WETLAND CONSERVATION STRATEGY FOR THE UPPER SNAKE RIVER, PORTNEUF DRAINAGE, AND ADJACENT VALLEYS

Prepared by
Mabel Jankovsky-Jones
Idaho Conservation Data Center

November 2001

Idaho Department of Fish and Game
Natural Resource Policy Bureau
600 South Walnut, P.O. Box 25
Boise, ID 83707

Report prepared with funding from the
United States Environmental Protection Agency
through Section 104(b) (3) of the Clean Water Act
Grant No. CD 980102-01-0

SUMMARY

The Idaho Conservation Data Center has received wetland protection grant funding from the Environmental Protection Agency under the authority of Section 104 (b)(3) of the Clean Water Act to enhance existing wetland information systems. The goal is to identify the following:

1) Where are the wetlands?
2) What is the condition and management status of wetlands?
3) What kind of wetlands are they?

This information can then be applied to state biodiversity, conservation, and water quality enhancement projects on a watershed basis. This builds on previous inventories in the state to create a consistent source of wetland information. Previous project areas included the Henrys Fork Basin, Big Wood River Basin, southeastern Idaho watersheds, the Idaho Panhandle, east-central basins, and Spokane River Basin. This document summarizes our findings on the main stem of the upper Snake River and its tributaries. The survey area includes the main Snake River and lower reaches of its major tributaries from the confluence with the Henrys Fork downstream to Milner. Tributaries surveyed include the Arbon, Portneuf, Rockland, and Curlew Valleys.

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

Assessment of the quality and condition of plant associations and the occurrence of rare plant and animal species allowed us to categorize 16 wetland sites based on conservation intent. Wetlands were surveyed using standard heritage program methods. The surveys were used to populate the Site Basic Record, Element Occurrene Record, and Community Characterization Abstract data bases of the Biological and Conservation Data System. Data base summaries are provided here and include information on the biological significance of the surveyed wetland sites, abstracts for selected plant associations, and summaries of plant and animal species of special concern. Land managers can apply the process presented here to categorize wetlands which were not surveyed.

We identify conservation strategies for sites surveyed and for plant associations that are unprotected or under-protected. Seven percent of the wetlands and deepwater habitat in the survey area have protection beyond regulatory provisions of the Clean Water Act. Most of the habitat within special management areas is deepwater habitat within the Lacustrine system (88%). Only two percent of wetlands excluding deepwater habitat are within special management areas. Most of the wetlands (excluding deepwater habitat) in the special management areas are emergent habitat. However, this only represents 2 percent of the emergent wetlands in the survey area. Deciduous forested wetlands and scrub-shrub wetlands are also poorly represented in special management areas and should be of high priority for conservation activities.

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

ACKNOWLEDGMENTS

This project could not have been completed with the assistance of the following individuals:

Bart Butterfield, *Idaho Department of Fish and Game*

Luana McCauley, *Idaho Conservation Data Center*

Stephanie Mitchell, *Idaho Conservation Data Center*

Bob Moseley, formerly with *Idaho Conservation Data Center*

Chris Murphy, *Idaho Conservation Data Center*

John Olson, *Environmental Protection Agency*

George Stephens, *Idaho Conservation Data Center*

Terry Vernholm, *Idaho Department of Fish and Game*

Linda Williams, formerly with *Idaho Conservation Data Center*

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INTRODUCTION

The broad definition of wetlands describes land areas where water regimes determine the soil characteristics and distribution of plant and animal species. This definition includes not only jurisdictional wetlands, supporting wetland hydrology, hydric soils, and hydrophytic vegetation (Environmental Laboratory 1987), but a broader range of ecologically significant areas such as riparian corridors and vernal pools (World Wildlife Fund 1992, Cowardin *et al.* 1979). In spite of the significance of wetlands, these highly productive land areas have often been overlooked with studies focusing on aquatic or terrestrial ecosystems.

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

In the past two decades it has become widely recognized that functions provided by wetlands including water quality protection, storm water control, ground water protection, and fish and wildlife habitat, are disproportionate to the small land area that they occupy. As an example, the global ecosystem services provided by wetlands are estimated to total $4.9 trillion a year (Constanza *et al.* 1997). This awareness has resulted in regulations, incentive programs, research, and protection of wetland habitat. Wetlands status and trends results may reflect the success of these programs as the rate of wetland loss has decreased dramatically (by 80%) in the most recent reporting period (Dahl 2000).

To set priorities for wetland conservation, information on the extent, type, and quality of wetlands is necessary to ensure that protection efforts capture the full range of wetland diversity. The United States Fish and Wildlife Service National Wetlands Inventory (NWI) provides a broad- scale view of the types and extent of wetlands. Plant associations nest into the hierarchical NWI classification at the dominance level and provide fine-scale information relative to on-the-ground management. The biological significance of specific wetland sites as well as quality may be assessed using plant association information and rare plant and animal occurrence data.

The purpose of this conservation strategy is to enhance our abilty to identify and classify wetlands to set priorities for conservation. It is our goal to make wetlands related information available to agencies and organizations involved in planning activities and the protection of wetlands and watersheds. The broad-scale data may be used to set basin-wide or county-wide goals for wetlands protection. Fine-scale information on specific wetland sites can be used to identify proposed conservation sites, sites with opportunities for restoration, and to comment on potential projects or permit activities.

The framework presented here, describing wetlands based on plant associations, can be applied by land managers to sites that were not surveyed as part of this project. Evaluation of NWI data can be used to assess wetland size and diversity of vegetation classes. An onsite visit is recommended to assess condition and to identify the diversity of plant associations within the vegetation classes. Rare plant and animal data can be requested from the Conservation Data Center (CDC) and the site significance may be assessed. Description, management, and status of rare plant associations and animal species summaries are included to guide management activities. Additional data including Geographic Information System (GIS) data layers, containing NWI maps and species distributions, and analog data base records are available at the CDC. The methods for accessing this information are included at the end of this document (Table 8).

SURVEY AREA

The survey area extends across the eastern Snake River Plain of southern Idaho to include wetlands along the main Snake River and its major tributaries. Most of the tributaries feed into the Snake River from the south and include the Portneuf River, Malad River, Curlew Valley, Bannock Creek, Deep Creek, and Rock Creek. The survey area includes portions of Jefferson, Bonneville, Bannock, Bingham, Power, Oneida, and Minidoka, counties. For purposes of sampling and discussion the main survey area was divided into 3 reaches and/or drainages based primarily on 4th level U.S.G.S. hydrologic units and secondarily on biological features as follows;

- Upper Snake River and Arbon Valley (includes Hydrologic Units 17040201, 17040206, and 17040209)
- Portneuf drainage (includes Hydrologic Unit 17040208)
- Rockland Valley, Curlew Valley, Malad Valley (parts of Hydrologic Unit 17040209 and includes 16020309 and 16010204)

The upper Snake River and Arbon Valley are mostly within the Snake River Basalts (342D) Section and the Rockland and Curlew Valleys are within the Northwestern Basin and Range Section (342B) of the Intermountain Semi Desert Province. The Portneuf drainage is within the Overthrust Mountain (M331D) Section of the Southern Rocky Mountain Steppe Province. Upland vegetation of the Snake River Basalts and Northwestern Basin and Range Sections is mostly dominated by sagebrush steppe. Vegetation on uplands of the Overthrust Mountains is lodgepole pine-subalpine fir forest and Douglas-fir forest (McNab and Avers 1994).

The Snake River Plain (SRP) is an arcuate band that extends nearly 400 miles across southern Idaho. The plain is a series of lava flows and sediment deposits dominated by Quaternary basalts of the Snake River group. The lava flows vary from less than 100 feet thick to several thousand feet thick (McNab and Avers 1994). The Snake River extends along the southern edge of the plain. Above Milner Dam the river bed is only slightly below the level of the Snake River Plain (Idaho Department of Water Resources 1993). During wetter ice age climates enough water accumulated in the Salt Lake basin to flow over Red Rocks Pass via the Marsh Creek and Portneuf Valleys to the Snake River. The floodwaters raised the water levels of ancient American Falls Lake which eventually overflowed into the Snake River (Alt and Hyndman 1989, Idaho Department of Water Resources 1993).

The aridity of the Snake River Plain is a function not only of low precipitation, but also a result of the porosity of basalt flows. Very few tributaries make their way from the mountains of central Idaho across the northern SRP to the Snake River. Once the streams leave the mountains, surface water sinks into basalt flows. Thus, most of the tributaries that feed into the Snake River enter from the south.

The Arbon, Rockland, Marsh, Malad, and Curlew Valleys are nestled between fault block mountains south of the Snake River. The valleys are sediment filled basins that overlay steeply dipping basin and range faults beneath the valley floor. Streams such as Bannock Creek, Rock Creek, Marsh Creek, Deep Creek and the Malad River meandered across the broad valley bottoms. Channel migration and overbank flooding are limited today, as many of these streams have been straightened for agricultural development or have downcut due to bank failure.

The area has an arid to semiarid continental climate with low annual rainfall, warm summers, and cold winters. Temperatures and precipitation are mostly consistent across the large survey area with slight variations due to elevation. American Falls at 4320 feet in elevation, in the eastern part of the survey area, has an average daily high temperature of 71°F in July and average daily low temperature of 25°F in January. Arbon at 5170 feet in elevation, in the southern portion of the survey area, reports an average daily high temperature of 68°F in July and an average daily low temperature of 22°F in January. American

Falls and Arbon receive an average of 12 inches and 17 inches of moisture respectively during late winter and spring months (Abramovich *et al.* 1998).

Methods

FIELD METHODS

Reference Areas and Sample Sites

A list of potential survey sites was generated by reviewing lists in the Idaho Wetland Information System (Pfieffer and Toweill 1992) and querying the Biological and Conservation Data System (BCD) for known sites and managed areas (Conservation Data Center 2001). "Hot spots" which support high concentrations of species of concern were also identified. In addition, wetland complexes were identified by inspecting USGS topographic quadrangle maps and NWI maps. This list was distributed to interested individuals within federal, state, and private land management agencies. Input was sought on the condition and biological significance of listed sites as well as suggestions for additional sites which were overlooked or of local concern. Landownership information was also acquired. The goal was to focus sampling on wetlands supporting relatively natural stands of vegetation. Sites were surveyed during the summers of 1998, 1999, and 2000 following Heritage Network Methodology to assess site condition, catalog plant associations, and document rare plant and animal occurrences (Bougeron *et al*. 1992).

Specific sites and cooperative landowners were not identified in the Arbon, Malad, or Rockland Valleys. Cursory windshield surveys indicated that most wetlands were confined to small remnants within an agricultural landscape. Access was pursued to sites in the Arbon Valley and Lincoln Creek Valley but was not obtained.

Field Data Collection

During the field inventory, information was collected using a standard set of CDC forms (Appendix H) for both the site and the individual plant associations:

Site Information - Site Survey Forms were used for documenting information on site location, occurrences of plant associations and rare species, general site description, key environmental factors, biodiversity significance, and management needs. The Site Survey Form in Appendix H provides more details.

Plant Associations – Sites were surveyed from vantage points and/or on foot to identify major vegetation types. For each each major vegetation type or plant association in the site one of two forms was used to document its occurrence. Most associations were sampled using a 10 X 10 meter plot to document the community's composition, structure, and environmental condition. Occasionally plot dimensions were varied for linear stands (20 X 5 meters) or a smaller plot was used for smaller stands of vegetation. The plots were placed in homogeneous stands of vegetation that best represented the vegetation mosaic within the site. Standard ecological sampling techniques developed by Natural Heritage Programs and Conservation Data Centers in the western U.S. were used (Bourgeron *et al*. 1992). Forms used for these plots correspond to Form II (Community Survey Form) and Form III (Ocular Plant Species Data) in Appendix H. An abbreviated form, called the Idaho Community Observation Form (Appendix H) was typically used to document types encountered where the composition and structure is well known in Idaho or when time was limited.

Species of Special Concern-Information on known locations of species of special concern was taken into the field. If known occurrences or new occurrences were found a plant or animal observation form was completed. Animal observations were limited to incidental sightings of leopard frogs.

OFFICE METHODS

National Wetlands Inventory

The United States Fish and Wildlife Service (USFWS) has conducted inventories of the extent and types of our nation's wetlands and deepwater habitats. The NWI maps wetlands at a scale of 1:24,000 as lines, points, and polygons. The maps use a hierarchical classification scheme for map units. Systems and subsystems are at the most general level of the hierarchy and progress to class and subclass with optional modifiers. Systems and subsystems reflect hydrologic conditions. Classes describe the dominant life form or substrate. Modifiers are used to describe water regime, water chemistry, soils, and human or natural activities such as impoundments or beaver use (Cowardin *et al.* 1979). The five major systems characterizing wetland and deepwater habitats are summarized in Table 1. Palustrine systems describe wetland habitats only, the remaining systems include both deepwater and wetland habitat. As an example the Lacustrine system includes limnetic (deepwater) and littoral (wetland) subsystems. Lacustrine limnetic subsystems include deepwater habitat at a depth of over 2 meters below the annual low water mark. Lacustrine littoral subsystems are all wetland habitats within the Lacustrine system that extends from the shore to a depth of 2 meters below low water. National Wetland Inventory maps were digitized for watersheds upstream of Lake Walcott and for the mainstem of the Snake River downstream of Lake Walcott.

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

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

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Wetland Plant Associations

The USFWS wetland classification system provides uniform terminology for defining the resource and has a variety of applications at higher levels for administrative, research, educational, and scientific purposes (Cowardin *et al.* 1979). The classification broadly organizes ecological units based on homogeneous natural attributes. The units, however, often include many dissimilar vegetation types with wide-ranging biological significance and unique management implications. The plant association is a vegetation unit that nests into the USFWS classification at the dominance level of the classification hierarchy. Plant associations are used to guide management, as a coarse filter for preservation of biodiversity, and to assess biological significance (Hansen *et al.* 1995, Kovalchik 1993, Padgett *et al*. 1989, and Youngblood *et al.* 1985, Reid 2000).

The plant association represents repeating assemblages of plant species that occur in response to complex environmental factors. It can be used as an indicator of difficult to measure or poorly understood

environmental or site attributes such as hydrologic functions. This information can be used to make predictions about the effects of management decisions and expected trends on similar units of land. Additionally, plant association descriptions, stand tables, and on-the-ground reference sites provide a baseline for replicating vegetation types in restoration efforts.

Our nation's biological resources are so great that management and protection of individual species is often impractical or ineffective. Community level conservation promotes protection of a more thorough range of biotic elements including rare, little known, or cryptic species whose priority for conservation has not been documented. The plant community or plant association is considered a coarse filter where species and biotic processes are represented. Species falling through the coarse or community filter are often the rarest species where fine filter protection of viable occurrences is still necessary (Grossman *et al.* 1994).

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

Review of existing classifications, gray literature, and previous survey work by the CDC were used to develop a preliminary list of wetland plant associations in Idaho. Previous survey work (Hall and Hansen 1997, Montana Wetland and Riparian Cooperative 2001) was summarized along with data collected from field surveys to generate a list of plant associations occurring specifically in the survey area.

Site and Community Data Bases

Field data were entered into the Biological Conservation Data System (BCD) at the CDC. The three modules of the BCD described below were the primary ones used for managing and reporting site and community information.

Site Basic Record (*SBR*) - This module is used to manage information about important biodiversity conservation sites in the state. The Site Survey Form, mentioned above, was developed to mirror the SBR. Numerous fields are contained in a SBR and are included under such headings as Location, Site Description, Site Design (including boundary description), Site Significance (ratings for biodiversity significance, protection urgency, management urgency, etc.), Protection, Stewardship, and References. Also, all community and rare species occurrences are automatically populated in the record via a relational feature from the Element Occurrence module (see below). In addition to the computer record, the site boundaries are mapped and digitized and a manual (hard copy) file is maintained for each site. These records are available on request from the CDC.

Element Occurrence Record (*EOR*) - This is the same module used to report rare species occurrences. Both species and communities or plant associations are "elements" of biodiversity, hence the generic name Element Occurrence Record. Information for each occurrence, in this case a plant association occurrence, is kept on map, computer, and manual files. Element occurrence records were also completed or updated for observations of plant or animal species of special concern.The computer file contains numerous fields under such headings as Location, Status (quality, dates of observation, etc.), Description, Protection, Ownership, and Documentation (sources of information about an occurrence). As mentioned above, this module is linked to the SBR.

Community Characterization Abstract (*CCA*) - CCAs provide a short, concise account of the nomenclature, classification, environmental and functional relationships, vegetation structure and composition, and conservation status for a particular natural community. This information is compiled from all available published and unpublished sources, as well as the personal knowledge and field data collected by CDC biologists. Coupled with the statewide wetland and riparian community classifications and the occurrence data bases maintained by the CDC, CCAs are a valuable resource for developing conceptual and quantitative ecological models for individual plant associations or suites of associations on a floodplain. Our long-term goal is to populate the CCA data base for all wetland and riparian plant associations in Idaho and produce a comprehensive reference manual for biologists and managers. In the near term, CCAs are being populated for regions of the state and "mini-guides" generated for specific watersheds or similar areas.

Site Ranking

The surveys and information on rare species distributions from the BCD provided a method to allocate sites into management categories. The categories differentiate wetlands based on the four factors: richness, rarity, condition, and viability. Sites were given a score of 0 (lowest) to 3 (highest) for each of the factors. The scores were summarized and arranged from highest to lowest. The sites were then divided into four management categories described in the next section. The purpose is to identify wetlands that are irreplaceable or sensitive to disturbance (Washington Department of Ecology 1991, Bursik and Moseley 1995, Grossman *et al.* 1994).

Table 2. Definitions and indicators of criteria for allocating wetland sites into management categories.

CRITERIA	DEFINITION		INDICATORS
Richness	Habitat diversity within the site.		Assemblage of numerous plant associations within a single unit of Cowardin's classification Assemblage of plant associations or ecological features (beaver ponds, peatlands, lakes...) within several units of Cowardin's classification (=high structural diversity)
Rarity	Presence of special status plant association, plant, or animal species.		High concentrations of state rare plant or animal species High quality occurrences of state rare plant associations
Condition	Extent which site has been altered from natural conditions.		Irrigation withdrawal, grazing, or logging having minimal impacts on wetland processes Exotic species sparse or absent Native species contributing the majority of cover and reproducing
Viability	Likelihood of continued existence of biota within the site.		Large size Offsite impacts (including upstream hydrologic alteration, weed infestations, and incompatible land use) minimal

Additional wetlands are present in the survey area that have not been surveyed for rare plants, rare animals, or native plant associations. The information presented in Table 2 can be summarized for unsurveyed or data poor wetlands by consulting National Wetland Inventory Maps, requesting plant and animal occurrence data from Idaho CDC, and on-site evaluation of impacts. In data poor wetlands, development of a plant species list with relative abundance (common, infrequent, rare) and rare plant

surveys by a qualified botanist may be necessary to determine the condition and biodiversity significance of the site. Site summaries for surveyed wetlands are included in Appendix E.

Class I Sites
Class I sites represent examples of plant associations in near pristine condition and often provide habitat for high concentrations of state rare plant or animal species. The high quality condition of the plant association is an indicator of intact site features such as hydrology and water quality. Impacts to Class I sites should be avoided as these sites are not mitigable and alteration (and in some cases enhancement) of these sites will result in significant degradation.

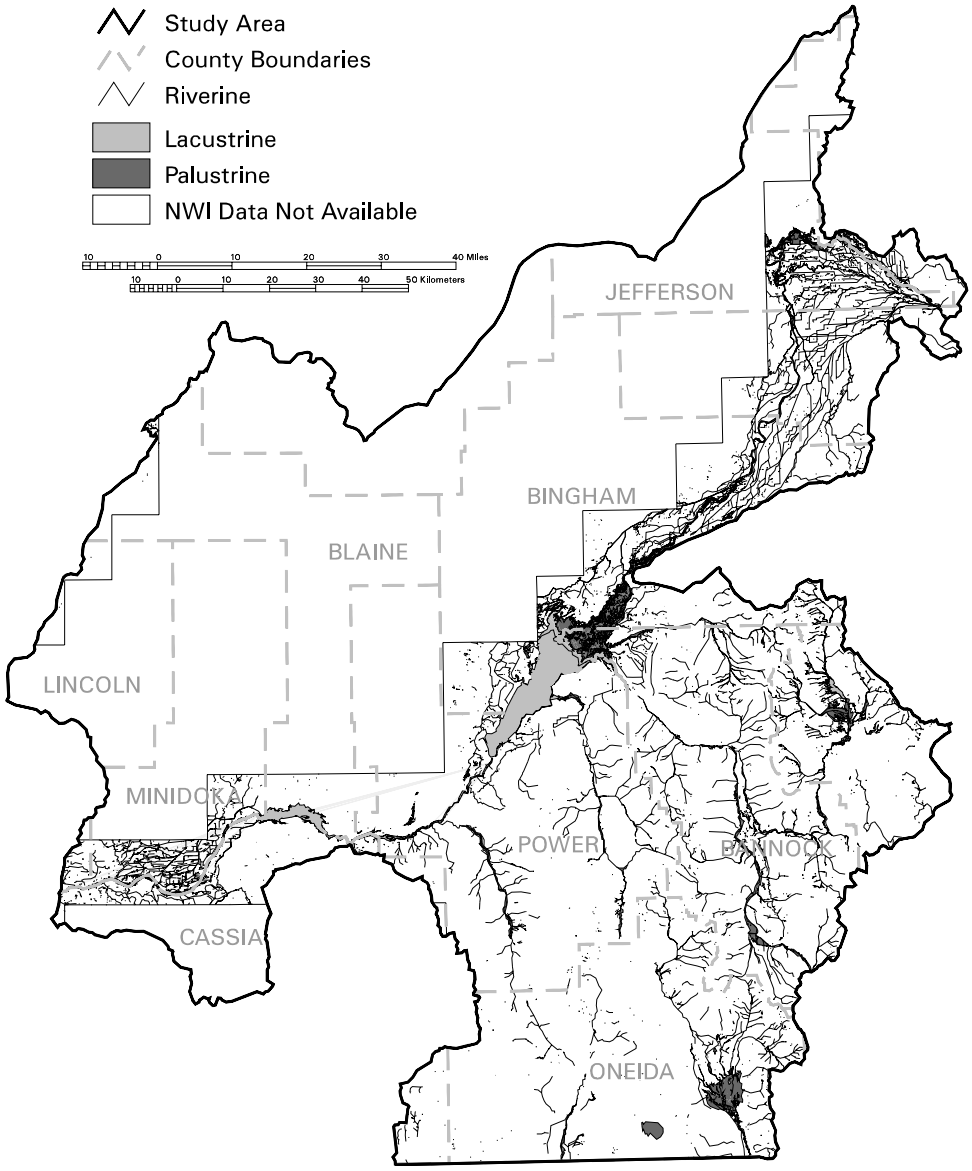
Conservation efforts should focus on full protection including maintenance of hydrologic regimes. Class I federal lands should be designated as Research Natural Area (RNA), Special Interest Area (SIA), Area of Critical Environmental Concern (ACEC), or Wildlife Refuge. Private lands should be acquired by a conservation organization, or be secured by the establishment of conservation easements to protect biological features.

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

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

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

Figure 1. Location of wetland and deepwater habitat in the survey area by system



Results

WETLAND ACREAGE AND TYPES

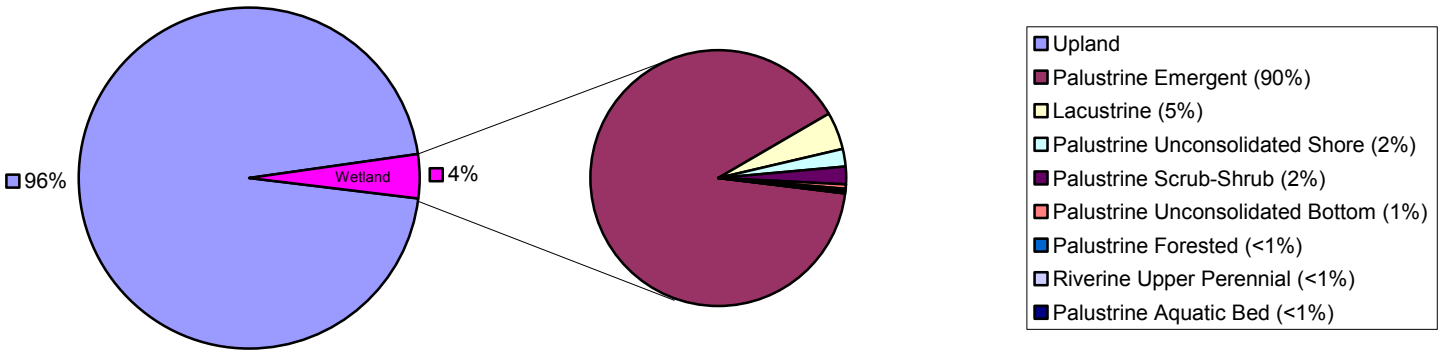
The NWI was used to determine the extent and types of wetlands. Data was compiled for watersheds in the eastern part of the survey area and for the mainstem of the Snake River only in the central and western part of the survey area (Figure 1). Complete NWI coverage is available and was summarized for the following watersheds:

- 16010204 (Lower Bear-Malad)
- 16020309 (Deep Creek-Curlew Valley)
- 17040208 (Portneuf River)

For watersheds with complete coverage wetlands represent an average of 2 percent of the total land area.

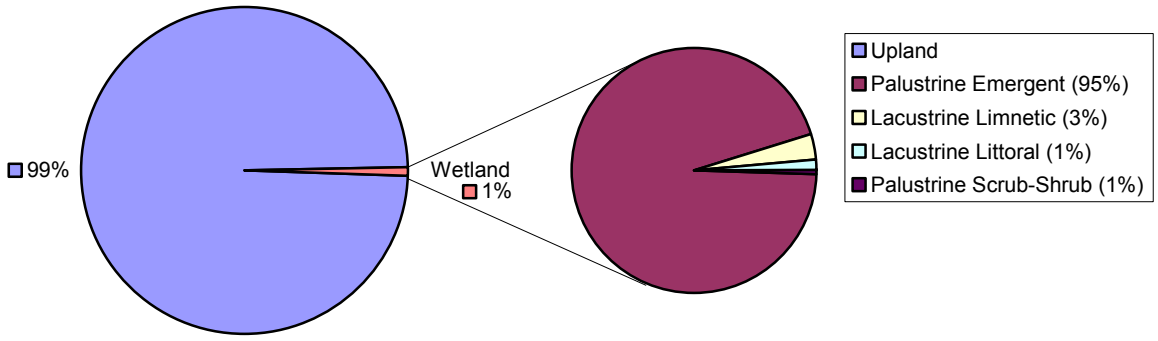
In the Lower Bear-Malad drainage, wetland including deepwater habitat makes up 4 percent of the land area (Figure 2). Palustrine emergent habitat comprises 90% of the wetlands.

Figure 2. Acreage of wetland and deepwater habitat in Hydrologic Unit 16010204 (Lower Bear-Malad)



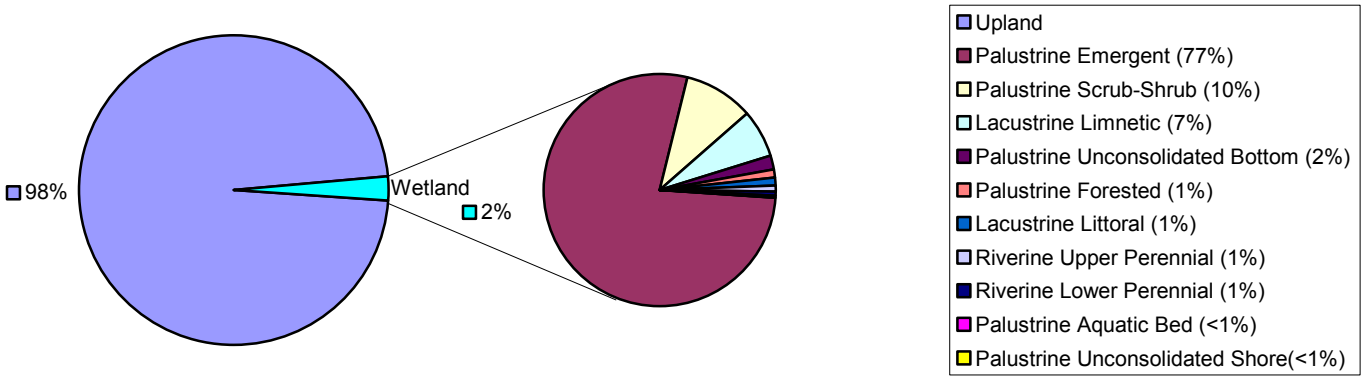
Wetland including deepwater habitat is uncommon in the Curlew Valley representing less than 1 percent of the total land area (Figure 3). Ninety three percent of the wetlands are within the Palustrine ermergent class.

Figure 3. Acreage of wetland and deepwater habitat in Hydrologic Unit 16020309 (Deep Creek-Curlew Valley)



The Portneuf drainage includes the Marsh Creek Valley. Wetlands make up 2 percent of the land area with the majority (77 %) being in the Palustrine emergent class (Figure 4).

Figure 4. Acreage of wetland and deepwater habitat in Hydrologic Unit 17040208 (Portneuf)



Wetland habitat acreage was also summarized along the following reaches:

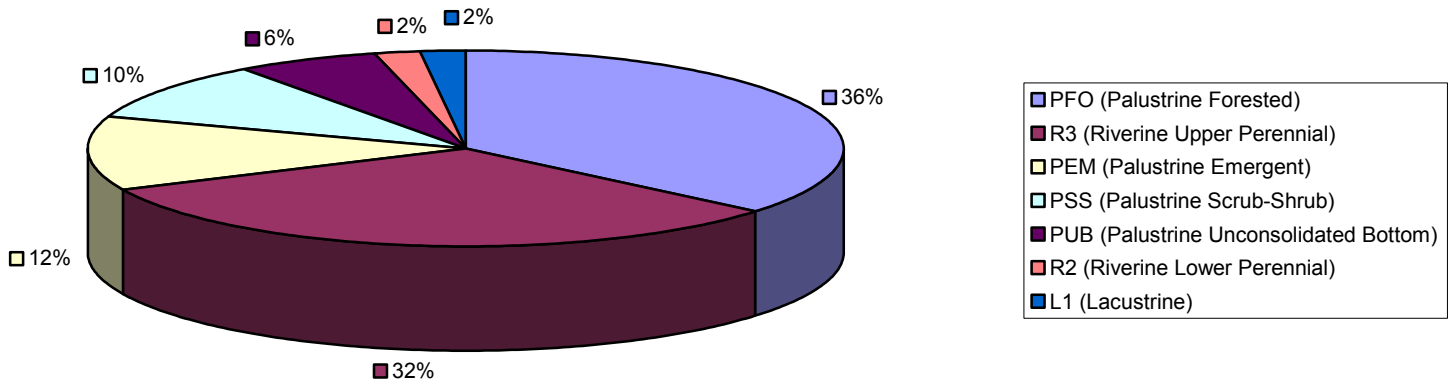
- 17040201 (Idaho Falls)
- 17040206 (American Falls)
- 17040209 (Lake Walcott)

The dominant wetland and deepwater habitats along the Snake River, based on area occupied by digitized NWI polygons are Lacustrine limnetic and Palustrine emergent.

Hydrologic unit 17040201 includes the Snake River from the confluence with the Henrys Fork to near Shelly. Dominant wetland types are Palustrine forested (36%), Riverine upper perennial (32%), Palustrine emergent (12%), and Palustrine scrub-shrub (10%) (Figure 5).

The American Falls and Lake Walcott reaches of the Snake River are dominated by Lacustrine limnetic

Figure 5. Acreage of wetland and deepwater habitat in Hydrologic Unit 17040201 (Idaho Falls)



habitat (46%) which includes the deepwater habitat created by impoundments along the river (Figures 6 and 7). The most common wetland class is Palustrine emergent.

Figure 6. Acreage of wetland and deepwater habitat in Hydrologic Unit 17040206 (American Falls)

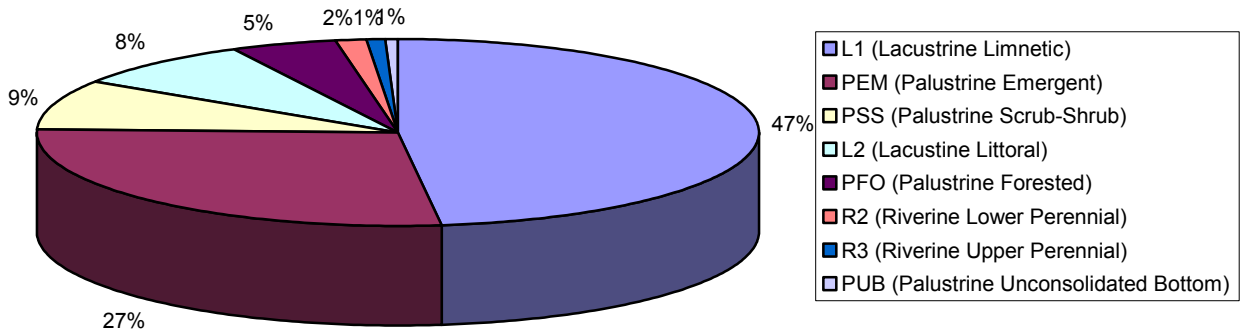
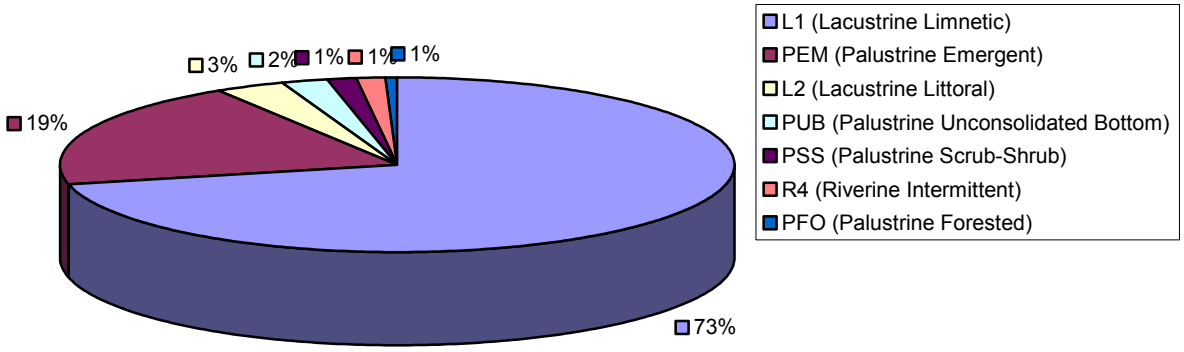
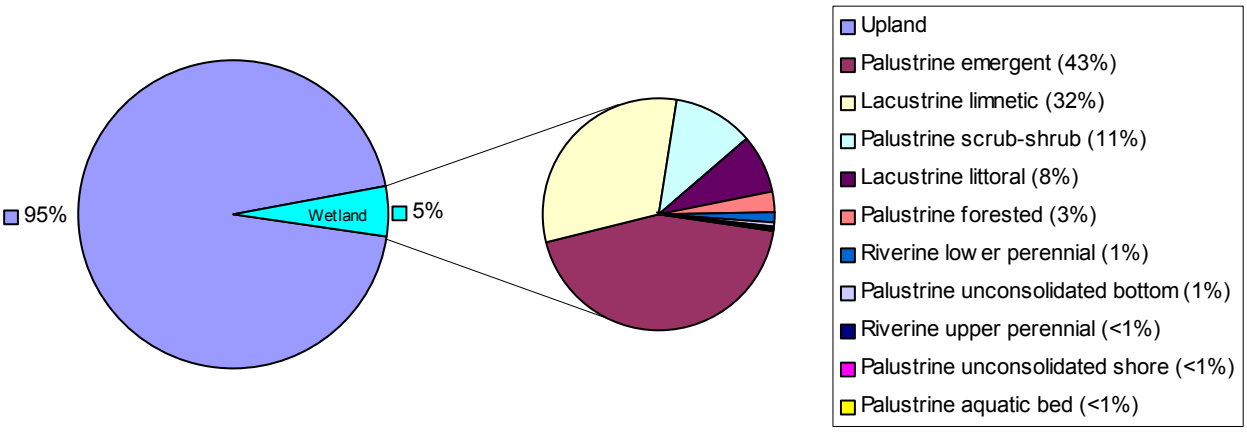


Figure 7. Acreage of wetland and deepwater habitat in Hydrologic Unit 17040209 (Lake Walcott)



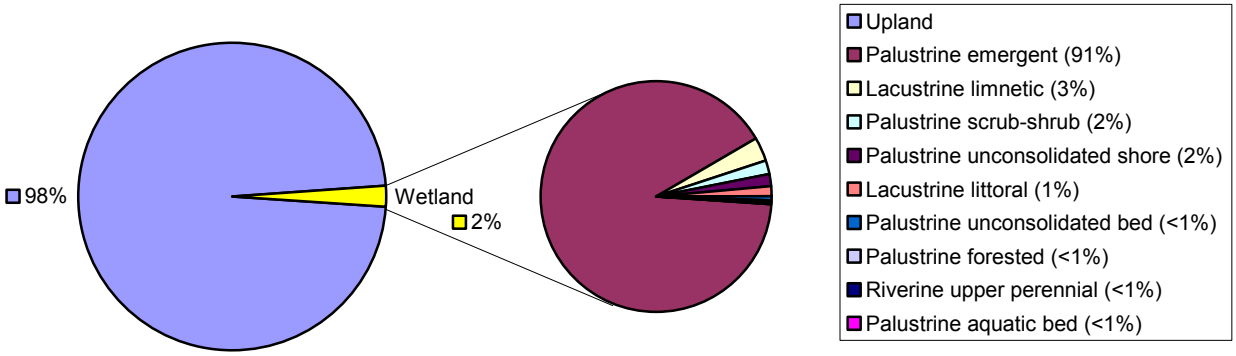
Complete NWI data was available for Oneida, Power, and Bannock Counties. Five percent of the land area in Bannock County includes wetland and deepwater habitat based on the NWI. Palustrine emergent and Lacustrine limnetic are the dominant wetland types (Figure 8).
Approximately 2 percent of the land area in Oneida County is wetland and deepwater habitat (Figure 9). Ninety percent of the wetland habitat acreage is within the Palustrine emergent class.

Figure 8. Acreage of wetland and deepwater habitat in Bannock County



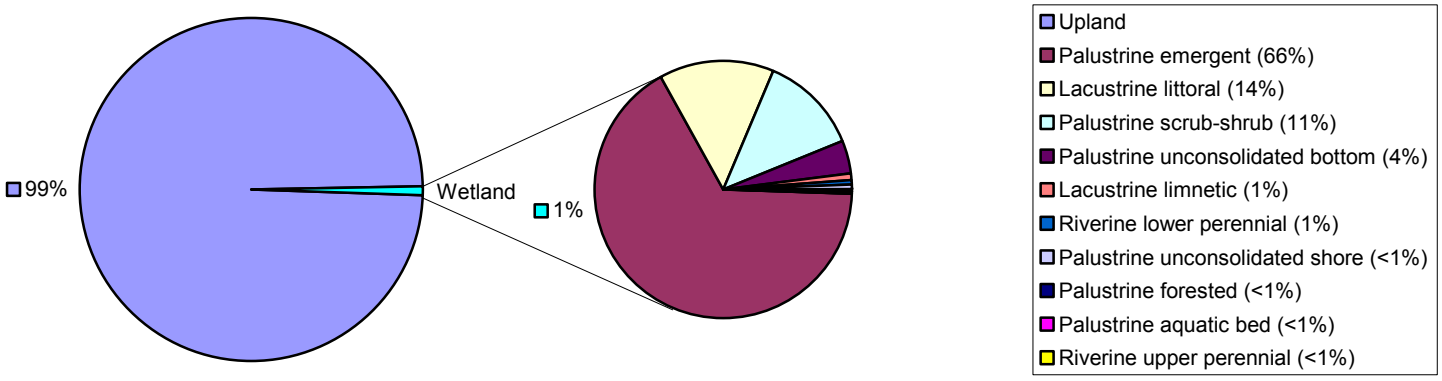
Less than 1 percent of the land area in Power County are wetlands. The dominant wetland type is

Figure 9. Acreage of wetland and deepwater habitat in Oneida County



Palustrine emergent (Figure 10). Appendix E summarizes the acres and frequency of occurrence of wetland and deepwater habitat by subclass for the survey area and counties.

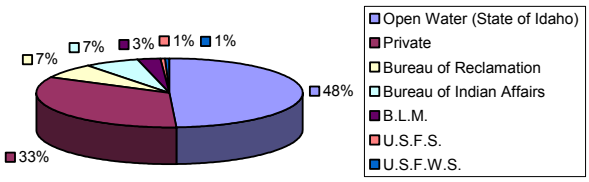
Figure 10. Acreage of wetland and deepwater habitat in Power County



WETLAND OWNERSHIP

Landownership was overlaid on the NWI to summarize ownership of wetland (including deepwater habitat) acres in the survey area (Figure 11). Open water comprises 58% of the land area occupied by wetland and deepwater habitat. Of the remaining wetland acres 33 percent of the land is in private ownership. The Bureau of Reclamation and the Bureau of Indian Affairs each own just over 6 percent of the wetlands.

Figure 11. Landownership of wetland and deepwater habitat in the survey area



WETLAND PROTECTION STATUS

The level of protection for wetlands in the survey area was determined by overlaying a management layer on the NWI. The management layer included land areas administered to maintain natural resource values such as Wildlife Management Areas, and Research Natural Areas. Approximately 11,947 acres of wetland and deepwater habitat are currently within special management areas, representing approximately 7 percent of the wetland and deepwater habitat in the survey area. The majority (87%) is deepwater habitat within the Lacustrine system. The acres of wetland and deepwater habitats in special management areas are summarized in Table 3.

Table 3. Acres of wetland and deepwater habitat within special management areas.

	Acres in Managed Areas	Total Acres	% of Type
System			
Class (Subsystem)			
Palustrine			
Aquatic bed	1	203	0.5
Emergent	934	60752	2
Forested	44	8942	0.5
Scrub-Shrub	71	11182	0.6
Unconsolidated Bottom	319	2292	14
Unconsolidated Shore	4	582	0.7
Total all Palustrine	**1373**	**83953**	**2**
Riverine			
Lower Perennial	0	1672	0
Upper Perennial	88	8080	1
Intermittent	4	389	1
Total all Riverine	**92**	**10141**	**1**
Lacustrine			
Limnetic	9992	58747	17
Littoral	490	8178	6
Total all Lacustrine	**10482**	**66925**	**16**
TOTAL ALL TYPES	**11947**	**161019**	**7**

WETLAND CONDITION

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

Wetland Losses

Wetland losses may be permanent or reversible. The distinction is made to identify those areas where restoration may be possible albeit costly. Nationally urban and rural development, agriculture, and silviculture account for wetland losses (Dahl 2000). In the survey area agriculture and development account for wetland losses. Historically drainage, land clearing, and conversion to cropland accounted for most wetland loss. Loss to road construction and home building has surpassed agricultural loss in

recent years. As population increases and economies switch from agricultural based to service based, losses due to development are likely to continue to exceed losses to agriculture.

The National Resource Inventory estimates that the Snake River sub-basin was stable in terms of wetland losses and gains on private land from 1982 to 1992 (Soil Conservation Service 1992). The estimates represent net gain versus net loss and do not evaluate the quality of the wetland habitat. Nationally, losses of forested and emergent wetlands have been offset by gains in scrub-shrub wetlands and freshwater ponds (Dahl 2000).

Functional Shifts

Most wetlands in the survey area are accessible and have been impacted by human influences resulting in shifts of wetland functions. *Impairments* are functional shifts that reduce wetland functions and include degradation and fragmentation. Degradation, the loss of one or more wetland functions, is indicated by shifts in species composition and may result in lowered water quality due to sediment or nutrient input or increased water temperatures (World Wildlife Fund 1992). Fragmentation occurs when functions are lost due to barriers restricting water or gene flow. *Type changes* occur when a wetland is converted from one type to another (e.g., emergent to open water). Functional shifts improving wetland functions are considered *enhancements*.

Impairments

Impairments to wetland functions may result from agricultural activities, urbanization, and hydrologic manipulation. These activities usually result in shifts in species composition when native species such as shrubs and trees are removed, exotics invade or are introduced, or hydrology is altered. Lowered water quality often results due to loss of thermal cover along streams, loss of filtering functions, and decreased bank stability.

The 1992 National Resource Inventory indicates that 30 percent and 18 percent of the wetlands and deepwater habitats on non-federal wetlands in the Upper Snake sub-basin are used for pasturelands and rangeland, respectively (Soil Conservation Service 1992). Pasture development has included placement of ditches, reseeding or interseeding with pasture grasses such as *Phleum pratense* (common timothy), and removal of native tree and shrub species. Wetland habitat used for rangelands typically includes emergent meadows or riparian bottomlands. Use of wetlands for rangeland affects species composition through the suppression of native woody species, removal and trampling of herbaceous species, introduction of exotic species, and compaction of soils. Several exotic species including *Carduus nutans* (musk thistle), *Cirsium arvense* (Canada thistle), *Cirsium vulgare* (bull thistle), *Conium maculatum* (poison hemlock), *Sonchus uligonosa* (marsh sow thistle), and *Tanecetum vulgare* (common tansy) become established due to ground disturbance (pers obs and Glennon 1991). In addition to the previously mentioned species, plants such as *Poa pratensis* (Kentucky blue grass) that lack the soil binding charateristic of native species may become established. Loss of native species along channels may result in failure of channel banks, and channel downcutting which ultimately may result in lowered water tables and a shift in wetland type and functions.

Road and trail building may result in fragmentation of wetland habitat. Fill material may restrict water movement and create an open water moat on the up-slope side of the fill. Eventually portions of the wetland may become dewatered down-slope. In addition, trails and roads are corridors for weed establishment.

Type changes
Type changes occur when a wetland is converted from one vegetation type to another and results in a shift in wetland functions. In the survey area type changes have been caused by reservoir inundation, habitat improvement projects, escape and establishment of nonnative species, and peat mining.

Water development projects at reservoirs has resulted in type changes in the survey area. Raised water levels replace riverine and spring fed wetlands with open water habitat. The drawdown zones of these reservoirs frequently supports a suite of increaser as well as nonnative plant species. *Arctium minus* (lesser burdock), *Polygonum hydropiper* (marshpepper knotweed), *Polygonum lapithifolium* (curlytop knotweed), and *Polypogon monspieliensis* (annual rabbitsfoot grass) are exotic species that will become established on the upper drawdown areas of reservoirs. *Butomus umbellata* (flowering rush), a very showy but exotic species, grows in and at the edge of shallow water in the same zone as *Typha latifolia* (common cattail) and *Scirpus acutus* (hardstem bulrush) along the Snake River and in large stands at Blackfoot Equalizing Reservoir near Blackfoot.

