WETLAND CONSERVATION STRATEGY FOR THE MIDDLE AND WESTERN SNAKE RIVER AND LOWER REACHES OF ITS MAJOR TRIBUTARIES INCLUDING THE BOISE RIVER AND PAYETTE RIVER

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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 high order streams of southern Idaho. The survey area includes the middle and western Snake River and lower reaches of its major tributaries from Milner dam to the confluence with the Payette River. Tributaries surveyed include the Boise River downstream of Lucky Peak and the lower reaches of the Payette River from Montour to the confluence with the Snake River.

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. Land ownership and management layers were overlaid on the NWI to determine ownership and the protected status of wetlands. Plant communities occurring in the survey area were placed into the hierarchical NWI classification and provide information relative to on-the-ground resource management.

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

We identify conservation strategies for sites surveyed and for plant communities that are unprotected or under-protected. Approximately 34% of the wetland and deepwater habitat is within areas with special management such as Wildlife Management Areas or Refuges. Most of the habitat within the special management areas is deepwater habitat within the Lacustrine littoral system which is created by impoundments. Palustrine wetlands which include emergent, forested, and scrub-shrub wetlands represent 7 percent of the wetlands with special management status. Due to a long history of land use most of the wetlands have been impacted and maintaining existing wetland functions should be a high priority throughout the survey area. An emphasis may be placed on those areas that continue to support native vegetation, unaltered hydrology, or critical wildlife habitat.

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.

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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 percent) 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 database records are available at the CDC. The methods for accessing this information are included at the end of this document (Table 8).

SURVEY AREA

The survey area extends across the Snake River Plain of south-central Idaho to include wetlands along the Snake River and its major tributaries. The survey area includes portions of Minidoka, Jerome, Gooding, Ada, Canyon, and Payette counties. For purposes of sampling and discussion the main survey area was divided into 4 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 (includes Hydrologic Unit 17040212)
- Middle and western Snake River (includes Hydrologic Units 17050101, 17050103, 17050115)
- Lower Boise River (includes Hydrologic Unit 17050114)
- Lower Payette River (includes Hydrologic Unit 17050122)

The upper Snake River is mostly within the Snake River Basalts (342D) Section of the Intermountain Semi Desert Province. The middle and western Snake, lower Boise and lower Payette Rivers are within the Owyhee Uplands Section of the Intermountain Semi-Desert (342) Province. Upland vegetation of the Snake River Basalts and Owyhee Uplands is dominated by sagebrush steppe. (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 to several thousand feet thick. The lava deposits of the western Snake River Plain within the Owyhee Uplands ecoregional section are older than those within the Snake River Basalts section to the east (McNab and Avers 1994). The Snake River extends along the southern edge of the plain. During wetter ice age climates enough water accumulated in ancient Lake Bonneville to overflow into the Snake River via Red Rocks Pass. The Bonneville Flood filled the canyon of the Snake River. The floodwaters ripped through narrow canyons eroding alcoves and scouring whirlpools. Downstream of Milner Dam the river has cut a canyon into the lava 400 to 500 feet deep. In broad valleys exaggerated sand and gravel bars and large boulders were deposited where water velocities slowed (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. The stored groundwater percolates southwest through porous zones and emerges as springs and seeps on the canyon walls of the middle Snake River. The springs may flow as single sources, in continuous clusters cascading abruptly into the river or form tributaries such as Billingsley Creek and Box Canyon Creek.

The middle Snake River springs often emerge in alcoves or box canyons along the north side of the river. The alcoves are likely remnants of ancient canyon entrenchment by the Snake River. The course of the Snake River has progressively been shifted northward by successive lava flows. The flows would fill the early canyon, forcing the river to cut a new canyon along the margin. Sometimes dams would be formed or the course would be altered, leaving down river segments dry as a new course was sought. The Snake River began the entrenchment process, but may have been diverted by lava flows changing its course leaving the box canyons and stream alcoves as they are today (Bowler 1981).

The Owyhee Uplands are a geologically diverse uplifted region that includes the loess covered basalt plateau of the western Snake River plain and the lower Boise and Payette River Valleys. The western Snake River canyon is surrounded by low lying badlands and benches of eroded lacustrine sediments. The Boise and Payette Rivers dissect broad alluvial valley bottoms that extend through an upland plain of lacustrine and fluviatile materials.

The flow regimes of the Boise, Payette, and Snake Rivers are highly regulated. Peak flows typically occur in late winter to early spring followed by low flows during late summer. On the Snake River flows increase significantly downstream of Milner Dam due to groundwater discharge, irrigation return and input from tributaries (Idaho Department of Water Resources 1993). Spring flows are also influenced by human activities. An analysis of flows at Box Canyon from 1951 to 1997 indicated an average low flow of 362 c.f.s. in April to an average high flow of 419 c.f.s. in October. The seasonal change is likely due to the influence of irrigation that begins in April and takes until October to seep into springs (Bowler 1981).

