmoss a Priority 1 species (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 northern bog clubmoss as G5 S1 (G5 = demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery, S1 = critically imperiled in Idaho because of extreme rarity or because of some other

factor of its biology making it especially vulnerable to extinction).

Conservation Status - Elsewhere:

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

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

OREGON - Threatened in Oregon, but more stable or common elsewhere (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 1990).

Ownership: Three populations are entirely on National Forest land; two on the Priest Lake RD, both in Research Natural Areas, and one on the Sandpoint RD. The remaining three are largely or entirely on private land, possibly with some State Department of Lands and Forest Service ownership at two of these.

Threats: Caicco (1987) reviewed the conservation status of three populations in the Priest River drainage. One population in a Forest Service RNA (Bottle Lake) is too small to instill much confidence in its long-term viability at the site. One population on private land is threatened by illegal filling of the bog habitat. The third population, occurring mostly on private land, has experienced increased trampling in recent years.

The Beaver Lake population on the Sandpoint RD occurs on several floating sphagnum islands, several yards out from the east shoreline. The islands have been artificially connected to the shore and to each other by a series of log bridges. Portions of the population have been heavily trampled by anglers, who have left considerable amounts of trash, had several fires, and erected fishing "perches" on the edge of the mat with logs and branches.

Management Implications: Current management of the Beaver Lake population on the Sandpoint RD does not appear to be compatible with long-term viability of the northern bog clubmoss population. The population is small, and has declined due to trampling by anglers. The habitat on which it occurs is very sensitive to disturbance. Special protective measures should be taken soon to assure the continued existence of this population.

ASSESSMENT AND RECOMMENDATIONS

Summary: Northern bog clubmoss has an extremely restricted distribution in Idaho, occurring exclusively on sphagnum mats. At almost all sites it is sympatric with one to several plant taxa considered rare in Idaho. Of the six populations known in Idaho, three are entirely on Forest

Service land; the remaining three occur largely on private land. Immediate threats have been observed at three of the populations, including the Beaver Lake population on the Sandpoint RD, and another (in Bottle Lake RNA) is too small to instill much confidence in its long-term viability.

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 northern bog clubmoss has a very restricted distribution in Idaho. Only six 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. Based on this information, I recommend that northern bog clubmoss remain on the Regional Foresters Sensitive Species List for the Northern Region.

Recommendation to the Idaho Panhandle National Forests: Northern bog clubmoss has a limited distribution in Idaho and occurs in a unique habitat. The population at Beaver Lake on the Sandpoint RD is small and threatened by angler trampling and disturbance. Protective measures should be implemented as soon as possible as well as population and habitat monitoring. The other populations administered by the Kaniksu NF should also be quantitatively monitored and protective measures implemented if deemed necessary.

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



## 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 six populations in Idaho, despite considerable floristic exploration of Idaho's wetlands by Brunsfeld and Johnson (1985), Rob Bursik of the University of Idaho Herbarium, the Idaho Natural Heritage Program, and others. A thorough inventory of wetlands on the Bonners Ferry and Sandpoint RDs in 1989, located only one new population in Bonner Co. The two Boundary Co. and one Bonner Co. populations occur on private land as follows:

1. Boundary Co.- Above inlet (north) of Bonner Lake, about two miles east of Moyie Springs. Only one, 6 foot individual was seen in 1989.
2. Boundary Co. - Off Herman Lake Road, over three miles northwest of Herman Lake. I observed a vigorous population here in 1989.
3. Bonner Co. - Northeast shore of Livermore Lake, ca. 7 miles east of Sagle. I observed only three individuals in 1989. All were first year shoots; no fertile stems were seen.

See Appendix 2 for the mapped location of hoary willow in Bonner 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.

At the Livermore Lake site in Bonner Co., hoary willow occurred in an area that had been disturbed in the past by activity associated with an adjacent boat launch. Shoreline vegetation appeared to be recovering. The three plants were rooted in a mineral substrate (sand) with little peat development. The wetland vegetation at the edge of the lake is seasonally flooded in the spring by higher lake levels and is dominated by Phalaris arundinacea, Scirpus acutus, Mentha arvensis, and Potentilla palustris. A rare species, Scirpus cyperinus is sympatric with hoary willow at this site (Appendix 3).

## CONSERVATION STATUS

Conservation Status - Idaho: The rarity of hoary willow in Idaho was 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". I believe that this category does not properly reflect the conservation status of hoary willow in Idaho, and will recommend that it be upgraded to a Priority 2 species at the 1990 Rare Plant Conference.

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 1990).

Ownership: All three northern Idaho 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 site abruptly end at a fence line 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.

The Livermore Lake population occurs adjacent to a boat launch site that appears to have gotten greater use in the past. The effects of this past disturbance on the hoary willow population is unknown, but the vegetation surrounding the launch site appears to be recovering.

Management Implications: None of the three northern Idaho populations occur 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 six sites in Idaho, three occur on private land in Boundary and Bonner Cos. All three populations occur adjacent to land that has been disturbed by agricultural or recreational uses, 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 or Bonner Cos., 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.