Elaeagnus angustifolia's (Russian Olive) ability to tolerate a wide range of soil conditions and moisture regimes has allowed it to become well established along the mainstem of the Snake River including the Lake Channel Canyon area near the townsite of American Falls and at Blackfoot Equalizing Reservoir. It will grow in the shade of cottonwood and willow stands and when these species senesce it will replace the native riparian forest and shrublands. It can also become established in emergent wetlands and will provide hiding cover for predaceous species. This species has been promoted for landscaping and mistakenly for wildlife habitat. Birds that use Russian olive are adaptable and can find food and shelter in a variety of trees. It is estimated that 1/3 of the bird species associated with native riparian forest and scrub-shrub habitat will not use sites dominated by Russian olive (City of Boulder no date). Control of this species is best accomplished by removing all sources of seed. This is a high priority for the Idaho Partner's in Flight and the Lake Walcott area is being considered for a pilot project (Ritter pers. conv. 2000).

Mining of peat has occurred in the Marsh Creek Valley. The peat that is being mined consists of poorly decomposed sedges and rushes. This activity has replaced emergent wetlands with open water habitat. In addition, ground disturbance provides avenues for establishment of non native species.

Enhancements
Enhancements increase or improve wetland functions. In the survey area enhancement projects have improved water quality and species diversity. The IDFG and Natural Resources Conservation Service (NRCS) are currently active in wetland enhancement on private lands in the Marsh Creek Valley including riparian fencing, planting and efforts to stabilize banks. Construction of levees, canals, and water structures has been used to restore wetlands for waterfowl habitat at Wildlife Management Areas including Market Lake. Wetlands are also being developed in the survey area to treat agricultural run-off. The created wetlands function to improve downstream water quality.

WETLAND DIVERSITY

Wetland Plant Associations

Sixty-one plant associations were identified in the survey area based on field inventories and review of available data (Table 3). A key to the plant associations is included in Appendix A. Descriptions of plant associations and management information are summarized in many classifications and have been compiled for high ranking associations occurring in the survey area in Appendix B. The associations are within the Cowardin's Lacustrine littoral system and Palustrine system including the forested, scrub-shrub, emergent (herbaceous), and aquatic bed classes reviewed in the following sections.

Forested Vegetation
The survey area is at or near the western limit of the range of several deciduous tree species including *Populus angustifolia* (narrow leaf cottonwood), *Acer negundo* (box elder), and *Acer grandidentatum* (bigtooth maple). Stands of narrow-leaf cottonwood are present on the Snake River and some of its tributaries such as the Portneuf River. *Acer negundo* and *A. grandidentatum* stands are only of occassional occurrence and small stands were observed in the Mink Creek drainage. In addition, *Populus trichocarpa* (black cottonwood) is also found in the study area. At upper elevations stands of *Populus tremuloides* (quaking aspen) are sometimes present along stream bottoms. These stands may alternate with reaches that support stands of *Pseudotsuga menziesii* (Douglas' fir) or *Picea engelmannii* (Engelmann spruce).

Scrub-Shrub Vegetation
Shrublands dominated by willows and other shrubs occur in nearly impenetrable patches along low gradient channels, as stringers or on narrow floodplains along high gradient streams, as patches within riparian forests, and in alkaline meadows. At lower elevations the willows *Salix lutea* (yellow willow), *Salix bebbiana* (Bebb's willow) and *Salix exigua* (coyote willow) may be present as the dominant species on stream reaches or may occur as a mosaic with other forested, scrub-shrub and emergent vegetation types. *Salix boothii* (Booth's willow) with lesser amounts of *Salix geyeriana* (Geyer's willow) form patches along low gradient streams at mid to upper elevations. Other common riparian shrubs include *Alnus incana* (mountain alder),
Betula occidentalis (water birch), and *Cornus sericea* (red-osier dogwood). *Potentilla fruticosa* (shrubby cinquefoil) and *Betula glandulosa* (bog birch) stands sometimes form small patches on subirrigated sites within *Salix boothii* and *Salix geyeriana* dominated wetlands. Additionally, stands of *Potentilla fruticosa* (shrubby cinquefoil) as well as *Sarcobatus vermiculatus* (greasewood) are sometimes present on poorly drained alkaline soils.

Emergent (Herbaceous) Vegetation
Herbaceous wetlands are most extensive where springs, groundwater, and/or base flow of river channels maintain a high water table throughout much of the growing season. Extensive emergent wetlands can be found at Fort Hall Bottoms, Marsh Creek Valley, and Sterling WMA. The vegetation includes a mosiac of near monocultures dominated by *Carex* spp. (sedges), *Scirpus* spp. (bulrushes), *Eleocharis* spp. (spikerush), or *Typha latifolia* (common cattail) in semipermanently flooded habitats. Seasonally flooded wetlands are also present and may support stands of *Agropyron smithii* (western wheatgrass), *Carex praegracilis* (clustered field sedge), *Distichlis stricta* (inland saltgrass), *Hordeum brachyantherum* (meadow foxtail), *Juncus balticus* (Baltic rush) and others. Several spring systems such as Lake Channel Canyon along the Snake River and Coop and Huffman Springs in the Curlew Valley are only seasonally saturated and may support a mosaic consisting of the previously mentioned species. Stands of emergent vegetation are also present as small patches in backwater sloughs and abandoned channels along river corridors and may include stands of *Carex lanuginosa* (woolly sedge), *Typha latifolia,* and *Scirpus acutus* (hardstem bulrush) at lower elevations and *Carex aquatilis* (water sedge), *Carex amplifolia* (bigleaf sedge), and *Carex utriculata* (bladder sedge) at mid to upper elevations.

Aquatic Bed and Lacustrine Littoral Vegetation
Palustrine and Lacustrine aquatic bed vegetation occurs in littoral (< 2 meters) and limnetic (> 2 meters) zones of ponds and lakes in the survey area. These truly aquatic habitats were not assessed in this inventory, but observations included dominance by *Chara* sp. (chara), *Potamogeton pectinatus* (sago pond weed), *Potamogeton richardsonii* (Richardon's pondweed), *Hippurus vulgaris* (mares tail), and *Ranunculus aquatilis* (white water-buttercup) in shallow littoral zones.

Table 4. Plant associations and ranks in the Upper Snake, Portneuf and adjacent drainages arranged by Cowardin system, class, and subclass.

Scientific Name	Common name	Rank	
PALUSTRINE FORESTED PLANT ASSOCIATIONS			
Acer negundo/Cornus sericea	Box elder/Red-osier dogwood	G3?	S1
Picea engelmannii/Calamagrostis canadensis	Engelmann spruce/Bluejoint reedgrass	G4	S4
Picea engelmannii/Cornus sericea	Engelmann spruce/Red-osier dogwood	G3	S2
Picea engelmannii/Equisetum arvense	Engelmann spruce/Common horsetail	G4	S2
Populus angustifolia/Betula occidentalis	Narrow-leaf cottonwood/Water birch	G3	S1
Populus angustifolia/Cornus sericea	Narrow-leaf cottonwood/Red-osier dogwood	G4	S1
*Populus angustifolia/*Herbaceous	Narrow-leaf cottonwood/Herbaceous	GU	SU
*Populus angustifolia/*Recent alluvial bar	Narrow-leaf cottonwood/Recent alluvial bar	GU	SU
Populus angustifolia/Rhus trilobata	Narrow-leaf cottonwood/Skunkbush sumac	G3	S2
Populus angustifolia/Symphoricarpos occidentalis	Narrow-leaf cottonwood/Western snowberry	GU	SU
Populus trichocarpa/Cornus sericea	Black cottonwood/Red-osier dogwood	G3?	S3
Populus tremuloides/Cornus sericea	Quaking aspen/Red-osier dogwood	G4	S4
Pseudotsuga menziesii/Cornus sericea	Douglas fir/Red-osier dogwood	G4	S4
PALUSTRINE SCRUB-SHRUB PLANT ASSOCIATIONS			
Alnus incana/Cornus sericea	Mountain alder/Red-osier dogwood	G3G4	S3
*Alnus incana/*Mesic forb	Mountain alder/Mesic forb	G3G4	S1
Artemisia tridentata tridentata/Elymus cinereus	Basin big sagebrush/Great basin wildrye	G2	S1
Betula glandulosa/Carex utriculata	Bog birch/Bladder sedge	G4?	S3
Betula occidentalis	Water birch	G3Q	S2
Betula occidentalis/Cornus sericea	Water birch/Red-osier dogwood	G3?	S2
Betula occidentalis/Mesic forb	Water birch/Mesic forb	G3	S1
Cornus sericea	Red-osier dogwood	G4	S3
Cornus sericea/Heracleum lanatum	Red-osier dogwood/Cow parsnip	G3	S2
Potentilla fruticosa (ft hall)			
Potentilla fruticosa/Deschampsia cespitosa	Shrubby cinquefoil/Tufted hairgrass	G4	S3
Prunus virginiana	Common chokecherry	G4Q	S3
Salix bebbiana/Mesic graminoid	Bebb's willow/Mesic graminoid	G3?	S3
Salix boothii/Carex utriculata	Booth willow/Bladder sedge	G4	S4
Salix boothii/Equisetum arvense	Booth's willow/Common horsetail	G3	S2
*Salix boothii/*Mesic forb	Booth's willow/Mesic forb	G3	S3
*Salix boothii/*Mesic graminoid	Booth's willow/Mesic graminoid	G3?	S3?
Salix exigua/Barren	Coyote willow/Barren	G5	S4
Salix geyeriana/Carex utriculata	Geyer willow/Bladder sedge	G5	S4
Salix geyeriana/Mesic graminoid	Geyer willow/Mesic graminoid	G2G3Q	S3
Salix lutea	Yellow willow	G3	S3
Salix lutea/Mesic forb	Yellow willow/Mesic forbs	G?	SP
Sarcobatus vermiculatus/Distichlis spicata	Greasewood/Inland saltgrass	G4	S1
Symphoricarpos occidentalis	Western snowberry	GU	SU
PALUSTRINE EMERGENT PLANT ASSOCIATIONS			

Agropyron smithii	Western wheatgrass	G3G5Q	S1
Calamagrostis canadensis	Bluejoint reedgrass	G4	S4Q
Carex amplifolia	Bigleaf sedge	G3	S1
Carex aquatilis	Water sedge	G5	S4
Carex lanuginose	Woolly sedge	G3?	S2
Carex nebrascensis	Nebraska sedge	G4	S3
Carex praegracilis	Clustered field sedge	G2G3Q	S2
Carex simulata	Short-beaked sedge	G4	S2
Carex utriculata	Bladder sedge	G5	S4
Deschampsia cespitosa	Tufted hairgrass	G4	S3
Distichlis spicata	Interior saltgrass	G5	S4
Eleocharis palustris	Creeping spikerush	G5	S3
Eleocharis rostellata	Wandering spikerush	G2	S2
Elymus triticoides	Beardless wildrye	GU	SU
Hordeum brachyantherum	Meadow barley	G3	S1?
Juncus balticus	Baltic rush	G5	S5
Phalaris arundinacea	Reed canary grass	G5	S5
Phragmites australis	Common reed	G4	S4
Scirpus acutus	Hardstem bulrush	G5	S4
Scirpus americanus	Threesquare bulrush	G3Q	S1
Scirpus pungens	Sharp bulrush	G?	S3?
Spartina gracilis	Alkali cordgrass	GU	SU
Sporobolus airoides	Alkali sacaton	G3Q	S3
Typha latifolia	Common cattail	G5	S4

Rare Flora

Four rare vascular plant species are known to occur in wetlands in the survey area (Table 4). The rare species have a widespread distribution, but are restricted to specialized wetland or riparian habitat. Additional information on the taxonomy, habitat, and distribution of these species is available in Appendix C.

Table 5. Rare flora of upper Snake River wetlands, conservation rank, and Idaho Native Plant Society (INPS) category (G=Globally Rare, 1=State Priority 1, 2=State Priority 2, S=Sensitive, M=Monitor, R=Review). Definitions of INPS categories are available on the Idaho Conservation Data Center Homepage (CDC 2000).

Scientific name	Common Name	Rank		INPS Category
Allenrolfea occidentalis	Iodine bush	G4	S1	2
Eupatorium maculatum	Joe pye weed	GU	SU	R
Salicornia rubra	Red glasswort	G4	S2	S
Muhlenbergia racemosa	Green muhly	G5	S2	1

Rare Animals

Wetland and riparian habitat in the upper Snake River basin provides breeding habitat for thirty-three wetland and riparian associated vertebrate species of concern. The Snake River is wintering habitat for bald eagles. Bald eagle nest sites are known from the mainstem of the Snake River and Market Lake.

Trumpeter swans also winter on the Snake River. Probable nesting areas for yellow billed cuckoos are reported from riparian habitat near American Falls Reservoir. The lesser goldfinch is reported from one location where a nest was observed near a stream in an area dominated by hawthorne and chokecherry. The remaining bird species of concern are species that utilize habitat associated with large lakes or reservoirs such as American Falls, Market Lake, and Lake Walcott.

The Snake River provides habitat for five aquatic species of concern. Yellowstone cutthroat trout occur in the Snake River and its tributaries including the Portneuf drainage. Four mollusc species of concern are present on the mainstem of the Snake River. The molluscs are most frequently found in highly oxygenated areas associated with riffles created by gravel and cobble bars.

Five bat species of concern are known from the upper Snake River. An Idaho study found that bat roosts were strongly correlated with the availability of water and habitats proximate to wetlands are sometimes preferred (Groves *et al.* 1997). Information from the Idaho Vertebrate Atlas (Groves *et al.* 1997) on the status, range, and habitat of vertebrate species of concern (with the exception of fish and molluscs) is included in Appendix F.

Table 6. Rare animals of upper Snake River wetlands.

Species	Common Name	Rank	
FISH			
Oncorhynchus clarki bouvieri	Yellowstone cutthroat trout	G4T2	S2
BIRDS			
Podiceps nigricollis	Eared grebe	G5	S4B,SZN
Aechmophorus occidentalis	Western grebe	G5	S4B,SZN
Aechmophorus clarkii	Clark's grebe	G5	S2B,SZN
Pelecanus erythrorhynchos	American white pelican	G3	S1B,SZN
Phalacrocorax auritus	Double-crested cormorant	G5	S2B,SZN
Ardea alba	Great egret	G5	S1B,SZN
Egretta thula	Snowy egret	G5	S2B,SZN
Bubulcus ibis	Cattle egret	G5	S2B,SZN
Nycticorax nycticorax	Black-crowned night-heron	G5	S3B,SZN
Plegadis chihi	White-faced ibis	G5	S2B,SZN
Cygnus buccinator	Trumpeter swan	G4	S1B,S2N
Haliaeetus leucocephalus	Bald eagle	G4	S3B,S4N
Numenius americanus	Long-billed curlew	G5	S3B,SZN
Larus pipixcan	Franklin's gull	G4G5	S2B,SZN
Larus delawarensis	Ring-billed gull	G5	S2S3B,S3N
Larus californicus	California gull	G5	S2S3B,S3N
Sterna caspia	Caspian tern	G5	S1B,SZN
Sterna hirundo	Common tern	G5	S1B,SZN
Sterna forsteri	Forster's tern	G5	S2S3B,SZN
Chlidonias niger	Black tern	G4	S2B,SZN
Coccyzus americanus	Yellow-billed cuckoo	G5	S1B,SZN
Carduelis psaltria	Lesser goldfinch	G5	S1B,SZN
MAMMALS			
Myotis yumanensis	Yuma myotis	G5	S3?
Myotis evotis	Long-eared myotis	G5	S3?
Myotis volans	Long-legged myotis	G5	S3?
Myotis ciliolabrum	Western small-footed myotis	G5	S4?
Antrozous pallidus	Pallid bat	G5	S1?

AMPHIBIANS			
Rana pipiens	Northern leopard frog	G5	S3
MOLLUSCS			
Valvata utahensis	Desert valvata	G1	S1
Fisherola nuttalli	Shortface lanx	G2?	S1
Physa natricina	Snake river physa	G1	S1
Taylorconcha serpenticola	Bliss rapids snail	G1	S1

CONSERVATION PRIORITIES FOR WETLANDS

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

Sixteen wetland sites were identified in the survey area (Table 7, Figure 11). In addition 6 other areas were visited and brief summaries are included in Appendix E. Many of these wetland sites represent relatively intact systems where actions such as livestock management, buffer creation, and public education will maintain and in some cases, improve wetland functions. Gains in wetland function can also be achieved by restoring hydrology at or adjacent to many of the identified sites.

Class I Sites

All of the wetland sites in the Upper Snake River Basin have been subject to impacts that lower rankings for the condition and viability criteria. The large emergent marshes support numerous bird species of special concern, however hydrology at these areas for the most part is maintained through artificial means. The definition of Class I sites could be modified for the survey area; however, this would result in inconsistencies with wetland work occurring statewide.

Class II Sites

Five wetland sites meet the richness, rarity, condition, and viability criteria to qualify as Class I sites. The Class I sites include expansive emergent wetland complexes that are habitat for numerous bird species of special concern. Most of the Class I sites have been recognized as Important Bird Areas (Idaho Important Bird Area Committee 2000). American Falls Reservoir and Market Lake are Globally Important Bird Areas that provide habitat for at least 14 different state species of special concern. American Falls Reservoir is a very large area that includes the Snake River, Fort Hall Bottoms, and the reservoir. The Snake River supports remnant stands of narrow-leaf cottonwood and shrubs. These stands are best developed on lands managed by the Bureau of Land Management and The Shoshone Bannock Tribes. The Shoshone Bannock Tribes also manage an extensive spring fed wetland complex supporting native emergent meadows at Fort Hall Bottoms. Fort Hall Bottoms could potentially be recognized as a separate site, however data sensitivity limited our ability to prepare summaries for this area. American Falls is an irrigation reservoir that provides shallow feeding areas for waterfowl and mudflats for migrating shorebirds. Market Lake is a restored wetland that supports a mosaic of permanently to seasonally flooded plant associations. Sterling supports a number of wetland plant associations including the only known occurrence of the iodine bush community in the state. High concentrations of species of concern have not been documented at the Sterling complex and it is unknown if this is due to species absence or lack of surveys.

The condition of the Class II sites has been compromised by weed infestations and hydrologic manipulation. Historically, Market Lake was an extensive wetland. The area has been restored by IDFG to maintain water levels. Enhancement of wetland functions at state and federally managed wetlands continues through chemical and biological weed control, burning, efforts to reduce sediment transport, and maintenance of water levels. All of the Class II sites are at least partially protected. The American Falls area is owned and managed by private, federal, and tribal entities. Currently there are no special management areas within this area though The Shoshone Bannock Tribes have fenced a number of the spring creeks and meadows are managed for native grass species.

Reference Sites

Reference sites include spring systems and riparian forests. Gibson Jack Creek and West Fork Mink Creek contain riparian bottomlands within established Research Natural Areas. The riparian corridors support a mosaic of emergent, forested, and scrub-shrub wetlands on moderate to high gradient streams. Two reference areas, on lands managed by IDFG, include riparian forests and shrublands along perennial streams at Portneuf WMA and riparian scrub-shrub and emergent habitat at an IDFG access area on the Portneuf River. Other IDFG access acres were also surveyed and summaries are included in Appendix E. Two spring systems were also identified that are currently informally managed to maintain wetland values. Big Spring is in the Portneuf drainage and includes a pond and emergent wetlands that to some extent are maintained by beaver. Co-op Spring is a spring complex in the arid Curlew Valley that has an impounded open water pond and low-lying swales with emergent plant associations. Both Big Spring and Co-op Spring are managed by the USFS and designation such as Special Interest Area or Wetland Conservation Area would be appropriate. The management of Research Natural Areas and Wildlife Management Areas/Access Areas should be monitored to maintain wetland processes.

Habitat Sites

The six Habitat Sites include spring systems and riparian bottomlands. Huffman Springs is in the Meadow Brook drainage in the Curlew Valley. The springs, while currently grazed, support a wide swath of native emergent habitat. Grazing impacts are most apparent within the spring creek channels and at the springheads. Grandine is also within the Curlew Valley and includes seasonally flooded meadows and some impounded wetlands. Lake Channel Canyon was formerly an extensive wetland on the north side of the Snake River. The wetlands have a long history of grazing and agriculture use including conversion to non-native hay pasture. In addition, Russian olive is abundant throughout the wetland complex. Currently small remnants of spring fed emergent wetlands remain including areas managed as part of the Minidoka National Wildlife Refuge. Lake Walcott is also managed as part of the Minidoka NWR and is recognized as a Globally Important Bird Area (Idaho Important Bird Area Committee 1997). Habitat along the Snake River includes 12,000 acres of open water and marsh. The relatively stable water levels of Lake Walcott, provided by dam operations, are conducive to the growth of aquatic plants, which provide waterfowl food most of the year. Emergent wetlands are also present in small bays where tributaries enter the reservoir. Cherry Springs includes a reach of West Fork Mink Creek that is managed as a Natural Area with trails by the USFS. The riparian corridor is a rich mix of riparian shrubs and trees and includes stands dominated by native maple species. The Marsh Creek Valley is an broad agricultural valley with an extremely low gradient channel that continues to support patches of native emergent wetlands. Projects in the valley have included bank stabilization and use of riparian pastures.

As opportunities for conservation easements, management agreements, or restoration projects arise they should be actively pursued at Habitat sites. All of the Habitat sites have potential for restoration or enhancement due to past use by domestic animals and/or alterations of hydrologic regimes. In some cases however, restoration may be as simple as fencing and allowing native vegetation to recover.

Revegetation, channel stabilization, weed control, and hydrologic restoration may be necessary and should be evaluated on a site by site basis.

Other Sites and Priorities for Conservation

A number of wetland sites in the Upper Snake River Basin are not summarized in this document. Other wetlands are present representing common vegetation types with important wetland functions. Regulatory protection for jurisdictional wetlands is provided by the Clean Water Act, however, wetlands that do not meet the regulatory criteria are vulnerable. Approximately 7 percent of wetlands in the survey area are currently managed to maintain wetland functions, projects which promote the conservation of all intact wetland habitats should be of high priority. Emphasis may be placed on those types which are unprotected (or under-protected), declining, or rare.

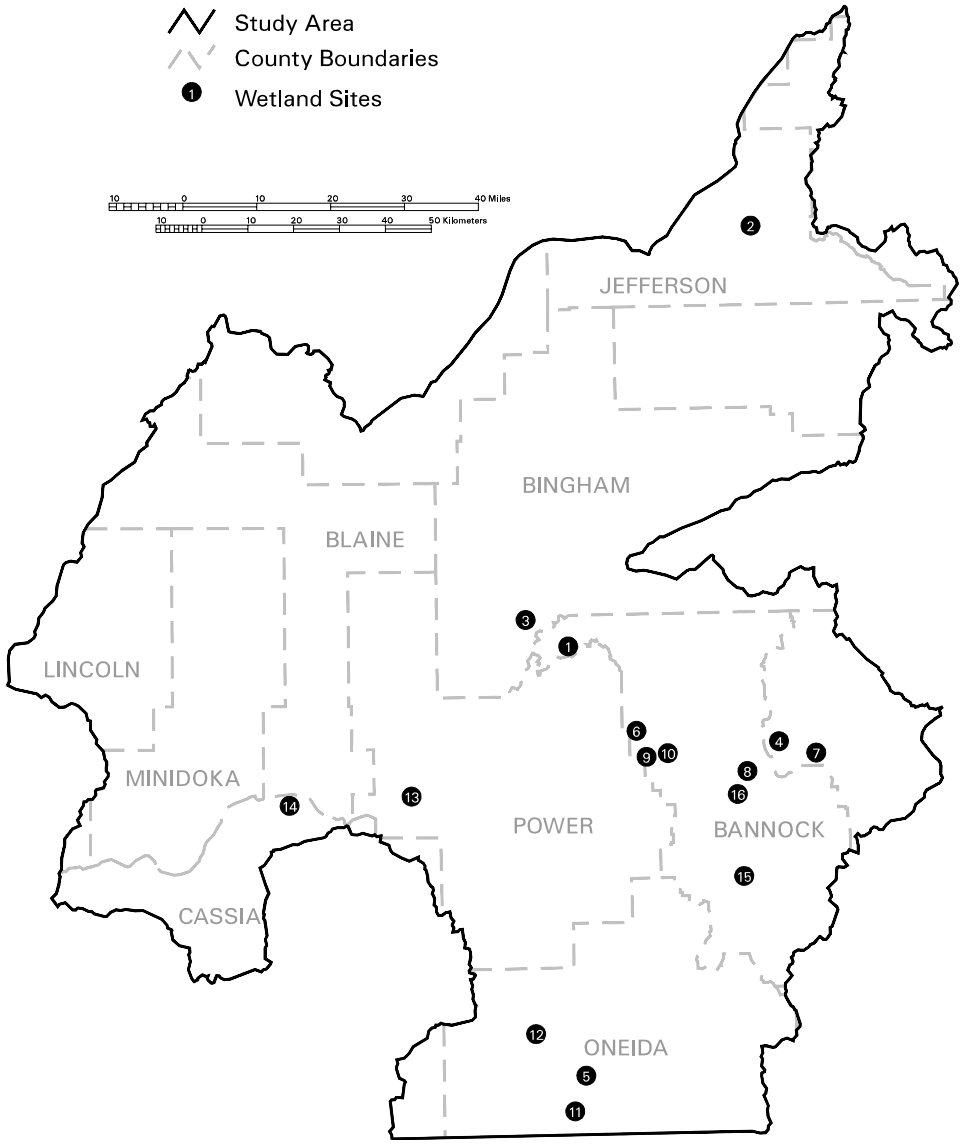
The dominant wetland and deepwater habitat in the survey area is within the Palustrine emergent class (37%). The abundance of emergent habitat may reflect conversion of forested and scrub shrub types to emergent types through removal and/or suppression of woody species. Eight percent of the emergent wetlands are within special management areas and include common emergent plant associations *Carex utriculata*, *Juncus balticus, Scirpus acutus,* and *Typha latifolia*. Emergent wetlands that are less well represented in special management areas include temporarily flooded wetlands dominated by species such as *Spartina gracilis, Deschampsia cespitosa*, and *Hordeum brachyantherum*, The Lacustrine limnetic subsystem includes open water within reservoirs and makes up 36 percent of the wetland and deepwater habitat in the survey area. Eighty four percent of the wetland and deepwater habitat within special management areas is within the Lacutstrine limnetic subsystem (Table 3). Less than 1 percent of forested and scrub-shrub plant associations are within special management areas. Opportunities to maintain existing native emergent, scrub-shrub, and forested wetlands should be pursued as well as projects that restore hydrology and native woody vegetation

How This Information Can be Used

Numerous programs provide opportunities for wetlands protection and restoration on private as well as publicly owned lands. Technical and restoration assistance for privately owned wetlands is available through the USFWS Partners for Wildlife program, IDFG Habitat Improvement Program (HIP), and the NRCS Wetland Reserve Program. Projects involving multiple cooperators are generally given higher priority. The HIP also provides assistance for projects on federal lands such as fencing and restoring wetlands and riparian areas. Technical assistance and assistance to secure project funds on lands with mixed ownership may be provided by Bring Back the Natives or Intermountain Joint Ventures. Special designation such as Research Natural Area (RNA), Area of Critical Environmental Concern (ACEC), or Special Interest Area (SIA) is a conservation approach for ecologically significant wetlands on federal lands. The majority of wetlands in the survey area are in private ownership; thus, the long-term goal of increasing the quality and quantity of wetlands will only be accomplished through continued cooperation between private landowners, federal, state, and local agencies, and concerned citizens.

The information presented here can help identify opportunities and prioritize sites for conservation. With only limited resources available for wetland protection and conservation, projects should be carefully considered. Projects which extend out from previous projects or focus on relatively natural habitats have a high probability for success. Reference wetlands are identified that can serve as baselines for restoration projects. The information presented in the plant association descriptions can be used to set restoration goals for species and community composition. The summaries of wetland sites and plant associations can aid in permit review by providing a regional context for wetland significance and rarity.

Figure 12. Location of wetland sites in the survey area. Site numbers correspond to those in Table 7.



	Wetland Site	Category	Protection Status	Ownership	Latitude/Longitude		County
1	AMERICAN FALLS RESERVOIR	Class II	p	PRI, TRIBE, USFWS	425730N	1124230W	Bannock, Bingham, Power
2	MARKET LAKE	Class II	+	IDFG	434650N	1120825W	Jefferson
3	STERLING	Class II	p	IDFG, PRI	430050N	1124555W	Bingham
4	BIG SPRING	Reference	+	USFS	424559N	1120556W	Caribou
5	CO-OP SPRING	Reference	-	USFS	420700N	1123723W	Oneida
6	GIBSON JACK CREEK	Reference	+	USFS	424716N	1122829W	Bannock,
7	MIKE'S PLACE	Reference	+	IDFG	424445N	1122829W	Caribou
8	PORTNEUF	Reference	+	IDFG, BLM	424255N	1122829W	Bannock
9	WEST FORK MINK CREEK	Reference	+	USFS	424420N	1122829W	Bannock
10	CHERRY SPRINGS	Habitat	+	USFS	424500N	1122829W	Bannock
11	GRANDINE	Habitat	-	USFS,PRI	420248N	1123936W	Oneida
12	HUFFMAN SPRINGS	Habitat	-	IDFG	421154N	1122829W	Oneida
13	LAKE CHANNEL CANYON	Habitat	p	USFWS, PRI	424005N	1122829W	Power
14	LAKE WALCOTT	Habitat	p	USFWS	424005N	1122829W	Cassia, Blaine, Minidoka, Power
15	MARSH VALLEY	Habitat	-	PRI	423330N	1122829W	Bannock
16	MCCAMMON POTHOLES	Habitat	+	IDPR	423956N	1122829W	Bannock

HOW TO REQUEST ADDITIONAL INFORMATION

Only part of the information on wetlands in the upper Snake River survey area has been summarized in this document. Additional data available for basin wide or site specific projects is housed at IDFG headquarters. This report and previous reports are available on the CDC home page at http://www2.state.id.us/fishgame/info/cdc/cdc.htm. The available data and methods of accessing the data are summarized in Table 8.

Table 8. Accessing wetlands related data housed at Idaho Department of Fish and Game. GAP=Gap Analysis Project, NWI=National Wetlands Inventory Maps, BCD=Biological and Conservation Database. Geographic Information System (GIS) data is available in ARCVIEW format.

DATA	FORMAT	WHAT IS AVAILABLE?	HOW DATA IS ACCESSED?
NWI	GIS	United States Fish and Wildlife Service NWI maps at 1:24,000	National Wetlands Inventory Homepage: http://www.nwi.fws.gov
BCD	GIS	Rare plant and animal distributions Conservation site locations Managed area locations	IDFG CDC Information Manager
BCD	ANALOG/ DISK	Occurrence data for rare plant and animal species and plant associations Location and biological significance of currently managed wetland areas Location and biological significance of wetland conservation sites in need of protection Community abstracts	IDFG CDC Information Manager

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Appendix A Key to wetland plant associations in southeastern Idaho

Appendix A

Key to wetland plant communities in the survey area.

Instructions for use of this key.

Locate a sample plot which represents the stand as a whole. Avoid ecotones between communities and microsites which represent small scale disturbances. Recommended plot size for forested communities is 1000 m^2 (20x50m), scrub-shrub communities 250 m^2 (25x10), and emergent communities 100 m^2 (10x10).

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

Record canopy cover for all species in the plot. Validate the key by comparing plot data with written descriptions (included for high ranking plant associations in Appendix B) and stand tables to check for the presence of constant and characteristic species (Youngblood *et al*. 1985, Padgett *et al.* 1989, Hansen *et al*. 1995, Merigliano 1995, Hall and Hansen 1997).

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

Key to overstory dominance groups

1. Picea engelmannii, Abies lasiocarpa, or Pseudotsuga menziesii dominating the overstory with at least 25% cover either collectively or seperately. Needle-leaved evergreen forest plant associations

1. Not as above. 2

    2. Populus angustifolia, P. trichocarpa, P. tremuloides, or Acer negundo present with a canopy cover of at least 15% and not representing a sere to conifer or shrub dominated types. Broad-leaved deciduous forest plant associations

    2. Trees absent or if present with less than 15% cover or restricted to microsites. 3

3. Shrubs present with a canopy cover of at least 10%. Scrub-shrub plant associations

3. Not as above shrubs and trees contributing minor amounts to composition or restricted to microsites. Herbaceous species with a combined cover of at least 15% or emergent herbaceous species with at least 5% cover. Emergent plant associations

Key to needle-leaved evergreen forest plant associations

1. Picea engelmanii or Abies lasiocarpa with at least 25% cover and successfully reproducing. 2

1. Pseudotsuga menziesii dominates the overstory. 9

    2. Cornus sericea with at least 25% cover. Picea engelmannii/Cornus sericea

    2. Not as above. 3

3. Equisetum arvense with at least 25% cover. Picea engelmannii/Equisetum arvense

3. Not as above. 4

4. Calamagrostis canadensis with at least 25% cover.
Picea engelmannii/Calamagrostis canadensis

4. Not as above. 6

5. Cornus sericea alone or in combination with willows, Equisetum arvense, or Actaea rubra with at least 10% cover. Pseudotsuga menziesii/Cornus sericea

5. Not as above. 6

6. Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. 7

6. Site without wetland characteristics. Upland site

7. Overstory and understory dominated by native plant species.
Unclassified or undocumented palustrine needle-leaved evergreen forest associations

7. Overstory or understory dominated by exotic plant species.
Human induced palustrine needle-leaved evergreen forest associations

Key to broad-leaved deciduous forest plant associations

1. Populus tremuloides with greater than 25% cover. 2

1. Not as above other deciduous tree species dominate the overstory. 4

2. Cornus sericea with at least 25% cover. Populus tremuloides/Cornus sericea

2. Not as above. 14

3. Populus angustifolia alone or in combination with P. acuminata with at least 25% cover. 4

3. Not as above. 10

4. Seedling or saplings of Populus angustifolia dominate the site on a recently deposited alluvial bar or island. Populus angustifolia/ Recent alluvial bar

4. Not as above. 5

5. Cornus sericea with at least 25% cover. Populus angustifolia/Cornus sericea

5. Not as above. 6

6. Betula occidentalis with at least 25% cover. Populus angustifolia/Betula occidentalis

6. Not as above. 7

7. Rhus trilobata with at least 25% cover. Populus angustifolia/Rhus trilobata

7. Not as above. 8

8. Symphoricarpos occidentalis, Amelanchier alnifolia, or Rosa woodsii with at least 5% cover. Populus angustifolia/Symphoricarpos occidentalis

8. Not as above. 9

9. Other native herbaceous species dominate the understory and shrubs with less than 25% cover. Populus angustifolia/Herbaceous

9. Not as above. 14

10. Populus trichocarpa with at least 25% cover. 11

10. Not as above. 12

11. Cornus sericea dominates the understory with at least 25% cover. Populus trichocarpa/Cornus sericea

11. Not as above. 14

12. Acer negundo with at least 15% cover. 13

12. Not as above. 14

13. Cornus sericea with at least 25% cover. Acer negundo/Cornus sericea

13. Not as above. 14

14. Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. 15

14. Site without wetland characteristics. Upland Site

15. Overstory and understory dominated by native plant species. Unclassified or undocumented palustrine broad-leaved deciduous forest associations

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

Key to scrub-shrub plant associations

1. Willows with at least 25% cover. 2

1. Willows absent or with less than 25% cover. Mixed scrub-shrub dominated plant associations

	2.	Tall willow species including Salix lutea, S. lasiandra, S. exigua, S. boothii, S. geyeriana, or S. bebbiana alone or in combination with at least 25% cover.	Tall willow plant associations
	2.	Not as above.	Mixed scrub-shrub dominated plant associations

Key to mixed scrub-shrub plant associations

1.	Potentilla fruticosa or Betula glandulosa alone or in combination with 15% cover.		4
1.	Not as above.		2
	2.	Sarcobatis vermiculatus or Artemisia tridentata the dominant shrub.	7
	2.	Not as above.	3
3.	Tall shrubs including Alnus incana, Betula occidentalis, Cornus sericea, Prunus virginiana, Rhus aromatic or Rosa woodsii dominant.		10
3.	Not as above.		36
	4.	Potentilla fruticosa or Betula glandulosa with at least 10% cover.	5
	4.	Not as above.	22
5.	Carex utriculata and/or C. aquatilis with at least 25% cover.		Betula glandulosa/Carex utriculata
5.	Not as above.		6
	6.	Deschampia cespitosa with at least 5% cover.	Potentilla fruticosa/ Deschampsia cespitosa
	6.	Not as above.	22
7.	Sarcobatus vermiculatus with at least 10% cover.		8
7.	Not as above.		9
	8.	Distichlis spicata with at least 5% cover.	Sarcobatus vermiculatus/ Distichlis spicata
	8.	Not as above.	22
9.	Artemisia tridentata with at least 10% cover.		Artemisia tridentata/Elymus cinereus
9.	Not as above.		22
	10.	Alnus incana with at least 25% cover.	11
	10.	Not as above.	13
11.	Cornus sericea with at least 10% cover.		Alnus incana/Cornus sericea

11. Not as above. 12

12. Mesic forbs including Mertensia sp., Heracleum lanatum, Aconitum columbianum, Smilacina stellata, Hydrophyllum fendleri alone or in combination with at least 25% cover. Alnus incana/Mesic forb

12. Not as above. 22

13. Cornus sericea with at least 25% cover. 14

13. Not as above. 16

14. Heracleum lanatum with at least 5% cover. Cornus sericea/Heracleum lanatum

14. Not as above.

15. Understory barren due to shading, annual scouring or absence of soil development. Cornus sericea

15. Not as above. 22

16. Betula occidentalis the dominant shrub with at least 15% cover. 17

16. Not as above. 20

17. Cornus sericea with at least 10% cover. Betula occidentalis/Cornus sericea

17. Not as above. 18

18. Mesic forbs including Mertensia sp., Heracleum lanatum, Aconitum columbianum, Smilacina stellata, Hydrophyllum fendleri alone or in combination with at least 25% cover. Betula occidentalis/Mesic forb

18. Not as above. 19

19. Other species than those listed above are understory dominants. Betula occidentalis

19. Not as above. 22

20. Prunus virginiana the dominant shrub with at least 40% cover. Prunus virginiana

20. Not as above. 21

21. Symphoricarpos occidentalis the dominant shrub with at least 40% cover. Symphoricarpos occidentalis

21. Not as above. 22

22. Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. 23

22. Site without wetland characteristics. Upland Site

23. Overstory and understory dominated by native plant species. Unclassified or undocumented palustrine scrub-shrub associations

23 Overstory or understory dominated by exotic plant species.
Human induced palustrine scrub-shrub associations

Key to tall willow plant associations

1. Salix lutea, S. exigua, S. bebbiana alone or in combination with at least 25% cover. 2

1. Not as above. 8

2. Salix exigua with greater cover than any of the other tall willow species. 3

2. Not as above. 4

3. Understory poorly developed or barren due to annual scouring or recent colonization by S. exigua. Salix exigua/Barren

3. Not as above. 16

4. Salix lutea the dominant willow and alone or in combination with other shrubs with at least 15% cover. 5

4. Not as above. 7

5. Mesic forbs including Mertensia sp., Heracleum lanatum, Aconitum columbianum, Smilacina stellata, Hydrophyllum fendleri alone or in combination with at least 25% cover.
Salix lutea/Carex utriculata

5. Not as above. 6

6. Other species not listed above dominate the overstory. Salix lutea

6. Not as above. 16

7. Salix bebbiana with at least 25% cover. Salix bebbiana/Mesic graminoid

7. Not as above. 16

8. Salix boothii the dominant willow, alone or in combination with S. geyeriana, or S. drummondina, with at least 25% cover. 9

8. Not as above. 13

9. Carex utriculata (rostrata) with at least 25% cover. Salix boothii/ Carex utriculata

9. Not as above. 10

10. Other mesic graminoids including Carex lanuginosa, Juncus balticus or Glyceria borealis alone or in combination with 25% cover. Salix boothii/Mesic graminoid

10. Not as above. 11

11. Understory somewhat sparse due to long periods of inundation and shading. Equisetum arvense present and sometimes contributing up to 60% cover to the understory. Salix boothii/Equisetum arvense

11. Not as above 12

12. Mesic forbs including Mertensia sp., Heracleum lanatum, Aconitum columbianum, Hydrophyllum fendleri alone or incombination with at least 25% cover. Salix boothii/Mesic forb

12. Not as above. 16

13. Salix geyeriana the dominant willow contributing up to 25% cover to the somewhat open shrub layer (Salix boothii absent or present in minor amounts). 14

13. Not as above. 16

14. Carex utriculata (rostrata) the dominant graminoid with at least 25% cover. Salix geyeriana/Carex utriculata

14. Not as above. 15

15. Mesic graminoids including Juncus balticus. Carex lanuginosa, Agrostis spp., and Glyceria spp. dominate the understory. Salix geyeriana/Mesic graminoid

15. Not as above. 16

16. Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. 18

16. Site without wetland characteristics. Upland Site

17. Overstory and understory dominated by native plant species. Unclassified or undocumented palustrine scrub-shrub associations

17. Overstory or understory dominated by exotic plant species. Human induced palustrine scrub-shrub associations

Key to emergent vegetation types

1. Carex species dominant. Sedge plant association key

1. Not as above or grass or forb species dominant. Non-sedge plant association key

Key to sedge plant associations

1. Carex utriculata (rostrata) with at least 50% cover or the dominant species. Carex utriculata

1. Not as above. 2

2. Carex aquatilis with at least 50% cover or the dominant species. Carex aquatilis

2. Not as above. 3

3. Carex praegracilis the dominant species. Carex praegracilis

3. Not as above. 4

4. Carex simulata with at least 50% cover or the dominant species. Carex simulata

4. Not as above. 5

5. Carex lanuginosa with at least 25% cover or the dominant species. Carex lanuginosa

5. Not as above. 6

6. Carex amplifolia with at least 25% cover or the dominant species. Carex amplifolia

6. Not as above. 7

7. Carex nebraskensis with at least 25% cover or the dominant species. Carex nebraskensis

7. Not as above. 8

8. Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. 9

8. Site without wetland characteristics. Upland Site

9. Community dominated by native plant species. Unclassified or undocumented palustrine emergent association

9. Native species replaced or nearly replaced by exotic plant species. Human induced palustrine emergent vegetation

Key to non-sedge types

1. Graminoids dominant. 2

1. Forbs dominant. 18

2. Calamagrostis canadensis with at least 25% cover or the dominant species. Calamagrostis canadensis

2. Not as above. 3

3. Phalaris arundinacea with at least 25% cover or the dominant graminoid. Phalaris arundinacea

3. Not as above. 4

4. Phragmites australis with at least 25% cover or the dominant graminoid. Phragmites australis

4. Not as above. 5

5. Hordeum brachyantherum with at least 15% cover or the dominant species.

Hordeum brachyantherum

5. Not as above. 6

6. Elymus triticoides with at least 15% cover or the dominant species. Elymus triticoides

6. Not as above. 7

7. Agropyron smithii with at least 15% cover or the dominant species. Agropyron smithii

7. Not as above. 8

8. Spartina gracilis with at least 10% cover. Spartina gracilis

8. Not as above. 9

9. Deschampsia cespitosa with at least 5% cover. Deschampsia cespitosa

9. Not as above. 10

10. Distichlis spicata with at least 25% cover or the dominant species Distichlis spicata

10. Not as above. 11

11. Sporobolus airoides with at least 25% cover or the dominant species. Sporobolus airoides

11. Not as above. 12

12. Scirpus acutus or S. validus with at least 25% cover or the dominant species. Scirpus acutus (validus)

12. Not as above. 13

13. Scirpus pungens with at least 15% cover or the dominant species. Scirpus pungens

13. Not as above. 14

14. Scirpus americanus with at least 15% cover or the dominant species. Scirpus americanus

14. Not as above. 15

15. Eleocharis palustris with at least 25% cover or the dominant species. Eleocharis palustris

15. Not as above. 16

16. Eleocharis rostellata with at least 25% cover or the dominant species. Eleocharis rostellata

16. Not as above. 17

17. Juncus balticus with at least 25% cover or the dominant species. Juncus balticus

17. Not as above. 18

18. Typha latifolia and/or Typha angustifolia alone or in combination

with at least 50% cover. Typha latifolia

18. Not as above. 19

19. Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. 20

19. Site without wetland characteristics. Upland Site

20. Community dominated by native plant species. Unclassified or undocumented palustrine emergent associations

20. Native species replaced or nearly replaced by exotic plant species. Human induced palustrine emergent vegetation

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APPENDIX B

Characterization abstracts for selected plant associations in the survey area.

Acer negundo/Cornus sericea

Box elder/Red-osier dogwood

RANGE

This association is a minor type in Idaho, Utah, and Colorado.

ENVIRONMENT

The *Acer negundo/Cornus sericea* plant association is found in mountainous areas within plateaus and canyonlands dissected by second order and higher streams. It typically occurs below 6500 feet on gently sloping terraces and benches (Padgett *et al.* 1989).

SOILS

Soils are sandy, fine loamy, and coarse-loamy to loamy skeletal and sandy skeletal. Water tables were at least 20 cm below the surface and deeper in many cases (Padgett *et al.* 1989).

VEGETATION COMPOSITION

The overstory of this forest association is dominated by *Acer negundo. Betula occidentalis, Alnus incana, Acer glabrum*, or *Acer grandidentatum* occasionally form a dense low tree layer. Cover of *Cornus sericea* is usually greater than 25 percent, and *Salix lutea* or *S. exigua* are occasionally present. Minor amounts of *Rosa* spp., *Ribes inerme,* and *Symphoricarpos oreophilus* may also be present. The herbaceous layer is highly variable *with Actaea rubra, Heracleum lanatum, Geranium richardsonii, Smilacina stellata,* and *Poa pratensis* sometime present (Padgett *et al.* 1989, Kittel *et al.* 1999).

ADJACENT COMMUNITIES

Upland vegetation includes stands dominated by *Abies lasiocarpa, Acer glabrum, Quercus gambellii, Artemisia tridentata* ssp. *vaseyana, Pinus edulis*, or *Juniperus osteosperma*. Adjacent riparian plant associations may be dominated by *Populus angustifolia, Salix exigua*, or other *A. negundo* types (Padgett *et al.* 1989).

MANAGEMENT CONSIDERATIONS

Cornus sericea's rhizomatous roots provide streambank stability. *Acer negundo*, while not rhizomotous, has strong roots that create stable site conditions (Padgett *et al.* 1989). Grazing can severely damage trees and eliminate regenerating stems of *Acer negundo*. Both of the dominant species in this association can be used for restoration and female trees of *Acer negundo* are recommended as they are better adapted for growing at the channel edge (Kittel *et al.* 1999).

SUCCESSIONAL DYNAMICS

The *Acer negundo/Cornus sericea* association is a relatively stable type that is likely to persist until stream channels meander away from the existing stands or until the channel cuts deeper. Limited data suggest that the occurrence of a climax community type dominated by *Acer negundo* and *Smilacina stellata* may result from drying of this habitat. *Acer negundo/Cornus sericea* is a stable type and conversion is likely to be slow (Padgett *et al.* 1989). Young stems of *Acer negundo* get water from the stream channel or from upper soil horizons that are fed by stream water. Mature trees are able to tap into deep groundwater and survive when water levels drop during the growing season (Kittel *et al.* 1999).

WILDLIFE FUNCTIONS

Acer negundo dominated riparian communities are important habitat for many wildlife species. A number bird species as well as squirrels will feed on the seeds of boxelder. Use by mule deer and white-tailed deer will occur in the fall (USDA 2000). *Cornus sericea* is a species that is highly palatable to wildlife and browsing may be high if stands are accessible.

CLASSIFICATION COMMENTS

This association has been described in Utah (Padgett *et al.* 1989), Colorado (Kittel *et al.* 1999), and reported in Idaho.

AUTHOR/DATE(UPDATE)

Mabel Jankovsky-Jones/1995-05-11(2001-02-28)

Picea engelmannii/Cornus sericea

Engelmann spruce/Red-osier dogwood

RANGE

The *Picea engelmannii/Cornus sericea* plant association (included in Picea/Cornus sericea) is a major type known from eastern Idaho, western Wyoming, northeastern Washington (Okanogan Highlands; Kovalchik 1993), northeastern Oregon (BlueMountains; Crowe and Clausnitzer 1997), Montana, Utah, and possibly Colorado. In Idaho, stands are known from the Centennial, Caribou, Grays, and Teton Ranges (Jankovsky-Jones 1996, Youngblood *et al.* 1985). In Wyoming, stands were

sampled in the Snake River Range and Greys River Range (Youngblood *et al.* 1985).

ENVIRONMENT

The *Picea engelmannii/Cornus sericea* (including Picea/*Cornus sericea*) plant association is found at elevations ranging from as low as 2500 ft in Montana (Hansen *et al.* 1995), to around 4200 to 5100 feet in Oregon (Crowe and Clausnitzer 1997) to as high as 7000 feet elsewhere. In eastern Idaho this community is typically found between 5500 and 6100 feet (Hall and Hansen 1997, Jankovsky-Jones 1996, Youngblood *et al.* 1985). Though it is the driest of the riparian Picea types, it is restricted to alluvial terraces, benches, or moist toeslopes immediately adjacent to high gradient streams in narrow V or trough shaped valleys. The topography ranges from flat to 5 percent slopes and may be undulating (Crowe and Clausnitzer 1997, Hall and Hansen 1997, Hansen *et al.* 1995, Youngblood *et al.* 1985). In narrow valleys, this association may occupy the whole floodplain. The water table is usually shallow (50 to 100 cm deep) and stands are often affected by seasonal high water (Hansen *et al.* 1995, Youngblood *et al.* 1985).

SOILS

The soils are derived from alluvium with coarse rock fragments (to 35%) and occasional decaying woody debris (Hall and Hansen 1997, Youngblood *et al.* 1985). Soils are coarse loamy, loamy silts, sandy, or clayey. They are gleyed and mottled, up to 60 cm deep, and have moderate available water capacity. Soil sub-groups are usually Cryoborolls (Aquic and Cumulic) and Cryaquolls (Cumulic, Histic, and Typic) but sometimes Cryofluvents and Cryorthents (Hansen *et al.* 1995, Youngblood *et al.* 1985). Such soils are succeptible to compaction and damage by logging machinery and livestock (Hansen *et al.* 1995).

VEGETATION COMPOSITION

The *Picea engelmannii/Cornus sericea* plant association has a partially closed overstory dominated by mature Picea. Picea (mostly P. engelmannii) constancy ranges from 86 to 100% with cover from 23 to 50% (Crowe and Clausnitzer 1997, Hall and Hansen 1997, Hansen *et al.* 1995, Kovalchik 1993, Youngblood *et al.* 1985). Mixed conifer species are common in both the overstory and the sub-canopy/tree understory resulting in high structural diversity (Youngblood *et al.* 1985). Snags and high levels of woody debris may be present (Crowe and Clausnitzer 1997). However, within the mixed conifer component, the species cover of mature, sapling, and seedlings is usually less than 25%. Species vary across the range, *though Abies lasiocarpa* and *Pseudotsuga menziesii* are most commonly encountered throughout. Other trees sometimes present, especially outside Idaho, are *Pinus contorta, Larix occidentalis, Abies grandis,* and *Populus* species. (Crowe and Clausnitzer 1997, Hansen *et al.* 1995, Kovalchik 1993). There is a dense shrub layer with high cover of mixed species. The dominant shrub species, Cornus sericea usually has 10 to 58% cover. Co-dominant shrubs, often with high constancy but lower cover than *Cornus sericea*, are *Alnus incana, Salix boothii*, and *Ribes lacustre*. *Salix drummondiana, Symphoricarpos albus, Linnaea borealis, Rubus parviflora*, and *Lonicera involucrata* are occasionally prominent. Graminoid cover is usually less than 50% with *Elymus glaucus* the most common species. *Calamagrostis canadensis, Carex* species, *Bromus* species, and *Cinna latifolia* are all sometimes present with low cover. Forb species richness is high but cover is low. Common forbs are *Actaea rubra, Thalictrum occidentale, Smilacina stellata*, and *Galium triflorum*. Other commonly associated forbs are *Fragaria virginiana, Aster* species, *Equisetum arvense, Osmorhiza* species, and *Senecio triangularis* (Crowe and Clausnitzer 1997, Hall and Hansen 1997, Hansen *et al.* 1995, Jankovsky-Jones 1996, Kovalchik 1993, Youngblood *et al.* 1985).

ADJACENT COMMUNITIES

Adjacent communities may be other *Picea* types such as the wetter *Picea/Equisetum arvense* or the drier *Picea engelmannii/Galium triflorum* (Hall and Hansen 1997, Kovalchik 1993). Other adjacent wet communities are dominated by *Alnus incana, Populus* species, *Salix* species (e.g. *Salix exigua*), *Carex* species, or other *Cornus sericea* types (Crowe and Clausnitzer 1997, Hall and Hansen 1997, Hansen *et al.* 1995, Youngblood *et al.* 1985). Adjacent uplands are often dominated by *Pseudotsuga menziesii, Pinus contorta,* or *Abies lasiocarpa* and occasionally *Abies grandis* (Crowe and Clausnitzer 1997, Hall and Hansen 1997, Hansen *et al.* 1995, Youngblood *et al.* 1985).

MANAGEMENT CONSIDERATIONS

Due to easily compacted soils, high water tables, and streamside locations many activities are usually incompatible. Road, structure, and recreation construction are not recommended (Hansen *et al.* 1995). Timber harvest leads to problems with

windthrow and rising water tables. Partial cutting does favor dominance by Picea while clearcutting promotes mixed conifer regeneration (Hall and Hansen 1997). Livestock grazing is also not recommended because of fragile soils and low forage amounts. *Picea engelmannii* provides good erosion control but is easily killed by fire. However, it quickly re-establishes on disturbed ground but not in areas of thick shrub, herbaceous, or duff cover. Also, its slow growth makes it a moderate revegetation option only in the long-term. By contrast, Cornus sericea provides excellent, long-term erosion control by stabilizing banks and recruiting debris. It also readily re-sprouts after fire (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

Overall, the successional dynamics of this community are poorly known. Based on ecological similarities, Youngblood *et al.* (1985) hypothesize that *Picea/Cornus sericea* is a persistent successional intermediate between *Cornus sericea/Galium triflorum* and *Picea/Galium triflorum*. Alternatively, *Picea engelmannii* (or other Picea) may be a late seral invader of many different related communities including: *Populus angustifolia or P. trichocarpa* or *P. tremuloides/Cornus sericea*, *Populus trichocarpa/Alnus incana-Cornus sericea, Alnus incana-Cornus sericea, Pseudotsuga menziesii stands, Salix* species communities, or other *Cornus sericea* plant associations (Crowe and Clausnitzer 1997, Hall and Hansen 1997, Hansen *et al.* 1995, Kovalchik 1993, Youngblood *et al.* 1985). Succession is probably multiple pathed, the result of interracting soil, site moisture, disturbance, and micro-climate factors. For example, *Picea engelmannii* quickly re-establishes after fire or other disturbance. However, it is slow in dominating stands which explains the remnant conifer and deciduous trees in the overstory. Though located in cold-air draining valleys, which are not fire prone, disturbance has a role in late seral *Picea engelmannii/Cornus sericea* dynamics. *Picea engelmannii* is easily killed by fire and succeptible to windfall and spruce beetle or spruce budworm infestation. These disturbances may help maintain Picea dominance by promoting reproduction (Crowe and Clausnitzer 1997, Hall and Hansen 1997).

WILDLIFE FUNCTIONS

The *Picea engelmannii/Cornus sericea* plant association provides good winter thermal cover for deer (especially white-tailed deer), bear, and elk (Crowe and Clausnitzer 1997, Hansen *et al.* 1995, Hansen *et al.* 1988). In addition, moose, elk, and other wildlife browse this community as *Cornus sericea* is a desired forage. *Cornus sericea* also overhangs streams forming hiding and thermal cover for fish. The diverse forest structure provides habitat and food for small mammals and birds (Crowe and Clausnitzer 1997, Youngblood *et al.* 1995).

CLASSIFICATION COMMENTS

The *Picea engelmannii/Cornus sericea* plant association is often treated as *Picea/Cornus sericea.* In Montana and Idaho, *Picea glauca* and *Picea engelmannii* hybrids are common, thus, lumping both species together is practical (Hall and Hansen 1997, Hansen *et al.* 1995). However, pure stands of Picea glauca are of conservation concern in Idaho and should be treated within the Picea glauca alliance. In Utah (and Wyoming, southeastern Idaho, and elsewhere) either *Picea pungens* or *Picea engelmannii* (or hybrids) may dominate, with similar understory composition. This also facilitates lumping under *Picea/Cornus sericea* or Conifer/*Cornus sericea* (Padgett *et al.* 1989). The *Picea engelmannii/Cornus sericea* type is possibly a successional intermediate between *Cornus sericea/Galium triflorum* and the climax *Picea/Galium triflorum* (Youngblood *et al.* 1985).

AUTHOR/DATE

Chris Murphy/1998-11-16

Picea engelmannii/Equisetum arvense

Engelmann spruce/Common horsetail

RANGE

The *Picea engelmannii/Equisetum arvense* plant association is a widely scattered minor type which extends eastward in Wyoming along the Wind River Range and northwestward into central Idaho and Montana and into eastern Oregon.

ENVIRONMENT

The plant association is usually restricted to gentle toeslopes, seeps and stream terraces with northerly aspects that have continuously saturated soils at the lower limit of the subalpine zone.

SOILS

Soils are usually derived from weathered cretaceous sediments. Textures are highly variable with a moderate water holding capacity. Soils are often wet throughout the year with standing water. Water

tables are usually less than 50 cm deep (Padgett *et al.* 1989).

VEGETATION COMPOSITION

Picea engelmannii dominates a normally dense overstory. *Abies lasiocarpa* and *Pinus contorta* are occasionally present on drier microsites such as windthrow hummocks. Shrub cover is usually negligible, with *Alnus incana, Betula occidentalis, Lonicera involucrata, Rosa* spp., and *Amelanchier alnifolia* occasionally present. These species normally indicate drier ecotonal or microsite conditions. A dense carpet of the diagnostic herb *Equisetum arvense* characterizes the undergrowth. Other associates include *Carex aquatilis, Carex disperma, Carex utriculata, Glyceria* spp., *Calamagrostis canadensis, Elymus glaucus, Geranium richardsonii, Senecio triangularis*, and *Smilacina stellata* (Padgett *et al.* 1989).

ADJACENT COMMUNITIES

Upland vegetation is usually dominated *by Abies lasiocarpa* or *Pseudotsuga menziesii*. Boundaries with adjacent riparian types are often distinct and include the *Carex* spp. or *Salix* spp. dominated communities.

MANAGEMENT CONSIDERATIONS

Stands have little or no forage value for livestock. Timber harvest and other soil compacting activities should be restricted to avoid dispacement or disturbance of wet soils.

SUCCESSIONAL DYNAMICS

The type is considered stable and represents a climax sere.

WILDLIFE FUNCTIONS

Stands provide habitat for *Parus gambeli* (mountain chickadee), *Regulus calendula* (ruby-crowned kinglet), *Dendroica coronata* (yellow-rumped warbler), *Piranga ludoviciana* (western tanager), *Coccothraustes vespertinus* (evening grosbeak), and *Carduelis pinus* (pine siskin). *Equisetum arvense* is of documented importance as a food source for grizzly bear (Knight and Blanchard 1983) and black bear use these sites for wallows (Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

Stands with mixed conifers have previously been grouped as *Picea* spp. and Conifer spp. types in Padgett *et al.* (1989), Youngblood *et al.* (1985) and Hansen *et al.* (1995). The Picea engelmannii/Equisetum arvense type here represents stands dominated by *P. engelmannii* as described by Pfister *et al.* (1977), Steele *et al.* (1981) and Mauk and Henderson (1984).

AUTHOR/DATE

Mabel Jankovsky-Jones/1995-04--04

Populus angustifolia/Betula occidentalis

Narrow-leaf cottonwood/Water birch

RANGE

The *Populus angustifolia/Betula occidentalis* plant association is a minor type in the Rocky Mountains reported from Colorado, Idaho, Wyoming, and Utah.

ENVIRONMENT

Stands are most often located on dynamic stream terraces and floodplains immediately adjacent to streams (Padgett *et al.* 1989). In systems with an unaltered hydrology, the channel and adjacent floodplain constantly undergo change. Flooding events deposit fine alluvium where cottonwood seedlings can germinate and become established. The seedlings will trap and accumulate sediment overtime and the sandbar will eventually be above the high water line of the floodplain (Kittel *et al.* 1999).

SOILS

Soils are typically well drained with more than 35% coarse fragments, at least in the subsurface horizons, with a low to moderate available water holding capacity. Water tables were rarely within 0.25 meters of the soil surface, and stands may be several (2) meters above the stream level (Padgett *et al.* 1989).

VEGETATION COMPOSITION

The *Populus angustifolia/Betula occidentalis* plant association is characterized by an overstory dominated by *Populus angustifolia* (20-70% cover) with *Acer negundo* occasionally codominant. Betula occidentalis forms a moderate to dense shrub layer with *Alnus incana, Acer grandidentatum*, *or A. glabrum* and *Salix* spp. as occasional associates. Other trees including *Pseudotsuga menziesii*, and *Juniperus scopulorum* may also be present. *Alnus incana, Cornus sericea, Rhus trilobata*, and/or *Rosa* spp. may be present. The herbaceous understory is

highly variable with cover ranging from absent to abundant. *Maianthemum stellatum*, *Equisetum arvense, Calamagrostis canadensis*, and *Osmorhiza chilensis* are often present. The exotics *Poa pratensis, Agrostis stolonifera, Phleum pratense*, and *Bromus inermis* may also be present (Johnston 1987, Padgett *et al.* 1989, Kittel *et al.* 1999).

ADJACENT COMMUNITIES

Adjacent upland communities include those dominated by *Pseudotsuga menziesii, Pinus ponderosa, Quercus gambelii, Juniperus osteosperma* or *J. scopulorum*, *Pinus edulis*, and/or *Acer glabrum* communities (Padgett *et al.* 1989).

MANAGEMENT CONSIDERATIONS

Populus angustifolia seedlings and *Betula occidentalis* are both highly palatable and browsed by cattle. Moderate to heavy grazing will open the shrub layer and eventually most shrubs may be eliminated leaving Symphoricarpos occidentalis and Rosa woodsii. If grazing continues, the stand may become dominated by Poa pratensis and become so open and dry that the potential has changed. The presence of native shrubs and grasses are indicative of the sites potential. Once remnant species have been eliminated, rehabilitation is very costly and success is questionable (Hansen *et al.* 1995). In Colorado it is recommended that sites only be grazed for short periods during the growing season or solely during the winter months (Kittel *et al.* 1999).

SUCCESSIONAL DYNAMICS

Stands of *Populus angustifolia/Betula occidentalis* are considered early to mid-seral. Cottonwood stands do not “regenerate” in-place but will migrate up and down a river reach as channels shift, alluvium is deposited and mature stands senesce. A high quality river reach will consist of a mosaic of different age classes of cottonwood stands and other plant associations dominated by shrubs and emergent species. During flood events alluvium will be trapped by stands resulting in aggradation of the alluvial surface (Kittel *et al.* 1999). The raising of the surface above the annual high water mark may result in a decline in reproduction *by Populus angustifolia* and eventual dominance *by Betula occidentalis*. *Pseudotsuga menziesii* and *Picea pungens* occasionally appear as later successional species. The presence of *Rhus trilobata and Rosa woodsii* indicates a drying trend in the soils and a tendency toward more xeric associations. Stands where *Acer grandidentatum* is abundant indicate succession toward the *Populus angustifolia/Acer grandidentatum* association (Padgett *et al.* 1989).

WILDLIFE FUNCTIONS

This association provides high structural diversity for wildlife including neotropical migrants. The roots of *Betula occidentalis* are important for maintaining streambank stability (Padgett *et al.* 1989).

CLASSIFICATION COMMENTS

This association has been described in Utah and southeast Idaho (Padgett *et al.* 1989), Colorado (Kittel *et al.* 1999), and Wyoming (Walford *et al.* 1997).

AUTHOR/DATE(UPDATE)

Linda Williams/1995-09-26(2001-02-27)

Populus angustifolia/Cornus sericea

Narrow-leaf cottonwood/Red-osier dogwood

RANGE

The *Populus angustifolia/Cornus sericea* plant association occurs in Colorado, Idaho, Montana, New Mexico, Nevada, Utah and Wyoming

ENVIRONMENT

Occurs on recently deposited alluvial flats or benches of streams and rivers, and around lakes and ponds (Hansen *et al.* 1995, Youngblood *et al.* 1985, Padgett *et al.* 1989).

SOILS

Deep, well drained soils are associated with floodplains. Soil textures vary from loam to coarse sand, and are generally well drained with a low to moderate available water holding capacity. These sites are often flooded in the spring with water tables lowering to 3 or more feet below the soil surface at the end of summer; upper soil profiles remain moist due to capillary action. Coarse textured soils, moderate stream gradients, and high coarse fragment contents throughout the soil profile provide an environment that produces a rapid movement of highly aerated groundwater. Redox concentrations (mottles) are common as evidence of a fluctuating water table.

VEGETATION COMPOSITION

The *Populus angustifolia/Cornus sericea* plant association is characterized by an overstory dominated by *Populus angustifolia* (20-70% cover)

with *Acer negundo* occasionally codominant. The dense shrub layer is diverse and dominated by *Cornus sericea* (20-90% cover). *Prunus virginiana, Amelanchier alnifolia, Symphoricarpos oreophilus, Alnus incana, Betula occidentalis, Rosa woodsii, Salix exigua* and other *Salix* species are often present. The herbaceous understory is highly variable with cover ranging from absent to abundant. *Maianthemum stellatum* and *Equisetum arvense* are often present.

ADJACENT COMMUNITIES

Adjacent wetter communities may be dominated by *Salix exigua, S. amygdaloides*, and *S. lasiandra*. Adjacent disturbed sites may be dominated by the *Populus angustifolia*/Herbaceous or the *Populus angustifolia/Symphoricarpos occidentalis* plant associations.

MANAGEMENT CONSIDERATIONS

Because of it's close proximity to streams and rivers and the flat topography, recreational developments and transportation corridors are common within this type; care must be taken when locating structures in order to avoid damage by flooding. Management should emphasize the importance of the understory shrub layer in streambank stabilization; a buffer strip should be maintained adjacent to rivers and streams. Under certain conditions, fire may be used as a tool to extend the life span or rehabilitate a stand. The presence of native shrubs and forbs is indicative of the sites potential. Once this native component is eliminated, the success of rehabilitation efforts is questionable (Hansen *et al.* 1995).

Forage production is rated from low to moderate due to the dense nature of the stands (Padgett *et al.*, Hansen *et al.* 1995). Most sites are presently subjected to heavy grazing pressures because of their topographic location and ease of access. Timber productivity ranges from low to moderate (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

The erosional and depositional pattern, and meandering of a river affects the distribution of plant communities. The rate of meandering determines the seral stage of the communities. Where the river meanders frequently, few stands progress to later successional stages. Near the outer edges of the floodplain, the effect of the river is less pronounced, allowing later successional stages to develop. In the absence of fluvial disturbance and sediment deposition, succession continues from the *Populus angustifolia/Cornus sericea* plant association to the Conifer/*Cornus sericea* habitat type. In the foothills of Montana, succession continues to *Fraxinus pennsylvanica/Prunus virginiana, Acer negundo/Prunus virginana*, or the *Juniperus scopulorum/Cornus sericea* types. In other instances, this plant association may be successional to the *Salix geyeriana/Calamagrostis canadensis* or *Salix lutea/Calamagrostis canadensis* stands, depending upon elevation.

On sites that are relatively undisturbed, the understory of the Populus angustifolia community will contain a diverse, dense shrub layer. With moderate levels of grazing or browsing, there will be an increase in *Symphoricarpos* spp. and Rosa spp., with a decrease in other shrubs. If grazing or browsing pressures continue and disturbance is severe enough, all shrubs can be eliminated and the understory will be converted to *Populus angustifolia*/Herbaceous plant association dominated by species such as *Poa pratensis, Phleum pratense, Bromus inermis*, and *Centaurea maculosa*. Once the stand has converted from a shrub-dominated understory to one that is dominated by herbaceous species, the ability to return the site to its former state is very difficult (Hansen *et al.* 1995, Padgett *et al.* 1989, and Youngblood *et al.* 1985).

Because of it's close proximity to streams and rivers and the flat topography, recreational developments and transportation corridors are common within this type; care must be taken when locating structures in order to avoid damage by flooding. Management should emphasize the importance of the understory shrub layer in streambank stabilization; a buffer strip of the *Populus angustifolia* dominated plant associations should be maintained adjacent to rivers and streams. Under certain conditions, fire may be used as a tool to extend the life span or rehabilitate a stand. The presence of native shrubs and forbs is indicative of the sites potential. Once this native component is eliminated, the success of rehabilitation efforts is questionable (Hansen *et al.* 1995).

Forage production is rated from low to moderate due to the dense nature of the stands (Padgett *et al.* 1989, Hansen *et al.* 1995). Most sites are presently subjected to heavy grazing pressures because of their topographic location and ease of access. Timber productivity ranges from low to moderate (Hansen *et al.* 1995).

WILDLIFE FUNCTIONS

Populus angustifolia and *Cornus sericea* are browsed by whitetail deer and moose, and used by beaver for food and building materials. Understory species provide food and cover for a variety of waterfowl, songbirds and small mammals. The streamside location of this plant association is very important in providing thermal cover, debris recruitment, and streambank stability for fish habitat (Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

Classification based on 10 stands in Montana, 10 stands in Utah, 10 stands in Colorado, and 10 stands in Idaho.

AUTHOR/DATE

Linda Williams/1995-09-20

Populus angustifolia/Rhus trilobata

Narrow-leaf cottonwood/Skunkbush sumac

RANGE

This association is a regional endemic known from Colorado, Utah, Idaho, Nevada, and Montana.

ENVIRONMENT

Occurs at mid-elevations on large islands, old stream terraces and benches of rivers. Stands are usually within 1 meter of the high water line but can also occur on higher terraces (Padgett *et al.* 1989, Manning and Padgett 1995, Kittel *et al.* 1999).

SOILS

A xeric moisture regime was indicated by soils in all stands sampled. Parent materials are often calcareous and soils are alkaline. Water-holding capacity ranged from low to moderate. No mottles were encountered. Particle size class were variable, though most were loamy-skeletal or sandy-skeletal at least in the subsurface horizons (Padgett *et al.* 1989, Manning and Padgett 1995, Kittel *et al.* 1999).

VEGETATION COMPOSITION

The overstory of this plant association is dominated by *Populus angustifolia* or *Populus acuminata* (20-40% cover). Occasional stems of *Populus acuminata* or *Populus deltoides* are reported in Colorado stands. Other trees/tall shrubs are typically absent, though *Betula occidentalis* occurred in one community and *Quercus gambellii* seedlings were in two communities in Utah. *Rhus trilobata* forms a dense shrub layer that is often impenetrable. *Salix exigua* and *Salix liguilifolia* (Colorado) may also be present. *Poa pratensis* often occupies any open areas, while *Elymus* spp., *Clematis ligusticifolia*, *Cynoglossum officianale*, *Gilia aggregata* may be present in minor amounts (Padgett *et al.* 1989, Kittel *et al.* 1999).

ADJACENT COMMUNITIES

Adjacent riparian associatons may be dominated by the *Salix exigua, S. lutea*, *Betula occidentalis* or *Populus angustifolia* with an understory dominated by *Cornus sericea* or *Rosa woodsii*.

MANAGEMENT CONSIDERATIONS

Cottonwood and the diagnostic shrub (*Rhus trilobata*) are seldom browsed when other feed is available. However, high stocking rates and depletion of other palatable species may result in this type being heavily browsed. Flow regulation and flood control results in a decline of cottonwood forests. *Rhus* has been noted as a sprouting species capable of colonizing large areas and perhaps responding with increased cover following fire.

SUCCESSIONAL DYNAMICS

This association is late seral within the riparian area and is transitional to uplands. It us only considered riparian due to the continued presence of *Populus* spp. on sites no longer amenable to the germination and establishment of new individuals of *Populus.* There also appeared to be no regeneration of *Populus* spp, in these communities by sucker establishment. This may be related in part to livestock browsing and trampling. Undergrowth and soil characteristics indicate this type to be early successional to an upland site and the presence of *Quercus gambellii* in Utah and *Juniperus scopulorum* in Idaho may indicate a trend towards these types (Padgett *et al.* 1989).

WILDLIFE FUNCTIONS

Rhus trilobata is considered only fair browse for deer. In the absence of other feed it may be browsed on. The mature cottonwood trees in this association provide habitat for cavity dependent species.

CLASSIFICATION COMMENTS

Classification is based on 5 stands in Utah, 32 stands in Colorado, 5 stands in Nevada and observations of the association in Idaho and Wyoming.

AUTHOR/DATE(UPDATE)
Mabel Jankovsky-Jones/1996-10-05(2001-02-28)

Populus tremuloides/Cornus sericea

Quaking aspen/Red-osier dogwood

RANGE

The *Populus tremuloides/Cornus sericea* plant association is a major type known from eastern and southern Idaho, east-central Nevada, Montana, and the Okanogan Highlands of northeastern Washington (Kovalchik 1993, Hansen *et al.* 1995, Manning and Padgett 1995, Hall and Hansen 1997). It may also exist in eastern Oregon, being included with stands of *Populus tremuloides/Alnus incana-Cornus sericea* (Crowe and Clausnitzer 1997). In Idaho it is known from the Salmon River, Teton River, Henry's Fork, Silver Creek, Portneuf River, and Boise River drainages (Collins 1979, Jankovsky-Jones 1996, Jankovsky-Jones 1997a, Jankovsky-Jones *et al.* 2000).

ENVIRONMENT

Populus tremuloides/Cornus sericea is found from low foothills and floodplains to high mountain valleys throughout its range. Elevations are as low as 2200 feet in Montana, 3000 feet in northeast Washington, and in the Boise River area of Idaho (Kovalchik 1993, Hansen *et al.* 1995, Moseley 1998). Mid-elevation sites are along mountain rivers, ranging from 3300 feet on the Salmon River to 4400 feet on the Henry's Fork in Idaho (Collins 1979, Jankovsky-Jones 1996). Elevations are as high as 6300 feet m in Montana, 6600 feet in eastern Idaho, and 6900 feet in Nevada (Hansen *et al.* 1995, Manning and Padgett 1995, Hall and Hansen 1997). *Populus tremuloides/Cornus sericea* is typically in narrow to broad U or V-shaped valleys, canyons, and floodplains which are seasonally flooded (Hansen *et al.* 1995, Hall and Hansen 1997). It is often along stable, low to moderate gradient streams on alluvial terraces or canyon colluvium, but can also be near seeps and springs (Kovalchik 1993, Manning and Padgett 1995). The association is sometimes found away from streams but usually in moist areas (such as depressions or old channels). These areas typically have a near surface water table in the spring which drops up to 2 m by late summer.

SOILS

Populus tremuloides/Cornus sericea is usually on Mollisol soils (Aquolls, Borolls, Haploxerolls) but also sometimes Entisols (shallow Fluvents, Aquic Xerofluvents) (Hansen *et al.* 1995, Manning and Padgett 1995). These Mollisols may have a surface muck layer derived from leaf litter and occasionally have enough organic matter to be Sapric Histisols (Kovalchik 1993, Hall and Hansen 1997). Soils are usually derived from coarse to fine alluvium (occasionally colluvium or ash) overlying river gravels and cobbles. Soil textures are sandy-skeletal, loamy skeletal, fine-loamy, silty loam, or organic loam which have low to high water holding capacity (Kovalchik 1993, Hansen *et al.* 1995, Manning and Padgett 1995, Hall and Hansen 1997).

VEGETATION COMPOSITION

Due to its broad geographical range, *Populus tremuloides/Cornus sericea* has variable vegetation. The dominant species are *Populus tremuloides* (Collins 1979, Kovalchik 1993, Hansen *et al.* 1995, Manning and Padgett 1995, Jankovsky-Jones 1996, Hall and Hansen 1997, Moseley 1998). In northern areas, sub-dominant trees include *Populus trichocarpa* and *Betula papyrifera* while conifers, such as *Picea engelmannii* or *Abies* spp., may be present elsewhere. Other tall shrubs, sometimes mixed with *Cornus sericea*, include *Salix* spp. (usually *Salix bebbiana*), *Betula occidentalis*, *Alnus incana, Prunus virginiana*, and *Crataegus douglasii*. Rosa woodsii (or other Rosa spp) typically dominates the low shrub understory and *Symphoricarpos albus* (sometimes *Symphoricarpos occidentalis)* (Collins 1979, Kovalchik 1993, Jankovsky-Jones 1996, Hall and Hansen 1997). The herbaceous understory is dominated by forbs which vary from low to moderate cover depending on the density of *Cornus sericea*. The most common species, all with cover less than 15% but sometimes with high constancy, are *Equisetum* spp. (*Equisetum arvense* and *E. hyemale*), *Actaea rubra, Smilacina* spp., *Galium* spp., (*Galium triflorum* and *G. aparine*), and *Urtica dioica*. Other forbs which are sometimes en-countered include *Viola* spp., *Taraxacum officinale, Osmorhiza chilensis, Geum macrophyllum*, and *Thalictrum* spp. (Collins 1979, Kovalchik 1993, Hansen *et al.* 1995, Manning and Padgett 1995, Jankovsky-Jones 1996, Hall and Hansen 1997, Moseley 1998). The graminoid layer has sparse cover, low diversity, and is dominated by exotic species. The common exotic grasses are *Bromus* spp. (usually *Bromus inermis* with up to 10% cover), *Agrostis stolonifera,* and *Poa pratensis*.

Even less common are native graminoids including *Calamagrostis canadensis, Bromus ciliatus, Carex* spp., and *Elymus glaucus*. The ground cover is predominantly litter (thickest where not flooded) with less than 5% cover of rocks (Kovalchik 1993, Manning and Padgett 1995, Moseley 1998).

ADJACENT COMMUNITIES

Adjacent associations with a similar moisture regime may include other *Populus tremuloides, Alnus incana, Salix* spp., or *Populus* spp. dominated types with *Rosa woodsii, Salix lutea, Cornus sericea, Prunus virginiana*, and *Crataegus douglasii* in the understory (Manning and Padgett 1995, Hall and Hansen 1997). Wetter sites range from saturated stands of *Typha* spp., *Scirpus* spp., *Eleocharis palustris, Carex utriculata, or Phalaris arundinacea* to *Alnus incana, Cornus sericea, Salix exigua*, or *Spiraea douglasii* dominated associations (Kovalchik 1993, Hansen *et al.* 1995, Hall and Hansen 1997). Adjacent drier riparian sites include *Populus tremuloides/Symphoricarpos albus* or *Pseudotsuga menziesii/Symphoricarpos albus* (Kovalchik 1993). Neighboring upland associations include pinyon-juniper, *Abies concolor, Pseudotsuga menziesii, Picea engelmannii*, and *Pinus contorta,* and *Artemisia tridentata* associations (Hansen *et al.* 1995, Manning and Padgett 1995, Moseley 1998).

MANAGEMENT CONSIDERATIONS

Populus tremuloides/Cornus sericea provides low to moderate livestock forage due to a limited understory. However, livestock will bed in the shade of this association causing trampling, soil compaction, and weed invasion. Livestock also browse both *Populus tremuloides* root suckers and *Cornus sericea*. Overgrazing will lower their vigor, eventually eliminating them from the site (Hansen *et al.* 1995, Hall and Hansen 1997, Ogle 1997). *Populus tremuloides* is intolerant of shade and reproduces mainly by clonal root suckers, but also by seeds germinating on moist mineral soil (Crowe and Clausnitzer 1997). *Cornus sericea* also reproduces from root resprouting. *Populus tremuloides* suckers grow best and proliferate after moderate intensity fire or overstory tree removal, though high intensity fires kill the roots. Fires are uncommon in this moist association and most young trees will die after a fire (though older trees resist some fires). Damage to trunks by fire allows insect or fungal species into trees which can eventually kill them (Hansen *et al.* 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997). In order for the plant association to recover after fire or logging, livestock grazing of root suckers must be eliminated for at least 3 years (Ogle 1997). Though beneficial for *Populus tremuloides* reproduction, logging for the limited lumber, fenceposts, or fuel wood is often not compatible with wet, compactible soils (Hansen *et al.* 1995, Hall and Hansen 1997, Ogle 1997). Similarly, recreation values are high but development is not compatible due to site wetness. Both *Populus tremuloides* and *Cornus sericea* reduce erosion by slowing overland flow, providing woody debris, and stabilizing streambanks (Manning and Padgett 1995). They are also good for long-term revegetation. Moreover, decomposition of their leaf litter improves soil nitrogen, organic matter, and fertility (Kovalchik 1993).

SUCCESSIONAL DYNAMICS

Several shrub dominated plant associations appear to be early seral or transitional to *Populus tremuloides/Cornus sericea*. These associations, which colonize sites with less developed soils and recently deposited alluvium, include *Alnus incana, Betula occidentalis, Salix* spp., and *Populus trichocarpa* or *Populus angustifolia* dominated types often with a *Cornus sericea* understory (Hansen *et al.* 1995, Hall and Hansen 1997). Similarly, the loss of *Betula occidentalis* from the early seral *Populus tremuloides/Betula occidentalis* association would likely result in a *Populus tremuloides/Cornus sericea* association (Collins 1979, Manning and Padgett 1995). Though *Populus tremuloides/Cornus sericea* is on sites too wet for conifer dominance, changes in hydrology would result in movement toward conifer spp. (e.g. *Abies lasiocarpa, Picea* spp., *Picea engelmannii, Pinus ponderosa, Pseudotsuga menziesii)* dominance (Kovalchik 1993, Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997). For example, overgrazing by livestock and wildlife may reduce *Populus tremuloides* and shrubs, promote establishment of weedy herbaceous species and result in replacement by the disclimax *Populus tremuloides/Poa pratensis* association (Hansen *et al.* 1995, Hall and Hansen 1997).

WILDLIFE FUNCTIONS

Populus tremuloides/Cornus sericea has high wildlife cover and forage value during most of year. *Populus tremuloides* suckers, buds, and bark are often heavily browsed by beaver, rabbits, moose, deer, small mammals, and elk (Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997, Ogle 1997). Moose also utilize *Cornus sericea* though its density may

reduce use by some species. Numerous bird species nest and feed in aspen including grouse, flickers, red-breasted nuthatches, chickadees, sapsuckers, grosbeaks, crossbills, and woodpeckers (Hansen *et al.* 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997). The roots and vegetation of this association often overhang streams providing excellent fish cover.

CLASSIFICATION COMMENTS

Populus tremuloides/Cornus sericea is an accepted plant association with a large amount of supporting data throughout its range. Crowe and Clausnitzer (1997) described a similar *Populus tremuloides/ Alnus incana-Cornus stolonifera* [syn. *Cornus sericea*] association which may be a variation of *Alnus incana-Cornus sericea*/Mesic forb and possibly includes *Populus tremuloides/Cornus sericea* stands. Many other studies recognize similar associations which sometimes have *Populus tremuloides* as a co-dominant species. These associations are dominated by *Betula occidentalis*, various *Populus* or conifer spp., or *Alnus incana* with a shrub layer dominated by *Cornus sericea* (Kovalchik 1993, Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997). These associations are successionally related to *Populus tremuloides/Cornus sericea* and complicate classification.

AUTHOR/DATE(UPDATE)

Chris Murphy/1998-12-08(2000-12-27)

Pseudotsuga menziesii/Cornus sericea

Douglas-fir/Red-osier dogwood

RANGE

This association in known from Montana (Hansen *et al.* 1995), Idaho (Hall and Hansen 1997), and Utah, where it is sometimes included in the Conifer/*Cornus sericea* association of Padgett *et al.* (1989).

ENVIRONMENT

This type occurs in mountains and the edges of high valleys. Elevations range from 3600 to 7400 feet. It occurs on alluvial benches and terraces of major streams and rivers and along small streams and creeks, usually in narrow, V-shaped valleys.

SOILS

The overlying litter layer is variable and may be moderately extensive or practically non-existent depending on the particular site. The texture of soils in the upper layers range from fine sands to silts and clays. The underlying substrate is generally alluvium, composed of coarse sands, gravels and cobbles. Large rocks may be present where this type occupies locations at the base of scree slopes. Sites tend to be well-drained due to this unconsolidated layer (Hall and Hansen 1997).

VEGETATION COMPOSITION

Stands are characterized by a *Pseudotsuga menziesii* overstory with *Populus tremuloides, Populus trichocarpa, Pinus ponderosa*, and *Juniperus scopulorum* occasionally associated as minor components. Where *Pseudotsuga menziesii* forms a dense canopy the understory is relatively sparse, and visa versa. The shrub layer is characterized by *Acer glabrum* and *Cornus sericea* as consistent members, with *Rosa woodsii* and *Prunus virginiana* also being common. The herbaceous layer is dominated by a diverse assemblage of low-growing plants, all with relatively low cover, probably due to shading by the tree and shrub canopy (Hall and Hansen 1997).

ADJACENT COMMUNITIES

Adjacent riparian associations include *Populus trichocarpa, Salix* spp., *Betula occidentalis, Alnus incana*, and *Populus tremuloides* types. Adjacent uplands support sagebrush-steppe, *Pseudotsuga menziesii*, and *Pinus ponderosa* types.

MANAGEMENT CONSIDERATIONS

Cornus sericea, Prunus virginiana, and *Acer glabrum* are preferentially browsed by livestock and wild ungulates and may decrease as grazing intensifies, leaving disturbance tolerant shrubs, such as *Symphoricarpos albus* and *Rosa woodsii* in high cover. Continued heavy grazing may cause a loss of shrubs altogether, leaving a depauperate understory of *Poa pratensis* (Hall and Hansen 1997). The streamside position of this association makes it important in providing thermal cover, debris recruitment, and streambank stability. *Cornus sericea* is an excellent shrub for controlling erosion along streambanks. This is especially important because this association is often along the headwaters of steep-gradient streams.

SUCCESSIONAL DYNAMICS

Stands of *Populus tremuloides* and a variety of shrub-dominated associations, typically *Salix* spp. and *Alnus incana*, represent seral stages of this

type. *Pseudotsuga menziesii* will probably be present and successfully reproducing in these stands, although usually in the understory. Heavy, persistent livestock grazing may result in a loss of shrubs or change in shrub composition.

WILDLIFE FUNCTIONS

This association provides valuable hiding cover and shade to a variety of species. Big game use may be high, depending upon the time of year. Whitetail deer may use this type year round as cover, while other big game species may use this type as cover only in the winter. *Cornus sericea* is favored by moose and beaver (Hall and Hansen 1997).

CLASSIFICATION COMMENTS

This plant association has been thoroughly sampled and described in Idaho and Montana. Padgett *et al.* (1989) describe a much broader Conifer/*Cornus sericea* association that includes the one described here, in addition to ones dominated by other conifers, such as *Abies lasiocarpa* and *Picea engelmannii.*

AUTHOR/DATE

Bob Moseley/1998-12-01

Alnus incana/Cornus sericea

Mountain alder/Red-osier dogwood

RANGE

Stands occur in Utah (Padgett *et al.* 1989), Nevada (Manning and Padgett 1995), Oregon (Crowe and Clausnitzer 1997), and Idaho (Jankovsky-Jones 1996, 1997a, 1997b, 1997c).

ENVIRONMENT

This plant association occurs immediately adjacent to streams that are subject to seasonal fluvial scouring and deposition. Surface topography is typically undulating and slopes are often 2% or less. Valley bottoms are narrow to moderately wide (Padgett *et al.* 1989). Elevations range from below 3,000 to nearly 8,000 feet.

SOILS

Soils form by fluvial deposition and scouring and generally have more that 35% coarse fragments at least in the subsurface horizons. Estimated available water-holding capacity ranged from low to moderate. Water tables are closely related to the height of the community above the water level of adjacent streams. Soils have been classified as Aquic Cryofluvents, Typic Udifluvents, Mollic Xerofluvents, and Typic and Aquaic Cryoborolls (Padgett *et al.* 1989).

VEGETATION COMPOSITION

Alnus incana dominates the tall shrub overstory of this community. *Betula occidentalis* may occasionally be present as a codominant. *Cornus sericea* forms a dense shrub layer *with Salix lutea, S. lasiolepis, Philadelphus lewisii, Crataegus douglasii*, and *Rosa woodsii*. The herbaceous layer is usually sparse, with no species occurring in high abundance (Padgett *et al.* 1989).

ADJACENT COMMUNITIES

Because of the wide elevational range of this type, adjacent upland communities range from sagebrush-steppe to coniferous woodland and forest types.

MANAGEMENT CONSIDERATIONS

The dominant shrub species are capable of holding coarse textured streambank materials in place, due to their rooting structure, and can act as filters for upland water and soil movement into channel systems. Livestock grazing is limited because of dense undergrowth (Padgett *et al.* 1989).

SUCCESSIONAL DYNAMICS

This early seral type occurs adjacent to streams and is frequently subjected to seasonal flooding, scouring and deposition. It appears to be long-lived; succession to other types is probably slow. At lower elevations, this plant association is replaced by the *Betula occidentalis/Cornus sericea* plant association and in some areas these two communities grade into one another with both *Alnus incana* and *Betula occidentalis* present in the overstory. *Alnus incana, Cornus sericea*, and *Betula occidentalis* are well adapted to growing immediately adjacent to streams. They appear to withstand periodic flooding and seem to require the more aerated ground water that flows through the coarse-textured subsurface soils with which they are commonly associated (Padgett *et al.* 1989, Manning and Padgett 1995).

WILDLIFE FUNCTIONS

The low tree/shrub layers provide structural diversity for birds and other animals, while providing shade to the adjacent streams (Padgett *et al.* 1989).

CLASSIFICATION COMMENTS

Classification is based on 5 plots from Utah (Padgett *et al.* 1989), 2 plots from Nevada (Manning and Padgett 1995), 17 plots in Oregon, and 2 plots from Idaho.

AUTHOR/DATE

Bob Moseley/1997-12-31

Alnus incana/Mesic forb

Mountain alder/Mesic forb

RANGE

Minor type in Montana, Idaho, Nevada, Utah, and Colorado.

ENVIRONMENT

The *Alnus incana*/Mesic forb plant association occurs on terraces and floodplains adjacent to streams with bedloads of boulders, cobble, and gravel (Padgett *et al.* 1989).

SOILS

Soils are generally shallow; surface textures range from sand to loamy sand. Mottling is typically present within 25 cm of the surface, indicating a seasonally high water table, and most sites remain somewhat moist and well-aerated through summer

VEGETATION COMPOSITION

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

ADJACENT COMMUNITIES

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

MANAGEMENT CONSIDERATIONS

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

SUCCESSIONAL DYNAMICS

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

WILDLIFE FUNCTIONS

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

CLASSIFICATION COMMENTS

The *Alnus incana*/Mesic forb plant association has been described in a number of classifications. Stands considered synonomous include those described in Nevada (Manning and Padgett 1995),

Colorado (Kittel *et al.* 1999), and Utah and southeastern Idaho (Padgett *et al.* 1989). Kovalchik *et al.* 's (1993) Washington *Alnus incana/*Mesic forb stands have shrub and tree composition similar to Idaho, Utah, and Nevada stands. The understory of Kovalchik's stands are somewhat distinct, however, with *Cinna latifolia, Streptopus amplexifolius*, and *Athyrium* spp. having high constancy. Kovalchik's stands are more appropriately treated as other associations. Hansen *et al.* (1995) treats all stands with *Alnus incana* as the dominant shrub as the *Alnus incana* dominance type.

AUTHOR/DATE

Linda Williams/1996-04-22(2000-10-16)

Artemisia tridentata ssp. tridentata/ Elymus cinereus

Basin big sagebrush/Basin wildrye

RANGE

This plant association has been reported from Colorado, Wyoming, Nevada, Idaho, Oregon, and possibly Wyoming (Hironaka *et al.* 1983, Weixelman *et al.* 1996, Reid *et al.* 2000).

ENVIRONMENT

This association is often in the transition zone between drier upland associations and the wetter riparian zone. *Artemisia tridentata* ssp. *tridentata* is an indicator of deep soil. It is most often found in areas of deep alluvial deposition on the valley bottom, usually on stream terraces, but also has been observed on toeslopes. Seasonal flooding on these sites is rare. Occurrences are generally below 6,000 feet in the north (Idaho) and 8,000 feet in the south (Nevada).

SOILS

The surface soil material is silty loam to sandy loam and can be very deep. Where coarse fragments occur in the soil profile, they are generally less than 60% by volume in any given horizon. In some stands, surface soils are moist into late summer and depth to field capacity moisture is within a meter of the surface in the summer. On deep alluvial terraces along larger rivers, this depth may be as deep as 3 m and the surface soils are dry by late summer. Soils at higher elevation sites in Nevada have been classified as Cryoborolls, while at lower elevations in Idaho they are Haploxerolls (Weixelman *et al.* 1996; Fisher and Moseley1997).

VEGETATION COMPOSITION

Artemisia tridentata ssp. *tridentata* dominates the shrub layer and a mixture of graminoids and forbs dominate the herbaceous layer in stands of high ecological condition, however, *Elymus cinereus* usually is the most abundant species, sometimes reaching near 100% cover. Basin big sagebrush generally has a canopy of 10-50%. It has a stout taproot that grows to a depth of 1 to 4 m and is able to tap moisture deep in the soil profile. Therefore, basin big sagebrush is considered a phreatophyte. Cover of *Chrysothamnus* spp. is low in high quality stands. Total graminoid cover can be as high as 70%, with *Elymus cinereus* comprising most of this. Total forb cover is generally between 5 and 20% (Weixelman *et al.* 1996).

ADJACENT COMMUNITIES

This association largely occurs in the sagebrush-steppe zone, with adjacent upland associations being dominated by various *Artemisia tridentata* varieties. Numerous riparian associations occur in the adjacent floodplain.