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 them 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 Sandpoint 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.

## DISCUSSION AND OVERALL RECOMMENDATIONS

Results of Idaho Natural Heritage Program surveys, 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 occurring in wetlands on the Kaniksu NF and vicinity. Additional populations may be discovered, especially in inaccessible areas, but existing data provide the basis for what I believe are informed recommendations on the status and management of rare plants occurring in wetland habitats on the Kaniksu NF.

### Summary of Conservation Status Recommendations for Rare Wetland Species on the Kaniksu NF

1. Currently Northern Region Sensitive (USDA Forest Service 1988a) - No Change.

#### SENSITIVE

Gaultheria hispidula (Caicco 1987; Moseley 1989)  
Lycopodium inundatum (Caicco 1987; this report)  
Oxalis trilliifolia (Caicco 1987)  
Trientalis arctica (Caicco 1987; Moseley 1989) - change  
from Sensitive to Watch  
Vaccinium oxycoccos (Caicco 1987)

#### WATCH

Carex buxbaumii (Caicco 1987; 1988; Moseley 1989)  
Carex flava (Caicco 1987; 1988; Moseley 1989; this report)  
Carex livida (Caicco 1987; 1988)  
Carex paupercula (Caicco 1988; Moseley 1989) - change  
from Watch to Sensitive  
Epipactis gigantea (Moseley 1989)  
Howellia aquatilis (Shelly and Moseley 1988)

2. Recommended additions to Northern Region Sensitive List.

Betula pumila var. glandulifera (Moseley 1989)  
Carex comosa (Moseley 1989)  
Cicuta bulbifera (Caicco 1987; Moseley 1989; this report)  
Dryopteris cristata (Caicco 1987; Moseley 1989; this report)  
Epilobium palustre (Moseley 1989)  
Hypericum majus (Caicco 1987; this report)  
Rhynchospora alba (Moseley 1989)  
Salix candida (Moseley 1989; this report)

3. Delete from Northern Region Sensitive List for Idaho.

Carex sitchensis (Caicco 1987)  
Scirpus cyperinus (Moseley 1989; this report)

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

Petasites sagittatus (Caicco 1987; Moseley 1989; this report)  
Scheuchzeria palustris (Caicco 1987; Moseley 1989)

#### 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 and Sandpoint RDs, 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 viability.

## Recommended Conservation Measures

1. Population monitoring will have to form the basis for any informed decisions concerning the effect(s) of Forest management on the viability of Sensitive species 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.

## REFERENCES

- Brunsfeld, S.J. 1983. Salix candida. Page 18 In: 1983 status changes and additions to: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.
- Brunsfeld, S.J., and F.D. Johnson. 1985. Field guide to willows of east-central Idaho. Bull. No. 39. Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow. 95 pp.
- Caicco, S.L. 1987. Field investigations of selected sensitive plant species on the Idaho Panhandle National Forest. Idaho Natural Heritage Program, Idaho Department of Fish and Game, Boise, ID. 44 pp., plus appendices.
- Caicco, S.L. 1988. Studies in the genus Carex on the Idaho Panhandle National Forests. Idaho Natural Heritage Program, Idaho Department of Fish and Game, Boise, ID. 44 pp., plus appendices.
- Cronquist, A. 1961. Cicuta. Pages 522-523 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 3; University of Washington Press, Seattle.
- Cronquist, A. 1964. Salix. Pages 37-70 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 2; University of Washington Press, Seattle.
- Cronquist, A. 1969a. Carex. Pages 220-345 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.
- Cronquist, A. 1969b. Dryopteris. Pages 71-76 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.
- Cronquist, A. 1969c. Lycopodium. Pages 23-28 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.
- Cronquist, A. 1969d. Scirpus. Pages 369-383 in: Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 1; University of Washington Press, Seattle.
- Hansen, P.L., S.W. Chadde, and R.D. Pfister. 1988. Riparian dominance types of Montana. Miscellaneous Publication No. 49, Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, MT. 411 pp.
- Henderson, D.M. 1981. Carex flava. Page 97 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.
- Hitchcock, C.L. 1961. Hypericum. Pages 433-434 in: Hitchcock, C.L.,

A. Cronquist, M. Ownbey, and J.W. Thompson; Vascular Plants of the Pacific Northwest, Part 3; University of Washington Press, Seattle.

Idaho Native Plant Society. 1989. Results of the fifth annual rare plant meeting, March 2-3, 1989. Sage Notes, The Idaho Native Plant Society Newsletter 12(2).

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

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

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

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

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

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

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

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

Moseley, R.K. 1989. Field investigations of 16 rare plant taxa occurring in wetlands on the Bonners Ferry Ranger District, Idaho Panhandle National Forests. Idaho Natural Heritage Program, Idaho Department of Fish and Game, Boise, ID. 75 pp., plus appendices.