MANAGEMENT CONSIDERATIONS

The diagnostic shrub and graminoid are only moderately palatable. During much of the year *Elymus cinereus* is coarse and unpalatable, it can however be damaged if young spring and fall growth is grazed. Spring and winter rest periods are needed to replenish the root reserves of *Elymus cinereus*. Elymus cinereus is generally resistant to fire, but can be eliminated in hot fires when soils are very dry. *Artemisia tridentata* will decrease with fire. Prescribed burns should be used only when soil moisture is high and at sites that have remnants of palatable grasses. Livestock should be excluded from burned sites to allow root reserves to build up and to prevent premature utilization of new shoots. Both *Elymus cinereus* and *Artemisia tridentata* ssp. *tridentata* can be used for range restoration and soil stabilization (Kittel *et al.* 1999).

SUCCESSIONAL DYNAMICS

Indicators of disturbance in this association, such as heavy livestock grazing or fire, include high coverage of species such as *Chrysothamnus* spp., *Iva axillaris, Iris missouriensis,* and *Bromus tectorum* (Weixelman *et al.* 1996). At low elevations in southwestern Idaho, *Sarcobatus vermiculatus* can occur in stands with canopy cover equal to the *Artemisia*. It is unknown if this reflects a successional stage due to livestock grazing.

WILDLIFE FUNCTIONS

Artemisia tridentata is not preferred browse but is a very important emergency food during winter months. Sage grouse, mule deer, elk, and pronghorn will forage on plants. Pygmy rabbits forage extensively on big sagebrush. This plant association does provide cover for upland game birds and small mammals (USDA 2000).

CLASSIFICATION COMMENTS

Artemisia tridentata ssp. *tridentata/Elymus cinereus* is included in Hironaka *et al.* (1983) as a habitat type known to be present in Idaho and adjacent states that was not studied as part of their classification. This association has recently been described in Nevada (Weixelman *et al.* 1996) and Idaho (Moseley 1998). A considerable amount of literature refers to plant associations with *Artemisia tridentata* as the dominant shrub. However, identificaion to the subspecies has not always occurred. The National Vegetation Classification (Reid *et al.* 2000) recognizes a broadly defined *Artemisia tridentata/Elymus cinereus* association that is used when subspecies is unknown. When subspecies is known the *Artemisia tridentata* ssp. *tridentata/Elymus cinereus* and *Artemisia tridentata* ssp. *vaseyana/Elymus cinereus* plant associations should be recognized.

AUTHOR

Bob Moseley/1998-01-05(2000-12-01)

Betula glandulosa/Carex utriculata

Bog birch/Beaked sedge

RANGE

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

ENVIRONMENT

This plant associaton occurs adjacent to beaver ponds, lakes, or marshes, and on seeps, swales and wet alluvial terraces adjacent to low gradient meandering streams (Hansen *et al.* 1995).

SOILS

Soils are commonly flooded until mid summer, and are saturated year round on wetter sites. Redox concentrations are present in some mineral soils; redox depletions (gleyed soil) occur rarely. Organic matter accumulations may form floating, quaking mats as this type encroaches onto open water. Drier extremes have shallow organic horizons overlying deeper mineral soil (Hansen *et al.* 1995).

VEGETATION COMPOSITION

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

ADJACENT COMMUNITIES

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

MANAGEMENT CONSIDERATIONS

Saturated soils are highly susceptible to soil compaction and streambank sloughing when used by livestock and heavy machinery. Overuse may result in reduced vigor or eventual elimination of shrubs from the site. Burning of this type can temporarily increase productivity of Carex species. However, care should be taken when burning along streambanks because of the excellent erosion protection provided by the *Betula glandulosa/Carex utriculata* association (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

The *Betula glandulosa/Carex utriculata* plant association represents a fairly stable type. Grazing my decrease the vigor of bog birch and increase the presence of species tolerant of grazing including *Agrostis stolonifera, Poa pratensis, Poa palustris*, and *Juncus balticus*.

WILDLIFE FUNCTIONS

Betula glandulosa is a valuable browse species for elk (Kufeld 1973). Communities dominated by *Betula glandulosa* may function to stabilize channel banks (frequently creating overhanging banks) and provide shade creating quality fish habitat.

CLASSIFICATION COMMENTS

The *Betula glandulosa/Carex utriculata* plant association was first described by Hansen *et al.* (1995). Stands dominated by *Betula glandulosa* are common throughout the Rocky Mountain region.

AUTHOR/DATE(UPDATE)

Linda Williams/1995-09-05(2001-03-01)

Betula occidentalis/Cornus sericea

Water birch/Red-osier dogwood

RANGE

The plant association is known from Montana and eastern Washington, south to Idaho, Utah, and Nevada.

ENVIRONMENT

Betula occidentalis/Cornus sericea is found at elevations ranging from 2100 to 7500 feet. It occurs on gentle slopes of stream banks and terraces of moderate to high gradient mountain and foothill streams. The surface topography of sites is often undulating (Padgett *et al.* 1989, Manning and Padgett 1995).

SOILS

Soils are formed in alluvium and textures are coarse to fine, ranging from loamy skeletal and fine-loamy over sandy-skeletal, to coarse-loamy. Water tables were typically below the depth of the soil pit (Padgett *et al.* 1989, Manning and Padgett 1995).

VEGETATION COMPOSITION

Betula occidentalis clearly dominates the tall shrub overstory with over 30% cover. The undergrowth is characterized by often impenetrable shrub undergrowth dominated by *Cornus sericea. Rosa woodsii* and tall *Salix* spp. are frequently present with up to 15% cover. In southwest Idaho stands, *Philadelphus lewisii* was present in both plots with 10% cover. The herbaceous layer varies inversely with the shrub layer. Herbaceous species that are consistently present include *Smilacina stellata, Equisetum* spp., *Galium triflorum, Elymus glaucus,* and *Poa pratensis.*

ADJACENT COMMUNITIES

Adjacent upland associations include those dominated by *Pseudotsuga menziesii, Pinus edulis, Juniperus osteosperma, Pinus ponderosa, Quercus gambellii, Artemisia tridentata*, and/or *Cercocarpus ledifolius.* Adjacent riparian associations include those dominated by various *Populus* spp. (Padgett *et al.* 1989, Manning and Padgett 1995).

MANAGEMENT CONSIDERATIONS

This association is important for streambank stabilization. Livestock use is typically impeded due to the dense shrub layer formed by *Cornus sericea* (Manning and Padgett 1995).

SUCCESSIONAL DYNAMICS

Pseudotsuga menziesii, Picea pungens, and *Abies lasiocarpa* are present in minor amounts in some communities, which may result in the eventual replacement of this type by the Conifer/*Cornus sericea* plant association. In some associations *Populus tremuloides, P. angustifolia,* or *Acer negundo* may indicate succession toward associations dominated by these species with an undergrowth of *Cornus sericea* (Padgett *et al.* 1989, Manning and Padgett 1995). Manning and Padgett (1995) note that overstory and undergrowth dominants are well adapted to sites in Nevada, and this may be a long-lived type which may survive until channel incision and/or lateral migration occurs.

WILDLIFE FUNCTIONS

Streams lined with stands of this association provide shade, travel corridors, and hiding cover for a variety of wildlife species. *Betula occidentalis* is usually only lightly browsed unless other forage is not available. *Cornus sericea* provides food and cover for mule deer, moose, elk, mountain goats, cottontail rabbits, snowshoe hares, and many birds. The fruits are an important back bear food and are also eaten by songbirds, grouse, quail, partridge, cutthroat trout, ducks, crows, mice, and other mammals. The young stems and bark are eaten by deer mice, meadow voles, and other small rodents. Beaver may use both of the diagnostic shrubs for food and building materials (Crowe and Clausnitzer 1997, Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

This is a well-documented type with classification based on 9 stands in Nevada (Manning and Padgett 1995), 14 stands in Utah and southeastern Idaho (Padgett *et al.* 1989), and an unknown number of stands in Montana (Hansen *et al.* 1995) and Washington (Evans 1989).

AUTHOR/DATE(UPDATE)

Linda Williams/1996-06-13(1998-12-01)

*Betula occidentalis/*Mesic forb

Water birch/Mesic forb

RANGE

The *Betula occidentalis*/Mesic forb plant association is of minor occurrence throughout the western United States in Colorado, Nevada, California, Oregon, Idaho, and Utah.

ENVIRONMENT

The *Betula occidentalis/*Mesic Forb plant association occurs on terraces and floodplains in narrow to moderately wide valleys. Stands may be well developed extending away from the channel edge or stringers that are confined to the channel edge where the valley wall meets the stream. Stands may also occur in association with seeps and spring fed channels (Padgett *et al.* 1989, Kittel *et al.* 1999).

SOILS

Shallow soils are formed in alluvium with mottles common within 20 inches of the soil surface indicating a seasonally high water table (Padgett *et al.* 1989, Kittel *et al.* 1999). Soils are very shallow and poorly developed over boulders in stands occurring in narrow, high gradient valleys.

VEGETATION COMPOSITION

Betula occidentalis clearly dominates the tall shrub overstory with 30 to nearly 100% cover. The undergrowth is characterized by mixed forbs with *Heracleum lanatum, Geranium richardsonii, Equisetum arvense, Aconitum columbianum, Epilobium angustifolium, Smilacina stellata* and other forbs with over 100% cover in combination. *Aquilegia formosa* is conspicuously present with up to 30% cover in Idaho stands that are associated with springs along the middle Snake River. A somewhat sparse low shrub layer is often present and may include *Rosa woodsii, Salix* spp., or *Cornus sericea*. Graminoids may be absent or *Carex microptera, Glyceria elata, Agrostis stolonifera*, and *Poa pratensis* may contribute a combined cover of up to 25%.

ADJACENT COMMUNITIES

Adjacent upland associations include forests, dominated by *Abies concolor, Pinus ponderosa,* and *Pinus edulis, Agropyron-Festuca* grasslands, or *Artemisia*-steppe vegetation. Adjacent riparian associations include those dominated by *Populus tremuloides, Rosa woodsii*, and/or various tall willows (Padgett *et al.* 1989, Manning and Padgett 1995, Moseley 1998).

MANAGEMENT CONSIDERATIONS

This plant association is open and lacks a dense low shrub layer. Livestock are likely to use these associations for forage and shade. Early season grazing should be avoided to increase vigor of the dominant shrub. The coarse textured soils are generally erodible and livestock use should be managed to avoid streambank damage. Shoots of water birch are killed by fire, but plants will resprout from uninjured basal buds (Youngblood *et al.* 1985, Hansen *et al.* 1995). The species is useful for revegetating disturbed sites. Seedlings that are 1 to 2 years old do well when planted in moist sites in the spring. Direct seeding has limited success. Once established the species is an effective streambank stabilizer (USDA 2000).

SUCCESSIONAL DYNAMICS

The presence of *Pinus ponderosa, Picea engelmannii,* and *Populus tremuloides*, among others, indicates a possible successional trend toward coniferous tree-dominated associations (Padgett *et al.* 1989). Manning and Padgett (1995) suggest the *Betula occidentalis*/Mesic forb association may represent good ecological condition, particularly when species such as *Aconitum columbianum* or *Smilacina stellata* are undergrowth dominants. Through heavy grazing, however, the type may be replaced by the *Betula occidentalis/Poa pratensis* association (Padgett *et al.* 1989, Moseley 1998).

WILDLIFE FUNCTIONS

Betula occidentalis associations frequently occur as stringers along streams that provide migration routes, hiding cover, and shade for both large and small mammals. Water birch is not an important browse species for big game animals, but use will occur if other woody species are not available

(Hansen *et al.* 1995). The catkins, buds, and seeds of water birch are eaten by sharp-tailed grouse, spruce grouse, ruffed grouse, redpolls, pine siskin, chickadees, and kinglets. Sap oozing from holes is feed for hummingbirds and red-naped sapsuckers. Plants that overhang stream banks provide shade and organic matter that benefit fish habitat (USDA 2000).

CLASSIFICATION COMMENTS

This plant association has been recognized in several studies from throughout the Intermountain West and Rocky Mountains (Padgett *et al.* 1989, Manning and Padgett 1995, Crowe and Clausnitzer 1997, Moseley 1998, Kittel *et al.* 1999).

AUTHOR/DATE(UPDATE)

Mabel Jankovsky-Jones/2000-03-21(2000-12-15)

Cornus sericea

Red-osier dogwood

RANGE

This is a widespread type known from Washington, Oregon, Idaho, Nevada, and Montana.

ENVIRONMENT

This type is typically adjacent to stream and river channels, but it can occupy a diversity of landforms. It may appear as dense linear bands on alluvial benches in narrow canyons or broad thickets on islands and floodplains of major streams and rivers. Most occurrences have evidence of annual or near-annual flooding (Manning and Padgett 1995, Hall and Hansen 1997).

SOILS

Soils of this association are classified as Inceptisols, Entisols, or Mollisols. Where sites are located outside of the active floodplain, a litter/duff layer 2 inches or more thick may accumulate. Surface horizons are comprised of a wide range of alluvial materials with textures ranging from silty clays to sandy loams. These layers may be relatively shallow or as deep as 5 feet. Underlying layers are typically coarse sands, gravels, and cobbles that facilitate the movement of aerated groundwater through the subsurface layers which may be important for the longevity of stands. Water availability ranges from high, where this type occupies floodplains immediately adjacent to active channels, to low on upper, remote floodplain sites. Mottled and gleyed soils may occur (Manning and Padgett 1995, Hall and Hansen 1997, Crowe and Clausnitzer 1997).

VEGETATION COMPOSITION

Cornus sericea forms a dense, closed canopy, often excluding understory shrub and herbaceous species. *Cornus sericea* is usually the only species with high cover values. Associated species vary with geography and elevation, but constant shrubs include *Rosa woodsii, Ribes hudsonianum, Acer glabrum, Salix exigua, S. lutea*, and *Clematis ligusticifolia.* Because of its wide range, a great diversity of herbaceous species are associated with this association, usually in low cover (Manning and Padgett 1995, Hansen *et al.* 1995, Hall and Hansen 1997, Crowe and Clausnitzer 1997).

ADJACENT COMMUNITIES

Because of the wide geographic range for this type, associations of adjacent uplands can be coniferous forest, aspen, sagebrush-steppe, and pinyon-juniper types.

MANAGEMENT CONSIDERATIONS

The herbaceous biomass varies widely and is largely dependent on the density of the dogwood canopy (Crowe and Clausnitzer 1997). Ratings for *Cornus sericea* palatability for livestock range from low (Manning and Padgett 1995, Crowe and Clausnitzer 1997) to "ice cream" (Hansen *et al.* 1995, Hall and Hansen 1997), but the stands are often so dense that they limit grazing in many cases. This community functions in a variety of ways to promote stream health. *Cornus sericea* forms dense root networks that stabilize streambanks against lateral cutting and erosion, provides cover in the form of overhanging branches and banks, and shades channels, effectively moderating extreme summer temperature fluctuations (Hall and Hansen 1997). Red-osier dogwood sprouts vigorously after a fire and germination of it's seed-bank is stimulated by fire (Crowe and Clausnitzer 1997).

SUCCESSIONAL DYNAMICS

This is considered an early seral association, typically colonizing sites adjacent to streams. The herbaceous cover is often sparse, probably due to the dense overstory canopy and regular flooding, scouring, and deposition. The latter factor is probably responsible for maintaining this as a persistent plant association on the landscape. The presence of tall shrubs or trees in some stands may represent succession toward *Alnus incana, Populus*

trichocarpa, P. tremuloides, P. angustifolia, Picea engelmannii, Pseudotsuga menziesii, or other associations.

WILDLIFE FUNCTIONS

Red-osier dogwood provides food and cover for mule deer, moose, elk, mountain goats, cottontail rabbits, snowshoe hares, and many birds. The fruits are an important black bear food and are eaten by songbirds, grouse, quail, partridge, cutthroat trout, ducks, crows, mice, and other mammals. The young stems and bark are eaten by deer mice, meadow voles, and other small rodents. Red-osier dogwood often grows in dense thickets because of its layering ability. These thickets provide good mule deer fawning and rearing areas as well as nesting habitat for many songbirds (Hansen *et al.* 1995, Crowe and Clausnitzer 1997).

CLASSIFICATION COMMENTS

Stands of *Cornus sericea* have been sampled in Washington, Oregon, Idaho, Nevada, and Montana. *Cornus sericea* is the dominant species in several associations and several classifications have treated stands as a *Cornus sericea* dominance type. The *Cornus sericea* association described here lacks structural diversity of the other types and understory species with high constancy or fidelity are lacking. This association seems most closely related to the *Cornus sericea/Galium triflorum* association described from Utah and eastern Idaho (Youngblood *et al.* 1985, Padgett *et al.* 1989).

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-01-02(2001-01-15)

Cornus sericea/Heracleum lanatum

Red-osier dogwood/Cow parsnip

RANGE

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

ENVIRONMENT

A combination of stream order and slope seem to be important in the establishment of the *Cornus sericea/Heracleum lanatum* plant association. The development of a Mollic epipedon indicates that this association, which occurs adjacent to stream channels, is stable enough for the incorporation of organic matter (Padgett *et al.* 1989, Youngblood *et al.* 1985). Many sites on which this association occur are currently elevated above the annual floodplain to a degree that annual fluvial action no longer takes place (Padgett *et al.* 1989).

SOILS

Some soils may contain more than 35% rock fragments; the fine earth is usually loamy (Youngblood *et al.* 1985). Estimated available water-holding capacity is typically low to moderate (Padgett *et al.* 1989).

VEGETATION COMPOSITION

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

ADJACENT COMMUNITIES

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

MANAGEMENT CONSIDERATIONS

Cornus sericea is an important streambank stabilizer due to its strongly rhizomatous nature, and the ability of above ground stems to slow water movement through the community during high water flows. This is particularly important on the higher gradient stream channels where scouring by seasonal flooding may occur. Some stream shading is provided adjacent to the streambanks. Little forage is available for grazing; the dense shrub stratum limits livestock movement through stands of this association (Padgett *et al.* 1989, Youngblood *et al.* 1985). Management should emphasize the importance of *Cornus sericea* for streambank stabilization. Rehabilitation should include fencing to exclude grazing by domestic livestock. In sites with a more open shrub layer, *Cornus* will readily establish along stream edges by direct seeding or

planting nursery grown stock. Its rapid growth will quickly stabilize deteriorating streambanks (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

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

WILDLIFE FUNCTIONS

Small mammals and avian species may seek shelter and food in this type (Youngblood *et al.* 1985). The dominant shrub is browsed by native ungulates (moose) and livestock when other feed is in short supply or unavailable.

CLASSIFICATION COMMENTS

Youngblood *et al.* (1985) describe a *Cornus sericea/Galium triflorum* association that is closely related to *Cornus sericea/Heracleum lanatum*. *Heracleum lanatum* is considered diagnostic and distinguishes the two. Padgett *et al.* 's 1989 treatment represents a broader association that may include both of Youngblood *et al.* 's (1985) types.

AUTHOR/DATE(UPDATE)

Linda Williams/1995-09-12(2001-03-01)

Prunus virginiana

Common chokecherry

RANGE

The *Prunus virginiana* dominance type is wide ranging, known from Colorado, Idaho, Montana, Nevada, eastern Oregon, South Dakota, eastern Washington, and Wyoming (Reid *et al.* 2000). In Idaho, it has been sampled in southeastern Idaho, observed on the Snake River Plain of south-central Idaho, and sampled in the Danskin Mountains of southwestern Idaho at the Dry Creek Spring Exclosure (Hall and Hansen 1997, Moseley 1999, Jankovsky-Jones *et al.* 2000). The *Prunus virginiana* dominance type is expected to occur in the canyon lands of the Owyhee Plateau in southwestern Idaho (Moseley 1998).

ENVIRONMENT

In Idaho, the *Prunus virginiana* dominance type is usually found between 4600 and 4900 feet elevation, but has been observed as low as 3370 feet and as high as 6435 feet (Hall and Hansen 1997, Moseley 1999, Jankovsky-Jones *et al.* 2000). It is typically located immediately adjacent to springs or seeps in steep and narrow V-shaped drainages, but is also found on alluvial stream terraces, riverine floodplains, and intermittently wet toe-slopes (Jones and Walford 1995, Hall and Hansen 1997). Streams are often spring-fed and perennial. In Colorado, the *Prunus virginiana* dominance type is often at the interface between riparian and upland areas and found in protected gullies, arroyos, at bases of cliffs, and on steep banks of incised channels (Kittel *et al.* 1999). Though often adjacent to springs, the *Prunus virginiana* dominance type is not found on perennially saturated soil (Hall and Hansen 1997, Moseley 1999). Water tables are often at least 1 m deep.

SOILS

Montana research found that soil supporting the *Prunus virginiana* dominance type was both well-drained and well-developed (e.g., Entisols (Torrifluvents) or Mollisols (Haploborolls and Argiborolls)) (Hansen *et al.* 1995). Soils typically have rich organic surface horizons enriched by copious leaf litter (Hall and Hansen 1997). Soils are deep sandy loams, silt-loams, or silt-clay loams (over 60 cm) overlying rock and sand alluvium (Jones and Walford 1995, Hall and Hansen 1997).

VEGETATION COMPOSITION

In Idaho, the *Prunus virginiana* dominance type is characterized by a dense, tall *Prunus virginiana* overstory with a relatively sparse understory that is low in diversity (Hall and Hansen 1997, Moseley 1999, Jankovsky-Jones *et al.* 2000). *Prunus virginiana* is typically 4 to 8 m tall with 70 to 98% cover. Several tall understory shrubs may occur, such as *Salix lutea, Crataegus douglasii,* and *Ribes aureum*, each with 10% or less cover (Moseley 1999, Jankovsky-Jones *et al.* 2000). Similarly, low understory shrubs, including *Rosa woodsii* and *Symphoricarpos oreophilus,* are sometimes observed with 10% or less cover each. *Juniperus scopulorum* may occasionally be observed with trace cover (Hall and Hansen 1997, Jankovsky-Jones *et al.* 2000). The herbaceous understory is highly variable but diversity and cover is generally low within stands. Total graminoid cover, for example, is less than 3% with only *Poa pratensis*

and *Carex* spp. notable (Moseley 1999, Jankovsky-Jones *et al.* 2000). Forb cover is usually moderate and composed both of a few tall forbs (e.g., *Smilacina* spp., *Osmorhiza chilensis, Ligusticum canbyi,* and *Urtica dioica*) and several weedy species (e.g., *Arctium minus, Galium aparine,* and *Cynoglossum officinale*) (Hall and Hansen 1997, Moseley 1999, Jankovsky-Jones *et al.* 2000). One stand sampled had high cover of *Osmorhiza chilensis* (Moseley 1999). Stands in other states, such as Colorado, Montana, Washington, and Wyoming, are mostly similar, but usually also have noticeable *Toxicodendron rydbergii* and *Bromus tectorum* as well as higher *Poa pratensis* cover (Hansen *et al.* 1995, Jones and Walford 1995, Kittel *et al.* 1999, Crawford 2000). Moss and lichen ground cover is minimal while litter (including woody debris) and exposed soil and gravel is high (Hall and Hansen 1997, Moseley 1999, Jankovsky-Jones *et al.* 2000).

ADJACENT COMMUNITIES

In Idaho, slightly wetter riparian communities adjacent to *Prunus virginiana* stands include those dominated by *Populus* spp., *Betula occidentalis, Cornus sericea,* and *Salix* spp. (e.g., *Salix lasiandra*) (Hall and Hansen 1997, Moseley 1999). Wetter adjacent streambanks are mesic graminoid types such as those dominated by *Carex* spp. Adjacent uplands and drier alluvial terraces are *Artemisia tridentata*-steppe types (with *Symphoricarpos oreophilus* and *Purshia tridentata*) or dominated by *Juniperus scopulorum* or *Pseudotsuga menziesii* (Hall and Hansen 1997, Moseley 1999, Jankovsky-Jones *et al.* 2000).

MANAGEMENT CONSIDERATIONS

Though *Prunus virginiana* is only moderately palatable for livestock, it is quite nutritious (USDA 2000). It is occasionally browsed, however, the foliage can be poisonous to livestock in large amounts (Hansen *et al.* 1995, USDA 2000). As a vigorous re-sprouter, *Prunus virginiana* is moderately tolerant of browsing. Dense stands found in the *Prunus virginiana* dominance type often deter grazing, however, heavy use (by both livestock and wildlife) will eventually open stands. This disturbance, especially with soil exposure, will promote invasion by exotic species such as *Poa pratensis, Bromus tectorum*, and other weeds, as well as *Rosa woodsii* (Hansen *et al.* 1995, Jones and Walford 1995, Kittel *et al.* 1999, USDA 2000). In the *Prunus virginiana* dominance type, however, understory forage production is typically low. Fire kills the above ground stems of *Prunus virginiana* but it readily re-sprouts, especially after spring burning (USDA 2000). Sometimes stem numbers and growth rates are stimulated by fire and soon exceed pre-fire levels. *Prunus virginiana* is useful for planting on disturbed riparian sites (Hansen *et al.* 1995). Its root system spreads readily and helps stabilize streambanks. In addition, humans harvest *Prunus virginiana* fruits for food, beverages, and medicines (Hansen *et al.* 1995, USDA 2000).

SUCCESSIONAL DYNAMICS

The *Prunus virginiana* dominance type apparently forms long-lasting communities on relatively stable sites. *Prunus virginiana* is tolerant of a wide range of ecologic conditions and may be either an early seral species or climax species depending on site conditions (USDA 2000). For example, in southeastern Idaho *Prunus virginiana* stands may be an earlier seral stage of *the Juniperus scopulorum/Cornus sericea* or *Pseudotsuga menziesii/Cornus sericea* plant associations (Hall and Hansen 1997). *Prunus virginiana* is tolerant of occasional flood disturbance and usually occupies protected riparian edges, terraces, and drier margins (Kittel *et al.* 1999, USDA 2000). *Prunus virginiana* dominated stands on moister sites may be related to *Salix* spp. or *Populus* spp. potential vegetation types (Jones and Walford 1995, Hall and Hansen 1997). Though infrequent in riparian settings, fire may play a role in rejuvenating *Prunus virginiana* stands (USDA 2000). On suitable sites, occasional disturbances may open the stand enough to allow invasion by *Elymus glaucus,* thus, changing the type to *Prunus virginiana/Elymus glaucus.* Too much grazing or disturbance promotes invasion by *Crataegus douglasii, Rosa woodsii, Poa pratensis, Galium* spp., and exotic forbs (Hansen *et al.* 1995, Jones and Walford 1995, Manning and Padgett 1995). This may result in *Prunus virginiana/Rosa woodsii* stands that represent marginally riparian conditions and succession toward drier habitats (Manning and Padgett 1995).

WILDLIFE FUNCTIONS

Prunus virginiana fruits are highly valued for food, especially by small mammals and birds (USDA 2000). *Prunus virginiana* forms dense thickets that provide thermal, hiding, and nesting cover for wildlife (Hansen *et al.* 1995, USDA 2000). In Idaho, mule deer have been observed bedding in *Prunus virginiana* stands (Moseley 1999). *Prunus virginiana* is fair to good quality forage for moose, elk, mule deer, as well as bear, coyote, pronghorn, and

bighorn sheep (Hansen *et al.* 1995, USDA 2000). *Prunus virginiana* is excellent winter browse for elk and deer and is very nutritious. Riparian *Prunus virginiana* shrubs shade streams and protect banks and help keep water temperature and quality ideal for salmonids (Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

The *Prunus virginiana* dominance type has been described from numerous plots sampled throughout the western United States (Reid *et al.* 2000). It has been sampled with at least 4 plots in southeastern Idaho (Hall and Hansen 1997, Jankovsky-Jones *et al.* 2000) but with only one in southwestern Idaho (Moseley 1999). In Idaho, *Prunus virginiana* often forms dense thickets in which there are no consistently important understory shrubs or herbs with high cover and constancy (Hall and Hansen 1997, Moseley 1999, Jankovsky-Jones *et al.* 2000). Consequently, delineation of a *Prunus virginiana* dominance type seems most practical. There are similarities with other *Prunus virginiana* plant associations (Manning and Padgett 1995, Moseley 1998 and 1999, Oregon Natural Heritage Program 1999, Crawford 2000) but numerous stands sampled in southern Idaho do not share important indicator species (with necessary cover or constancy) with these types. Classification of *Prunus virginiana* stands is further complicated by site disturbances that create heterogeneous understories (Hansen *et al.* 1995, Hall and Hansen 1997). Further sampling of *Prunus virginiana* stands may lead to refinements in classification.

AUTHOR/DATE

Chris Murphy/2001-01-04

Salix bebbiana/Mesic graminoid

Bebb's willow/Mesic graminoid

RANGE

Salix bebbiana/Mesic Graminoid is a potentially rare type known from southern Utah (Padgett *et al.* 1989) and where Pack River enters Lake Pend Oreille in northern Idaho (Jankovsky-Jones 1997b). The similar *Salix*/Mesic Graminoid community is scattered in the mountains of Nevada (Manning and Padgett 1995) and the general *Salix bebbiana* dominance type is known in eastern Idaho and Montana. In addition, similar *Salix bebbiana* dominated communities have been described in Yellowstone National Park in Wyoming, Arizona, and New Mexico (Hansen *et al.* 1995, Hall and Hansen 1997).

ENVIRONMENT

Salix bebbiana/Mesic graminoid and the similar *Salix bebbiana* dominance type are found at variable elevations ranging from as low as 1890 to 3000 feetm in northern Idaho and Montana (Jankovsky-Jones 1997b) to over 5880 feet in Montana, eastern Idaho, and southern Utah (where *Salix bebbiana*/Mesic Graminoid is as high as 8400 feet) (Padgett *et al.* 1989, Hansen *et al.* 1995, Hall and Hansen 1997). *Salix bebbiana*/Mesic Graminoid is located in meadows of both small, intermittent stream valleys or broad valley floodplains and deltas of major rivers. It is found on alluvial terraces, sub-irrigated lower slopes, and abandoned oxbows (Padgett *et al.* 1989, Jankovsky-Jones 1997b). The broad *Salix bebbiana* dominance type is on those landforms and on streambanks of active channels and near seeps or springs (Hansen *et al.* 1995, Hall and Hansen 1997). Stream gradients range from about 2 to 5% (Padgett *et al.* 1989).

SOILS

Soils for this community, and the similar *Salix bebbiana* dominance type, are clay, silt, or sandy loams with up to 50% coarse gravel and cobble fragments formed over old alluvium deposits. Soils are Mollisols classified as Aquic, Pachic, or Cumulic Cryoborolls with a high accumulation of organic matter (sometimes nearly enough to be Histosols) and low to high water holding capacity (Padgett *et al.* 1989, Hansen *et al.* 1995, Hall and Hansen 1997). Water tables are often deep, but mostly within 1 m of soil surface indicated by gleyed and mottled soils.

VEGETATION COMPOSITION

Padgett *et al.*'s (1989) *Salix bebbiana*/Mesic Graminoid stands were dominated by *Salix bebbiana* with 79% cover. This compares with 32 to 75% cover for the general *Salix bebbiana* dominance type (Hansen *et al.* 1995, Hall and Hansen 1997) and 85% cover in mixed *Salix*/Mesic graminoid community (Manning and Padgett 1995). Other tall willows commonly associated with *Salix* bebbiana are *Salix boothii, Salix lutea*, *and Salix exigua.* However, *Salix lasiandra*, *Salix drummondiana, Salix lasiolepis*, and *Salix pseudomonticola* are occasionally common with cover and constancy varying from low to high (Padgett *et al.* 1989, Hansen *et al.* 1995, Manning and Padgett 1995, Hall and Hansen 1997). There is

a shrub understory at willow bases dominated by *Ribes inerme* and Rosa species (usually *Rosa woodsii* with variable cover and constancy) with *Symphoricarpos oreophilus* and *Potentilla fruticosa* occasionally present (with low cover). The general *Salix bebbiana* dominance types described by Hansen *et al.* (1995) and Hall and Hansen (1997) have much higher shrub cover and diversity. The understory is dominated by a variable mix of graminoids and low mesic forbs. The most common graminoids in *Salix bebbiana*/Mesic graminoid are *Poa pratensis, Carex nebrascensis*, and *Carex praegracilis*, and *Phalaris arundinacea* (Padgett *et al.* 1989, Jankovsky-Jones 1997b). In this community (Padgett *et al.* 1989), and the broader *Salix*/Mesic Graminoid (Manning and Padgett 1995), *Agrostis stolonifera, Juncus balticus, Carex microptera, Eleocharis palustris, Hordeum brachyantherum*, and *Scirpus microcarpus* are sometimes important. Forb species cover ranges from low to high with the most common species being *Trifolium* spp., *Galium triflorum, Equisetum arvense, Actaea rubra, Taraxacum officinale, Aconitum columbianum*, and *Geranium richardsonii* (Padgett *et al.* 1989, Manning and Padgett 1995).

ADJACENT COMMUNITIES

Wetter associations adjacent to *Salix bebbiana*/ Mesic graminoid (and the broader *Salix bebbiana* community) are dominated by graminoids (such as *Carex aquatilis, Carex utriculata*, *or Carex nebrascensis*) or tall willows (such as *Salix geyeriana*) with a *Carex utriculata* understory (Hansen *et al.* 1995). Adjacent on sites with similar moisture levels *as Salix bebbiana*/Mesic graminoid are mesic graminoid or forb (e.g. *Wyethia* spp.) meadows or a mosaic of associations dominated by tall *Salix* species, *Populus tremuloides, Betula occidentalis*, or *Alnus incana* (Padgett *et al.* 1989, Hall and Hansen 1997). Drier communities adjacent to *Salix bebbiana* types are *Poa pratensis* and *Potentilla fruticosa/ Deschampsia cespitosa* (Hansen *et al.* 1995). Adjacent uplands are dominated by conifers (such as *Pinus ponderosa, Pseudotsuga menziesii*, and *Abies lasiocarpa*), *Populus tremuloides, Quercus gambelii*, or *Artemisia tridentata* steppe (Padgett *et al.* 1989, Hansen *et al.* 1995).

MANAGEMENT CONSIDERATIONS

The *Salix bebbiana*/Mesic graminoid association produces moderate to high forage amounts for livestock. In addition, the highly *palatable Salix bebbiana* is tolerant of sustained, long-term, and repeated grazing and will remain on sites after other Salix species are eliminated (Hansen *et al.* 1995, Hall and Hansen 1997). However, under heavy grazing even *Salix bebbiana* will lose its vigor and decline in cover to the point of elimination. The mesic graminoid understory is also susceptible to overgrazing which causes the loss of native graminoids and the increase of exotic species cover (Manning and Padgett 1995). In addition, the moist, fine-textured soils of *Salix bebbiana* communities are easily compacted and damaged by livestock trampling (or machines), especially when wet. Overgrazing will also damage streambanks causing erosion, a drop of the water table, and the loss of *Salix bebbiana* and *Salix* reproduction (Hansen *et al.* 1995, Hall and Hansen 1997, Padgett *et al.* 1989). The root masses of both Salix bebbiana and mesic graminoids are effective streambank stabilizers through their sediment trapping and binding abilities. However, less disturbed communities are more effective because native rhizomatous graminoids, such as *Carex nebrascensis* and *Juncus balticus*, provide much better erosion control than shallow rooted exotic species (Manning and Padgett 1995). *Salix bebbiana* and associated native graminoids are also useful for long-term revegetation (Hansen *et al.* 1995, Hall and Hansen 1997). *Salix bebbiana* readily resprouts from roots after quick, hot fires (though it is damaged by slower burns) and, with long periods of rest from grazing, stands will regenerate. Thus, prescribed burning is a good tool for regenerating less vigorous stands (Hansen *et al.* 1995, Hall and Hansen 1997).

SUCCESSIONAL DYNAMICS

Salix bebbiana/Mesic graminoid is apparently a stable association (especially when dominated by native graminoids, Padgett *et al.* 1989), though many *Salix bebbiana* communities are considered by Hansen *et al.* (1995) and Hall and Hansen (1997) to be browsing or grazing disclimax types. *Salix bebbiana* is both a pioneer successional species and tolerant of long-term, sustained browsing. Thus, it is able to persist under grazing pressures which eliminate other Salix species from a site (Hansen *et al.* 1995, Hall and Hansen 1997). Thus, the *Salix bebbiana*/Mesic Graminoid community may be derived from related, but overgrazed, types dominated by *Salix geyeriana, Salix lutea, Salix boothii*, or *Salix drummondiana* with mesic graminoid understories (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996). The presence of exotic grasses with significant cover, hedged *Salix* spp., and low *Salix* regeneration

in the *Salix bebbiana*/Mesic graminoid community also supports the grazing disclimax hypothesis. If site moisture decreases due to environmental changes or further overgrazing, *Populus trichocarpa, Populus tremuloides*, or *Picea engelmannii* dominated communities may replace *Salix bebbiana*/Mesic graminoid (Padgett *et al.* 1989, Manning and Padgett 1995).

WILDLIFE FUNCTIONS

The *Salix bebbiana*/Mesic graminoid association provides good forage and cover for elk, moose, mule and whitetail deer, and beaver (Hansen *et al.* 1995, Manning and Padgett 1995, Hall and Hansen 1997). *Salix bebbiana* receives heavy browsing in winter by wildlife, especially elk. *Salix bebbiana* is also used by songbirds and game birds for nesting and food (Hansen *et al.*1995). The roots *of Salix bebbiana* and associated mesic graminoids protect and build streambanks which form overhanging cover for fish (Hansen *et al.* 1995, Hall and Hansen 1997).

CLASSIFICATION COMMENTS

Stands of the *Salix bebbiana*/Mesic graminoid association are probably included within a broader *Salix bebbiana* "dominance type" by Hansen *et al.* (1995) and Hall and Hansen (1997). It is also lumped within a general *Salix*/Mesic graminoid community where *Salix bebbiana, Salix drummondiana, Salix exigua, Salix lutea, Salix lasiandra*, and/or *Salix lasiolepis* are all common (Manning and Padgett 1995, Weixelman *et al.* 1996). *Salix bebbiana*/Mesic graminoid is possibly a grazing induced disclimax, (due to exotic grasses in the understory) but in less disturbed stands both *Salix boothii* or *Salix lutea* sometimes have moderate cover (Hansen *et al.* 1995, Hall and Hansen 1997). It is unlikely that *Salix bebbiana*/Mesic graminoid would be confused with *Salix boothii*/Mesic graminoid or *Salix lutea*/Mesic graminoid associations because these two types rarely have *Salix bebbiana* present (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996).

AUTHOR/DATE

Chris Murphy/1999-01-05

Salix boothii/Equisetum arvense

Booth's willow/Common horsetail

RANGE

Salix boothii/Equisetum arvense is a major type within the Greys River drainage and the Centennial Mountains of Wyoming, extending westerly into central Idaho (Youngblood *et al.* 1985).

ENVIRONMENT

Stands are found adjacent to small streams and are often on steep toeslope seeps in narrow valley bottoms.

SOILS

This plant association was found on soils with family particle-size classes ranging from sandy-skeletal to clayey, with no consistent pattern of corresponding depth to the water table or surface topography (Youngblood *et al.* 1985).

VEGETATION COMPOSITION

Salix boothii and/or *Salix drummondiana* dominate the tall shrub layer (35-50% cover). *Ribes lacustre* or *R. inerme* and *Lonicera involucrata* may contribute significant cover under the tall willows. *Equisetum arvense* or *Saxifraga odontoloma* contribute high cover to the forb understory. Other species with high constancy *include Geranium richardsonii* and *Geum macrophyllum* (Youngblood *et al.* 1985).

ADJACENT COMMUNITIES

Bordering communities usually contain *Carex utriculata*, and may include stands of *Salix boothii* or *S. wolfii.* Conifer stands may border this type, especially on the toeslopes. These stands usually will belong to the *Picea/Equisetum arvense* plant association. Other neighboring communities may be described by the *Salix boothii/Smilacina stellata*, *Salix wolfii*/Mesic forb, or *Mertensia ciliata* plant associations (Youngblood *et al.* 1985).

MANAGEMENT CONSIDERATIONS

Stands are characterized by a nearly impenetrable shrub layer. The shading effects along with seasonal inundation and scouring may account for the low diversity of herbaceous species. Grazing animals may open the canopy and shift the site to one dominated by native and exotic mesic forbs. Fencing and exclusion of grazing late in the season

when sites are accessible are practical management actions.

SUCCESSIONAL DYNAMICS

Because of the variability of site characteristics associated with this plant association, it is difficult to suggest clear successional trends. Some sample stands are found on stable sites where organic accumulations exceeded 12 inches. Other stands include small amounts of conifers, which suggests a potential relationship with the *Picea/Equisetum arvense* plant association. Stands were also found on recent alluvium over buried surface horizons. It is suggested that as the stand becomes drier, it may integrate to *Salix boothii/Smilacina stellata* plant associations (Youngblood *et al.* 1985).

WILDLIFE FUNCTIONS

Information not compiled.

CLASSIFICATION COMMENTS

Classification is based on 15 stands in eastern Idaho and western Wyoming.

AUTHOR/DATE

Linda Williams/1995-09-13

Salix exigua/Barren

Sandbar willow/Barren

RANGE

Stands occur in Idaho (Jankovsky-Jones 1996, 1997a, 1997b, 1997c, Moseley 1998), Nevada (Manning and Padgett 1995), Utah (Padgett *et al.* 1989), and probably elsewhere.

ENVIRONMENT

This association occurs along active streambanks or on nearby stream terraces. Flooding in this association is probably an annual event. The soils are young and fluvial in origin. It can occur in valley bottoms with very low to moderate gradients and can be from narrow to very wide. Elevations are mostly below 5,500 feet (Padgett *et al.* 1989, Manning and Padgett 1995, Moseley 1998).

SOILS

Soils are highly variable, ranging from highly stable Cumulic Haplaquolls and Aquic Cryoborolls to early developmental Typic Udifluvents. All have developed on alluvium of varying ages. Estimated available water-holding capacity ranged from low to high, and particle-size classes include fine-loamy and sandy-skeletal. Water tables ranged from near the surface to over 3 feet below the surface (Padgett *et al.* 1989).

VEGETATION COMPOSITION

A dense stand of *Salix exigua* dominates the overstory of this otherwise depauperate association. Other willows, such as *S. lasiandra, S. amygdaloides,* and *S. lutea,* may occasionally be minor components. *Rosa woodsii, Ribes inerme,* or *Cornus sericea* may be present in the shrub layer, but in very low cover. The undergrowth is open with predominantly bare ground, rock, or leaf litter. Forb species are scattered and in low cover, although diversity may be high. Graminoids are generally absent or in low cover (Manning and Padgett 1995).

ADJACENT COMMUNITIES

A wide range of upland associations can occur on adjacent slopes, ranging from salt desert shrub and sagebrush-steppe associations at the lower elevations to low-montane coniferous woodlands and forests at the higher elevations.

MANAGEMENT CONSIDERATIONS

There is essentially no herbaceous livestock forage available in this type. The willows provide stability of streambanks as well as stream shading.

SUCCESSIONAL DYNAMICS

The *Salix exigua*/Barren type is an early successional type with little undergrowth development. Some stands have rather xeric soils, which inhibits the establishment of herbaceous species, while others are very wet, but have had insufficient time for establishment. Succession in this association without outside disturbance will likely lead toward the *Salix exigua*/Mesic forb or *S. exigua/*Mesic graminoid types in moist situations, while drier sites may develop into the *S. exigua/Poa pratensis* community (Padgett *et al.* 1989).

WILDLIFE FUNCTIONS

Stands of this association provide excellent thermal and hiding cover for a wide range of wildlife species. *Salix exigua* is normally not as heavily browsed as other willow species. Beavers utilize *Salix exigua* for both food and for constructing dams (Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

This is a well sampled and analyzed association documented with numerous plots. Manning and Padgett (1995) described the *Salix exigua*/Bench community from Nevada that is considered the same as the *Salix exigua*/Barren type of Padgett *et al.* (1989). Tuhy and Jensen (1982) described a similar type with no diagnostic undergrowth for central Idaho. One or more of Cole's (1995) *Salix exigua* types may be included here.

AUTHOR/DATE(UPDATE)

Bob Moseley/1997-12-31(2001-12-01)

Salix geyeriana/Carex utriculata

Geyer's willow/Bladder sedge

RANGE

This is a common and widespread type in the Intermountain and Rocky Mountain areas. It is distributed from the eastern Sierra Nevada (Manning and Padgett 1995) and central Oregon (Kovalchick 1987) on the west, across northeastern Oregon (Crowe and Clausnitzer 1997), Idaho (Tuhy 1981, Tuhy and Jensen 1982, Mutz and Queiroz 1983, Youngblood *et al.* 1985, Jankovsky-Jones 1996, Hall and Hansen 1997), Nevada (Manning and Padgett 1995), and northern Utah (Padgett *et al.* 1989) to Colorado (Kittel et al. 1999), Wyoming (Norton *et al.* 1981, Chadde *et al.* 1988, Walford *et al.* 1997) and Montana (Hansen *et al.* 1995).

ENVIRONMENT

Throughout its distribution, this association occurs in mountains and high valleys at elevations ranging from 4,300 to 9,000 feet. This type is most common on broad, level floodplains, but does occur in narrow bands along smaller streams in open, U-shaped valleys. Valley bottom gradients are usually low. Surface microtopography is often hummocky as a result of the irregular buildup of organic material. Hydrology of these sites is usually maintained through subirrigation and soil moisture is maintained at or near the surface in most cases. These sites may or may not be annually flooded during high water in the spring and early summer.

SOILS

This association occurs on a range of soil types that are typically wet, cold, and organic or have organic surface horizons. They are generally classified as Mollisols and Histisols. Organic surface horizons, often extending to a depth of 18 inches or more, are riddled with fibrous root and plant material. Soil textures are categorized as fine, generally silts and clays. Deeper alluvial mineral deposits are comprised of coarse and fine sands and gravels. The soils are usually mottled (Hall and Hansen 1997).

VEGETATION COMPOSITION

Salix geyeriana dominates the open overstory and characteristically appears in large, often widely spaced clumps. *Salix geyeriana* can be as much as 3 m tall. A diversity of other shrubs may be present, but usually in low amounts. Some of these subordinate shrubs include *Betula glandulosa, Salix boothii, Salix drummondiana, Ribes inerme, Lonicera involucrata, Potentilla fruticosa,* and *Alnus incana*. The lower shrubs of this group often occur at the base of *S. geyeriana. Carex utriculata* clearly dominates the understory. Other sedges and grasses, such as *Carex aquatilis, Carex interior,* and *Calamagrostis canadensis*, may be present, but they have low cover. Forb species are sparse, but *Geum macrophyllum* appears to be the most constant species across the range of this type.

ADJACENT COMMUNITIES

Adjacent upland and riparian associations vary considerably across the wide range of this type. Upland types include sagebrush-steppe, aspen, and coniferous forest. Adjacent riparian associations are even more diverse and too numerous to mention here, but mostly include other willow types and those dominated by graminoids.

MANAGEMENT CONSIDERATIONS

The wet organic soils can be strongly impacted by livestock and heavy machinery, but the dense roots and rhizomes of *Carex utriculata* bind the soils and stabilize the site. Loss of the shallow water table, through soil damage and/or stream incision will initially shift undergrowth composition towards drier graminoids and forbs. Willow regeneration will be limited and the mature individuals will eventually become decadent. *Carex utriculata* provides a very high level of streambank stabilization.

SUCCESSIONAL DYNAMICS

The *Salix geyeriana/Carex utriculata* association is the wettest of all *S. geyeriana* types. Prolonged, intense utilization by livestock and wild ungulates may shift the site potential to a drier grazing disclimax, characterized by more open stands with

exotic grasses, such as *Poa pratensis* and *Agrostis stolonifera,* dominating the understory. Beavers may exert a significant influence on sites as well. Active dams maintain high water tables needed to support this type. However, sustained removal of willows by beavers may reduce the site to a *Carex utriculata* association. When beaver abandon a site, the dams eventually deteriorate and the water table may drop, shifting the site potential to the *S. geyeriana/Calamagrostis canadensis* type (Hall and Hansen 1997).

WILDLIFE FUNCTIONS

A diversity of wildlife species, ranging from small mammals to rodents and songbirds, use this type for food, cover and nesting. Moose and beaver, in particular, are important in this association. Beaver may provide a vital role in the maintenance of this association in many places by maintaining high water tables (Hall and Hansen 1997).

CLASSIFICATION COMMENTS

This association has been quantitatively defined and described by at least 12 studies throughout the Intermountain region and Rocky Mountains. All these classifications have used the old name, *Carex rostrata*, which is now known to be strictly boreal. This name is now superseded by *C. utriculata* (Reznicek 1987). Because of the wide geographic distribution, different studies have taken different approaches to its classification, with some taking rather narrow approach and others taking a much broader view of this type. Most of the variability revolves around the treatment of *Salix boothii, Salix drummondiana,* and *Carex aquatilis. Salix geyeriana* and *S. boothii* have been treated differently in different classifications. For example, Hansen *et al.* (1995) in Montana include in their *Salix geyeriana* types those stands with all combinations of *S. geyeriana* and *S. boothii,* citing similarities between the two species in the environments they occupy and in management issues. On the other hand, Padgett *et al.* (1989) place stands with at least 25% cover of *S. boothii* into their *S. boothii* associations, even if the stands have greater cover of the taller *S. geyeriana*, arguing that that much *S. boothii* cover significantly alters the structure of the vegetation. Some studies have taken an even broader approach by lumping stands dominated by *Salix geyeriana* and *S. drummondiana,* as well as *S. boothii, S. lemmonii, S. bebbiana, S. wolfii* and/or *Betula glandulosa,* into a generic *Salix/Carex utriculata* type (e.g., Tuhy and Jensen 1982, Kovalchik 1987, Crowe and Clausnitzer 1997). Studies have also taken varying approaches to the amount of *Carex aquatilis* in this association. Some studies (e.g., Youngblood *et al.* 1985, Mutz and Queiroz 1983, Hall and Hansen 1997) take the broad view by defining a *S. geyeriana/Carex utriculata* type with either *C. utriculata* or *C. aquatilis* as the herbaceous dominant. A narrower approach has been taken by others (e.g., Padgett *et al.* 1989, Walford *et al.* 1997), where *C. utriculata* is the sole herbaceous dominant and *C. aquatilis*-dominated sites would be a different association. The association described here is a narrow one, that is *Salix boothii*-dominated sites are treated as different associations (sensu Padgett *et al.* 1989, Walford *et al.* 1997, and others) and *Carex aquatilis*-dominated understory similarly defines a separate type (sensu Padgett *et al.* 1989 and others).

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-12-04(2000-12-12)

Salix geyeriana/Mesic graminoid

Geyer's willow/Mesic graminoid

RANGE

Salix geyeriana/Mesic Graminoid is a widely distributed major type. In southeastern Idaho, it is known from observations and plots in the Aspen, Preuss, Caribou, and Bear River Ranges and Grays Lake National Wildlife Refuge (Padgett *et al.* 1989, Jankovsky-Jones 1997c). It is also known from eastern Idaho near Henrys Lake, the Yellowstone Highlands, and the upper Teton River basin (Jankovsky-Jones 1996). In central Idaho, it is found in the Pioneer/White Knob Mountains (Jankovsky-Jones 1999a). Walford *et al.* (1997) sampled *Salix geyeriana*/Mesic Graminoid in or near the Absaroka, Bighorn, and Wind River Mountains of northwest Wyoming. The association is also known in the Wasatch Mountains and the high south-central plateaus of Utah (Padgett et. al. 1989). Manning and Padgett (1995) described the association in the eastern Sierra Nevada Mountains and surrounding areas of California and Nevada. It is also found in the Santa Rosa Range of north Nevada (Manning and Padgett 1995) and the Toiyabe and Monitor Ranges of central Nevada (Weixelman *et al.* 1996). In addition, Evenden (1989) described a *Salix geyeriana*/Mesic Graminoid-Forb association in the Trout Creek Mountains of southeastern Oregon and Hansen *et al.* (1995) described a broader *Salix geyeriana* association type in Montana. Both of

these associations may encompass some stands of *Salix geyeriana*/Mesic Graminoid.

ENVIRONMENT

Salix geyeriana/Mesic Graminoid is often found in wide valleys and basins filled with Quaternary alluvium or morainal outwash, such as alpine cirques and U-shaped troughs, but is also located in narrow valleys (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). The association is on seasonally saturated sites such as flat, gently sloping, or hummocky streambanks, terraces (about 60 cm above bankfull channel), benches, floodplains (which it may fill), moist meadows, and, occasionally, gravel bars. It is usually adjacent to meadow seeps and springs or streams which seasonally flood (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). However, it is sometimes in old floodplains now abandoned due to lateral stream migration. Typical associated streams vary from moderate gradient, narrow and meandering to low gradient braided rivers, but are often Rosgen B or C types (Manning and Padgett 1995, Walford *et al.* 1997).

SOILS

Soils are cold and moist with organic horizons, usually categorized as silt loams, silty clay loams, or clay loams with moderate to high water holding capacity (Padgett *et al.* 1989, Manning and Padgett 1995). However, coarse loamy, loamy skeletal, and more recent sandy alluvium soils are sometimes present, but rarely with more than 35% coarse fragments (Weixelman *et al.* 1996, Walford *et al.* 1997). Soils are most often classified as Cryaquolls (Typic) and Cryoborolls (Typic and Pachic), and Cryofluvents (Typic), but Borosaprists, Borofibrists, Haplaquolls, and Haploborolls are also observed (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). Soils often have redoximorphic features (usually mottling) within 50 cm of the surface since the water table usually ranges from the surface to 76 cm deep (occasionally deeper). Due to slow decomposition and high production of these sites, litter/duff cover is high (up to 66%).

VEGETATION COMPOSITION

The *Salix geyeriana*/Mesic Graminoid association is characterized by an open canopy of clumped, 2-3 m tall, *Salix geyeriana* with 21 to 71% cover (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). *Salix boothii* is occasionally mixed with *Salix geyeriana,* but is usually shorter and has less than 20% cover. Scattered around the bases of these willows are lower shrubs, including *Ribes inerme*, but also *Ribes aureum*, *Rosa woodsii*, *Pentaphylloides floribunda, Salix lemmonii,* and *Salix wolfii* (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). The herbaceous understory is dominated by a diverse mix of mesic graminoid species that varies in composition depending on the amount of grazing disturbance. *Poa pratensis* is ubiquitous in all stands, however, with cover ranging from less than 8% in higher quality stands (Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997) to 44% in disturbed stands (Padgett *et al.* 1989). In mid or late-seral stands, the most common graminoids are *Carex lanuginosa*, *Deschampsia cespitosa*, *Carex microptera*, and occasionally *Carex nebrascensis* (Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). Other graminoids in less disturbed stands, occassionally with moderate cover and constancy, include *Calamagrostis canadensis, Carex aquatilis, Carex simulata, Carex subnigricans, Carex utriculata, Glyceria* spp. (e.g. *Glyceria striata*), *Elymus trachycaulus,* and others. In addition to *Poa pratensis,* stands that have been disturbed by grazing may have high cover of exotic grasses such as *Agrostis stolonifera, Bromus inermis, Phalaris arundinacea, Phleum pratense,* and *Poa palustris* (Padgett *et al.* 1989, Jankovsky-Jones 1996 and 1997a). *Carex praegracilis*, *Juncus balticus*, and *Carex praticola* are common native species which may increase with disturbance (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). The cover of mesic forbs is less than that of graminoids. The most common species, usually with low cover and variable constancy, are often indicative of some disturbance. Forb species include: *Taraxacum officinale*, *Achillea millefolium, Trifolium* spp., *Thalictrum* spp., *Potentilla gracilis, Geum macrophyllum, Smilacina stellata,* and *Iris missouriensis* (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). Moss cover can be high but its constancy is low.

ADJACENT COMMUNITIES

Stands of vegetation adjacent *Salix geyeriana*/Mesic Graminoid include associations in springs or seeps dominated by *Carex aquatilis, Carex utriculata,* or *Carex nebrascensis* (Manning and Padgett 1995, Weixelman *et al.* 1996). Adjacent riparian associations with similar moisture regimes are *Salix*

wolfii/Deschampsia cespitosa, Salix boothii/Mesic Graminoid, various other *Salix* types (e.g. those dominated by *Salix exigua, S. lemmonii,* or *S. planifolia*), *Iris missouriensis,* or *Deschampsia cespitosa* (Manning and Padgett 1995, Walford *et al.* 1997). Neighboring on slightly drier floodplains are *Populus tremuloides/Symphoricarpos albus, Poa pratensis* meadow, and *Artemisia cana* stands (Padgett *et al.* 1989, Weixelman *et al.* 1996). Adjacent to the comparable, but broader, *Salix geyeriana* association type in Montana were *Salix geyeriana/Carex utriculata* and *Salix geyeriana/ Calamagrostis canadensis* on wetter sites and *Populus tremuloides/Cornus sericea, Pentaphylloides floribunda/Deschampsia cespitosa,* and *Juncus balticus* associations on drier sites (Hansen *et al.* 1995). Uplands adjacent to *Salix geyeriana*/Mesic Graminoid are dominated by *Picea* spp., *Pinus contorta, Pinus jeffreyi* (Sierra Nevada Mountains), *Populus tremuloides,* and *Artemisia tridentata* var. *vaseyana* steppe (Padgett *et al.* 1989, Manning and Padgett 1995).

MANAGEMENT CONSIDERATIONS

The high cover of grasses and sedges makes Salix geyeriana/Mesic Graminoid highly productive for livestock forage. *Salix geyeriana* may be more palatable to livestock and less tolerant of grazing than *Salix boothii* (Hansen *et al.* 1995, Crowe and Clausnitzer 1997, Walford *et al.* 1997). In addition, this association has many corridors between willow clumps that allow for livestock access (Padgett *et al.* 1989, Hansen *et al.* 1995, Walford *et al.* 1997). These attributes make *Salix geyeriana/*Mesic Graminoid susceptible to overgrazing and conversion of the understory from native species to exotic grasses. Overgrazing of *Salix geyeriana* causes lost vigor, decreased stand density, and eventual elimination. After overgrazing, *Salix geyeriana* stands regain vigor if rested for at least 3 to 6 years (Kovalchik 1987, Hansen *et al.* 1995, Crowe and Clausnitzer 1997). However, the mesic graminoid understory will become dominated by *Poa pratensis* or other weedy species, which increase with grazing (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). *Poa pratensis* is palatable, moderately productive, and tolerant of heavy grazing (Kovalchik 1987). Livestock grazing, as well as human developments (e.g. roads, recreation sites, etc.), may compact the wet Mollisol soils of *Salix geyeriana/*Mesic Graminoid and are not usually compatible. When the association converts to *Poa pratensis* dominance, streambank stability decreases and cattle trampling causes bank sloughing, creek overwidening, and water table alterations (Kovalchik 1987, Padgett *et al.* 1989, Manning and Padgett 1995, Hansen *et al.* 1995). The *Carex* sod mats, characteristic of a high quality understory, have excellent soil stabilizing ability. In contrast, *Poa pratensis* roots are poor soil binders. *Salix geyeriana* will sprout vigorously after fire, especially in wetter stands after quick, hot fires. Thus, prescribed burning is effective in rejuvenating old clumps (Hansen *et al.* 1995). *Poa pratensis* and other graminoids resprout better after cooler fires (Hansen *et al.* 1995, Kovalchik 1987). *Salix geyeriana,* though more difficult to root than *Salix boothii* or *Salix drummondiana,* is valuable for revegetation of streambanks. It has high value for stabilizing streambanks, trapping debris, creating pools, and reducing erosional energy (Hansen *et al.* 1995). Re-establishment of willows may help raise the water table and allow reinvasion by native species such as *Carex lanuginosa* (Kovalchik 1987).

SUCCESSIONAL DYNAMICS

While *Salix geyeriana*/Mesic Graminoid does exist in less disturbed, late-seral states (with an understory of *Carex lanuginosa, Calamagrostis canadensis, Deschampsia cespitosa, Carex microptera, Carex nebrascensis,* and other native species), it more often reflects disturbance by livestock grazing (with understories dominated by Poa pratensis, other exotic grasses, and native increasers such as *Carex praegracilis, Juncus balticus,* and *Carex praticola*) (Padgett *et al.* 1989, Manning and Padgett 1995, Weixelman *et al.* 1996, Walford *et al.* 1997). Similarly, understory shrub and forb composition may be the result of grazing disturbance (e.g. some species, such as *Achillea millefolium, Rosa woodsii,* and *Taraxacum officinale* increase under grazing while others decrease) (Weixelman *et al.* 1996, Hall and Hansen 1997). Thus, it is hypothesized that under persistent, heavy livestock grazing the association will move toward *Salix geyeriana/Poa pratensis, Salix geyeriana/Poa palustris, Salix geyeriana/Mesic* Graminoid- Forb, or *Salix geyeriana*/Mesic Forb (Youngblood *et al.* 1985, Evenden 1989, Padgett *et al.* 1989, Walford *et al.* 1997). *Salix geyeriana* may be less tolerant of browsing pressure than *Salix boothii,* thus, grazing may move the association toward *Salix boothii* dominated associations (Hansen *et al.* 1995, Walford *et al.* 1997). Continued overgrazing may directly or indirectly eliminate *Salix geyeriana,* such as by decreasing its vigor or altering hydrologic conditions (Hall and Hansen 1997). The resulting

associations may be drier types such as *Poa pratensis* meadows, mesic graminoid or forb meadows, conifer types, or *Populus tremuloides* associations. The association may naturally form on frequently flooded gravelbars, streambanks, or springs with bare sand and gravel substrates necessary for willow establishment (Weixelman *et al.* 1996, Walford *et al.* 1997). Alternatively, *Salix geyeriana*/Mesic Graminoid possibly originated from *Salix geyeriana*/ *Calamagrostis canadensis, Salix geyeriana/Carex aquatilis, Salix geyeriana/Carex utriculata,* or *Salix geyeriana/Deschampsia cespitosa* associations which have been disturbed by grazing and subsequently invaded by various mesic graminoid species (Mutz and Queiroz 1983, Youngblood *et al.* 1985, Padgett *et al.* 1989, Hansen *et al.* 1995, Manning and Padgett 1995, Hall and Hansen 1997, Walford *et al.* 1997).

WILDLIFE FUNCTIONS

The *Salix geyeriana*/Mesic Graminoid association provides good cover, bedding ground, and forage for wildlife such as beaver, deer, moose, small mammals, and elk (especially in the winter) (Hansen *et al.* 1995, Walford *et al.* 1997). *Salix geyeriana* has moderate to high value as ungulate and beaver forage and is apparently more palatible than *Salix boothii (*Manning and Padgett 1995, Crowe and Clausnitzer 1997). Songbirds, upland gamebirds, and other birds use this association for nesting and foraging (Crowe and Clausnitzer 1997, Hall and Hansen 1997). The dense root network of *Salix geyeriana* and understory *Carex* spp. stabilizes streambanks, allowing streambank undercutting which creates excellent fish habitat (Hansen *et al.* 1995, Hall and Hansen 1997). Beaver ponds, often associated with *Salix geyeriana* associations, also provide excellent fish and waterfowl habitat.

CLASSIFICATION COMMENTS

Salix geyeriana/Mesic Graminoid is a broad association, which may encompass Salix geyeriana/Poa pratensis, and other *Salix geyeriana* associations with no clearly dominant understory graminoid species. When ecological conditions are good, it has higher cover and constancy of *Calamagrostis canadensis, Carex aquatilis, Carex lanuginosa, Carex rostrata* [syn. *Carex utriculata*], and *Deschampsia cespitosa,* possibly causing confusion with *Salix geyeriana* associations named for dominance of any one of these species (Mutz and Queiroz 1983, Youngblood *et al.* 1985, Padgett *et al.* 1989, Hansen *et al.* 1995, Manning and Padgett 1995, Hall and Hansen 1997, Walford *et al.* 1997). More often, however, the *Salix geyeriana*/Mesic Graminoid association is a grazing induced disclimax with high cover and constancy of increasers such as *Agrostis stolonifera, Bromus inermis, Carex praticola, Carex praegracilis, Juncus balticus, Phalaris arundinacea, Phleum pratense, Poa palustris,* and *Poa pratensis* (Padgett *et al.* 1989, Kovalchik 1987, Manning and Padgett 1995, Jankovsky-Jones 1996 Weixelman *et al.* 1996, Walford *et al.* 1997). Thus, communities such as *Salix geyeriana/Poa palustris* and *Salix geyeriana/Poa pratensis* can be confused with *Salix geyeriana*/Mesic Graminoid (Mutz and Queiroz 1983, Youngblood *et al.* 1985, Padgett *et al.* 1989). The broader *Salix geyeriana* association of Hansen *et al.* (1995) is characterized by more cover of mesic graminoids than mesic forbs and likely encompasses stands of *Salix geyeriana*/Mesic Graminoid. In addition, *Salix geyeriana*/Mesic Graminoid can be confused with mixed *Salix* associations and *Salix boothii* associations which share similar mesic graminoid understories (Mutz and Queiroz 1983, Youngblood *et al.* 1985, Kovalchik 1987, Padgett *et al.* 1989, Manning and Padgett 1995, Crowe and Clausnitzer 1997, Walford *et al.* 1997). Youngblood *et al.* (1985) and Hansen *et al.* (1995), for example, lump stands co-dominated by *Salix boothii* within their *Salix geyeriana* associations.

AUTHOR/DATE

Chris Murphy/1999-03-01

Sarcobatus vermiculatus/Distichilis stricta

Greasewood/Saltgrass

RANGE

This type occurs in Colorado, Idaho, Montana, Washington, and Oregon (Reid *et al.* 2000), and possibly also Wyoming, Nevada, and Utah (Daubenmire 1970).

ENVIRONMENT

The *Sarcobatus vermiculatus/Distichilis stricta* association occurs in broad, level to gently sloping bottomlands, either along low-gradient creeks and rivers or in internally drained basins. These depositional areas generally have deep alluvial soils. The water table is generally within a few cm of the soil surface throughout the growing season. Elevations are generally less than 5,000 feet and the climate is arid. Salts accumulate in the soils as inflowing surface waters evaporate.

SOILS

The type occurs on poorly-drained, fine-textured alluvium. Soils have a high pH. Daubenmire (1970) found that *Sarcobatus vermiculatus* raises the soil pH directly beneath the canopy.

VEGETATION COMPOSITION

This plant association is characterized by a sward of *Distichilis stricta* over which are scattered bushes of *Sarcobatus vermiculatus* growing 1-2 m tall. Species richness is very low.

ADJACENT COMMUNITIES

The low elevations occupied by this association limit adjacent upland vegetation to either salt-desert shrub (e.g., *Atriplex confertifolia* and *Grayia spinosa*) or *Artemisia tridentata*-steppe vegetation. Adjacent wetland vegetation may include *Distichlis spicata, Juncus balticus,* and *Eleocharis palustris.*

MANAGEMENT CONSIDERATIONS

Ordinarily, *Sarcobatus vermiculatus* is little used by livestock, but under heavy grazing pressure the shrubs become smaller and develop a compact canopy of foliage, with *Bromus tectorum* replacing the *Distichilis*. It has been shown that in a *Sarcobatus* stand where *Distichilis* had been replaced by *Bromus tectorum* because of past heavy grazing, winter rains moistened the soil profile no deeper than 6 dm. However, the negligible transpiration of the leafless shrub in winter allowed so much water to be stored in the soil that the following spring *Bromus* was distinctly more productive here than in a nearby area where the only shrub was the evergreen, *Artemisia tridentata* (Daubenmire 1970).

SUCCESSIONAL DYNAMICS

Fire kills *Sarcobatus vermiculatus* back only to the ground surface, and sprouts from the root crown appear promptly afterward (Daubenmire 1970). *Distichilis stricta* appears to recover to near pre-fire cover within five years. Heavy grazing leads to the dominance by annuals such as *Bromus tectorum, Lepidium perfoliatum,* and *Bassia hyssopifolia*, but the *Distichilis* itself is highly tolerant of grazing. Only severe use will bring about its displacement.

WILDLIFE FUNCTIONS

Sarcobatus vermiculatus may be utilized by cattle, deer, and antelope in the winter, but it is poisonous to sheep (Muegler and Stewart 1980). This association may provide some habitat as well as thermal and hiding cover for big game and upland birds (Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

The *Sarcobatus vermiculatus/Distichlis spicata* plant association has been reported in several classifications (Daubenmire 1970, Mueggler and Stewart 1980, and Kittel *et al.* 1999) and documented with recent field data.

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-01-05(2000-02-22)

Agropyron smithii

Western wheatgrass

RANGE

Agropyron smithii associations have been reported at lower elevations in Montana, Idaho, Colorado, Utah, Nebraska, Saskatchewan, and Wyoming.

ENVIRONMENT

This community occurs on flat to gently sloping topography. Landforms where this association occurs are variable ranging from floodplains to depressions to alluvial fans where overland flow or groundwater allows for seasonably wet moisture regimes.

SOILS

Soil texture ranges from poorly drained to very poorly drained clay to silt loams. Soils vary widely from neutral to moderately akaline (Hansen *et al.* 1995). The soils are deep (40-100 cm) and well developed.

VEGETATION COMPOSITION

Agropyron smithii occurs in nearly pure stands (80% cover) with few associates having high constancy or abundance. Species such as *Eleocharis palustris, Koeleria macrantha* and *Poa nevadensis* may be locally abundant. *Artemisia leudoviciana, Bouteloua gracilis, Stipa viridula,* and *Stipa comata* may also be present.

ADJACENT COMMUNITIES

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

MANAGEMENT CONSIDERATIONS

This type is tolerant of grazing pressure and drought. Overgrazing in May and June may decrease its productivity. Following drought or management of overgrazed areas the dominant species will rapidly colonize areas it previously occupied (Hansen *et al.* 1995). *Agropyron smithii* is tolerant of fire during the dormant state. During the growing season recovery from fire may be delayed. The dominant graminoid has potential for revegetating disturbed or degraded wetland sites. Transplants are desirable since seedlings may be slow growing. Once the species becomes established, the plants are able to spread quickly by rhizomes (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

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

WILDLIFE FUNCTIONS

Agropyron smithii stands may be used by waterfowl for nesting sites. The diagnostic graminoid is browsed by antelope and deer during the spring when stems are palatable (Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

The *Agropyron smithii* plant association has been quantitatively described in Montana (Hansen *et al.* 1995) and documented in Idaho with recent field data and observations (Jankovsky-Jones *et al.* 2000, Idaho Conservation Data Center 2000).

AUTHOR/DATE(UPDATE)

Mabel Jankovsky-Jones/1996-02-05(2000-01-14)

Carex amplifolia

Bigleaf sedge

RANGE

Stands are documented from northeastern Oregon and southeast Idaho. Similar stands were described in central Oregon.

ENVIRONMENT

The *Carex amplifolia* plant association is known from narrow valley bottoms at moderate elevations. Stands develop on floodplains with a constant source of water from adjacent springs and on spring fed toe-slopes. Water is at or near the surface for most of the growing season and stands help to maintain the baseflow in adjacent streams.

SOILS

Soils are variable and may be organic or mineral.

VEGETATION COMPOSITION

Carex amplifolia has nearly continuous cover (40-60%) with scattered associated forbs and graminoids. Common associates include *Scirpus microcarpus, Glyceria elata, G. grandis, Juncus ensifolius, Habenaria hyperborea, Mimulus guttatus,* and *Veronica americana*.

ADJACENT COMMUNITIES

Adjacent riparian habitats may be dominated by Cornus sericea or stringers of Pseudotsuga menziesii. Adjacent uplands support vegetation with an overstory dominated by Pseudotsuga menziesii, Pinus pondrosa, Abies grandis, and occasionally Abies lasiocarpa.

MANAGEMENT CONSIDERATIONS

The diagnostic graminoid has low palatability except in the spring and soils are typically avoided due to instability. If no other forage is available stands may be susceptible to grazing and fragile soils will be damaged. Carex amplifolia does have thick rhizomes that respond well to rest and short duration fall grazing (Kovalchik 1987). However, with continued use by livestock the diagnostic sedge and associated native species may be eliminated and replaced by forbs.

SUCCESSIONAL DYNAMICS

Information on the succesional status of this plant association is limited. Kovalchik's (1993) similar *Scirpus microcarpus (Carex amplifolia)* association is on early seral sites on floodplains. The *Carex amplifolia* stands described here are less dynamic with a stable water source.

WILDLIFE FUNCTIONS

Stands supporting *Carex amplifolia* may provide water sources throughout the growing season for wildlife. Forage is available early in the spring when snow still covers adjacent uplands. While most large animals may avoid these sites because of wet soils and low palatability of the diagnostic sedge; moose were observed browsing in stands in southeast

Idaho. Stands may provide habitat for amphibians if woody debris is on site (Kovalchik 1987, Crowe and Clausnitzer 1999).

CLASSIFICATION COMMENTS

Classification is based on 12 plots sampled by Crowe and Clausnitzer (1999) in Oregon. Kovalchik (1987) described a *Scirpus microcarpus (Carex amplifolia)* association that is dominated *by S. microcarpus* and/or *C. amplifolia*. Stands of Carex amplifolia have been observed in Idaho and quantitative data is available from 1 site. Kovalchik's (1994) *Scirpus microcapus (Carex amplifolia)* plant association includes communities dominated by Carex amplifolia. Kovalchik's stands typically occur on fluvial surfaces rather than in association with springs or seeps.

AUTHOR/DATE

Mabel Jankovsky-Jones/2000-11-15

Carex nebrascensis

Nebraska sedge

RANGE

The *Carex nebrascensis* plant association has been documented in every Western State, with the possible exception of New Mexico and Washington (Manning and Padgett 1995, Reid *et al.* 2000).

ENVIRONMENT

This association typically occurs at low to mid-elevations in the mountains, ca. 3,300 to 9,200 feet depending on latitude. It most often occurs in meadows and on broad alluvial terraces with fine-textured soils, but also around seeps. Although stands can occur near streams and rivers, the high water tables found in this type appear to result from lateral subirrigation rather than fluvial flooding. Valley bottom widths can range from very narrow to very broad (typically moderate to broad) and gradients can range from very low to very high (typically low). It also occurs along a wide variety of Rosgen stream classes (Youngblood *et al.* 1985, Padgett *et al.* 1989, Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997).

SOILS

The *Carex nebrascensis* association is mostly associated with deep, fine-textured mineral soils (Mollisols, Andisols, Entisols, and Inseptisols). It rarely occurs on organic substrates (Histisols). Water tables are typically at or near the surface, at least in the early growing season, occasionally dropping to more than 1 m. Estimated available water holding capacity is moderate to high (Youngblood *et al.* 1985, Padgett *et al.* 1989, Hansen *et al.* 1995, Crowe and Clausnitzer 1997).

VEGETATION COMPOSITION

Stands of the *Carex nebrascensis* plant association are generally small and widely scattered on the landscape. *Carex nebrascensis* clearly dominates the vegetation, with generally minor amounts of other graminoids, including *Glyceria striata, Deschampsia cespitosa, Juncus balticus, Calamagrostis neglecta,* and *Poa pratensis,* among many others. Forbs species present in the association are highly variable and typically sparse (Youngblood *et al.* 1985, Padgett *et al.* 1989, Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997).

ADJACENT COMMUNITIES

Because of the wide elevational and geographical distribution, adjacent upland associations can range from sagebrush-steppe at the lower elevations to a diversity of montane and subalpine coniferous forest types. Adjacent riparian associations are equally diverse and include coniferous forest, deciduous forest, tall shrub, low shrub, and herbaceous associations.

MANAGEMENT CONSIDERATIONS

Carex nebrascensis, although an increaser in some associations, is very palatable to livestock and an excellent soil binder in wet meadows. Several studies suggest that management of this association should allow for regrowth at the end of the grazing season to replenish carbohydrate reserves for winter respiration and early spring growth. The typically wet, fine-textured soils are susceptible to compaction and hummocking by excessive livestock use particularly if the sod layer is broken and hummocks are present. Grazing value ratings are high for elk, cattle and horses, and medium for sheep and deer. The erosion control potential rating is high. It is valuable for streambank stabilization because of its strong rhizomes and dense roots (Manning and Padgett 1995).

SUCCESSIONAL DYNAMICS

Some studies consider all stands of the *Carex nebrascensis* association to be a grazing disclimax (e.g., Hansen et al 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997), while others consider it to be the potential natural community in some cases (e.g., Youngblood *et al.* 1985, Padgett *et al.* 1989, Manning and Padgett 1995). These latter studies apparently sampled stands that they considered to have received little or no grazing pressure. *Carex nebrascensis* is strongly rhizomatous and robust, outcompeting other species that occupy similar sites, such as *Deschampsia cespitosa.* The dominance of *C. nebrascensis* may represent disturbance conditions because it can persist under heavy grazing. Under high quality conditions, however, increaser species (e.g., *Juncus balticus, Poa pratensis, Aster* spp.*,* and/or *Trifolium* spp.) are either absent or present with low cover. While *Deschampsia cespitosa* may have once codominated some sites, the strongly rhizomatous habit of *C. nebrascensis* has likely facilitated its continued dominance. Once *C. nebrascensis* dominates a site, it should be considered the potential natural community for these sites (Manning and Padgett 1995).

WILDLIFE FUNCTIONS

Carex nebrascensis is palatable to elk and provides food and cover for waterfowl (Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

Classification of this association is based on many plots from many studies in Oregon, Nevada, Idaho, California, Montana, Wyoming, Utah, and Colorado, at least.

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-12-08(2001-01-15)

Carex praegracilis

Clustered field-sedge

RANGE

The *Carex praegracilis* plant association is reported from Idaho, Oregon, Colorado, Wyoming, Montana, and California.

ENVIRONMENT

The *Carex praegracilis* plant association is found on a variety of landforms ranging from subirrigated moist meadows to floodplains of large rivers. The association is typically found at middle to lower elevations.

SOILS

Soils are deep and range from heavy clays to sandy clay loams with mottling and may be alkaline (Kittel *et al.* 1999). Soils are saturated early in the growing season and surface dry by mid-summer.

VEGETATION COMPOSITION

Carex praegricilis is the dominant graminoid on high quality sites with continuous (90 percent) cover in some locations. Other species that may be present include *Carex nebrascensis, Eleocharis palustris, Juncus balticus, Potentilla palustris,* and *Elymus triticoides.* On alkaline sites *Distichlis spicata* and *Muhlenbergia asperifolia* may be present.

ADJACENT COMMUNITIES

Stands of *Carex praegracilis* typically occupy a complex mosaic made up of patches of *Typha latifolia, Scirpus* spp., *Carex nebrascensis, Agropyron smithii, Elymus triticoides, Juncus balticus,* and *Potentilla fruticosa.*

MANAGEMENT CONSIDERATIONS

Carex praegracilis is rated as highly palatable to cattle and moderately palatable to sheep and horses. Meadows are often used as irrigated hay pasture and cows are reported to get a good gain on *C. praegricilis* hay. The rhizomatous habit of *Carex praegracilis* allows it to persist with annual haying and grazing. Stands are susceptible to compaction if disturbed in early spring or summer. Heavy use can decrease stand area and allow other species to become dominant. This species is useful for revegetation and can be planted from commercially available seed or from transplants (Elzinga and Rosentreter 2001).

SUCCESSIONAL DYNAMICS

Little is known about the successional pattern of *Carex praegracilis* dominated areas.

WILDLIFE FUNCTIONS

Carex praegracilis is considered good forage for elk and is valued as winter forage. It will function as a streambank stabilizer and stabilize overhanging banks for fish habitat (Elzinga and Rosentreter 2001). Meadows supporting *Carex praegracilis* provide nesting habitat for wrens, rails, and other birds.

CLASSIFICATION COMMENTS

The *Carex praegricilis* plant association is classified based on a limited number of quantitative vegetation plots sampled in Colorado (2 plots), Oregon (3 plots), and Idaho (1 plot) (Crowe and Clausnitzer 1997, Moseley 1998, Kittel *et al.* 1999). This association is typically found at lower elevations where much of the land is in private ownership and only limited sampling has occurred. Some stands do support near monocultures of the diagnostic species. However, hydrologic fluctuations (both natural and human caused) and ground disturbance seem to favor more diverse stands with a mix of mesic graminoids including *Carex praegricilis, C. nebrascensis, Juncus balticus, Eleocharis palustris, Agropyron smithii,* and *Elymus triticoides.* Mixed graminoid stands are difficult to classify especially when no species shows clear dominance.

AUTHOR/DATE(UPDATE)

Mabel Jankovsky-Jones/2000-11-17(2001-01-04)

Carex simulata

Short beaked sedge

RANGE

The *Carex simulata* association is a minor, although widespread, type which occurs in the montane valleys throughout southern and south central Idaho; the Wyoming Range and the Yellowstone Volcanic Plateau of northwestern Wyoming (Youngblood 1985), the Uinta Mountains and the Wasatch Plateau of Utah (Padgett *et al.* 1989), the mountains of Montana (Hansen *et al.* 1995), the Rio Grande and Closed Basins of Colorado (Kittel *et al.* 1999), and is scattered throughout central Oregon (Kovalchik 1987).

ENVIRONMENT

Stands are located in wet depressions such as broad meadows, toe slope seeps or gentle slopes below seeps, flat alluvial terraces adjacent to streams, and swales formed by abandoned channels.

SOILS

Soils of the *Carex simulata* plant association commonly have organic matter accumulation 30-120 cm thick; Padgett *et al.* (1989) noted that although the degree of organic matter decomposition is variable, communities within his study area were most often associated with organic soils rather than highly decomposed mineral soils. Kovalchik (1987) describes soils of this association as organic loam and sedge peats. This type may also be found on poorly drained, fine textured mineral soils (Hansen *et al.* 1995) or fine loams and clays with organic surface horizons of thick (cumulic) mollic epipedons (Youngblood *et al.* 1985).

VEGETATION COMPOSITION

Carex simulata dominates stands with up to 85% cover. *Carex simulata* may not always be the dominant species, but it is an indicator for this association. Moss cover is typically high. Low species diversity, with *Carex aquatilis, C. utriculata, Deschampsia cespitosa* and *Juncus balticus* being the only associates with high constancy, is characteristic. The shrubs *Potentilla fruticosa, Salix wolfii* and *S. brachycarpa* are sometimes present. The most common forbs include *Pedicularis groenlandica* and *Swertia perennis.*

ADJACENT COMMUNITIES

Wetter sites are dominated by *Scirpus acutus*, open water (Hansen *et al.* 1995), *Carex utriculata* or *Carex aquatilis* (Padgett *et al.* 1989). Stands of *Potentilla fruticosa/Deschampsia cespitosa* are common on drier sites (Hansen *et al.* 1995), while uplands may be dominated by *Pinus contorta, Picea engelmannii, Populus tremuloides,* shrub-steppe, or dry grasslands (Padgett *et al.* 1989).

MANAGEMENT CONSIDERATIONS

Carex simulata appears able to withstand moderate grazing pressures, though impacts on soils may include hummocking and pitting if stands are used when sites are wet (Padgett *et al.* 1989). Hummocked meadows will continue to support *Carex simulata* if water table levels are maintained (Elzinga and Rosentreter 2001). Stands are generally to wet to burn except in the fall. Recovery from resprouting rhizomes is rapid unless the soil surface becomes dry, organic soils become flammable, and fire penetrates the soil destroying sedge rhizomes (Kovalchik 1987). Transplanted rhizomes can be used for restoration of riparian and wetland habitat. Seed, while less effective, may also be used (Elzinga and Rosentreter 2001).

SUCCESSIONAL DYNAMICS

The strongly rhizomatous *Carex simulata* appears to form a dense, stable association (Padgett *et al.* 1989). Continually high water tables limit the successful establishment of most other species. Due

to the season long high water table, the sites are often inaccessible and minimally disturbed (Hansen *et al.* 1995). Most reproduction is via spread by rhizomes; seed is produced, but germination rates are low (Elzinga and Rosentreter 2001).

WILDLIFE FUNCTIONS

The dense stands created by *Carex simulata* provide cover for waterfowl and small mammals. Where stands vegetate stream channels, they provide good bank stability and may create overhanging banks for fish (Elzinga and Rosentreter 2001). This type may provide early spring forage for deer when adjacent uplands are still covered by snow (Kovalchik 1987).

CLASSIFICATION COMMENTS

The *Carex simulata* plant association has been well described and documented from Idaho (Tuhy and Jensen 1982), Utah (Youngblood *et al.* 1985, Padgett *et al.* 1989), Montana (Hansen *et al.* 1995), Oregon (Kovalchik 1987), Colorado (Kittel *et al.* 1999) and California (Nachlinger 1985).

AUTHOR/DATE(UPDATE)

Linda Williams/1995-08-06(2001-01-04)

Carex utriculata

Bladder sedge

RANGE

This plant association occurs in Oregon (Kovalchik 1987), Nevada (Manning and Padgett 1995), Utah (Padgett *et al.* 1989), Idaho, Wyoming (Youngblood *et al.* 1985, Jones and Walford 1995), Montana (Hansen *et al.* 1995), and Colorado (Kittel *et al.* 1999).

ENVIRONMENT

This association is widespread at moderate to high elevations in the mountains and rarely found in low-elevation valleys or on volcanic plains. It occurs in a wide variety of landscape settings, such as in narrow to broad valley bottoms on meadows, seeps, stream terraces and is commonly associated with ponds and sloughs that have silted in. It can occur in standing water or on sites that become relatively dry during the latter part of he growing season. Valley bottom gradients are low (Padgett *et al.* 1989, Hall and Hansen 1997).

SOILS

Soils are classified as Histisols, Mollisols, Inceptisols, and Entisols. Mineral soils are generally very organic-matter rich and often have an incipient histic epipedon forming at the surface. These soils may eventually become Histisols. Most of the mineral soils are fine-textured and have high water holding capacity. The soils are saturated to the surface well into the summer and the water table is usually within 2 feet of the surface late into the growing season (Crowe and Clausnitzer 1997, and others).

VEGETATION COMPOSITION

Carex utriculata typically exhibits monospecific dominance in this association, with dense cover. *Carex nebraskensis, C. simulata, C. aquatilis,* and/or *Juncus balticus* may be present but are usually not abundant in this species-poor association. Litter often accumulates and few species can establish on these organic, permanently saturated or inundated soils. This is why willows are rarely present (Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997).

ADJACENT COMMUNITIES

Because of the wide elevational and geographical distribution, adjacent upland associations can range from sagebrush-steppe at the lower elevations (rare) to a diversity of montane and subalpine coniferous forest types.

MANAGEMENT CONSIDERATIONS

Though *C. utriculata* produces large amounts of herbage every year, it apparently is relatively unpalatable to livestock, especially as it matures. It is a coarse sedge with high amounts of silica in its leaf cells. The dense network of rhizomes and roots provides excellent streambank stabilization and frequently forms the overhanging banks associated with good fish habitat. These banks may slump if subjectsed to heavy grazing or trampling (Hansen *et al.* 1995). This is a good species for restoration by using transplanted rhizomes or commercially available or collected seed (Elzinga and Rosentreter 2001).

SUCCESSIONAL DYNAMICS

Carex utriculata is a widespread species that occupies mineral or organic soils with seasonably high water tables. This association typically colonizes recently formed ponds and/or sites in or adjacent to low-gradient stream channels. It has

been observed that *C. utriculata* has higher cover on sites that are seasonally flooded; continually inundated sites had decreased shoot density. It can colonize permanently flooded sites, often doing so from the outer edge. As soil and litter build up, these sites are more conducive to increased *C. utriculata* dominance. This species is relatively long-lived and maintains dominance if high soil moisture is maintained. As soil moisture decreases, other species such as *C. nebraskensis, C. simulata,* or *Deschampsia cespitosa* may replace *C. utriculata* (Manning and Padgett 1995).

WILDLIFE FUNCTIONS

This association performs a vital role in maintaining water quality and aquatic health in headwater streams. Past beaver activity is often evident in this plant association, and *Carex utriculata* is one of the species likely to pioneer newly flooded beaver ponds. Palatability appears to be lower than for other sedges such as *Carex nebraskensis* or *C. aquatilis* (Padgett *et al.* 1989). Rhizomes and sprouts are important food for muskrats and are occasionally eaten by waterfowl (Elzinga and Rosentreter 2001). *Carex utriculata* provides valuable breeding and feeding grounds for waterfowl and snipe. Common yellowthroats, red-winged blackbirds, song sparrows, and tree swallows are commonly associated with this association (Crowe and Clausnitzer 1997).

CLASSIFICATION COMMENTS

Carex utriculata plant associations have been described in Oregon (Kovalchik 1987), Nevada (Manning and Padgett 1995), Utah (Padgett *et al.* 1989), Montana (Hansen *et al.* 1995), Idaho, Wyoming (Youngblood *et al.* 1985) and Colorado (Kittel *et al.* 1999). This sedge forms near monocultures and the plant association is easily identified. Identification can however be complicated as sedges including *Carex vesicaria, Carex atherodes,* and *Carex aquatilis* have similar growth form and occupy similar habitat.

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-01-02(2001-01-04)

Distichlis spicata var. *stricta*

Inland saltgrass

RANGE

Stands of *Distichlis spicata* are known from across the western United States and Saskatchewan. It is found in semi-arid and arid regions with intermittent flooding in the western Great Plains, Intermountain Region and southwestern U.S. from New Mexico to Montana west to Washington, Oregon and California. It also is likely to occur in Mexico (from Reid *et al.* 1999).

ENVIRONMENT

Stands of *Distichlis spicata* occupy saline or akaline basins, swales, pond and lake margins, and seep areas that are intermmittently flooded (Hansen *et al.* 1995). Water tables are usually at or slightly below the surface. Soils are commonly alkaline with a high concentration of soluble salts (Hansen *et al.* 1995).

SOILS

Soil textures vary from sandy clay to sandy loams to sandy clay loams with cobbles and gravel (Kittel *et al.* 1999). Soils are deep and generally have an impermeable layer and are thus poorly drained (Reid *et al.* 1999).

VEGETATION COMPOSITION

Distichlis spicata occurs in nearly pure stands with sparse to dense cover. Higher cover and species diversity are correlated with higher moisture in wet years and near boundaries with other vegetation associations. High soil salinity favors *Distichlis spicata* over other species though very high salinity may dwarf and reduce cover of *Distichlis*. Species associated with high salinity sites may include *Puccinellia nutalliana, Triglochin maritima, Salicornia rubra,* and *Suaeda calceoliformis.* Species from areas with lower salinity may include *Juncus balticus, Scirpus maritimus, S. nevadensis, Hordeum brachyantherum, H. jubatum, Agropyron smithii*, and *Muhlenbergia asperifolia* (Reid *et al.* 1999, Jankovsky-Jones *et al.* 2000).

ADJACENT COMMUNITIES

Adjacent wetter communities may be dominated by *Scirpus acutus, Scirpus americanus, Scirpus maritimus, Scirpus nevadensis,* or open water. Drier sites may be dominated by *Sarcobatus vermiculatus, Artemisia tridentata* or other upland types (Hansen *et al.* 1995).

MANAGEMENT CONSIDERATIONS

Forage production in this type is low due to the unpalatible nature of the diagnostic graminoid. The high clay content and saline nature of the soils make them susceptible to compaction problems and limit the practicality of development. On degraded

alkaline sites, *Distichlis spicata* may be planted and tends to do quite well due to the rhizomatous growth form (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

Distichlis spicata is tolerant of low to moderately alkaline soils. It is a warm season grass growing from early summer to fall spreading primarily by rhizomes (Kittel *et al.* 1999). Sites supporting *Distichlis spicata* have an intermittent flooding regime that when combined with a high evaporation rate in dry climates causes accumulations of soluble salts in the soil. At some sites, vegetation forms zones where species abundance and composition is stratified by salt tolorance. For example, in playas soil salinity typically increases from the edge to the center allowing for several concentric vegetation zones. Microtopography can also affect vegetation composition. Accumulation of soil may form hummocks where plants with less salt and alkali tolerance can occur (Reid *et al.* 1999).

WILDLIFE FUNCTIONS

Distichlis spicata is a tough, course plant that is of low to fair palatability for livestock and wildlife. It does provide cover for small wildlife species, forming a dense sod that provides good concealment. Pure stands of saltgrass provide nesting sites for numerous species of ducks and shorebirds (USDA 2000). Stands may be used for foraging by northern harriers and other species of raptors.

CLASSIFICATION COMMENTS

The classification of vegetation stands dominated by *Distichis spicata* is difficult for two reasons. First, *D. spicata* is a widespread halophytic grass species that dominates or codominates the herbaceous layer of stands classified into many different associations. This results in many closely related associations where this grass is a diagnostic species. Secondly, most of these related associations have an intermittent, temporary, seasonal or tidal flood regime. These flood regimes sometimes separate vegetation that otherwise is very similar. For example, the flood regime that separates this plant association from associations in the *Distichlis spicata*-(*Hordeum jubatum*) Temporarily Flooded Alliance can be somewhat arbitrary in regions that have large year-to-year variation in precipitation (from Reid et al 1999). A *Distichlis spicata-Scirpus nevadensis* plant association is listed as occurring in Idaho and other western states. Documentation for this community, in Idaho at least, is limited. Closely related plant associations have been described with a variety of associated species. The association described here includes nearly pure stands of *Distichlis spicata* and stands with a high number of associates may be tied to more mesic zones, areas with lowered alkalinity, or disturbed sites.

AUTHOR/DATE(UPDATE)

M. Jankovsky-Jones/1999-02-18(2001-01-04)

Eleocharis palustris

Common spikerush

RANGE

Eleocharis palustris is a common type in California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming, and Saskatchewan. It has been documented from essentially every western state except Arizona and New Mexico.

ENVIRONMENT

The *Eleocharis palustris* plant association is found at low to moderate elevations, generally in wide, low gradient valleys of all shapes. Sites are wet basins, floodplains, meadows, gravel bars, and lake edges. It is typically in sites that are prone to yearly flooding or persistent surface water. Where streams are present, they are Rosgen's C and E stream types. Elevations range from 2,200 to at least 8,700 feet, depending on latitude (Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997).

SOILS

Soils of this plant association are classified as Mollisols, Entisols, Histisols, and Inseptisols. Textures are variable, ranging from sites that are very coarse-fragment rich to others that are deep and fine-textured. The surface is usually high in organic matter and the litter accumulation may blend into rich, black organic muck soils. The fine-textured upper horizons often arise from alluvial deposition. Sands, gravels, and cobbles usually constitute the main body of deeper subsurface materials (Manning and Padgett 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997).