Oregon Natural Heritage Data Base. 1989. Rare, threatened and endangered plants and animals of Oregon. Oregon Natural Heritage Data Base, Portland, OR. 40 p.

Shelly, J.S., and R.K. Moseley. 1988. Report on the conservation status of Howellia aquatilis, a candidate threatened species. Status survey report prepared for the U.S. Fish and Wildlife Service, Regions 1 and 6. Available from U.S. Fish and Wildlife Service, Boise, ID. 166

p.

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

Steele, R. 1981. Scirpus cyperinus. Page 135 In: Vascular plant species of concern in Idaho, by the Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, Bull. No. 34, Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

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

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

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

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

USDA Forest Service. 1988c. Sensitive Plant Program Handbook -Region 4. R-4 FSH 2609.25. Intermountain Region, Ogden, UT.

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

## Appendix 1

Line drawings of rare plants found in wetlands  
of the Sandpoint Ranger District.

- Page 1. Carex flava
- Page 2. Cicuta bulbifera
- Page 3. Dryopteris cristata
- Page 4. Hypericum majus
- Page 5. Lycopodium inundatum
- Page 6. Salix candida
- Page 7. Scirpus cyperinus

\*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 Sandpoint Ranger District.

- Map 1. Portion of 1965 Twentymile Creek 7.5' quadrangle - Beaver Lake
- Map 2. Portion of 1951 Packsaddle Mtn 15' quadrangle - Gamble Lake,  
Livermore Lake and Lost Lake
- Map 3. Portion of 1968 Edgemere 7.5' quadrangle - Hoodoo Lake
- Map 4. Portion of 1968 Sandpoint 7.5' quadrangle - Kootenai East
- Map 5. Portion of 1951 Elmira 7.5' quadrangle - Pack River Flats and  
Trout Creek
- Map 6. Portion of 1965 Naples 7.5' quadrangle - Sand Lake

## APPENDIX 3

Locality summary for sensitive plants  
on and around the Sandpoint Ranger District  
(see Appendix 2 for maps of the following sites)

- 1. Beaver Lake - (Forest Service)  
Carex flava  
Lycopodium inundatum
- 2. Gamble Lake -(Private)  
Scirpus cyperinus
- 3. Hoodoo Lake - (Forest Service and/or Private)  
Carex flava  
Hypericum majus
- 4. Kootenai East - (Private)  
Scirpus cyperinus

5. Livermore Lake - (Private)  
Salix candida  
Scirpus cyperinus
6. Lost Lake -(Forest Service)  
Dryopteris cristata  
Cicuta bulbifera
7. Pack River Flat - (State)  
Scirpus cyperinus
8. Sand Lake - (State)  
Carex flava  
Hypericum majus  
Scirpus cyperinus
9. Trout Creek - (Forest Service)  
Scirpus cyperinus

#### APPENDIX 4

List of wetlands unsuccessfully searched for rare plants  
in the vicinity of the Sandpoint Ranger District.

1. Pearson Creek beaverponds - T60N, R2W, S11,14
2. Bloom Lake - T60N R1W S35,36
3. Bradley Lake - T60N R1W S14
4. Antelope Lake - T55N, R2E S12
5. Beehive Lakes/Creek - T61N R2W S7
6. Porcupine Lake area - T57N R2E S34
7. Moose Lake area - T59N R3E S29
8. Lake Darling area - T58N R2E S1,12
9. Mud Lake - T56N R1W S23
10. Dennick Lake - T59N R1E S6

#### APPENDIX 5

Slides of rare plants on the Sandpoint Ranger District  
and their habitats.

1. Carex flava - close-up of spike.
2. Carex flava - overall habit; note yellowish spikes and bract that is divergent at a sharp angle to spikes.
3. Cicuta bulbifera - whole plant at edge of Perkins Lake; note purplish bulbils on upper branches.
4. Cicuta bulbifera - close-up of highly dissected leaf, with very narrow, linear segments.
5. Dryopteris cristata - whole plant; note sterile, evergreen leaves in basal rosette, and fertile, deciduous leaves erect in middle.
6. Lycopodium inundatum - close-up of erect, fertile stems, terminated by a cone with sporophylls that resemble the leaves.
7. Lycopodium inundatum - overall habit; note spreading, prostrate stems and erect fertile stems growing among Drosera rotundifolia.
8. Lycopodium inundatum - habitat at Beaver Lake; note considerable trampling disturbance on floating sphagnum island.

9. Lycopodium inundatum - close-up of disturbed habitat at Beaver Lake; note remnant Lycopodium stems in lower center and at edges (left and right) of trampled area.
10. Petasites sagittatus - whole plant; plants about 2 feet tall.
11. Salix candida - close-up of upper stem; note leaves that are dark green above and woolly-white below.
12. Salix candida - habitat at Herman Lake Road; note individuals in Carex rostrata stand in foreground.
13. Scirpus cyperinus - close-up of inflorescence; note tawny appearance resulting from long bristles.
14. Scirpus cyperinus - whole plant; plant pictured is about 4 feet tall.