VEGETATION COMPOSITION

Eleocharis palustris is an aggressive, rhizomatous species that nearly excludes all other species from establishing any significant cover. Common associates in high quality sites include *Alopecurus aequalis, Mentha arvense, Rumex crispus,*

Eleocharis acicularis, Carex utriculata, Glyceria spp., and *Phalaris arundinacea*. On some sites, aquatic species, such as *Hippuris vulgaris, Utricularia vulgaris,* and *Potamogeton natans,* have high cover.

ADJACENT COMMUNITIES

Due to the wide geographic distribution of this type adjacent upland communities are varied, including shrub-steppe, woodland, and coniferous forest types. Adjacent riparian communities may be dominated by an equally varied assortment of types including deciduous forest, tall shrub, low shrub, and herbaceous communities.

MANAGEMENT CONSIDERATIONS

Seasonally wet conditions and low palatability of *Eleocharis palustris* limit the grazing value of this type for livestock, even during drought years when upland forage dries early and dies back (Kovalchik 1987). Sites occupied by this type are typically inundated or at least saturated for so much of the year as to preclude most development. Trampling damage and soil churning occurs readily with livestock use and may result in a shift toward more disturbance tolerant species such as *Hordeum jubatum, Carex nebrascensis,* and *Juncus balticus* (Hall and Hansen 1997).

SUCCESSIONAL DYNAMICS

Padgett *et al.* (1989) suggest that *Eleocharis palustris* can represent an early seral species on ponds and streambanks where water is at or above the ground surface. As siltation occurs over time, other communities, such as *Carex utriculata,* may replace it. However, due to the continual saturated conditions and dense growth of *Eleocharis palustris,* once formed, stands appear difficult to displace and may persist as climax vegetation. If water levels rise, *Scirpus* spp. and *Typha latifolia* may be able to supplant *E. palustris.* Hansen *et al.* (1995) have observed that disturbance can drastically shift the vegetative composition of this type toward increaser or invader species such as *Hordeum jubatum.*

WILDLIFE FUNCTIONS

Broad zones of this type along streams, rivers, lakes, and reservoirs provide valuable feeding and nesting areas for waterfowl. *Eleocharis palustris* and associated plants are a valuable source of food and cover for waterfowl. Wild ungulates seldom browse this habitat type due to its low palatability (Hall and Hansen 1997).

CLASSIFICATION COMMENTS

The *Eleocharis palustris* plant association is widespread and has been described in numerous classifications throughout the United States. In Idaho two plant associations dominated by *Eleocharis palustris* are recognized. The one described here represents stands that occur along streams, rivers, and lakeshores. An *Eleocharis palustris* vernal pool association is also recognized that occurs in vernal lake beds that dry completely by the end of the growing season. In some cases, *Eleocharis palustris* may be confused with *E. rostellata,* especially if the stolons of *E. rostellata* are not present or not obvious. Be sure of the plant's identity. A misidentification will result in the wrong community type and the sites on which they occur are very different ecologically.

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-12-08(¯2001-10-01)

Eleocharis rostellata

Wandering spikerush

RANGE

Eleocharis rostellata is widespread form southern Canada to South America, It occurs in disjunct populations and may not be present in every state (USDA 2000). In the western United States *Eleocharis rostellata* is a minor association in Idaho, Montana, and Yellowstone National Park, Wyoming, and may occur in Washington, British Columbia, Colorado, and other parts of Wyoming.

ENVIRONMENT

This association occurs in thermal areas or areas with alkaline or calcareous soils, especially at the northern edge of it's distribution. It is also found around cold springs in desert canyons. Water tables are at or near the surface throughout the year.

SOILS

This association is known to occur in a variety of soils from relatively deep organic, to alkaline and calcareous soils, to coarse wet mineral soils that are directly in contact with thermal waters.

VEGETATION COMPOSITION

The association forms near monocultures, and may occur as a quaking mat, or may be more open with considerable areas of bare soil, gravel, rock, and open water (Moseley 1995). Hansen *et al.* (1995)

state that *E. rostellata* dominates a low (less than 30 cm) herbaceous layer. Moseley (1995) notes that there are two distinct phases of the communtiy: stands with 90% cover of *E. rostellata*, occurring on relatively deep organic soils and sometime forming a quaking mat; and stands with less than 70% cover that are more open, with considerable areas of bare soil, gravel, rock, and open water on the surface. The open phase appears restricted to mineral substrates and occurs on gentle as well as very steep slopes. Low species diversity is characteristic of the *E. rostellata* plant association. Common associated species with low cover include *Deschampsia cespitosa, Polypogon monspeliensis, Juncus balticus, Muhlenbergia asperifolia, Potentilla fruticosa, Aster ascendens, Berula erecta, Mimulus guttatus, Helianthus nuttallii, Castilleja exilis, Scirpus americanus, Carex simulata, C. nebrascensis,* and *C. scirpoidea.*

ADJACENT COMMUNITIES

Adjacent upland associations are often sagebrush-steppe or coniferous forest types. Adjacent riparian associations may be dominated by *Carex* spp., *Potentilla fruticosa,* and *Deschampsia cespitosa.*

MANAGEMENT CONSIDERATIONS

This association is threatened by development of thermal areas for recreation. Because of the wet, often unstable nature of the substrate, soil disturbance and grazing by livestock is probably minimal. Yet trampling damage of the wet, organic soils of this association occurs readily with any livestock utilization. Livestock may graze forage plants in this association, but overgrazing can cause compositional changes to species of lower palatability (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

Little is known about the successional dynamics of this association. It is reported to be an early colonizer of bare substrates. It is presumed to be a stable association once established, unless water tables are altered (USDA 2000).

WILDLIFE FUNCTIONS

This association is a source of green forage early in the spring and attracts wildlife (especially elk and deer). Waterfowl will eat the stems, roots, and achenes of this plant association (Hansen *et al.* 1995, USDA 2000).

CLASSIFICATION COMMENTS

In Montana, Hansen *et al.* (1995) lumped all combinations of *E. rostellata* and *E. pauciflora* into an *E. pauciflora* habitat type due to similarities in environmental conditions and management concerns. The *E. rostellata* association is distinct, and at least partially thermophilic, unlike the *E. pauciflora* type. In some cases, *Eleocharis rostellata* may be confused with *E. palustris,* especially if the stolons of *E. rostellata* are not present or not obvious. Be sure of the plant's true identity. A misidentification will result in the wrong plant association and the sites on which they occur are very different ecologically.

AUTHOR/DATE(UPDATE)

Linda Williams/1995-12-20(2001-01-15)

Hordeum brachyantherum

Meadow barley

RANGE

Manning and Padgett (1995) described this association from widely scattered locations in western, central, and northern Nevada. It has been sampled in the Owyhee Mountains of southwestern Idaho, at a spring fed wetland on a terrace above the middle Snake River of central Idaho, and in a spring fed meadow in the Sublette Range of southeast Idaho.

ENVIRONMENT

This plant association is known from the mountains, where it occurs at elevations ranging from 5,600 to 8,800 feet. It occurs along streams or in meadows (mostly), in valley bottoms that range from very narrow to very wide and have low to moderate gradients. Two sites in Nevada were along C3 and B3 stream channels (Manning and Padgett 1995). The Idaho sites are near headwater springs.

SOILS

All soils sampled in Nevada had thick mollic epipedons and, therefore, were all Mollisols. Soil particle size classes were clayey, silty, or fine-loamy. The depth to the water table in Nevada was greater than three feet (Manning and Padgett 1995). Soils at the Idaho site were seasonally to semi-permanently saturated.

VEGETATION COMPOSITION

Hordeum brachyantherum typically forms a continuous layer with cover ranging from 25 to near 100%. Cover of graminoid associates varies and may include *Carex douglasii, C. microptera, C. athrostachya, Agropyron trachycaulum, Deschampsia cespitosa, Poa nevadensis, Eleocharis palustris,* and/or *Poa pratensis.* The forb cover is very sparse and is characterized by *Aster* spp., *Epilobium* spp., *Mimulus guttatus, Iris missouriensis,* and *Rumex crispus* (Manning and Padgett 1995).

ADJACENT COMMUNITIES

Adjacent upland associations include *Artemisia tridentata* ssp. *vaseyana, Artemisia arbuscula, Pinus contorta,* and *Juniperus occidentalis* types. Adjacent riparian associations may be dominated by *Salix geyeriana, S. lemmonii, Carex* spp., *Iris missouriensis,* and *Glyceria grandis* types.

MANAGEMENT CONSIDERATIONS

Hordeum brachyantherum has low to moderate resource value rating for all livestock and a high rating for mule deer in the spring. Because of its tufted habit, *H. brachyantherum* has a low to moderate potential for streambank stabilization. Heavy livestock grazing will result in the replacement of this type with other less desirable types. In addition, surface soil compaction from livestock is probable in this association due to the typically fine-textured particle size and moist condition (Manning and Padgett 1995).

SUCCESSIONAL DYNAMICS

Manning and Padgett (1995) suggest that *Hordeum brachyantherum* is an early seral species that can be replaced by other native mesic graminoids if left undisturbed. However, the one stand sampled in Idaho is within an exclosure that has been in place from between 30 and 50 years. It can maintain dominance with grazing, although excessive use will lower vigor and cover, and increase cover of various *Aster* spp., *Potentilla gracilis,* and/or *Juncus balticus.* The *H. brachyantherum* plant association typically occurs on sites similar to the *Agrostis stolonifera* type and has seral status similar to the *Poa nevadensis* plant association. *Poa nevadensis* and *H. brachyantherum* are often present together and may codominate in some places in Nevada (Manning and Padgett 1995).

WILDLIFE FUNCTIONS

Hordeum brachyantherum is only moderately palatable to livestock and big game with palatability declining in the latter part of the growing season. Small mammals and waterfowl may make limited use of *H. brachyantherum* leaves and seeds for food (Elzinga and Rosentreter 2001).

CLASSIFICATION COMMENTS

This association has been quantitatively defined by Manning and Padgett (1995) from eastern and northern Nevada, supplemented with one plot and one observation from southern Idaho. The *Poa nevadensis* plant association is closely related to this plant association. According to Manning and Padgett (1995), if a stand in which both species occur is clearly dominated by *Poa nevadensis* it is placed in the *Poa nevadensis* plant association. If they have more or less equivalent cover, the stand is placed in the *Hordeum brachyantherum* plant association. Their observations suggest that the site conditions must be fairly moist for the *Hordeum brachyantherum* type, while they are usually much drier for the *Poa nevadensis* type.

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-12-08(2001-01-05)

Juncus balticus

Baltic rush

RANGE

The *Juncus balticus* plant association has been documented from every state in the western United States, with the exception of Arizona (Reid *et al.* 2000).

ENVIRONMENT

The elevational range occupied by stands of *Juncus balticus* is as wide as the geographic range, ranging from 3,000 feet in Montana to over 10,000 feet farther south. Throughout its range it occurs near seeps, in meadows, and on alluvial terraces. Where streams are present, the Rosgen reach types have been identified as B3, B4, C3, C4, C6, E4, E6, and F4. Surface topography is usually level or sometimes undulating or hummocky. Valley bottom characteristics are equally diverse, with widths ranging from very narrow to very broad and gradients from low to high (Padgett *et al.* 1989, Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997).

SOILS

This plant associaton typically occurs on fine-textured surface soils. Textures range from silt to sandy-loam. The water table ranges from the surface to ca. 50 cm below the surface, occasionally falling below 1 m by the end of the summer. Estimated available water-holding capacity ranges from low to high. A horizon soils have been classified as Mollisols, Inceptisols, and Histisols. Soil reaction ranges from neutral to mildly alkaline, pH 7.0 to 8.0 (Padgett *et al.* 1989, Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997).

VEGETATION COMPOSITION

Baltic rush dominates stands with canopy cover generally over 50%, usually higher. Cover by other graminoids is usually low, although *Poa pratensis* appears to be a common associate over the range of this type. There is a wide diversity of other graminoids and forbs, both native and exotic, that occur with low cover in *Juncus balticus* stands throughout its range (Padgett *et al.* 1989, Hansen *et al.* 1995, Manning and Padgett 1995, Crowe and Clausnitzer 1997, Walford *et al.* 1997).

ADJACENT COMMUNITIES

As would be expected with an association distributed over the western United States and having at least a 6,000-foot elevational range, the adjacent upland and riparian associations are diverse. Upland associations range from steppe and shrub-steppe at the lower elevations to alpine associations at the higher.

MANAGEMENT CONSIDERATIONS

Grazing value ratings for *Juncus balticus* are moderate for cattle and low (except in the spring when rated medium) for sheep, horses, mule deer, and elk. *Juncus balticus* has vigorous rhizomes and a wide ecological amplitude. It is an excellent streambank stabilizer with dense fibrous roots that not only bind horizontally in the soil, but grow to a greater depth than other rhizomatous graminoids. It has high erosion control potential. Because of its tenacious nature and relatively low palatability to livestock, this species is very important as a soil binder and streambank stabilizer. Planting *J. balticus* plugs in the floodplain of an incised but aggrading stream will enhance bank building by binding soils and trapping sediment (Manning and Padgett 1995).

SUCCESSIONAL DYNAMICS

Numerous studies state unequivocally that the *Juncus balticus* plant association is a livestock grazing-induced type (e.g., Evenden 1989, Hansen *et al.* 1995, Manning and Padgett 1989, Hall and Hansen 1997, Crowe and Clausnitzer 1997), while others hedge somewhat stating that many or most occurrences are grazing induced (e.g., Padgett *et al.* 1989; Walford *et al.* 1997). There is evidence for the latter view. Two stands in central Idaho occur at sites that were never grazed by livestock as they have been excluded by insurmountable cliff bands. They contain extensive near-monocultures of *Juncus balticus* and have significant hummocking (Jankovsky-Jones 1999a. Observations in Montana and elsewhere indicate that *J. balticus* acts as an increaser and/or invader, occurring over a wide range of environmental conditions. It can increase after intensive grazing on sites occupied by the *Carex nebrascensis, Deschampsia cespitosa, Calamagrostis canadensis,* and possibly others because of its high tolerance of grazing. Once established *J. balticus* will maintain community dominance until site conditions are radically changed, either through a severe drop in water table depth or season-long flooding (Evenden 1989, Padgett *et al.* 1989, Hansen *et al.* 1995, Manning and Padgett 1995).

WILDLIFE FUNCTIONS

Juncus balticus stands provide important nesting, hiding, and feeding cover for shorebirds and waterfowl. Elk and deer will feed on plants especially early in the growing season (USDA 2000).

CLASSIFICATION COMMENTS

This plant association has been quantitatively defined and described by many studies throughout the western United States. In Idaho, Tuhy's (1981) *Juncus balticus-Muhlenbergia filiformis* plant association is included in this type.

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-12-09(2001-01-05)

Phragmites australis

Common reed

RANGE

This plant association is known from throughout the west and northwest in Montana (Hansen *et al.* 1995), Colorado (Kittel *et al.* 1999), Idaho (Huschle

1975, Hall and Hansen 1997), Utah, Oregon, and California (Reid *et al.* 2000).

ENVIRONMENT

Stands of *Phragmites australis* are associated with both spring-fed and run-off dominated habitats at lower elevations. Along floodplains, *Phragmites* may occur on banks, in oxbows, in backwater areas, and in low swales. The association may also occur in contact with springs on canyon walls and hillsides. Disturbed areas such as irrigation canals, human made ponds, ditches, and railroad embankments may also support stands of this species (Hansen *et al.* 1995, Kittel *et al.* 1999). Most sites are classified as seasonally flooded, although it occurs around constant-flow springs in the canyons of southwestern Idaho. Elevations reported in Montana are from 2,100 to 3,850 feet, while in Idaho it occurs between 3,000 and 5,280 feet (Hansen *et al.* 1995, Hall and Hansen 1997, Jankovsky-Jones *et al.* 2000).

SOILS

Soils are generally Entisols and Mollisols. Soil texture ranges from clay to silty or sandy loams. Sites often experience prolonged flooding, though water tables may fluctuate tremendously from at least 50 cm above to 1 m below the soil surface at the end of the growing season (Hansen *et al.* 1995, Hall and Hansen 1997).

VEGETATION COMPOSITION

Phragmites is a strongly rhizomatous perennial that generally forms tall (7-11 feet), dense stands that appear as a monocultures. Some stands may be quite extensive in size. Most stands have few associated species and they generally occur only in trace amounts. Some exceptions include *Toxicodendron rydbergii*, which may form a continuous understory (Asherin 1976). *Agrostis stolonifera* and *Scirpus acutus* had high cover in a stand in eastern Idaho (Hall and Hansen 1997). Around springs in southwestern Idaho *Aster hesperius* and *Angelica kingii* had relatively high cover (10% and 30%, respectively) in undisturbed stands (Moseley 1998).

ADJACENT COMMUNITIES

Adjacent uplands in eastern Idaho include *Juniperus scopulorum* (Hall and Hansen 1997), while in the Owyhee canyonlands and Snake River Plain of southwestern Idaho it was *Artemisia tridentata* spp. *wyomingensis* associations. This association often borders open water and a number of riparian and wetland types, including *Scirpus acutus, Typha latifolia, Populus* spp. (cottonwoods), *Salix exigua,* other *Salix* spp, *Rhus trilobata, Betula occidentalis,* and various other herbaceous types (Hansen *et al.* 1995, Hall and Hansen 1997).

MANAGEMENT CONSIDERATIONS

Herbage production in the *Phragmites australis* association is high to very high. *Phragmites* is highly palatable to both livestock and wildlife, especially when the plants are young and growing vigorously. It is moderately tolerant of grazing. However, heavy grazing pressure may reduce the size and extent of stands. *Phragmites* produces good quality hay and silage. This plant association provides excellent streambank protection. Rhizomes hold and stabilize the bank while the stems and leaves help trap and filter sediments (Hansen *et al.* 1995, Hall and Hansen 1997).

SUCCESSIONAL DYNAMICS

Sites occupied by this plant asociation are typically so wet as to preclude most forms of disturbance or development. *Phragmites australis* is a strongly rhizomatous perennial that tends to out compete all but the most disturbance-loving herbaceous species. However, with increased disturbance weedy species such as *Cirsium arvense* may invade. *Typha latifolia* and *Scirpus acutus* associations can occupy adjacent sites and appear to compete with one another, although the specific physical site requirements that allows one association to dominate over another are unknown (Hansen *et al.* 1995,Hall and Hansen 1997).

WILDLIFE FUNCTIONS

Phragmites australis is highly palatable to both livestock and wildlife, especially when the plants are young and growing vigorously. The 10+-foot height of *Phragmites* provides excellent thermal and hiding cover for large wildlife species. Waterfowl use this habitat for nesting and hiding cover. Other birds, such as red-winged and yellow-headed blackbirds are common inhabitants (Hansen *et al.* 1995, Hall and Hansen 1997). *Phragmites* is the larval host plant for a butterfly, the yuma skipper (*Ochlodes yuma*) (Ferris and Brown 1981).

CLASSIFICATION COMMENTS

This plant association has been described in numerous classifications and documented with recent field data (Hansen *et al.* 1995, Moseley 1998,

Kittel *et al.* 1999). The following associations are considered synonomous with the *Phragmites australis* plant associations: *Phragmites australis/ Toxicodendron rydbergii* (Huschle 1975, Asherin and Claar 1976), *Phragmites australis/Scirpus lacustris* (Johnston 1987). *Phragmites communis* is a synonym for *Phragmites australis.*

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-12-09(2001-01-05)

Scirpus acutus

Hardstem bulrush

RANGE

Stands are known from Oregon, Washington, Nevada, California, Colorado, Idaho, North Dakota, South Dakota and Montana.

ENVIRONMENT

Stands of this association occur along the margins of ponds, lakes, and reservoirs, stringers paralleling stream and river channels, or broad swaths in backwater marshes and sloughs. It is found at low to mid-elevations, from about 2,000 feet to at least 6,600 feet. This type often inhabits relatively deep water, although the water level may be drawn down considerably through the growing season (Hansen *et al.* 1995, Hall and Hansen 1997).

SOILS

Soils are commonly Mollisols (Aquolls), Entisols (Aquents), or occasionally Histisols. Textures of surface horizons on long-lived stands are predominantly fines, which appear as black or gleyed, mucky clay or silty loam soils with high concentrations of decomposed and partially decomposed plant material that accumulate over time from annual dieback. Alluvial sands, gravels and cobbles may form an unconsolidated matrix in the subsurface horizons. Water tables are generally at or above the soil surface throughout the growing season. Soil reaction varies from neutral to moderately alkaline (pH 7.0 to 8.0)(Hansen *et al.* 1995, Hall and Hansen 1997).

VEGETATION COMPOSITION

The *Scirpus acutus* plant association usually appears as an impenetrable monotypic stand often reaching 2 m or more in height. *Scirpus* spp. require high levels of moisture throughout the year, and while stands may colonize saturated soils along streambanks or the periphery of ponds and reservoirs, they typically extend out into the water column to 2 m in depth. Due to the dense growth form and flooded water regimes, other species are largely absent, or if present, in limited amounts (Cole 1995, Hansen *et al.* 1995, Hall and Hansen 1997).

ADJACENT COMMUNITIES

Aquatic communities are present in adjacent open water habitat. On sites with similar soils and moisture regimes *Typha latifolia* stands may be present. A wide variety of wetland and riparian associations occupy adjacent drier sites. Adjacent uplands are also quite variable throughout the range of this association.

MANAGEMENT CONSIDERATIONS

Wet conditions and lack of palatable forage limit livestock use of this type. However, if upland forage becomes sparse and soil conditions dry, livestock may make use of *Scirpus acutus.* Soils are wet throughout the growing season and easily damaged from trampling by livestock and wildlife. Vegetation can also be damaged by trampling. This community will burn in either late fall or early spring if the water levels have dropped sufficiently (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

Scirpus acutus occupies some of the wettest sites on the landscape and tolerates prolonged flooding better than most riparian communities. These highly saturated conditions, coupled with an extremely dense growth form, allow this species to colonize sites at an early successional stage and maintain dominance on undisturbed sites as the climax vegetation. However, *Scirpus acutus* is regularly accompanied by other hydrophytes, such as *Sparganium emersum* and *Typha latifolia*. The reasons for the distribution of these species is difficult to discern, but minor changes in water chemistry or nutrient availability may favor the expansion of one species over another. Seasonal climatic changes may also play a role in determining which species may dominate a site at a particular point in time (Hall and Hansen 1997). Cole (1995) discusses tentative successional relationships of her *Scirpus acutus* types.

WILDLIFE FUNCTIONS

Scirpus acutus provides valuable nesting and roosting cover for a variety of songbirds and waterfowl, notably redwinged blackbirds, yellow-

headed blackbirds and wrens. *Scirpus acutus* is a staple for muskrats and is used in construction of their huts. Seeds of *S. acutus* are eaten by a variety of birds. Waterfowl managers often attempt to increase the proportion of *S. acutus* relative to *Typha latifolia* as a means of improving habitat (Hall and Hansen 1997).

CLASSIFICATION COMMENTS

Hansen *et al.* (1995) and Hall and Hansen (1997) have a *Scirpus acutus* habitat type in their classifications that includes all combinations of *Scirpus acutus* and *S. validus* (=*S. tabernaemontani*) due to similarities in environmental conditions and management concerns. *Scirpus validus* is often treated as a separate alliance in the Western Regional Vegetation Classification (Reid *et al.* 2000). Characteristics that separate the two species are quite subtle and the two species will hybridize. We are inclined to include stands of *Scirpus validus* in the *Scirpus acutus* association. Cole (1995) described four associations with *S. acutus* as the dominant species, *S. acutus-Veronica anagallis-aquatica, S. acutus-Lemna* sp., *S. acutus-Lemna* sp.-*Solanum dulcamara,* and *S. acutus-Typha latifolia.* The *Scirpus acutus* type described in here encompasses enough compositional and structural variation to include Cole's types.

AUTHOR/DATE(UPDATE)

Bob Moseley/1998-01-05(2001-01-05)

Scirpus americanus

Threesquare bulrush

RANGE

Scirpus americanus is widely distributed throughout North and South America. The *Scirpus americanus* plant association occurs in Idaho, Colorado, Montana, and Oregon.

ENVIRONMENT

Scirpus americanus occurs around lakes, springs, and in subirrigated marshes and wet meadows. The plant is tolerant of alkaline conditions.

SOILS

Soils are variable ranging from relatively deep organic, to alkaline and calcareous clay soils, to coarse wet mineral soils that are directly in contact with thermal waters.

VEGETATION COMPOSITION

The *Scirpus americanus* plant association may occur in alkaline habitats or in association with hot springs. *Scirpus americanus* clearly dominates with 50-90% cover. Stems of *Scirpus americanus* can reach over 3 meters tall. Low species diversity is characteristic. Minor amounts of *Eleocharis palustris, Carex nebraskensis, Carex utriculata* and *Aster frondosus* are present in alkaline situations. Where the type occurs in association with hot springs, *Eleocharis palustris* is frequently replaced by *Eleocharis rostellata.* It was also noted that the forbs *Helianthus nutallii* and *Epilobium watsonii* were present in association with the type at hot springs.

ADJACENT COMMUNITIES

Adjacent associations may be dominated by *Carex* spp., *Eleocharis* spp. (*palustris* or *rostellata*), *Potentilla fruticosa, Deschampsia cespitosa,* or *Distichlis spicata* var. *stricta*. This type often occurs in the sagebrush-steppe zone.

MANAGEMENT CONSIDERATIONS

Trampling damage of the wet, organic soils of this association occurs readily with any livestock utilization. Livestock may graze forage plants in this association, and overgrazing can cause compositional changes to species of lower palatability. *Scirpus americanus* may have potential for restoration of wetlands as it is a prolific seed producer and it is fairly drought tolerant once established. Dense stands function to filter sediments and stabilize soils of lake margins and stream banks (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

Scirpus americanus is an early colonizer and able to persist under drought conditions. Due to the rhizomatous nature of the species, few other species become established. Stands in Utah are reported as climax with little competition from other species (USDA 2000).

WILDLIFE FUNCTIONS

Scirpus species are used by muskrats for building huts and some waterfowl for constructing nests. Waterfowl may use these areas for nesting and hiding cover. Other birds such as red-winged blackbirds and yellow headed blackbirds are common (Hansen *et al.* 1995). Rhizomes of *Scirpus americanus* provide food for muskrat and geese. In fact, "eat outs" are reported where populations of muskrat and geese are so high that all the rhizomes

and rootstocks are consumed and stands are eliminated (USDA 2000).

CLASSIFICATION COMMENTS

In Montana, Hansen *et al.* (1995) lumped all combinations of *Scirpus americanus* and *S. pungens* into a *S. pungens* habitat type due to similarities in environmental conditions and management concerns. Likewise, Kittel *et al.* (1999) considered the two species synonymous. There are taxonomic issues between *Scirpus americanus, Scirpus pungens,* and *Scirpus olneyi* that need to be understood before description of these plant associations can be fully developed. Kartesz (1994) considers *S. pungens* and *S. olneyi* synonymous with *S. americanus.* However, for the Flora of North America project *Scirpus olneyi* and *S. americanus* are considered synonyms and *S. pungens* is treated as a distinct species (Hurd pers. comm. 2000).

AUTHOR/DATE(UPDATE)

Mabel Jankovsky-Jones/1996-10-23(2001-01-08)

Scirpus pungens

Leafy bulrush

RANGE

Scirpus pungens is common and widespread in the United States. This association has been described from Utah, Wyoming, Idaho, Montana, western North Dakota and western Nebraska.

ENVIRONMENT

Stands of this association are found along low-gradient, meandering, usually perennial streams and around the margins of ponds and marshes (Hansen *et al.* 1995, Jones and Walford 1995, Walford 1996, Moseley 1998). Along streams, this type helps to filter out sediments and build streambanks (Hansen *et al.* 1985).

SOILS

Stands of this association have been sampled on Fluvaquents and Haplaquolls in Montana (Hansen *et al.* 1995). Textures of the upper soil horizons may be clay, clay loam, and sandy loam (Hansen *et al.* 1995, Jones and Walford 1995, Walford 1996). Loamy sand has been found deep in the soil profile (Walford 1996).

VEGETATION COMPOSITION

Scirpus pungens dominates the herbaceous vegetation layer, which is 1 foot to 2 feet tall; other species that often are present are *Spartina gracilis, Hordeum jubatum, Pascopyrum smithii,* and *Eleocharis palustris.* Stands of this association contain no tree or shrub layer, but a few scattered trees and shrubs may be present, most commonly of *Populus deltoides, Salix amygdaloides, Salix exigua, Salix lutea,* or *Symphoricarpos occidentalis.* These woody species are often present as sprouts.

ADJACENT COMMUNITIES

Adjacent wetter sites often support stands of *Eleocharis palustris*, *Typha latifolia* or *Scirpus acutus* herbaceous vegetation types. Adjacent drier riparian sites often support stands of *Spartina pectinata*, *Spartina gracilis, Distichlis stricta,* or *Pascopyrum smithii* herbaceous vegetation types. In southwestern Idaho, this community is often adjacent to *Salix exigua* communities.

MANAGEMENT CONSIDERATIONS

Stands of this association produce abundant herbage, but most of the species are relatively unpalatable to livestock, so use is light unless little other forage is available. The vegetation provides nesting and hiding cover for waterfowl and songbirds, and food for a variety of animal species. Warm-water fish may use inundated stands as spawning beds. The strong rhizomes of *Scirpus pungens* provide moderate protection to streambanks from erosion (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

Scirpus pungens becomes established on wet, bare sediments and often comes to dominate such sites quickly (Hansen *et al.* 1995). It occupies some of the wettest sites on the landscape and tolerates prolonged flooding better than most riparian species. These highly saturated conditions, coupled with an extremely dense rhizomatous growth form, allow this aggressive species to colonize sites at an early successional stage and maintain dominance on undisturbed sites as the climax vegetation (Hall and Hansen 1997).

WILDLIFE FUNCTIONS

This type is an important source of shade, hiding cover, and food for wildlife. It is used by muskrats for constriction of huts. Waterfowl use this type for nesting and hiding cover. Warm water fish may make use of this type as spawning beds.

CLASSIFICATION COMMENTS

In Montana, Hansen *et al.* (1995) lumped all combinations of *Scirpus americanus* and *S. pungens* into a *S. pungens* habitat type due to similarities in environmental conditions and management concerns. Likewise, Kittel *et al.* (1999) considered the two species synonymous. There are taxonomic issues between *Scirpus americanus, Scirpus pungens,* and *Scirpus olneyi* that need to be understood before description of these plant associations can be fully developed. Kartesz (1994) considers *S. pungens* and *S. olneyi* synonymous with *S. americanus.* However, for the Flora of North America project, *Scirpus olneyi* and *S. americanus* are considered synonyms and *S. pungens* is treated as a distinct species (Hurd pers. comm. 2000). The two species are generally mutually exclusive and, from a biodiversity conservation standpoint, associations should be separated into two types.

AUTHOR/DATE(UPDATE)

George Jones/1997-09-15(2001-01-08)

Spartina gracilis

Akali cordgrass

RANGE

This is a minor association with a widespread distrubution including the northern and western Great Plains and northern portions of the Intermountain West.

ENVIRONMENT

Stands occur in moist poorly drained often alkaline areas along streams, in swales, meadows, and on the margins of marshes and ponds.

SOILS

Soils range from clay to silt loams, and are generally slightly to moderately saline or alkali (pH 7.5 to 8.5).

VEGETATION COMPOSITION

Vigorous rhizomes allow *Spartina gracilis* to occur in nearly pure stands (60% cover). Frequently though, cover of associated species is high and may include *Agropyron smithii, Muhlenbergia asperifolia, Juncus balticus, Poa juncifolia, Puccinellia nutalliana*, and *Scirpus pungens*.

ADJACENT COMMUNITIES

Adjacent wetter plant associations may be dominated by the *Typha latifolia, Scirpus acutus, Carex utriculata, Deschampsia cespitosa, Juncus balticus* or open water communities, while drier sites may be dominated by *Agropyron smithii, Poa juncifolia, Potentilla fruticosa* or upland vegetation (Hansen *et al.* 1995, Jankovsky-Jones 1996).

MANAGEMENT CONSIDERATIONS

Forage value for livestock is fair and stands are reported to be a good source of hay if they are mowed two to three times during the year before becoming too coarse. Palatability of type is greatest in the spring when young plants are actively growing; however,sites are generally quite wet during the spring and soils are susceptible to damage.

SUCCESSIONAL DYNAMICS

This association is an early colonizer of alkaline and saline habitats and is able to persist under wet conditions. Disturbance of this association can dramatically increase the amount of increaser and invader species such as *Hordeum jubatum, Glycyrrhiza lepidota*, and *Helianthus maximiliani* (Hansen *et al.* 1995).

WILDLIFE FUNCTIONS

The association may provide hiding cover for wildlife. Birds also make limited use of this type (Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

This association has been described with quantitative data in Montana (Hansen *et al.* 1995), Colorado (Kittel *et al.* 1999), and Wyoming (Jones and Walford 1995). It is also reported in Idaho and Washington and may occur in California and elsewhere given the wide distribution of the species. In Montana stands dominated by *Spartina gracilis* as well as those dominated by *Spartina pectinata* are treated as a single association due to similarities in environmental conditions and management considerations. Distinct associations however, where one or the other species is diagnostic, are recognized by several classifications based on landform and soil chemistry (Jones and Walford 1995, Reid *et al.* 2000, Kittel *et al.* 1999).

AUTHOR/DATE(UPDATE)

Linda Williams/1996-11-04(2001-03-07)

Sporobolus airoides

Alkali sacaton

RANGE

This plant association is known to occur in the Great Plains, Great Basin, and in southwestern deserts. It is reported in California, Colorado, Kansas, Montana, New Mexico, and Texas (Reid *et al.* 2000). It has been observed and sampled in Idaho as well.

ENVIRONMENT

This association occurs in intermittent drainageways, terraces, swales, basins, and alluvial flats at lower elevations. Sites usually have a somewhat high water table due to landscape position and impermeable subsurface material (Reid *et al.* 1999).

SOILS

Soils may be non-saline but are usually moderately saline to alkaline sands or clays.

VEGETATION COMPOSITION

The graminoid, *Sporobolus airoides,* is clearly the dominant plant species and may be present as a monoculture. Associated species reported in Idaho include *Agropyron smithii, Poa nevadensis,* and *Distichlis spicata* (Jankovsky-Jones *et al.* 2000). Common associates reported from Great Plains states include *Buchloe dactyloides, Bouteloua gracilis, Schizachyrium scoparium, Hordeum pulsillum,* and *Sporobolus cryptandrus* (Kittel *et al.* 1999, Reid *et al.* 1999). Widely scattered shrubs such as *Allenrolfea occidentalis, Atriplex canescens, Chrysothamnus* spp., and *Sarcobatus vermiculatus* may also be present.

ADJACENT COMMUNITIES

Adjacent vegetation is variable. Wetland plant associations may include *Scirpus acutus* and *Juncus balticus.* In stands along floodplains stands of *Populus* spp. or *Salix* spp. may be adjacent. In both Idaho plots, uplands are *Artemisia tridentata* ssp. *wyomingensis/Stipa comata.* In the Great Plains upland grasslands or shrublands with *Bouteloua, Atriplex,* and *Sarcobatus* or *Pinus edulis-Juniperus* spp. woodlands are reported (Jankovsky-Jones *et al.* 2000, Reid *et al.* 1999).

MANAGEMENT CONSIDERATIONS

Palatability of Sporobolus airoides is highest early in the growing season before plants become coarse. It is less palatable than *Agropyron* spp. and *Bouteloua* spp. that may be growing nearby. Cattle may graze this species in the winter and sheep may use it heavily if other browse is not available (USDA 2000). With heavy grazing, cover of *Distichlis spicata* is reported to increase. The diagnostic graminoid is commonly used for reseeding disturbed landscapes such as mine sites and has been used for restoring riparian sites. Seedling establishment requires extra irrigation, but once plants are established little maintenance is required (USDA 2000).

SUCCESSIONAL DYNAMICS

The *Sporobolus airoides* plant association is considered early-seral. The association occurs on areas of the floodplain that are infrequently flooded and areas with high water tables because of landscape position (Kittel *et al.* 1999). Cover of *Sporobolus airoides* may be decreased as increases in salinity make room for other species such as *Distichlis spicata.* If salinity is not changed, hummocks will form that collect sand. Eventually other grasses will become established in response to decreased salinity and moisture.

WILDLIFE FUNCTIONS

Sporobolus airoides is rated as poor to fair browse for big game, birds, and waterfowl. It is listed as fair to good browse for small mammals (USDA 2000).

CLASSIFICATION COMMENTS

Several plant associations with *Sporobolus airoides* as the diagnostic species have been described for the western United States. Further classification work is probably needed to fully clarify the attributes that distinguish this plant association from other associations that have high cover of *Sporobolus airoides.*

AUTHOR/DATE

Mabel Jankovsky-Jones/2000-03-13

Typha latifolia

Broad-leaved cattail

RANGE

This association is found in virtually every state in the United States and is likely to be found in most Canadian provinces.

ENVIRONMENT

This association is found along margins of streams, rivers, ponds, and in overflow channels and backwater sloughs. It will also form stands along roadways and railways, in drainage ditches and elsewhere water collects to a depth of 2 to 3 feet and remains for over half of the growing season (Kittel *et al.* 1999).

SOILS

Soils are deep heavy silty clay loams and organic mucks (Kittel *et al.* 1999) overlying deposits of fine silts or clays that are often inundated throughout the year (Hansen *et al.* 1995).

VEGETATION COMPOSITION

This association is dominated by hydrophytic macrophytes, especially *Typha latifolia,* which grow to approximately 2 meters. *T. latifolia* can form dense stands in places, almost to the exclusion of other species. Found in lesser amounts in this community are other typical wetlands species, *Carex* spp., *Scirpus* spp., *Potamogeton* spp., *Lemna* spp., and *Veronica* spp.

ADJACENT COMMUNITIES

This plant association has a wide range and may be present in both riverine and non-riverine wetlands. Thus adjacent vegetation is highly variable and includes both wetland and upland plant associations that are too numerous to mention.

MANAGEMENT CONSIDERATIONS

Stands of *Typha latifolia* do not provide much forage for livestock. Though they will enter stands and trample vegetation late in the growing season when other forage is not available. In Montana, it is reported that stands may be converted to the Carex nebrascensis association with heavy livestock use (Hansen *et al.* 1995).

SUCCESSIONAL DYNAMICS

Typha spp. produce abundant seeds and spread rapidly. Under saturated conditions stands will persist and are adapted to prolonged submergence (Hansen *et al.* 1995).

WILDLIFE FUNCTIONS

Typha latifolia stands provide an important source of food, hiding cover, and shade for wildlife. Muskrats will use stems for constructing huts. As long as stands are not too thick, they will be utilized by waterfowl. Deer may also use stands for hiding cover and food. This is critical nesting and roosting habitat for yellow headed and red-winged blackbirds (Hansen *et al.* 1995).

CLASSIFICATION COMMENTS

The *Typha latifolia* plant association has been described in numerous classifications throughout the United States. Some local classifications have identified associations such as *Typha latifolia-Sagitaria latifolia* and *Typha latifolia-Scirpus* spp. that are included in this association. *Typha angustifolia* is less common in Idaho and few pure stands have been documented; usually it occurs with and may hybridize with *Typha latifolia*. At the present time stands with *Typha angustifolia* are included in the *Typha latifolia* association.

AUTHOR/DATE(UPDATE)

J. F. Drake/1995-10-19(2001-01-09)

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Appendix C

Taxonomy, range, status, and management of rare wetland and riparian plant species along the middle and western snake and its major tributaries.

Allenrolfea occidentalis (Wats.) Kuntze

CURRENT STATUS

BLM - None
USFS R4 – None
USFWS – None
Idaho Native Plant Society – State Priority 2
CDC Rank – G4 S1

TAXONOMY

Family: Chenopodiaceae

Common Name: Iodine bush

Citation:

Technical Description: Shrub 50 - 200 cm, glabrous; stems much-branched, jointed; internodes 5 - 20 mm, green to more or less glaucous, fleshy, leaves sessile more or less decurrent, scale-like triangular; inflorescence a spike, 5 - 25 mm, cylindric, sessile, flowers spirally arranged; bracts peltate; flowers bisexual, calyx 1-1.5 mm, 4-5 lobed, enclosing and falling with the fruit, stamens 1-2, exerted, stigmas 2; fruit more or less 1 mm ovoid; seed red-brown (from Hickman 1993).

Nontechnical Description: Information not compiled.

Distinguishing Features and Similar Species: A. occidentalis is most similar to Salicornia rubra which also has clearly jointed stems and grows in similar habitat. Salicornia is a herbaceous species with opposite leaves while Allenrolfea is a shrub with alternate leaves.

DISTRIBUTION

Range: South through Nevada and Utah to southern California, Arizona, New Mexico, western Texas, and northern Mexico. It is most common in the Lahonton and Bonneville Basins of the Great Basin (Holmgren 1997). In Idaho it is known from one location near Sterling Wildlife Management Area.

Habitat and Associated Species: Occurs in moist or seasonally moist places, such as stream banks and meadows that are high in salt concentrations. Vegetation is open, mostly exposed ground with few associates. Associated species do include Sarcobatus vermiculatus, Salicornia rubra, Sporobolus airoides, Chenopodium album, Atriplex nuttallii, Bassia hyssopifolia, and Suaeda occidentalis

MANAGEMENT

Threats: This is a very rare species in Idaho with only a single population known from the state. The known population is large and undisturbed and no threats were noted.

Eupatorium maculatum L.

CURRENT STATUS

USFS Region 4 - None
USFWS - None
BLM - None
Idaho Native Plant Society – Review
CDC Rank - G5 S1

TAXONOMY

Family: Asteraceae (Composite)

Common Name: Joe pye weedGreen muhly

Citation: Cent. Pl. I. 27. 1755.

Technical Description: Stout, fibrous-rooted perennial, 61-5 or even 20 dm tall; stems speckled or sometimes more evenly purplish; leaves whorled, mostly 3's or 4's firm, lance-elliptic to lanceolate or lance-ovate, gradually or abruptly narrowed to the petiole, pinnately veined, mostly 6-20 cm long and 2-7 cm wide, sharply serrate, densely covered beneath with short, spreading, curly hairs; heads clustered in a corymbiform, rather flat topped inflorescence; involucre 6.5-9 mm high, its bracts well imbricate in several series, often purplish; flowers purple, mostly 9-22 in each head (Cronquist 1994).

Nontechnical Description: Joe-pye Weed is a stout, fibrous-rooted, herbaceous perennial that can be up to 1.5 m tall. The lance-shaped leaves are 6-20 cm long, have serrated edges, and occur in whorls of 3-4 on the stem. The foliage is covered with short, curled hairs. Flowerheads are arranged in a flat-topped, umbrella-like inflorescence at the top of the stem. Each head has 2-3 series of a few overlapping, purplish involucral bracts and 9-22 purple disk flowers. Ray flowers are lacking. The seeds have numerous, thin, stiff bristles on top, forming a pappus. Flowering in August (from Montana Natural Heritage Program 2001).

Distinguishing Features and Similar Species: The large size, whorled leaves, and purple, discoid flower heads make this species distinctive. Several varieties of Eupatorium are recognized (var. foliosum, var. maculatum, and var. bruneri). The Montana Heritage program tracks Eupatorium maculatum var bruneri. Idaho specimens have not been identified to variety, but they are likely var. bruneri as well.

DISTRIBUTION

Range: British Columbia to Newfoundland and south to New Mexico, Kansas, and North Caroline. Also in Great Plains. In Idaho this species is known from a single collection at Fort Hall Bottoms.

Habitat and Associated Species: Moist meadows, springs, and along spring fed streams. Associated species include Scirpus acutus, Urtica dioica, and Phragmites australis.

MANAGEMENT

Threats: In the survey area this is known from a collection at Fort Hall Bottoms. No threats are known.

Muhlenbergia racemosa (Michx.) B.S.P.

CURRENT STATUS

USFS Region 4 - None
USFWS - None
BLM - None
Idaho Native Plant Society – State Priority 1
CDC Rank - G5 S2

TAXONOMY

Family: Poaceae or Graminae (Grass)

Common Name: Green muhly

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

Technical Description: Rhizomatous perennial up to 1 m tall, the culms terete to slightly flattened, hollow, often branching above, puberulent at and adjacent to the nodes; sheaths slightly keeled; ligules truncate, about 1(3) mm long, finely erose-ciliate; blades flat, 2-7 mm broad; panicle 2.5-10(14) cm long, contracted, the branches

tightly appressed; glumes narrow, subequal, attenuate to slender awns equalling or longer than the body, (4)5-6.5 mm in overall length; lemma about 3(2.5-3.5) mm long, including the attenuate or shortly awned tip, pilose on the lower half; palea subequal to the lemma; anthers 0.5-1 mm long (Hitchcock 1969).

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

Distinguishing Features and Similar Species: Green muhly is sometimes separated from Muhlenbergia glomerata and both species were once considered rare in Idaho. Pohl and Mitchell (1965) present evidence for the recognition of the diploid Muhlenbergia glomerata, found in wet meadows and bogs, as distinct from the tetraploid M. racemosa of mesic to dry habitats. Hitchcock (1969) could find no way to discern the two so lumped then in his treatment of the Northwest flora, stating that whatever the treatment chosen, it is a rare entity. Chipman (1999) resurveyed several documented locations in southeast Idaho and found that most of the populations were Muhlenbergia glomerata. Glennon (1991) also indicated that plants he found were M. glomerata.

DISTRIBUTION

Range: Hitchcock (1969) gives the range of green muhly as being from British Columbia, southward on the east side of the Cascades to northeastern Oregon, Nevada, Arizona, and northern Mexico, east to Newfoundland and in the U.S. to Oklahoma, Tennessee, and Maryland. In Idaho it is known from Bonner, Boundary, Fremont, Teton, Bannock, and Caribou counties.

Habitat and Associated Species: The areas supporting Muhlenbergia racemosa are dominated by birch, willows, and sedges on both mineral and organic soil.

MANAGEMENT

Threats: In the survey area is known from a collection at Fort Hall Bottoms.

Salicornia rubra A. Nels.

CURRENT STATUS

USFS Region 4 - None
USFWS - None
BLM - Sensitive
Idaho Native Plant Society - Sensitive
CDC Rank - G4 S2

TAXONOMY

Family: Chenopodiaceae (Goosefoot)

Common Name: Red glasswort

Citation: Bull. Torrey Club 26:122. 1899.

Technical Description: Freely branched erect or ascending annual 1-2 (2.5) dm tall, usually more or less reddish, at least at maturity; spikes generally very numerous, slender, 1-3 (up to 10) cm long, the joints mostly about 2 (2.5) mm long and approximately as thick, the scales less spreading and more rounded than the lower leaves; central flower of each cluster considerably above the others, the upper margin usually about even with the node above, in outline attenuate-cuneate below, ovate-rounded above, the lateral flowers more nearly ovate in outline; mature calyx sharply carinate and raised around the central puckered opening (from Cronquist 1964).

Nontechnical Description: Information not compiled.

Distinguishing Features and Similar Species: Red glasswort is the only glasswort known from our area, all others are found in coastal salt marshes. Salicornia rubra is most similar to Allenrolfea occidentalis which also has clearly jointed stems and grows in similar habitat. Salicornia is a herbaceous species with opposite leaves while Allenrolfea is a shrub with alternate leaves.

DISTRIBUTION

Range: Red glasswort is distributed from southern British Columbia and eastern Washington to Nevada, east to Saskatchewan, Kansas and New Mexico. Occasionally it is introduced west of the Cascades. In Idaho, Red glasswort occurs in the southeastern part of the state in Cassia, Franklin, Caribou, Bingham, Bear Lake, Oneida, and Bannock counties. In the survey area it is known from near Springfield and Sterling Wildlife Management Area.

Habitat and Associated Species: Occurs in moist saline or alkaline soil. Associates may include other Chenopodium species, Distichlis spicata, and Monolepsis nuttaliana.

MANAGEMENT

Threats: Threats include alteration of hydrologic cycles, grazing and agriculture conversion. Populations persist with light grazing, but numbers decline as ground becomes hummocky. Potential habitat observed which had been plowed and left fallow had many of the expected associates present, but no Red glasswort was found.

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Appendix D.

Not included in CDC homepage version

Appendix E

Site summaries for wetlands along the upper Snake River its major tributaries.

AMERICAN FALLS RESERVOIR

Location:

American Falls Reservoir is located along the Snake River in southeastern Idaho. Several small towns (including Pingree, Michaud, Aberdeen, Springfield, and Schiller) are within a few miles of the site. The city of American Falls is located at the southwestern end of the site, near American Falls Dam.

Richness:

The site encompasses the reservoir and its surrounding uplands and Fort Hall Bottoms. American Falls Reservoir is an irrigation reservoir that provides shallow feeding areas for waterfowl and mudflats for migrating shorebirds. Sand bluffs are used as nesting habitat by barn owls and swallows. Fort Hall Bottoms includes cottonwood forests along the Snake River and an extensive area of diverse native emergent habitat associated with springs.

Rarity:

There are over 200 recorded bird species at American Falls Reservoir including species of special concern. Muhlenbergia racemosa, Salicornia rubra, and Eupatorium maculatum, plant species of concern, occur within this site. The riparian and bottomland vegetation consists of cottonwood forest and willows.

Condition:

American Falls Reservoir is used for hunting, fishing, and boating. Grazing occurs in and around the site.

Viability:

Sagebrush and agricultural fields surround the site.

Key Environmental Factors:

Information not compiled at this time.

Other Values:

American Falls Reservoir is recognized as a Global Important Bird Area by the National Audubon Society and the American Bird Conservancy.

Conservation Intent:

An irrigation water operation plan by the U. S. Bureau of Reclamation (BOR) is in progress that will address optimal water levels for species affected by BOR operations.

Management Needs:

Information not compiled at this time.

Information Needs:

Bouffard reported that threatened and endangered mollusks occur below American Falls Dam and potentially in the reservoir. The CDC has no occurrence information for mollusks in these areas and either tracking down existing data or additional surveys are recommended.

Rare Plant Occurrences:

MUHLENBERGIA RACEMOSA	G5	S2

Rare Animal Occurrences:

BUFO BOREAS	G4 S4
PODICEPS NIGRICOLLIS	G5 S4B,SZN
AECHMOPHORUS OCCIDENTALIS	G5 S4B,SZN
AECHMOPHORUS CLARKII	G5 S2B,SZN
PHALACROCORAX AURITUS	G5 S2B,SZN
ARDEA ALBA	G5 S1B,SZN
EGRETTA THULA	G5 S2B,SZN
BUBULCUS IBIS	G5 S2B,SZN
NYCTICORAX NYCTICORAX	G5 S2B,SZN
PLEGADIS CHIHI	G5 S2B,SZN
CYGNUS BUCCINATOR	G4 S1B,S2N
HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N
NUMENIUS AMERICANUS	G4 S3B,S4N
LARUS DELAWARENSIS	G5 S2S3B,S3
LARUS CALIFORNICUS	G5 S2S3B,S3
STERNA CASPIA	G5 S1B,SZN
STERNA HIRUNDO	G5 S1B,SZN
STERNA FORSTERI	G5 S2S3B,SZ
CHLIDONIAS NIGER	G4 S2B,SZN
COCCYZUS AMERICANUS	G5 S1B,SZN
GULO GULO LUSCUS	G4T4 S2

Author:
S. Bouffard

MARKET LAKE

Location:

Market Lake begins approximately 2 miles north of Roberts (near WMA Headquarters) and extends up a broad valley between the rolling lava of the upper Snake River Plain for approximately 4.5 miles. From Interstate 15, take exit 135 at Roberts. Turn east, traveling on County Road 627 to the junction with County Road 2880 East. Turn north and drive through the town of Roberts. At the 0.5 mile mark, the road forks; continue on the right fork. Travel to County Road 800 North and follow the signs to Market Lake WMA headquarters.

Richness:

Market Lake occurs in the rolling volcanic plains of the eastern Snake River Plain. It consists of four main marsh areas that were once more extensive prior to agricultural development early in the 1900's. The WMA was established in 1956 and levees, canals, and water control structures were constructed to restore the wetlands. The water levels are actively manipulated throughout the site to maximize waterfowl habitat. The East Springs Marsh consists largely of open water, Scirpus acutus, and Typha latifolia habitats. Extensive Juncus balticus occurs up-gradient from the marsh communities on the eastside. The Carex

utriculata community occurs in small patches near the northern spring. The marsh is bordered by a narrow to wide band of Sarcobatus vermiculatus that was probably the S. vermiculatus/Distichlis stricta association but is now quite weedy. The Sandy Marsh area occurs as a series of wetlands in rolling, sand-covered lava. It mostly consists of open water, T. latifolia, S. acutus, and J. balticus communities with small areas of Scirpus pungens and a very small stand of Sporobolus airoides. Small patches of the Carex praegracilis community are most prominent in this area, although it can be found scattered throughout the site. The Main Marsh is divided into four areas by levees. An extensive stand of T. latifolia occurs in all but No. 4, which is open water and Scirpus acutus. The Triangle Marsh has a large stand of T. latifolia at the North end, a relatively large stand of Scirpus americanus in the middle, and an interesting and large stand of what appears to be the Carex simulata community, although Calamagrostis neglecta is dominant or co-dominant throughout. This stand extends across the road into the southwest portion of the Sandy Marsh area. The uplands are rolling lava covered with sandy loess that supports the Artemisia tridentata wyomingensis/Stipa comata community, although, in mostly a degraded state.

Rarity:

Market Lake is a spring staging area for over 100,000 waterfowl including Canada geese, tundra swans, and ducks. Special status species found at Market Lake are white-faced ibis, Franklin's gull, snowy egrets, black-crowned night-herons, long-billed curlew, peregrine falcons and American white pelicans.

Condition:

Sonchus arvense and Cirsium arvense occur in extensive colonies along the wetland margins. Patches of Russian thistle occur in the uplands.

Viability:

Information not compiled at this time.

Key Environmental Factors:

Market Lake WMA is managed primarily to maintain and improve critical habitat for waterfowl. This habitat consists of nesting and brood-rearing areas, loafing areas, and food and cover sites. Constructed dikes impound water, which sustains wetland areas. Together with water level control structures, these dikes enable area managers to regulate wetland water levels to meet varying seasonal management requirements. Wetland vegetation is periodically manipulated to maintain quality waterfowl nesting, feeding, and brood-rearing cover. Prescribed burning, herbicide applications, mowing and water level changes within impoundment areas all serve to maintain ideal vegetation/open water ratios.

Other Values:

Market Lake has very high values for waterfowl and shorebirds. Market Lake is recognized as a Globally Important Bird Area by the National Audubon Society and the American Bird Conservancy.

Conservation Intent:

Area is currently managed as a Wildlife Management Area for waterfowl production.

Management Needs:

Information not compiled at this time.

Information Needs:

No vascular plant species list was made. Upland vegetation was not inventoried. The Carex simulata community should be studied further. Need map of vegetation types to better determine acreage. Ecological boundaries for site need to be defined; right now the boundaries follow land ownership.

Plant Community Occurrences:

CAREX UTRICULATA	G5 S4
SCIRPUS PUNGENS	G? S3?
SPOROBOLUS AIROIDES	G3Q S3
CAREX PRAEGRACILIS	G2G3QS2
CAREX SIMULATA	G4 S2
JUNCUS BALTICUS	G5 S5
SCIRPUS ACUTUS	G5 S4
SCIRPUS AMERICANUS	G3Q S1
TYPHA LATIFOLIA	G5 S4

Rare Animal Occurrences:

PODICEPS NIGRICOLLIS	G5 S4B,SZN
AECHMOPHORUS OCCIDENTALIS	G5 S4B,SZN
ARDEA ALBA	G5 S1B,SZN
EGRETTA THULA	G5 S2B,SZN
NYCTICORAX NYCTICORAX	G5 S3B,SZN
PLEGADIS CHIHI	G5 S2B,SZN
CYGNUS BUCCINATOR	G4 S1B,S2N
FALCO PEREGRINUS ANATUM	G4T3 S1B,SZN
LARUS PIPIXCAN	G4G5 S2B,SZN
LARUS DELAWARENSIS	G5 S2S3B,S3
LARUS CALIFORNICUS	G5 S2S3B,S3
STERNA FORSTERI	G5 S2S3B,SZ
CHLIDONIAS NIGER	G4 S2B,SZN

Author:

R. K. Moseley

STERLING

Location:

The site is mostly within Sterling WMA, located in Bingham County just east of Aberdeen along the northwest shore of American Falls Reservoir. The WMA consists of three large, noncontiguous segments. Of these, the site includes those segments of the WMA that contain wetlands; this excludes the entire southern segment and the upland areas (eastern portion) of the middle segment adjacent to American Falls Reservoir. To reach the area drive north from Aberdeen 2.5 miles, turn east of 1400 South. Follow that 2 miles to 2500 West, turn right and continue 0.5 mile to an information center on the left hand side of the road.

Richness:

The WMA encompasses a wetland complex bound by farmland under cultivation or in pasture. These wetlands receive water from natural runoff and springs, as well as from irrigation runoff and canal seepage. The landscape is very gently rolling volcanic plains with little surface water connection between many of the wetland complexes. Approximately 138 acres of wetland and open water habitat exist on the WMA. Smooth-stem bulrush (Scirpus acutus) and cattail (Typha latifolia) communities comprise most of the wetlands. Small, but significant areas of the Baltic rush (Juncus balticus) and saltgrass (Distichilis stricta) communities also occur in the area. Very small stands of the Nebraska sedge (Carex nebraskensis) and field sedge (C. praegracilis) communities occur on the mesic fringes of the wetlands. Of special interest is the occurrence of the iodine bush (Allenrolfea occidentalis) community. A rather large, barren area on the north segment (northeast corner of the WMA) has a salt-encrusted soil surface and very low plant cover. Iodine bush is one of nine chenopods present and, along with Salicornia rubra, one of the only species with significant cover. The discovery of iodine bush at the WMA in 1997 was the first in Idaho.

Rarity:

High biodiversity value. The area has extensive low elevation marshes and the only known occurrence in Idaho of the iodine bush community, which is at the very northern edge of its range at Sterling. It is more common on the salt flats in the Great Basin.

Condition:

Russian olive is a seriously invasive plant at the WMA. There is an ongoing control program on the southern wetlands of the WMA.

Viability:

Information not compiled at this time.

Key Environmental Factors:

The wetlands are maintained through groundwater, spring, and surface flows. Considerable fluctuation of water levels occur due to weather and irrigation practices. Water levels are manipulated to enhance waterfowl production.

Other Values:

High values. The site attracts and provides habitat for a variety of waterfowl and shorebird species. Sterling and the adjacent American Falls Reservoir probably support the greatest variety of shorebirds in Idaho.

Conservation Intent:

Information not compiled at this time.

Management Needs:

Special management considerations should be taken to perpetuate the rare iodine bush community.

Information Needs:

1997: The wetland communities were surveyed very briefly one day. Wetland communities need to be mapped and inventoried more precisely, especially on the northern segment. The iodine bush community should be mapped and sampled in detail, due to its rarity.

Plant Community Occurrences:

DISTICHLIS STRICTA	G5 S4
CAREX NEBRASCENSIS	G4 S3
CAREX PRAEGRACILIS	G2G3QS2
JUNCUS BALTICUS	G5 S5
SCIRPUS ACUTUS	G5 S4
TYPHA LATIFOLIA	G5 S4
ALLENROLFEA OCCIDENTALIS	G4 S1

Rare Plant Occurrences:

SALICORNIA RUBRA	G4 S2

Author:
R. K. Moseley

BIG SPRING

Location:
Big Spring is ca 7 miles northwest of the town site of Pebble at the headwaters of Pebble Creek. From U.S. 30 near Pebble, travel 7 miles on Forest Service Road 036 to Big Spring Guard Station.

Richness:
Big Spring emerges in a small pool at the head of a moderately wide valley. The spring creek and small tributaries meander through a meadow dominated by Carex utriculata (bladder sedge). The spring creek has mats of Hippuris montana (mare's tail), Beckmannia syzigachne (sloughgrass), Veronica anagallis-aquatica (water speedwell), and stems of Mimulus guttatus (yellow monkey flower). Portions of the meadow may have formerly supported Salix boothii (Booth's willow) and Salix geyeriana (Geyer's willow) stands, which seem to be recovering.

Rarity:
The area is of general biodiversity interest.

Condition:
The Big Spring Pool is the water supply for the campground.
Small patches of Cirsium arvense (Canada thistle) are present.

Viability:
The area is upstream of the campground. A trail is present away from the wetland on the hillside.

Key Environmental Factors:
Beaver activity and woody debris dams help maintain site hydrology.

Other Values:
Information not compiled at this time.

Conservation Intent:

The springs are currently fenced. Fences should be maintained to protect water quality.

Management Needs:
Need to institute management to allow continued recovery of woody species.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

CAREX UTRICULATA	G5	S4

Author:
M. Jankovsky-Jones

CO-OP SPRING

Location:
Co-op Spring is located ca 3 miles south-southeast of Holbrook, Idaho, on the Curlew National Grasslands.

Richness:
Co-op Spring includes a series of drainageways extending from springs that flow into Sweeten Pond. The drainageways support a diverse assemblage of emergent wetland plant communities. The communities are near monocultures of Distichlis spicata, Hordeum brachyantherum, Juncus balticus, Eleocharis palustris, Scirpus acutus, S. americanus, or Typha latifolia on a dry to moist gradient. An alkaline pond is also present, which supports mudflats and open water habitat.

Rarity:
Area supports a diverse mix of emergent alkaline wetlands and an alkaline pond.

Condition:
Historically, the area has been grazed. In the 1990's, the wetlands were fenced. Three dams were constructed in the middle 1970's to maintain open water. Water levels are also supplemented by a groundwater well.

Conyza canadensis and Cirsium arvense are present and occasionally cover large patches. Elaeagnus angustifolia is also present and should potentially be monitored to prevent spread into emergent wetlands.

Viability:
Information not compiled at this time.

Key Environmental Factors:
Information not compiled at this time.

Other Values:
Information not compiled at this time.

Conservation Intent:
The area is currently fenced. Designation as a Wetland Conservation Area or Special Interest Area is appropriate.

Management Needs:
Funding and commitment of staff time are needed to maintain groundwater pump so habitat functions are not compromised.

Information Needs:
Need to check draft EIS to see if special designation is proposed. Apparently this is one of Charles Trost's (ISU) survey sites and he should be contacted to see if there are bird occurrences in the area.

Plant Community Occurrences:

DISTICHLIS STRICTA	G5 S4
ELEOCHARIS PALUSTRIS	G5 S3
JUNCUS BALTICUS	G5 S5
SCIRPUS ACUTUS	G5 S4
SCIRPUS AMERICANUS	G3Q S1
TYPHA LATIFOLIA	G5 S4
HORDEUM BRACHYANTHERUM	G3 S1?

Rare Plant Occurrences:

Salicornia rubra	G4 S2

Author:
M. Jankovsky-Jones

GIBSON JACK CREEK

Location:
Gibson Jack Creek RNA is about 6 miles (9.7 km) south of Pocatello. The RNA occupies the headwaters of Gibson Jack Creek, a tributary of the Portneuf River. From Pocatello, several access routes are possible. The City Creek Road heads southwest from town and winds up to the top of Kinport Peak which is just north of the northern RNA boundary. Following the Bannock Highway southeast from town, turn right and head southwest on the Gibson Jack Creek Road which can be followed to the eastern boundary of the RNA..

Richness:
Gibson Jack Creek RNA contains several shrub types in unusually fine condition. These include mountain sagebrush (Artemisia tridentata ssp. vaseyana), black sagebrush (Artemisia nova), Utah juniper (Juniperus osteosperma) and chokecherry-serviceberry (Prunus virginiana-Amelanchier utahensis) communities. The area also contains several forest types, including bigtooth maple (Acer grandidentatum), aspen (Populus tremuloides), Douglas fir (Pseudotsuga menziesii), and subalpine fir (Abies lasiocarpa). It includes a small drainage basin complete with streams, beaver dams, and ponds. Red-osier dogwood (Cornus sericea) dominates the riparian zone, with willows, including whiplash willow (Salix lasiandra), attaining prominence on the lower 0.25 mile. An unclassified

forb-dominated community interrupts the red-osier dogwood and continues up the northerly fork to end of permanent water. The south fork near the headwaters of Gibson Jack Creek formerly supported a string of beaver ponds. The ponds were breached in 2000. Former dams are thickets of red-osier dogwood (Cornus sericea) and former ponds are a mix of mesic graminoids and mesic forbs with stems of willow becoming established. The mountainous country provides geologic, elevational, slope, and aspect variation, resulting in great differences in vegetation. Forests cover most of the north-facing slopes while shrubs and grass dominate on southern slopes. Boundaries between vegetation communities are sharp and easily distinguished. The RNA is part of a city watershed, and as such, the area has been protected from most uses for over 75 years.

Rarity:

The site encompasses one of the few protected occurrences of juniper woodland vegetation.

Condition:

Approval for establishment of Gibson Jack Creek as an RNA occurred on April 1, 1982. The RNA is all National Forest land within the Pocatello Ranger District on the Caribou National Forest. The area is also part of the Pocatello water supply watershed. Recreational use of the area is significant and may include hiking, hunting, horseback riding, snowmobile use, and trail cycle use. The RNA falls within Management Area 020/021, Lower Portneuf - Rattlesnake. The RNA also falls within the Mink Creek Recreation Area Special Management Unit, a unit designed to provide coordination for the numerous special designations and activities that cover mountains just south of Pocatello.

No information is available regarding the occurrence of exotic species.

Viability:

Land immediately adjacent to the RNA is also within the Caribou NF's Mink Creek Recreation Area Special Management Unit. The nearby West Fork Mink Creek (which is also part of the Pocatello water supply watershed) is also established as an RNA. Land ownership in adjacent sections includes private, state, and BLM. Cattle were in the head of the northerly fork in 1997; light grazing was observed.

Key Environmental Factors:

Parent materials are primarily quartzites of Upper Precambrian and Lower Cambrian origin. Rocks are mapped as Camelback Mountain Quartzite and Mutual Formation quartzite and argillite. The principly south-facing slope of the site is highly dissected, giving rise to relatively high topographic diversity. Slopes are steep to gentle; with aspects ranging from southeast to southwest. The beaver ponds indicated on the 1971 quad map have been vacated for a long period of time; beaver were not active in the drainage in 1997.

Other Values:

Idaho State University has used the Gibson Jack Creek drainage for many years as a location for undergraduate research studies in various natural sciences. The general area is important for recreational use due to the close proximity of Pocatello. The drainage is part of the Pocatello Forest Reserve, an area established to provide watershed protection.

Conservation Intent:

The area is an established Research Natural Area.

Management Needs:
Recreational use, forest stand structure, and livestock use should be monitored.

Information Needs:
Plant community composition data is needed to verify element occurences.

Plant Community Occurrences:

PSEUDOTSUGA MENZIESII/ACER GLABRUM	G4? S3
PSEUDOTSUGA MENZIESII/CALAMAGROSTIS RUBESCENS	G5 S4?
PSEUDOTSUGA MENZIESII/OSMORHIZA CHILENSIS	G4G5 S3
JUNIPERUS OSTEOSPERMA/ARTEMISIA NOVA/AGROPYRON SPICATUM	SPIG5? S1?
ARTEMISIA TRIDENTATA VASEYANA-SYMPHORICARPOS OREOPHILUS/AGROPYRON SPICATUM	PG5? S3
CORNUS SERICEA/HERACLEUM LANATUM	G3 S2
ARTEMISIA NOVA/AGROPYRON SPICATUM	G4G5 S3
CAREX AMPLIFOLIA ASSOCIATION	G3 S1
ACER GRANDIDENTATUM/BERBERIS REPENS	G? S1
JUNIPERUS OSTEOSPERMA/ARTEMISIA ARBUSCULA ARBUSCULA/ AGROPYRON SPICATUM	G2 S2

Author:
A. H. Pitner

MIKE'S PLACE

Location:
Mike's Place is located along the Portneuf River, west of U.S. 30 near Pebble, Idaho.

Richness:
Near Pebble, numerous springs emerge in and along the channel of the Portneuf River. The sluggish channel supports dense mats of Rorippa nasturtium-aquaticum. The riparian community is mostly dominated by graminoids including Phalaris arundinacea and Scirpus microcarpus. Small stands of Glyceria grandis, Agrostis stolonifera, Solidago canadensis, Typha latifolia, Juncus balticus, Scirpus acutus, and Carex utriculata are also present. Shrubs are occasionally present and plant associations include Salix boothii/Carex utriculata.

Rarity:
Area is of general interest as a reference area.

Condition:
The area surveyed is managed as an access area and impacts from sportsmen are minor. Adjacent land upstream and downstream and in the valley bottom is used for hay pasture and grazing. A railroad bed runs the length of the Portneuf River.

Several weedy species are present on the floodplain. Only Cirsium arvense seems to pose a threat to native communities. The dominant aquatic plant is a non-native.

Viability:
Portneuf Valley upstream is in high intensity agriculture that is sure to contribute sediments and nutrients.

Key Environmental Factors:
Hydrology is driven by both run-off events and springs.

Other Values:
Information not compiled at this time.

Conservation Intent:
Information not compiled at this time.

Management Needs:
Need to monitor trails and weeds.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

SALIX BOOTHII/CAREX UTRICULATA	G4 S4
JUNCUS BALTICUS	G5 S5
SCIRPUS MICROCARPUS	GU SU

Author:
M. Jankovsky-Jones

PORTNEUF

Location:
Portneuf WMA lies along the west slope of the Portneuf Range, ca 16 miles south of Pocatello and 4 miles north of McCammon. The county road (Inkom Road) runs along the west side of the site - several trailheads are located along it. Two dirt roads traverse the site along Crane Creek and Robbers Roost Creek.

Richness:
A description of the riparian attributes of the site follows. Three perennial streams traverse the site: the northermost is Upper Rock Creek (0.75 mile), central is Crane Creek (2 miles), and the southernmost is Robbers Roost Creek (2 miles). Quinn Creek, on the very southern boundary, is fenced out of the site and is grazed. Three communities occur in the site: Populus angustifolia/Betula occidentalis along lower Robbers Roost Creek; Betula occidentalis/Cornus sericea along upper Robbers Roost and lower Crane Creeks; and Populus tremuloides/Cornus sericea along upper Crane and Upper Rock Creeks. All stands are narrow, occurring in steep-sided valleys. The uplands are dominated by Juniperus scopulorum, Acer grandidentatum, and mountain shrub communities.

Rarity:
The site contains nearly five miles of ungrazed riparian habitat along three different creeks. The site also contains habitat for sharp-tailed grouse, a declining and vulnerable species throughout its range. In addition, upland communities of Acer grandidentatum, Juniperus scopulorum, and mountain shrub are in fine ecological condition. The site is not grazed by domestic livestock. Most of the adjacent lowlands in the valley are grazed, in crop agriculture, or developed for residential purposes.

Condition:
Information not compiled at this time.

Viability:
Information not compiled at this time.

Key Environmental Factors:
Information not compiled at this time.

Other Values:
Site provides winter range for about 500 mule deer, perhaps twice as many as there were when livestock grazed the area. The site also supports blue and ruffed sage grouse, ringnecked pheasant, and Hungarian partridge. The site also hosts sightseers, horseback riders, cross country skiers, hikers, and picnickers.

Conservation Intent:
Information not compiled at this time.

Management Needs:
Information not compiled at this time.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

POPULUS TREMULOIDES/CORNUS SERICEA	G4 S4
POPULUS ANGUSTIFOLIA/BETULA OCCIDENTALIS	G3 S1
BETULA OCCIDENTALIS/CORNUS SERICEA	G3? S2

Author:
R. K. Moseley

WEST FORK MINK CREEK

Location:
West Fork Mink Creek is located seven miles (11 km) south of Pocatello about midway up the West Fork Mink Creek drainage, a tributary of the Portneuf River. From Pocatello, travel south on the Bannock Highway about 12 miles (19 km). Turn left and head northwest on an old FS Road, now FS Trail 059 up the West Fork Mink Creek. After about 1.5 miles (2.4 km), the trail enters a corridor between the two units of the site.

Richness:

West Fork Mink Creek site is divided into two units with a buffer strip between the two along the old road/trail that heads up the creek. The two units are quite different and the site features a variety of vegetative cover types including Douglas-fir (Pseudotsuga menziesii) and aspen (Populus tremuloides) forests on north-facing slopes and sagebrush-grass types on south-facing slopes. The upper slopes of Slate Mountain have a thin soil mantle with many exposed shale outcrops and support a predominantly black sagebrush-Sandberg's bluegrass (Artemisia arbuscula nova-Poa secunda) association. About 10% of the upper slopes has a Utah juniper (Juniperus osteosperma) tree cover. The lower xeric slopes support the basin big sagebrush/Great Basin wildrye (Artemisia tridentata ssp. tridentata/Elymus cinereus) association and a variety of shrub species. The western portion of the site is predominantly timbered with Douglas-fir (Pseudotsuga menziesii) and quaking aspen (Populus tremuloides), with several small dry meadow-like openings. West Fork Mink Creek is formed by numerous springs which emerge about 0.5 mile above the site. Four riparian communities occur along the creek. At least two small stands of ample-leaved sedge (Carex amplifolia) are present on seeps that emerge at the base of slopes and on stream terraces above high water. A small stand of Booth's willow/beaked sedge (Salix boothii/Carex utriculata) occurs on a seepy bench near the upper boundary of the site. The Douglas fir/red-osier dogwood (Pseudotsuga menziesii/Cornus sericea) community occurs along about 0.75 mile of the stream through the upper end of the site and about 0.25 mile of a lower tributary stream. Stream gradients are approximately 10% in the Douglas fir community. Downstream of where two side tributaries enter West Fork Mink Creek, stream gradient lessens and the water birch/mesic forb (Betula occidentalis/Mesic forb) community occupies the stream bottom and extends downstream of the site boundary.

Rarity:

The site encompasses juniper woodland plant associations.

Condition:

Approval for establishment of West Fork Mink Creek as an RNA occurred on May 8, 1973. The site is all National Forest land on Pocatello Ranger District, Caribou National Forest and is within the Pocatello municipal watershed. The watershed is open to all but motorized recreational uses during the period March 16 - November 30. During the period December 1 - March 15 only nordic skiing, snoWshoeing, and walking are permitted within the watershed (these restrictions are effective 06/15/95 by Special Order 04/05/01). The site is within Management Area 020/021, Lower Portneuf - Rattlesnake. The site is also within the Mink Creek Recreation Area Special Management Unit, a unit designed to provide coordination for the numerous special designations and activities that cover mountains just south of Pocatello.

No information is available about exotic species.

Viability:

Land immediately adjacent to the site is also within the Caribou NF's Mink Creek Recreation Area Special Management Unit. The nearby Gibson Jack Creek (which is also part of the Pocatello water supply watershed) is also established as an RNA. Land ownership in adjacent sections includes private, state, and BLM.

Key Environmental Factors:

Physiography is steep to moderately sloped, generally southwest- and northeast-facing, but strongly dissected. Parent materials are shale and limestone of the Bloomington Formation and undifferentiated metamorphosed sedimentary rocks.

Other Values:

Idaho State University has used the West Fork Mink Creek drainage for many years as a location for undergraduate research studies in various natural sciences. The general area is important for recreational use due to the close proximity of Pocatello. The drainage is part of the Pocatello Forest Reserve, an area established to provide watershed protection. As of 1973, the City of Pocatello relied on West Fork Mink Creek for approximately 20% of it water supply. The area also provides summer range for mule deer and some elk, as well as habitat for numerous other species of wildlife.

Conservation Intent:

The area is an established Research Natural Area.

Management Needs:

Recreation use, forest stand structure, and livestock use should be monitored.

Information Needs:

Plant community composition data is needed to verify element occurrences.

Plant Community Occurrences:

POPULUS TREMULOIDES-PSEUDOTSUGA MENZIESII/ SYMPHORICARPOS OREOPHILUS	G3G4 S?
POPULUS TREMULOIDES/AMELANCHIER ALNIFOLIA-SYMPHORICARPOS OREOPHILUS/CALAMAGROSTIS RUBESCENS	G4 S4
JUNIPERUS OSTEOSPERMA/PURSHIA TRIDENTATA-SYMPHORICARPOS OREOPHILUS/AGROPYRON SPICATUM	G1Q S1
PSEUDOTSUGA MENZIESII/CORNUS SERICEA	G4 S4
ARTEMISIA TRIDENTATA TRIDENTATA/ELYMUS CINEREUS	G2 S1
BETULA OCCIDENTALIS/MESIC FORB	G3 S1
SALIX BOOTHII/CAREX UTRICULATA	G4 S4
ARTEMISIA NOVA/POA SECUNDA	G3Q S3
ARTEMISIA NOVA/AGROPYRON SPICATUM	G4G5 S3
PURSHIA TRIDENTATA/AGROPYRON SPICATUM	G3 S1S2
CAREX AMPLIFOLIA ASSOCIATION	G3 S1
JUNIPERUS OSTEOSPERMA/ARTEMISIA ARBUSCULA ARBUSCULA/ AGROPYRON SPICATUM	G2 S2
PSEUDOTSUGA MENZIESII/CALAMAGROSTIS RUBESCENS, PACHISTIMA MYRSINITIES PHASE	G5 S2?

Rare Animal Occurrences:

MYOTIS EVOTIS	G5 S3?
MYOTIS VOLANS	G5 S3?

Author:

A. H. Pitner

CHERRY SPRINGS

Location:

Cherry Springs is ca 8 miles south of Pocatello in the Mink Creek drainage within the Caribou National Forest. From Interstate 15, take the Portneuf area exit (Mink Creek Recreation Area) and travel west to the junction with the Bannock Highway. Turn south on the Bannock Highway to the forest boundary and continue 1 mile to the Cherry Springs Nature Area.

Richness:

The Cherry Springs and Mink Creek area are situated in the riparian corridor of Mink Creek. The valley bottom supports dense thickets of Cornus sericea, Acer negundo, Prunus virginiana, and Crataegus douglasii. Upland vegetation includes stands of Populus tremuloides and Pseudotsuga menziesii at upper elevations and Artemisia tridentata and Juniperus spp. at lower elevations.

Rarity:

The mix of vegetation types and ecotones provide habitat for a variety of special status avian species including northern goshawk, sharp-tailed grouse, flammulated owl, northern pygmy owl, pinyon jay, Bohemian waxwing, Scott's oriole, and lesser goldfinch.

Condition:

School groups use the area as an outdoor classroom. Recreational uses include bird watching, picnicking and camping in undeveloped campsites.

Most exotics are along trails where light gaps have been created. Exotics include Dactylis glomerata, Poa pratensis, and Arctium minus.

Viability:

Information not compiled at this time.

Key Environmental Factors:

Information not compiled at this time.

Other Values:

The area is managed as a Nature Area that is used by school groups as an outdoor classroom. It is also a popular area for family picnics. Cherry Springs is recognized as a State Important Bird Area by the National Audubon Society and the American Bird Conservancy.

Conservation Intent:

Area is managed as a Nature Area by USFS.

Management Needs:

Primitive trail establishment on uplands and in the valley bottom should be monitored and discouraged if necessary.

Information Needs:

Information not compiled at this time.

Plant Community Occurrences:

ACER NEGUNDO/CORNUS SERICEA	G3? S1
PRUNUS VIRGINIANA	G4Q S3
CORNUS SERICEA	G4 S3

Rare Animal Occurrences:

BUFO BOREAS	G4 S4
RANA PIPIENS	G5 S3

Author:
M. Jankovsky-Jones

GRANDINE

Location:
Grandine is located 8.5 miles south of Holbrook, Idaho in the Curlew Valley. From Holbrook, travel south 7.5 miles to where the highway turns west. Rather than turning west, continue south on the gravel road to the USFS Grandine Administrative site. The wetlands can be accessed on foot by walking southwest of the administrative site.

Richness:
Grandine is a small wetland complex fed by groundwater. The wetlands include stands of Sarcobatus vermiculatus/Distichlis spicata, Sporobolus airoides, Spartina gracilis, Agropyron smithii, Juncus balticus, and Carex nebrascensis on a dry to wet gradient.

Rarity:
Contains the somewhat uncommon grassland communities, Spartina gracilis (GU, SU) and Sporobolus airoides (G3Q, S3).

Condition:
Area and wetlands are used for grazing livestock.

Exotics are abundant within the site. Around enhanced ponds, Elaeagnus angustifolia is well established. Numerous exotics also occur in the meadows including Cirsium arvense.

Viability:
Information not compiled at this time.

Key Environmental Factors:
Information not compiled at this time.

Other Values:
Provides habitat for ground nesting birds including northern harriers and sandpipers.

Conservation Intent:
Impacts to hydrology should be avoided to maintain wetland functions.

Management Needs:
The site will probably persist with current management and the only management recommendations are to maintain current hydrology and/or restore hydrology at farmed wetland to the south.

Information Needs:
Native meadows on adjacent private lands should be surveyed before they are mowed. Unmowed margins indicated that the Deschampsia cespitosa and Eleocharis rostellata communities might be present.

Plant Community Occurrences:

SPARTINA GRACILIS	GU	SU
SPOROBOLUS AIROIDES	G3Q	S3
CAREX NEBRASCENSIS	G4	S3
JUNCUS BALTICUS	G5	S5
TYPHA LATIFOLIA	G5	S4
ELEOCHARIS ROSTELLATA	G2	S2
SARCOBATUS VERMICULATUS/DISTICHLIS STRICTA	G4	S1

Author:
M. Jankovsky-Jones

HUFFMAN SPRINGS

Location:
Huffman Springs is ca 6 miles northwest of the townsite of Holbrook and is located within the Meadow Brook Creek drainage. From Holbrook, travel northwest on the Rockland Road to Meadow Brook Creek Road (FS021). Travel 2 miles southwest on the Meadow Brook Creek Road to where an open meadow is apparent on the west side of the road. The spring sources can be accessed on foot.

Richness:
Huffman Spring and Meadow Brook Creek create extensive meadows on the east side of the Sublette Range. The wettest sites are mostly dominated by Carex nebrascensis. Small floating mats are present that support patches of Carex simulata. Spring creeks also have dense stands of Carex nebrascensis except where channels are deeper and filled with Catabrosa aquatica and Rorippa nasturtium-aquaticum. Somewhat drier areas are a mix of mesic graminoids including Carex praegracilis, Deschampsia cespitosa, Poa secunda, Juncus balticus, and Hordeum brachyantherum.

Rarity:
The area contains high quality grasslands dominated by Hordeum brachyantherum and Deschampsia cespitosa.

Condition:
The area is an active grazing allotment. Impacts include trailing, areas of hummocks, bare ground, and an increase in the overall extent of the increaser Carex nebrascensis as areas are dewatered. This was noted on floating mats where encroachment by increasers was occurring.

Poa pratensis has high cover and dominates portions of the drier meadow.

Viability:
Information not compiled at this time.

Key Environmental Factors:
Information not compiled at this time.

Other Values:
Information not compiled at this time.

Conservation Intent:
Impacts to site hydrology should be avoided to maintain wetland functions.

Management Needs:
Livestock use should be a very short duration or eliminated to prevent further alterations to hydrology and an increase in areas of bare ground.

Information Needs:
The meadows are a diverse mix of mesic graminoids with no species clearly showing dominance. It is unclear what factors such as hydrology or past land use lead to presence or absence of certain species in drier sites.

Plant Community Occurrences:

CAREX NEBRASCENSIS	G4	S3
HORDEUM BRACHYANTHERUM	G3	S1?

Author:
M. Jankovsky-Jones

LAKE CHANNEL CANYON

Location:
Lake Channel Canyon is located approximately 10 miles east of American Falls on the north side of the Snake River. The best access is probably from American Falls or Aberdeen, though four-wheel drive (very rough roads!) access is possible from Lake Walcott near Rupert. From American Falls, cross the dam and turn west on the Lamb-Weston Road, travel to the Borah Road and then turn south. Continue until reaching the Lake Channel road. The Lake Channel road extends for about 10 miles to the west to Lake Channel Canyon.

Richness:
Lake Channel Canyon was formed by the floodwaters of ancient Lake Bonneville. The canyon extends for 4 miles to the south and apparently emptied into the Snake River by flows extending west 5 miles to Bonanza Bar. The canyon includes stabilized and unstabilized dunes, freshwater and alkaline wetlands and small amounts of open water habitat. Wetlands at Bonanza Lake and east of Morgans Waterhole are mostly a mosaic of Scirpus acutus and Juncus balticus. At Bonanza Lake, open water is surrounded by a narrow fringe of Eleocharis palustris and stands of the woody species, Salix exigua and Salix amygdaloides. East of Morgans Waterhole, small patches of Scirpus americanus, Carex nebrascensis and Carex

praegracilis occupy areas with peat buildup. Alkaline wetlands are present at Gifford Spring near the western edge of Bonanza Bar and pools are ringed with concentric bands of Distichlis spicata, Puccinellia nuttalliana, Scirpus americanus, Juncus balticus, and degraded, early seral Sarcobatus vermiculatus/Distichlis spicata (currently dominated by Chrysothamnus nauseosus). There are also extensive Scirpus acutus stands in a perennially flooded pond and along the shores of Lake Walcott. Agriculture use in the canyon includes livestock pasture and cultivated croplands. Many of the historic wetlands in the mid-canyon have been converted. Isolated wetland remnants do remain in meadows.

Rarity:

Dune deposits provide habitat for Cincindela arenicola. The wetlands are a refugium for waterfowl and shorebirds and include alkaline wetlands with uncommon plant communities.

Condition:

It appears that an impoundment has been built in the distant past on the south end of Bonanza Lake. The canyon has a long history of agricultural use including cultivated hay ground and livestock grazing. Some wetlands have been lost due to agricultural conversion.

Elaeagnus angustifolia is well established on the perimeter of the USFWS managed wetland. The shade created a popular loafing area for livestock and the understory has a thick cover of Cirsium arvense. Cirsium arvense is also present in drier wetlands dominated by Juncus balticus. Bromus tectorum is also present on drier wetland margins.

Viability:

Irrigation within the canyon and on uplands have lowered water levels in wetlands since at least the 1950's.

Key Environmental Factors:

Information not compiled at this time.

Other Values:

Information not compiled at this time.

Conservation Intent:

Portions of canyon are managed by the USFWS as part of the Minidoka National Wildlife Refuge. State and BLM managed wetlands west of Bonanza Bar are unprotected but designation such as Wetland Conservation Area or Area of Critical Environmental Concern would be appropriate. Privately owned wetland would be an excellent nomination to the Wetland Reserve Program of the Natural Resources Conservation Service.

Management Needs:

Management could focus on removing non-native woody species (Elaeagnus angustifolia), grazing management (in particular on state and federally managed lands), enhancing hydrology (through acquisition of water rights) and protecting remaining unplowed meadow and upland habitat. The first two needs could be addressed by working with and providing funding to public land management agencies; the latter two needs require cooperation from private landowners.

Information Needs:
Additional information on the historic versus current water levels would be helpful. Extent of native wetlands on the middle canyon needs to be confirmed. The area around Bonanza Lake was not surveyed because access was denied.

Plant Community Occurrences:

DISTICHLIS STRICTA	G5 S4
CAREX NEBRASCENSIS	G4 S3
CAREX PRAEGRACILIS	G2G3QS2
JUNCUS BALTICUS	G5 S5
SCIRPUS ACUTUS	G5 S4
SCIRPUS AMERICANUS	G3Q S1
TYPHA LATIFOLIA	G5 S4
HORDEUM BRACHYANTHERUM	G3 S1?

Rare Animal Occurrences:

CICINDELA ARENICOLA	G2 S1

Author:
M. Jankovsky-Jones

LAKE WALCOTT

Location:
Lake Walcott is located on the Snake River in south-central Idaho and is 12 miles northeast of Rupert. It is reached by driving northeast 6 miles from Rupert on Highway 24 via Acequia, then east 6 miles on County Highway 400-North. The southern boundary of Lake Walcott lies adjacent to the old US 30-North and Interstate 15-West on the extreme eastern end near Raft River.

Richness:
Lake Walcott includes some 12,000 acres of open water and marsh. Minidoka Dam is operated mainly as a diversion point for irrigation water. The relatively stable water levels of Lake Walcott are conducive to the growth of aquatic plants, which provide waterfowl food most of the year. Adequate cover for many kinds of wildlife is found in this area with stands of roundstem bulrush, cattail, willow and sagebrush predominating. Several islands are used by colonial nesting birds. The shoreline is quite irregular with many small bays and inlets favored by both migrating and molting waterfowl. Surrounding uplands are sage steppe and grassland range, which provide adequate habitat for ground-nesting birds. A narrow fringe of trees and shrubs surrounds the reservoir. Soils are primarily lava rock and sand with a trace of clay. Sand dunes, juniper stands, bunchgrass, and sage add variety to the area.

Rarity:
Several bird species of special concern occur at Lake Walcott including the American white pelican, double crested cormorant, black-crowned night-heron, grasshopper sparrow, loggerhead shrike, western burrowing owl, long-billed curlew, ferruginous hawk, bald eagle, trumpeter swan, and the common loon. Other species of special concern are the Utah valvata snail and Idaho dunes tiger

beetle. Game birds included ring-necked pheasant, sage grouse, Hungarian partridge, and pheasants. There are approximately 200 species of birds including golden eagles, hawks, and owls in this area. Mammals that occur in the area are mule deer, antelope, bobcats, coyotes, badgers, skunks, racoons, marmots, cottontail and jackrabbits. The rare pygmy rabbit may also occur at the refuge.

Condition:

Lake Walcott is primarily used for wildlife conservation. Secondary uses include fishing, boating, picnicing, wildlife observation and photography.

Introduced annual and perennial plants, especially cheatgrass, are abundant.

Viability:

Adjacent lands are used for farming and grazing.

Key Environmental Factors:

Information not compiled at this time.

Other Values:

Lake Walcott is recognized by the National Audubon Society and the American Bird Conservancy as a Global Important Bird Area. The area provides habitat for large numbers of nesting and migratory waterfowl using the Pacific Flyway, which extends from the Artic to Central America. Local schools use Lake Walcott for environmental education. Recreation usage includes wildlife observation and photography, fishing, hunting, picnicking, and boating (within restricted areas).

Conservation Intent:

Information not compiled at this time.

Management Needs:

Native grasses are planted after wildfires where possible and grazing was discontinued over most of the Lake Walcott area in 1995. During nesting and molting seasons, areas are closed off to protect the waterfowl and other wildlife.

Information Needs:

Bouffard reported that pygmy rabbits might be present on the refuge. The CDC has no occurrence information for this species in the area and addittional surveys are recommended.

Rare Animal Occurrences:

PODICEPS NIGRICOLLIS	G5	S4B,SZN
AECHMOPHORUS OCCIDENTALIS	G5	S4B,SZN
PELECANUS ERYTHRORHYNCHOS	G3	S1B,SZN
PHALACROCORAX AURITUS	G5	S2B,SZN
EGRETTA THULA	G5	S2B,SZN
BUBULCUS IBIS	G5	S2B,SZN
CYGNUS BUCCINATOR	G4	S1B,S2N
HALIAEETUS LEUCOCEPHALUS	G4	S3B,S4N
BUTEO REGALIS	G4	S3B,SZN
NUMENIUS AMERICANUS	G5	S3B,SZN
LARUS CALIFORNICUS	G5	S2S3B,S3
STERNA CASPIA	G5	S1B,SZN

CHLIDONIAS NIGER	G4 S2B,SZN
VALVATA UTAHENSIS	G1 S1

Author:
S.H. Bouffard

MARSH VALLEY

Location:

Marsh Valley is ca 11 miles southeast of Pocatello and extends for ca 36 miles from Inkom to near Red Rock Pass. Most of the valley is privately owned. Several of the private landowners are cooperators with Idaho Fish and Game and may provide access for research purposes.

Richness:

Marsh Valley is a 36-mile long valley that was carved by the floodwaters of ancient Lake Bonneville. Marsh Creek is a very slow moving stream that meanders across the valley bottom. The valley has a long history of agricultural use, which has impacted the channel condition and vegetation composition. It is estimated that approximately half of the valley bottom is still dominated by native vegetation. Much of the valley dries to the surface by the middle of the growing season. Permanently saturated sites are associated with springs, which emerge at or near the valley wall. Small areas of floating mats are present in association with some of the springs. Existing natural vegetation in the valley is a complex mosaic of Typha latifolia and Scirpus acutus in the moistest sites and Agropyron smithii, Deschampsia cespitosa, Juncus balticus, and Carex nebrascensis in better drained areas. The extent of Agropyron smithii and Deschampsia cespitosa stands is impressive and this may be an artifact of drier conditions due to channel downcutting and other actions leading to a lowered water table.

Rarity:

Portions of the valley have not been seeded or plowed and extensive stands of native graminoids persist including large stands of Agropyron smithii (G3G5Q, S1) and Deschampsia cespitosa (G4?, S3). The wetlands provide habitat for sandhill cranes, leopard frogs, and northern harriers. Marsh Creek is habitat for great blue heron and mallards.

Condition:

Marsh Valley has a long history of agricultural use. Most of the valley is used as grazing land. Portions of the valley have been seeded and/or plowed for hay pasture. The channel has been impacted by livestock use: woody vegetation is absent and banks are steeply cut. Portions of the valley feature extensive hummocking due to livestock use. Peat mining (for sedge peat) has occurred in the valley. This activity is focused on stands of native vegetation that are too wet for other agricultural use.

Viability:

Non-native species are abundant, particularly in areas where there has been ground disturbance. Species that are present in emergent wetlands and in patches

include Cirsium arvense, Carduus nutans, and Chenopodium hybridum.

Key Environmental Factors:
Information not compiled at this time.

Other Values:
Information not compiled at this time.

Conservation Intent:
Opportunities to work with landowners to maintain and restore wetland functions should be actively pursued.

Management Needs:
Potential for restoration in the Marsh Creek Valley is very high due to persistence of native species. Any efforts, which would restore hydrology are encouraged!

Information Needs:
Only a six-mile reach of Marsh Creek near Arimo was surveyed on the ground. The remainder of the valley was surveyed with binoculars. Access to other areas, particularly areas with springs, may add new community occurrences.

Plant Community Occurrences:

AGROPYRON SMITHII	G3G5QS1
DESCHAMPSIA CESPITOSA	G4 S3
CAREX NEBRASCENSIS	G4 S3
JUNCUS BALTICUS	G5 S5
SCIRPUS ACUTUS	G5 S4

Rare Plant Occurrences:

SALICORNIA RUBRA	G4 S2

Rare Animal Occurrences:

RANA PIPIENS	G5 S3
AECHMOPHORUS OCCIDENTALIS	G5 S4B,SZN

Author:
M. Jankovsky-Jones

MCCAMMON POTHOLES

Location:
About 1.5 miles northwest of McCammon, just above the Interstate 15 and State Route 30 intersection. Site is located on both sides of the interstate.

Richness:
Site occurs in a rolling basalt plain covered with heavily grazed Artemisia tridentata wyomingensis stands with Bromus tectorum understory, and Artemisia arbuscula/Poa secunda community type. Agropyron smithii occurs in a few

depressions. A 15 acre pond occurs in the deepest depression surrounded by rim rock. Hydrology of the pond is controlled by groundwater; there are no inlets or outlets. A 4 meter wide band of Scirpus acutus surrounds the pond and is largely protected from grazing. Other riparian communities present at potholes within the site are Typha latifolia, Eleocharis palustris, and Juncus balticus.

Rarity:
Information not compiled at this time.

Condition:
Bromus tectorum is abundant.

Viability:
Information not compiled at this time.

Key Environmental Factors:
The potholes occur on a small internally drained basin on relatively recent lava flows. Hydrology is controlled by groundwater; there are no inlets or outlets.

Other Values:
Information not compiled at this time.

Conservation Intent:
Portions of the area are managed as a Natural Area by Idaho State University.

Management Needs:
Information not compiled at this time.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

ELEOCHARIS PALUSTRIS	G5	S3
JUNCUS BALTICUS	G5	S5
SCIRPUS ACUTUS	G5	S4
TYPHA LATIFOLIA	G5	S4

Rare Animal Occurrences:

RANA PIPIENS	G5	S3

Author:
L. Williams

SURVEY NOTES ON OTHER SITES

Blackfoot Equalizing Reservoir

Plant associations

Salix exigua dominance type
Carex simulata
Distichlis strichta

Juncus balticus
Scirpus acutus
Scirpus americanus
Typha latifolia

Description

A raised water table that has been enhanced by reservoir operations and agricultural irrigation helps to maintain a wetland complex along the Blackfoot River just west of Blackfoot. The reservoir is approximately 400 acres in size and supports extensive stands of Typha latifolia and Scirpus acutus along with the non-native emergent species Butomus umbellata in permanent to semipermanently flooded areas. The area is situated on very sandy soils and unvegetated dunes are present. On the east side of the reservoir a vast area with macro-relief of hummocks and swales are present. The hummocks are dominated by the upland species Artemisia tridentata and Chrysothamnus nauseosus. Moist swales are typically vegetated with patches of Typha latifolia and Scirpus acutus, Juncus balticus stands also cover extensive areas. Margins of wet areas support a fringe of Distichlis stricta. Elaeagnus angusitifolia is widespread within the wetland and forms extensive woodlands in the general area.

Inman Creek

Plant associations

Populus trichocarpa/Cornus sericea
Cornus sericea
Salix boothii/Carex utriculata
Carex utriculata
Scirpus microcarpus

Description

Inman Creek is a tributary of Rapid Creek in the Portneuf Range of eastern Idaho. The small stream occupies a narrow valley bottom. The valley walls support occasional well developed sloped, spring fed wetlands dominated by Carex utriculata and Scirpus microcarpus in its upper reaches. Small stands of Salix boothii are also present. Downstream of the confluence of the north and south forks, Inman Creek enters a narrow steep canyon that supports a dense thicket of Cornus sericea. Occasional patches of cottonwood are present to create a tall overstory. Few impacts to stands were noted in the narrow canyon with exception of input of sediments and rock from road maintenance activities and a dispersed recreation site near the forest boundary. The dispersed recreation site has numerous spur roads and the local area is weedy with a more open shrub canopy. Few appear to venture too far upstream from this area. Further downstream from the dispersed recreation site a campground is present. The canyon is not as steep downstream of the forest boundary, but high quality shrub stands appear to continue to where the valley widens downstream of Dry Canyon.

Lower Portneuf Access Site

Plant associations

Salix exigua/Mesic forb

Description

The Lower Portneuf Access Site is along the Portneuf River ca 2 miles upstream of Lava Hot Springs. The access area includes ca 1 river mile of the Portneuf River is it runs through a relatively wide valley bottom between mountain slopes. The valley bottom terraces appear to be composed of travertine and fine textured alluvium. The travertine ridges cross the river creating short cascades and falls; the tallest and most complex being at the upper end of the site. Most of the terrace is a dense stand of seeded Bromus inermis,

although a relatively large stand of nearly pure Elymus cinereus occurs near the access road. The river is entrenched into the terrace and 6 to 8 foot cut banks occur in some spots along the channel. The riparian zone is dominated by Salix exigua. The hydrologic regime is impacted by the operation of Chesterfield Reservoir.

Salyer Spring

Plant associations

Prunus virginiana
Salix exigua/Barren
Salix lutea/Mesic graminoid
Carex nebrascensis

Salyer Springs emerge on the east side of the Sublette Range in southern Idaho. The spring supports both emergent and scrub-schrub wetlands. An emphemeral drainage at the head of the spring is thicket of Prunus virginiana. Other scrub-shrub wetlands in the valley bottom and at hillside seeps are dominated by Salix exigua. Emergent wetlands are mostly dominated by Carex nebrascensis with Catabrosa aquatica and Rorippa nasturtium aquatica filling spring creeks. The wetland trends to the east and narrows to another ephemeral channel, then opens to another meadow dominated by Carex nebrascensis. This meadow has a stand of Salix lutea at the downstream end. The wetland continues down valley onto private land and there are areas that are completely void of large patches of vegetation. Tall shrubs and trees (Salix alba) provide habitat for owls, other raptors and song birds in a desert setting. The fruits of chokecherry and gooseberry are food for birds and most likely coyotes. The area is fenced but does have a long history of grazing. Disturbance has allowed for the establishment of Cirsium arvense, Arctium minus, and other exotics. Staff at Curlew National Grasslands staff indicated that the area is currently only grazed for only one week during the year.

A 190 acre area of upland steppe vegetation ca. 2 miles south of Salyer Spring proper was recommended as a Bureau of Land Management Research Natural Area in 1983. The proposed RNA was called Salyer Spring but did not include any of the springs. The proposed RNA was rejected by the Resource Area.

South Fork Toponce Creek

Plant associations

Salix boothii/Carex utriculata
Betula glandulosa/Carex utriculata
Potentilla fruticosa/Deschampsia cespitosa
Carex utriculata

Description

South Fork Toponce Creek meanders through a wide valley bottom that trends to the east. The stream supports a broad band of riparian shrubs and graminoids. A raised water table is the result of both beaver activity and springs which emerge at or near the valley bottom. Salix boothii, Salix geyeriana, and Betula glandulosa form dense thickets. In saturated areas the understory is dominated by Carex utriculata and other wet site graminoids. Betula glandulosa is intermixed in the willow stands and is also the community dominate at seeps and springs. The moist shrublands are interupted by drier patches where the understory is dominated by Poa pratensis. Stands of Pontentilla fruticosa are present on slightly raised terraces. Patches of Carex utriculata are present near active beaver dams. Mudflats of former beaver dams and channels of slow moving spring creeks are well vegetated with Catabrosa aquatica, Hippurus vulgaris, Alopecurus aequalis, and Mimulus guttatus.

The South Fork Toponce Creek is within an active grazing allotment. Impacts to the channel include bank failure with headcuts up to 3 meters high and channel entrenchment. In all but the wettest areas banks are dominated by early seral and annual species. Drier terraces have abundant Poa pratensis and Cirsium arvense. Rudbeckia occidentalis (an increaser with grazing pressure) also creates dense patches.

Upper Portneuf Access Site

Plant associations

Salix lutea

Description

The Sportman's Access site includes ca 1 mile of the Portneuf River as it runs, slow, deep, and wide through the relatively wide valley bottom bordered by mountain slopes approximately 7 miles upstream of Lava Hot Springs. The adjacent terraces, composed of deep, fine textured alluvium, are farmed. The broad riparian xone through the site is a mixture Salix lutea seemingly most prominent; although S. exigua, S. bebbiana, and S. geyeriana, and Cornus sericea are at least locally common. Crataegus douglasii occurs in small stands of large, old, plants. The dense herbaceous understory is mostly rhizomatous exotics with Agropyron repens and Cirsium arvense being prominent alongy with Phalaris arundinacea and Bromus inermis. Heracleum lanatum and Urtica dioica are the most common natuve herbs. A stand of aspen also occurs on a terrace along the west side of the river.

Water quality and timing of flooding events is impacted by upstream uses. The water regime is controlled to an unknown extent by Chesterfield Reservoir ca. 17 miles upstream. Water quality is impacted by sediment and nutrient inputs.

Appendix F

Wetland and deepwater habitat for Hydrologic Units and counties

Wetland and deepwater habitat within Hydrologic Unit 16010204 (Lower Bear-Malad)			
COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBHh	28	402.44	3.05
L1UBKHx	1	38.03	0.29
L2AB3Fh	3	9.28	0.07
L2UB/AB3Hh	3	18.12	0.14
L2UBFh	24	99.52	0.76
L2UBH	1	14.74	0.11
L2USCh	10	51.30	0.39
PAB3F	1	0.74	0.01
PAB3Fh	1	2.37	0.02
PAB3Fx	1	0.39	0.00
PAB3Hh	1	0.89	0.01
PAB4/UBFx	1	0.94	0.01
PAB4Fx	1	0.12	0.00
PEM1A	41	2524.23	19.15
PEM1Ah	1	19.59	0.15
PEM1B	58	38.82	0.29
PEM1C	112	9023.56	68.46
PEM1Cb	1	0.27	0.00
PEM1Ch	26	103.32	0.78
PEM1Cx	8	4.23	0.03
PEM1F	43	101.69	0.77
PEM1Fb	2	0.61	0.00
PEM1Fh	2	0.74	0.01
PEM1Fx	1	0.24	0.00
PFO1A	6	30.40	0.23
PFO1B	2	1.29	0.01
PFO1C	2	6.98	0.05
PSS1/EM1C	1	4.11	0.03
PSS1A	9	56.62	0.43
PSS1B	19	24.66	0.19
PSS1C	40	185.73	1.41
PSS1Cb	1	3.70	0.03
PSS1Ch	2	6.92	0.05
PSS1F	2	1.90	0.01
PUB/AB4F	1	0.68	0.01
PUB/EM1Fx	1	0.14	0.00
PUBF	9	4.55	0.03
PUBFh	19	9.13	0.07
PUBFx	31	20.86	0.16
PUBH	10	5.77	0.04

PUBHh	16	22.79	0.17
PUBHx	7	4.22	0.03
PUSA	27	267.64	2.03
PUSAx	2	0.90	0.01
PUSC	11	18.98	0.14
PUSCh	7	10.27	0.08
PUSCx	2	1.08	0.01
R3UBH	2	34.51	0.26
TOTAL	**600**	**13180.02**	**100.00**

Wetland and deepwater habitat within Hydrologic Unit 16020309 (Curlew Valley)

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBHh	16	124.76	3.19
L2AB4Fh	9	30.67	0.78
L2USAh	2	8.14	0.21
L2USCh	4	14.46	0.37
PAB3F	2	0.26	0.01
PAB3Fx	1	0.48	0.01
PAB4H	1	0.17	0.00
PEM1/SS1B	1	3.43	0.09
PEM1A	18	120.88	3.09
PEM1Ah	11	7.90	0.20
PEM1B	28	36.32	0.93
PEM1C	30	3462.12	88.43
PEM1Ch	12	13.97	0.36
PEM1Cx	1	0.31	0.01
PEM1F	7	5.23	0.13
PEM1Fh	2	23.38	0.60
PEM1Fx	1	0.27	0.01
PEMA	4	1.34	0.03
PEMAh	2	0.69	0.02
PEMB	3	0.61	0.02
PEMC	2	0.53	0.01
PFO1A	4	12.50	0.32
PSS1/EM1Ch	1	0.84	0.02
PSS1Ah	1	2.15	0.05
PSS1B	7	4.39	0.11
PSS1C	4	8.61	0.22
PSS1Ch	4	8.67	0.22
PSSA	2	0.47	0.01
PSSB	5	1.28	0.03
PUBF	6	0.95	0.02
PUBFh	16	5.99	0.15
PUBFx	8	2.13	0.05

PUBHh	7	2.35	0.06
PUBHx	10	3.18	0.08
PUSAh	3	1.19	0.03
PUSC	2	0.33	0.01
PUSCh	7	2.43	0.06
PUSCx	5	1.81	0.05
TOTAL	**249**	**3915.18**	**100.00**

Wetland and deepwater habitat within Hydrologic Unit 17040201 (Idaho Falls)

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	7	116.63	0.90
L1UBHh	15	96.66	0.74
L1UBHx	3	32.78	0.25
L2USA	2	3.92	0.03
PAB3F	1	1.60	0.01
PAB3H	1	6.41	0.05
PAB4F	16	23.35	0.18
PAB4Fx	1	0.72	0.01
PAB4H	13	8.99	0.07
PAB4Hx	1	0.64	0.00
PEM/FO1C	1	1.68	0.01
PEM/SS1A	1	31.94	0.25
PEM/SS1C	1	5.72	0.04
PEM1/SS1A	6	30.67	0.24
PEM1/SS1C	1	4.33	0.03
PEM1A	102	427.12	3.29
PEM1Ad	1	10.17	0.08
PEM1Ah	1	1.33	0.01
PEM1B	6	4.10	0.03
PEM1C	217	469.79	3.62
PEM1Ch	3	6.61	0.05
PEM1Cx	2	1.81	0.01
PEM1F	178	346.13	2.67
PEM1Fh	10	38.32	0.30
PEM1Fx	7	4.99	0.04
PEM1H	4	5.66	0.04
PEM1Hh	1	1.22	0.01
PEM1KA	3	10.79	0.08
PEM1KC	1	2.45	0.02
PEM1KCh	18	109.52	0.84
PEM1KCx	1	3.24	0.02
PEM1KFh	8	58.40	0.45
PFO/EM1A	10	306.56	2.36
PFO1/EM1A	3	30.99	0.24
PFO1A	371	4194.39	32.32

PFO1C	26	71.50	0.55
PFO1J	8	66.88	0.52
PSS1/EM1A	1	0.27	0.00
PSS1/EM1C	2	24.73	0.19
PSS1A	288	790.48	6.09
PSS1C	183	429.18	3.31
PSS1Ch	3	1.11	0.01
PSS1F	4	3.95	0.03
PUB/EM1KHh	3	193.89	1.49
PUBF	93	83.69	0.64
PUBFh	11	17.01	0.13
PUBFx	50	42.58	0.33
PUBH	41	56.25	0.43
PUBHb	5	1.36	0.01
PUBHh	37	147.10	1.13
PUBHx	73	99.98	0.77
PUBKF	3	1.73	0.01
PUBKFh	8	15.99	0.12
PUBKHh	3	79.50	0.61
PUBKHrx	3	11.27	0.09
PUBKHx	6	35.29	0.27
PUS/EM1C	5	5.57	0.04
PUS1/SS1A	10	20.35	0.16
PUSA	2	3.29	0.03
PUSC	5	7.66	0.06
PUSCh	1	0.36	0.00
R2UBKHx	5	255.66	1.97
R3RSC	2	0.75	0.01
R3UBH	520	3739.82	28.82
R3USA	51	66.32	0.51
R3USC	253	298.54	2.30
TOTAL	**2722**	**12971.68**	**100.00**

Wetland and deepwater habitat for digitized maps within Hydrologic Unit 17040206 (American Falls)

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBHh	134	39887.60	46.17
L2AB3Hh	23	64.42	0.07
L2UBF	3	36.70	0.04
L2UBFh	24	1066.93	1.24
L2UBFx	1	30.77	0.04
L2UBH	2	29.37	0.03
L2UBHh	20	3355.92	3.88
L2UBKHrx	1	28.46	0.03
L2USAh	4	1.99	0.00

L2USCh	107	2302.87	2.67
PAB3/EM1Fh	1	1.52	0.00
PAB3/UBH	1	7.35	0.01
PAB3F	3	7.54	0.01
PAB3Fh	4	4.04	0.00
PAB3Hh	4	3.87	0.00
PAB4/UB4F	1	11.88	0.01
PAB4/UBFh	1	2.25	0.00
PAB4F	5	12.60	0.01
PAB4Fh	1	0.56	0.00
PAB4Fx	3	1.37	0.00
PAB4Hh	6	8.99	0.01
PAB4KHrx	2	4.82	0.01
PABFh	1	0.41	0.00
PEM1/FO1A	21	163.28	0.19
PEM1/FO1C	20	182.52	0.21
PEM1/FO1Cb	1	32.10	0.04
PEM1/SS1A	30	451.79	0.52
PEM1/SS1B	2	3.33	0.00
PEM1/SS1C	70	1762.66	2.04
PEM1/SS1F	4	163.53	0.19
PEM1/UBF	5	86.38	0.10
PEM1/UBFb	7	27.49	0.03
PEM1/UBFrx	1	3.91	0.00
PEM1/UBH	1	0.57	0.00
PEM1/USC	1	54.41	0.06
PEM1/USCh	1	275.73	0.32
PEM1A	416	8597.07	9.95
PEM1Ad	2	8.09	0.01
PEM1Ah	14	50.06	0.06
PEM1B	62	93.43	0.11
PEM1C	684	8018.39	9.28
PEM1Cd	1	0.49	0.00
PEM1Ch	59	1249.79	1.45
PEM1Cx	2	3.93	0.00
PEM1F	502	1462.09	1.69
PEM1Fb	12	62.53	0.07
PEM1Fh	39	44.25	0.05
PEM1Fx	10	9.72	0.01
PEM1H	1	8.16	0.01
PEM1Hx	1	0.23	0.00
PFO1/EM1A	3	7.34	0.01
PFO1/EM1C	9	118.25	0.14
PFO1/SS1C	25	151.65	0.18

PFO1A	241	2425.83	2.81
PFO1B	4	4.41	0.01
PFO1C	173	1095.86	1.27
PFO5C	1	1.72	0.00
PFO5Hb	1	0.38	0.00
PSS/EM1Ah	1	9.78	0.01
PSS1/EM1A	3	99.72	0.12
PSS1/EM1C	14	477.01	0.55
PSS1/FO1A	17	158.58	0.18
PSS1/FO1C	26	178.66	0.21
PSS1/UB1F	1	12.21	0.01
PSS1/USCh	2	168.05	0.19
PSS1A	164	1460.19	1.69
PSS1Ah	12	16.75	0.02
PSS1B	28	44.51	0.05
PSS1C	457	4221.18	4.89
PSS1Cb	3	48.37	0.06
PSS1Ch	25	110.22	0.13
PSS1F	15	89.77	0.10
PSS1Fh	1	6.56	0.01
PSS1J	4	104.06	0.12
PUB/AB4F	1	2.32	0.00
PUB/EM1F	2	10.30	0.01
PUB/EM1Fb	8	19.50	0.02
PUBF	108	161.54	0.19
PUBFb	1	0.58	0.00
PUBFh	46	50.36	0.06
PUBFx	93	118.86	0.14
PUBH	49	56.15	0.07
PUBHb	21	14.60	0.02
PUBHh	40	57.58	0.07
PUBHx	23	14.33	0.02
PUBKFrx	1	1.42	0.00
PUBKFx	1	1.00	0.00
PUBKH	1	1.50	0.00
PUBKHrx	9	36.60	0.04
PUBKHx	5	3.81	0.00
PUS/EM1C	1	4.32	0.00
PUS/EMC	1	69.98	0.08
PUSA	15	5.99	0.01
PUSAx	1	1.63	0.00
PUSC	16	19.50	0.02
PUSCh	2	0.95	0.00
PUSCx	3	2.04	0.00

PUSJ	2	1.62	0.00
R2UBH	54	695.66	0.81
R2UBKHx	20	592.05	0.69
R3UBH	515	3083.67	3.57
R3USA	105	220.11	0.25
R3USC	223	361.07	0.42
R4SBA	5	35.65	0.04
R4SBC	6	13.10	0.02
R4SBF	14	31.06	0.04
TOTAL	**4943**	**86388.07**	**100.00**

Wetland and deepwater habitat within Hydrologic Unit 17040208 (Portneuf)

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	5	36.94	0.18
L1UBHh	69	1358.61	6.47
L1UBKHx	1	9.40	0.04
L2AB3/UBHh	1	18.58	0.09
L2AB3Fh	5	11.49	0.05
L2AB3H	1	1.69	0.01
L2AB3Hh	2	36.69	0.17
L2UBHh	2	80.33	0.38
L2UBHx	5	24.28	0.12
L2USCh	10	40.55	0.19
PAB3F	6	8.48	0.04
PAB3Fb	2	1.53	0.01
PAB3Fh	3	6.79	0.03
PAB3Hh	2	1.52	0.01
PAB4F	7	8.94	0.04
PAB4Fh	4	1.36	0.01
PAB4H	5	2.96	0.01
PAB4Hh	1	0.15	0.00
PAB4KHx	1	1.25	0.01
PEM1/AB4F	1	4.29	0.02
PEM1/FO1A	1	3.07	0.01
PEM1/SS1C	4	10.51	0.05
PEM1/SS1Fb	2	2.82	0.01
PEM1/SS4C	1	2.29	0.01
PEM1/UBF	1	4.09	0.02
PEM1/UBFb	28	78.27	0.37
PEM1/UBFh	2	1.92	0.01
PEM1A	202	6137.28	29.21
PEM1B	215	291.83	1.39
PEM1C	586	8659.42	41.21
PEM1Cb	13	18.57	0.09
PEM1Ch	43	83.97	0.40

PEM1Cx	4	5.57	0.03
PEM1E	1	1.06	0.01
PEM1F	270	871.40	4.15
PEM1Fb	56	97.08	0.46
PEM1Fh	13	42.42	0.20
PEM1Fx	1	0.18	0.00
PEM1Hb	1	0.55	0.00
PEM1Hh	4	11.73	0.06
PFO1A	29	93.96	0.45
PFO1B	2	13.29	0.06
PFO1C	18	99.16	0.47
PFO1F	1	6.43	0.03
PFO1Fb	1	9.14	0.04
PFO4/SS1B	1	9.32	0.04
PFO4B	2	27.59	0.13
PSS1/EM1A	3	27.44	0.13
PSS1/EM1B	4	57.92	0.28
PSS1/EM1C	2	18.94	0.09
PSS1/FO4B	1	3.30	0.02
PSS1A	56	319.54	1.52
PSS1B	75	145.79	0.69
PSS1C	238	1409.88	6.71
PSS1Cb	17	52.65	0.25
PSS1Ch	12	15.83	0.08
PSS1Cx	1	3.62	0.02
PSS1F	5	8.03	0.04
PSS1Fb	1	1.80	0.01
PSS4C	1	8.99	0.04
PSS5Hh	2	1.40	0.01
PUB/AB3Hh	1	2.44	0.01
PUB/EM1F	1	9.02	0.04
PUB/EM1Fb	7	12.23	0.06
PUB/EM1Fh	1	1.12	0.01
PUB/EM1Fx	1	1.89	0.01
PUB/EM1Hb	1	0.72	0.00
PUBF	76	59.08	0.28
PUBFB	3	0.57	0.00
PUBFb	19	6.89	0.03
PUBFh	44	20.38	0.10
PUBFx	24	22.04	0.10
PUBH	61	78.87	0.38
PUBHb	107	44.43	0.21
PUBHh	37	28.70	0.14
PUBHx	42	33.44	0.16

PUBKHrx	6	33.58	0.16
PUBKHx	17	28.25	0.13
PUSA	4	12.24	0.06
PUSC	8	12.80	0.06
PUSCh	3	0.60	0.00
R2AB4H	1	24.47	0.12
R2UBH	9	59.60	0.28
R2UBHx	1	44.58	0.21
R3UBH	26	159.45	0.76
TOTAL	**2553**	**21011.30**	**100.00**

Wetland and deepwater habitat for digitized maps within Hydrologic Unit 17040209 (Lake Walcott)

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBHh	740	16505.00	70.08
L1UBHx	11	64.65	0.27
L1UBKrx	4	73.26	0.31
L2ABFh	1	1.34	0.01
L2EMAh	4	1.08	0.00
L2EMFh	178	715.68	3.04
L2EMGh	8	27.69	0.12
L2UBFh	4	38.93	0.17
L2USAh	2	0.20	0.00
L2USCh	9	11.69	0.05
PAB/EMF	1	3.49	0.01
PAB3Hh	1	1.48	0.01
PAB4Hh	1	0.54	0.00
PABC	7	3.25	0.01
PABCh	1	0.16	0.00
PABCx	3	0.88	0.00
PABF	23	17.47	0.07
PABFh	5	20.54	0.09
PABFx	10	2.80	0.01
PABH	3	2.68	0.01
PABHh	1	0.99	0.00
PABHx	2	0.37	0.00
PEM1/UBFh	1	1.54	0.01
PEM1A	34	969.82	4.12
PEM1Ah	29	18.92	0.08
PEM1B	27	46.72	0.20
PEM1C	45	1526.87	6.48
PEM1Ch	10	11.94	0.05
PEM1F	12	10.58	0.04
PEM1Fh	6	3.77	0.02
PEMA	124	201.51	0.86

PEMAd	1	27.11	0.12
PEMAh	101	158.29	0.67
PEMAx	1	0.21	0.00
PEMB	11	4.64	0.02
PEMC	337	720.93	3.06
PEMCd	5	14.66	0.06
PEMCh	347	476.51	2.02
PEMCx	15	16.74	0.07
PEMF	50	196.93	0.84
PEMFh	33	112.81	0.48
PEMFx	1	14.60	0.06
PEMJ	1	1.86	0.01
PFO1A	2	5.85	0.02
PFO1C	1	3.39	0.01
PFOA	11	14.78	0.06
PFOAh	42	76.04	0.32
PFOAx	1	2.65	0.01
PFOC	17	19.89	0.08
PFOCh	36	33.50	0.14
PFOCx	1	0.31	0.00
PSS1A	10	24.92	0.11
PSS1Ah	13	6.07	0.03
PSS1B	11	16.77	0.07
PSS1C	5	13.47	0.06
PSS1Ch	1	8.08	0.03
PSSA	10	14.00	0.06
PSSAh	28	31.13	0.13
PSSB	3	1.66	0.01
PSSC	92	86.46	0.37
PSSCh	164	123.65	0.53
PSSCx	21	14.78	0.06
PSSF	1	0.91	0.00
PUBF	13	11.86	0.05
PUBFh	12	13.32	0.06
PUBFx	50	47.16	0.20
PUBG	2	5.00	0.02
PUBH	56	85.69	0.36
PUBHh	18	24.39	0.10
PUBHx	115	202.19	0.86
PUBK	3	1.95	0.01
PUBKHrx	4	3.61	0.02
PUBKrx	40	93.55	0.40
PUBKx	1	0.27	0.00
PUSA	21	6.01	0.03

PUSAh	6	3.72	0.02
PUSAx	3	0.68	0.00
PUSC	30	17.68	0.08
PUSCh	68	32.11	0.14
PUSCx	61	47.07	0.20
PUSJ	1	0.45	0.00
PUSK	1	0.56	0.00
R3RBH	11	85.53	0.36
R3RSA	19	12.02	0.05
R3RSC	6	3.31	0.01
R3UBH	11	14.24	0.06
R3USA	1	0.34	0.00
R4SBA	1	0.51	0.00
R4SBC	4	1.51	0.01
R4SBFrx	33	258.09	1.10
R4SBFx	16	48.62	0.21
TOTAL	**3287**	**23550.92**	**100.00**

Wetland and deepwater habitat within Bannock County.

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	5	36.94	0.09
L1UBHh	4	13065.93	32.02
L1UBKHx	1	9.40	0.02
L2AB3Fh	5	11.49	0.03
L2AB3H	1	1.69	0.00
L2AB3Hh	3	42.13	0.10
L2UBFh	5	40.68	0.10
L2UBH	1	15.40	0.04
L2UBHh	14	1446.10	3.54
L2UBHx	5	24.28	0.06
L2USCh	14	1694.89	4.15
PAB3F	2	4.83	0.01
PAB3Fh	3	6.79	0.02
PAB3Hh	2	1.52	0.00
PAB4F	4	1.14	0.00
PAB4Fh	3	0.93	0.00
PAB4H	1	0.16	0.00
PAB4Hh	1	0.15	0.00
PEM1/AB4F	1	4.29	0.01
PEM1/FO1C	7	134.46	0.33
PEM1/FO1Cb	1	32.10	0.08
PEM1/SS1A	3	262.68	0.64
PEM1/SS1C	32	1034.22	2.53
PEM1/SS1F	2	74.97	0.18
PEM1/SS1Fb	2	2.82	0.01

PEM1/UBF	2	17.02	0.04
PEM1/UBFb	9	32.22	0.08
PEM1/USC	1	46.67	0.11
PEM1/USCh	1	275.73	0.68
PEM1A	182	3818.87	9.36
PEM1Ah	1	34.12	0.08
PEM1B	118	190.12	0.47
PEM1C	481	9610.73	23.55
PEM1Cb	4	9.01	0.02
PEM1Ch	27	797.29	1.95
PEM1Cx	3	3.55	0.01
PEM1F	216	1154.34	2.83
PEM1Fb	27	84.39	0.21
PEM1Fh	11	41.55	0.10
PEM1Fx	1	0.18	0.00
PEM1H	1	2.28	0.01
PFO1/EM1C	5	73.85	0.18
PFO1/SS1C	9	32.89	0.08
PFO1A	50	496.07	1.22
PFO1B	2	2.93	0.01
PFO1C	25	547.93	1.34
PFO5Hb	1	0.38	0.00
PSS1/EM1A	2	73.88	0.18
PSS1/EM1B	3	25.52	0.06
PSS1/EM1C	4	403.24	0.99
PSS1/UB1F	1	12.21	0.03
PSS1/USCh	2	168.05	0.41
PSS1A	79	571.72	1.40
PSS1B	45	107.81	0.26
PSS1C	334	3109.49	7.62
PSS1Cb	4	54.65	0.13
PSS1Ch	9	53.30	0.13
PSS1Cx	1	3.62	0.01
PSS1F	5	46.26	0.11
PUB/AB3Hh	1	2.44	0.01
PUB/EM1F	1	9.02	0.02
PUB/EM1Fb	9	24.04	0.06
PUB/EM1Fx	1	1.89	0.00
PUBF	22	30.23	0.07
PUBFB	3	0.57	0.00
PUBFb	5	1.59	0.00
PUBFh	30	14.33	0.04
PUBFx	18	18.10	0.04
PUBH	64	66.74	0.16

PUBHb	39	21.69	0.05
PUBHh	19	16.46	0.04
PUBHx	24	16.72	0.04
PUBKHrx	6	33.58	0.08
PUS/EM1C	1	4.32	0.01
PUS/EMC	1	9.00	0.02
PUSA	4	12.24	0.03
PUSC	18	27.70	0.07
PUSCh	1	0.16	0.00
PUSCx	3	2.04	0.01
R2UBH	64	442.66	1.08
R2UBHx	1	44.58	0.11
R3UBH	40	148.79	0.36
R3USA	6	5.28	0.01
R3USC	9	5.63	0.01
TOTAL	**2178**	**40811.67**	**100.00**

Wetland and deepwater habitat within Oneida County.

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBHh	44	527.20	3.08
L1UBKHx	1	38.03	0.22
L2AB3Fh	3	9.28	0.05
L2AB4Fh	9	30.67	0.18
L2UB/AB3Hh	3	18.12	0.11
L2UBFh	24	99.52	0.58
L2UBH	1	14.74	0.09
L2USAh	2	8.14	0.05
L2USCh	14	65.75	0.38
PAB3F	3	1.00	0.01
PAB3Fh	1	2.37	0.01
PAB3Fx	2	0.87	0.01
PAB3Hh	1	0.89	0.01
PAB4/UBFx	1	0.94	0.01
PAB4Fx	1	0.12	0.00
PAB4H	1	0.17	0.00
PEM1/SS1B	1	3.43	0.02
PEM1A	58	2644.24	15.47
PEM1Ah	13	27.95	0.16
PEM1B	85	80.10	0.47
PEM1C	143	12486.61	73.03
PEM1Cb	1	0.27	0.00
PEM1Ch	40	117.98	0.69
PEM1Cx	9	4.55	0.03
PEM1F	53	107.34	0.63
PEM1Fb	2	0.61	0.00

PEM1Fh	10	24.70	0.14
PEM1Fx	2	0.51	0.00
PFO1A	10	42.90	0.25
PFO1B	2	1.29	0.01
PFO1C	2	6.98	0.04
PSS1/EM1C	1	4.11	0.02
PSS1/EM1Ch	1	0.84	0.00
PSS1A	9	56.62	0.33
PSS1Ah	1	2.15	0.01
PSS1B	28	29.40	0.17
PSS1C	44	194.34	1.14
PSS1Cb	1	3.70	0.02
PSS1Ch	6	15.58	0.09
PSS1F	2	1.90	0.01
PUB/AB4F	1	0.68	0.00
PUB/EM1Fx	1	0.14	0.00
PUBF	15	5.49	0.03
PUBFh	35	16.55	0.10
PUBFx	40	23.46	0.14
PUBH	10	5.97	0.03
PUBHh	17	23.78	0.14
PUBHx	16	7.16	0.04
PUSA	27	267.64	1.57
PUSAh	2	0.77	0.00
PUSAx	2	0.90	0.01
PUSC	12	19.12	0.11
PUSCh	14	12.71	0.07
PUSCx	5	2.48	0.01
R3UBH	2	34.51	0.20
TOTAL	**834**	**17097.26**	**100.00**

Wetland and deepwater habitat within Power County.

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBHh	280	22016.84	72.09
L2AB3Hh	12	31.01	0.10
L2ABFh	1	1.34	0.00
L2EMAh	4	1.08	0.00
L2EMFh	96	461.78	1.51
L2UBHh	8	235.23	0.77
L2USAh	2	1.10	0.00
L2USCh	82	530.75	1.74
PAB3Fh	4	4.04	0.01
PAB3Hh	1	1.48	0.00
PAB4/UBFh	1	2.25	0.01
PAB4F	1	0.83	0.00

PAB4Hh	1	0.54	0.00
PABFh	1	3.40	0.01
PABH	1	0.48	0.00
PEM1/FO1A	3	15.44	0.05
PEM1/UBFh	1	1.54	0.01
PEM1A	112	1571.58	5.15
PEM1Ad	2	8.09	0.03
PEM1Ah	31	22.49	0.07
PEM1B	64	69.25	0.23
PEM1C	127	3284.57	10.75
PEM1Ch	28	102.49	0.34
PEM1Cx	1	2.02	0.01
PEM1F	59	186.71	0.61
PEM1Fh	9	8.42	0.03
PEMA	60	78.89	0.26
PEMAh	17	15.12	0.05
PEMC	83	147.92	0.48
PEMCh	37	86.59	0.28
PEMCx	1	1.63	0.01
PEMF	11	85.68	0.28
PEMFh	7	7.58	0.02
PFO1A	5	15.83	0.05
PFO1B	3	2.27	0.01
PFO1C	5	16.78	0.05
PFOC	4	2.59	0.01
PSS1A	59	495.17	1.62
PSS1Ah	21	18.80	0.06
PSS1B	22	37.06	0.12
PSS1C	79	409.83	1.34
PSS1Ch	18	60.23	0.20
PSS1Fh	1	6.56	0.02
PSSA	4	6.12	0.02
PSSAh	2	2.02	0.01
PSSC	24	30.42	0.10
PSSCh	7	3.80	0.01
PUB/EM1Fb	1	0.71	0.00
PUBF	19	13.38	0.04
PUBFb	1	0.58	0.00
PUBFh	20	10.42	0.03
PUBFx	18	13.28	0.04
PUBH	44	49.89	0.16
PUBHh	35	36.26	0.12
PUBHx	116	188.79	0.62
PUBKHrx	4	3.61	0.01

PUBKHx	19	28.47	0.09
PUSA	26	9.88	0.03
PUSAx	1	1.63	0.01
PUSC	23	16.67	0.05
PUSCh	5	0.90	0.00
PUSCx	10	11.64	0.04
PUSJ	2	1.62	0.01
R2UBH	60	54.72	0.18
R3UBH	2	1.60	0.01
R3USA	1	0.34	0.00
TOTAL	**1809**	**30540.06**	**100.00**

Appendix G.

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

S1 Critically imperiled statewide (typically 5 or fewer occurrences or less than five percent of native range currently occupied by high quality examples of type) or especially vulnerable to extirpation from the state.

S2 Imperiled statewide because of rarity (typically 6-20 occurrences or six to twenty-five percent of native range currently occupied by high quality occurrences of type) or especially vulnerable to extirpation from the state.

S3 Rare or uncommon statewide (typically 21-100 occurrences or twenty-six to fifty percent of native range currently occupied by high quality occurrences of type).

S4 Apparently secure statewide (many occurrences, fifty-one to seventy-five percent of native range currently occupied by high quality occurrences of type).

S5 Demonstrably secure statewide and essentially ineradicable under present conditions (seventy-six to one hundred percent of native range currently occupied by high quality examples of type).

SH Of historical occurrence statewide, perhaps not verified in the last 20 years but suspected to still be extant.

SX Extirpated statewide.

SE Represents human induced community type (exotic) which has been so altered that pre-settlement condition cannot be assessed or the end result of successional processes will continue to be an altered type.

SP Purported for state. Includes types which are formally described for adjacent states, but lack persuasive documentation (i.e., plot data) for recognition as a state type.

S#? Rank followed by a ? indicates the assigned rank is inexact.

S? Type not yet ranked statewide.

GQ Synecologic status of type is unclear. Type based on classification work in a small geographical area, habitat descriptions, or field notes. Full recognition of type dependent on additional analysis.

UNK Plant communities with ranks as UNK or state ranks blank represent types listed by the MRA as occurring in the basin whose conservation status needs to be analyzed prior to assigning a rank. This information (stand tables and community descriptions) is currently unavailable.

APPENDIX H.

Idaho Conservation Data Center Site and Community Reporting Forms: Site Survey Form, Community Survey and Ocular Plant Species Data Forms, and Idaho Community Observation Form.

FORM I. SITE SURVEY FORM WHTF 10/30/92

IDENTIFICATION AND LOCATION
SOURCECODE_____
MANUAL _____
SITENAME_____ STATE _____
MO DAY YEAR EXAMINERS
____-_____-____ _____
____-_____-____ _____
COUNTY:_____ QUADNAME: _____ QUADCODE: _____
_____ _____ _____
_____ _____ _____
____T/____R/_____SECTION(s)
____T/____R/_____SECTION(s)
DIRECTIONS -->_____
_____
_____

ELEMENT OCCURRENCES

Element Name Occ. Plot No. Found? Found? Found? No.
_____
_____
_____
_____
_____
_____
_____
REVISIT NEEDS-->_____
_____
_____

SITE DESCRIPTION/DESIGN

SITE DESCRIPTION--> _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
TOPOGRAPHIC BASE MAP:
___yes___no 1. element locations and/or boundaries?
___yes___no 2. both primary and secondary boundaries?

FORM I. SITE SURVEY FORM Page 2

BOUNDARY JUSTIFICATION-->_____

_____

_____

_____

PROTECTION URGENCY	MANAGEMENT URGENCY
U1 immediate threat	M1 needed this year
U2 threat w/i 5 yrs	M2 needed w/i 5 yrs (or loss)
U3 threat but not w/i 5 yrs	M3 needed w/i 5 yrs (or degrade)
U4 no threats	M4 may be needed in future
U5 land protected	M5 none needed
PU COMMENTS:	MU COMMENTS:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

STEWARDSHIP

LAND USE COMMENTS --> _____

_____

_____

_____

POTENTIAL HAZARDS --> _____

_____

_____

EXOTIC FLORA/FAUNA COMMENTS--> _____

_____

_____

OFF-SITE CONSIDERATIONS--> _____

_____

_____

SITE AND ELEMENT MANAGEMENT NEEDS --> _____

_____

_____

SKETCH MAP (e.g., show: (1) EO locations, (2) study plots, (3) natural landmarks, (4) disturbance features, such as structures, trails, logging areas, etc... Include cross section if possible. Include scale and indicate north.)

FORM II. **COMMUNITY SURVEY FORM**
WHTF 10/30/92

IDENTIFICATION AND LOCATION

SOURCECODE_____ **MANUAL**_____ **UNITS** __ft __m
PLOT NO._____ **MO**____ **DAY**___ **YEAR**____ EOCODE_____*___
EXAMINER(s) _____
PNC_____ CT _____
SITE_____ **STATE**_____ **COUNTY**_____
PURP___ **PREC**___ **QUADNAME**_____ **QUADCODE**_____
____**T**/____**R**/___**S**/___4S/___4/4 COMMUNITY SIZE (acres)_____
PLOT TYPES_____ **PLTRL**_____ **PLOT W**_____**SURVEY**_____
PHOTOS_____Specim_____SpecClas_____
DIRECTIONS -->_____
_____
_____
_____

CONSERVATION RANKING

QUAL ___ **Com**: _____
COND ___ **Com**: _____
VIAB ___ **Com**: _____
DEFN ___ **Com**: _____
RANK ___ **Com**: _____
THREATS _____
MGMT: _____
OWNERPROT__**PROT**:_____

ENVIRONMENTAL FEATURES

DL_____ **SOIL RPT**_____
SOIL UNIT_____ **SOIL TAXON**_____P**M**_____
LANDFORM_____ **PLOT POS**_____ **SLP SHAPE**_____ **ASP**_____
SLOPE % _____**ELEVATION** _____ EROS POTENT_____ EROS TYPE_____
HORIZON ANGLE (%): N____**E**____**S**____**W**____ **IFSLP**_____ **IFVAL**_____
SPFE_____
GROUND COVER: ___S+___G+___R+___L+___W+___M+___BV+___O ~ = 100%
GROUND COVER DIST_____ ANIMAL USE EVIDENCE_____
DISTURBANCE HISTORY (type, intensity, frequency, season)-->
_____
_____
_____
RIPARIAN FEATURES: **Channel Width**_____**Channel Entrench**_____
Surface Water_____**Channel Depth**_____**Dist from H20**_____
Valley Floor Gradient_____**Floodplain Width**___Bed Material_____

GENERAL SITE DESCRIPTION (landscape condition and adjacent ct's)
_____

FORM III. OCULAR PLANT SPECIES DATA
10/30/92PltIDL____

PLOT NO. __________ NO. SPECIES ____ PNC ___________________________

TREES Tot Cv___ MHt___
Tal Cv___ Med Cv___
Low Cv___ Grd Cv___ CC

T 1__________________/_______ _____
T 2__________________/_______ _____
T 3__________________/_______ _____
T 4__________________/_______ _____
T 5__________________/_______ _____

SHRBS Tot Cv___ MHt___
Tal Cv___ Med Cv___
Low Cv___ Grd Cv___ CC

S 1__________________/_______ _____
S 2__________________/_______ _____
S 3__________________/_______ _____
S 4__________________/_______ _____
S 5__________________/_______ _____
S 6__________________/_______ _____
S 7__________________/_______ _____
S 8__________________/_______ _____
S 9__________________/_______ _____
S10__________________/_______ _____
S11__________________/_______ _____
S12__________________/_______ _____

GRAM Tot Cv___ MHt___
Med Cv___ Low Cv___
Grd Cv___ CC

G 1__________________/_______ _____
G 2__________________/_______ _____
G 3__________________/_______ _____
G 4__________________/_______ _____
G 5__________________/_______ _____
G 6__________________/_______ _____
G 7__________________/_______ _____
G 8__________________/_______ _____
G 9__________________/_______ _____
G10__________________/_______ _____
G11__________________/_______ _____
G12__________________/_______ _____

FRBS Tot Cv___ MHt___
Med Cv___ Low Cv___
Grd Cv___ CC

F 1__________________/_______ _____
F 2__________________/_______ _____
F 3__________________/_______ _____
F 4__________________/_______ _____
F 5__________________/_______ _____
F 6__________________/_______ _____
F 7__________________/_______ _____
F 8__________________/_______ _____
F 9__________________/_______ _____
F10__________________/_______ _____
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F14__________________/_______ _____
F15__________________/_______ _____
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_____________________/_______ _____
_____________________/_______ _____

FERN Tot Cv___ MHt___ Med Cv___
Low Cv___ Grd Cv___
BRYO/LICH Tot Cv___

COMMENTS (EODATA) -->

Idaho Community Observation Form

Mail to:
Idaho Conservation Data Center
Idaho Dept. of Fish and Game
600 S. Walnut
P.O. Box 25
Boise, ID 83702
(208) 334-3402

For office use only
Source Code _____ Quad Code _____
Community Code_____ Occ # _____
Map Index # _____ Update Y _____ N _____

Please provide as much of the following information as you can. Please attach a map (USGS 7.5 minute series preferred) showing the site's location and boundaries. If observation is based on a a detailed survey please attach a copy of plot data. A releve' form is available on the back of this sheet.

Community name: _____ Source:_____
Reporter: _____ Phone _____
Affiliation and Address _____
Date of field work: _____County _____
Location:_____
_____
_____
Quad name: _____ T_____R_____ _____¼ of_____ ¼ sec_____
_____ T_____R_____ _____¼ of_____ ¼ sec_____
_____ T_____R_____ _____¼ of_____ ¼ sec_____
_____ T_____R_____ _____¼ of_____ ¼ sec_____
Landowner/Manager: _____ Photographs: Slide _ Print _
Elevation: _____to_____ Aspect: _____ Slope (indicate % or ◦) _____ Stand area: _____
Evidence of disturbance/threats: _____
_____
_____
Current land use:_____
_____
_____
_____
Substrate/Soils: _____
_____
_____
_____
General description of community: _____
_____
_____
_____
Any Special Plants or Animals present: _____
_____
_____
Successional status/Seral and structural condition: _____
_____
_____
_____
Overall site quality: Excellent _____ Good _____ Fair _____ Poor _____ Comments: _____
_____
Basis for report: Remote image _____ Binocular/Telescopic survey_____
Windshield survey _____ Brief walk-thru _____ Detailed survey _____ Other_____
Continue by completing releve' information on the back or attaching plot survey form.

Relevé: In the space below, indicate each species cover % within the growth form categories:
Is this a complete species list____ ? or partial species list_____?

Trees	Shrubs	Herbs/Graminoids