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. Twin Falls at 1118 m in elevation (3670 feet), in the eastern part of the survey area, has an average daily high temperature of 22°C (71°F) in July and average daily low temperature of –3°C (27°F) in January. Payette at 655 m in elevation (2150 feet), in the western portion of the survey area, reports an average daily high temperature of 23°C (74°F) in July and an average daily low temperature of -2°C (28°F) in January. Most locations receive an average of near 25 cm (10 inches) or less of precipitation during the 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. Land ownership 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 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).

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 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 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 observation form was completed.

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 systems that extend from the shore to a depth of 2 meters below low water. Available NWI data was digitized and entered into a Geographic Information System for river corridors in the survey area.

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.
Lacustrine	Lakes and ponds which exceed 2 meters in depth.
Riverine	Wetland and deepwater habitats contained within a channel.
Palustrine	All nontidal wetlands dominated by trees, shrubs, persistent emergents, and emergent mosses and lichens.

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 rangewide. 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. Data from surveys conducted by the Conservation Data Center and previous survey work (Cole 1995, 1996, 1997) was used 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 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 or plant association. 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 project 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 state rare 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 plant associations. The information presented in Table 2 can be summarized for unsurveyed or data poor wetlands by consulting NWI 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

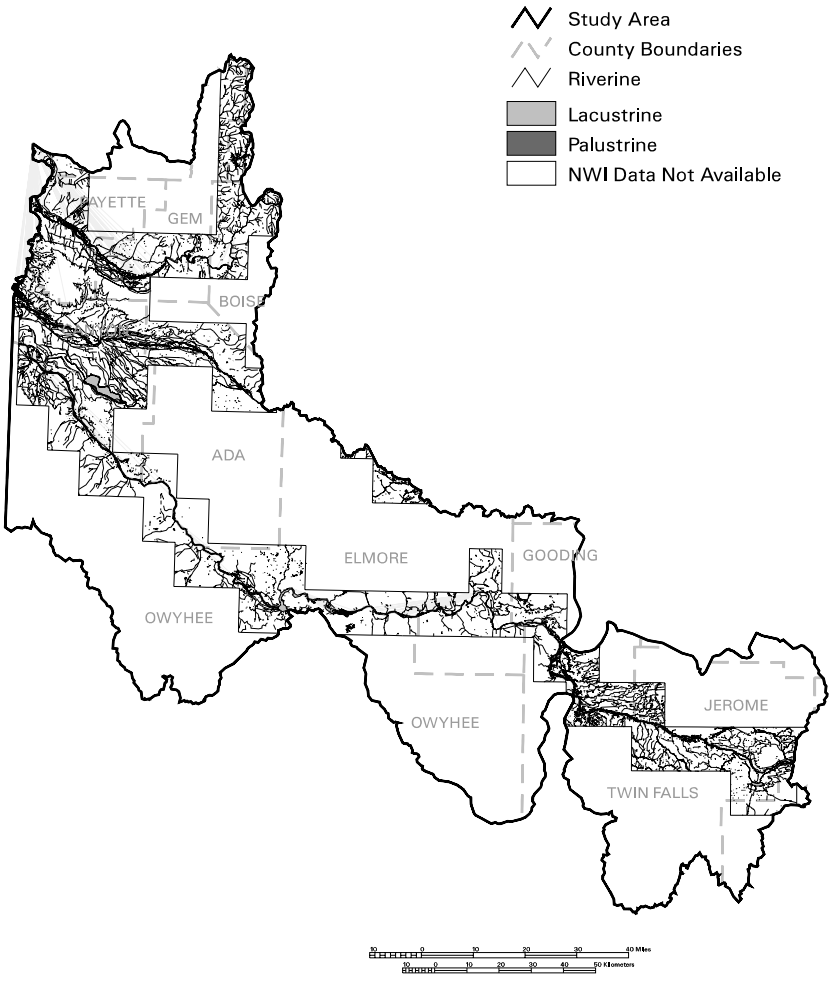
Habitat sites have moderate to outstanding wildlife values, such as food chain support or maintenance of water quality, and may have high potential for designation as or expansion of existing wildlife refuges or managed areas. Human influences are often present and management may be necessary to maintain 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.

RESULTS

WETLAND ACREAGE AND TYPES

The NWI maps were summarized from Milner Dam to the confluence with the Payette River to determine the extent and types of wetlands (Figure 1). Total wetland acres
were summarized by Hydrologic Units for digitized NWI for the riparian corridor along the Middle Snake River, Western Snake River (includes three hydrologic units), Lower Boise River and Lower Payette River. Wetland (including deepwater) habitat represents 2.6 percent of the land area on digitized quadrangle maps.

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



National Wetland Inventory maps were digitized for the mainstem Snake River from Milner to the confluence with the Payette River. Acreage of wetlands based on area occupied by NWI polygons along the upper Snake River from near Milner to Glenns
Ferry (Figure 2), middle Snake River from Glenns Ferry to C. J. Strike (Figure 3), from C. J. Strike to Roswell (Figure 4), and from Roswell to the confluence with the Payette River (Figure 5). The dominant wetland and deepwater habitats along the Middle and western Snake River, based on the area occupied by digitized NWI polygons, are Riverine (40%), Lacustrine (21%), Emergent (17%) and Scrub-Shrub (8%).

Figure 2. Wetland and deepwater habitat in Hydrologic Unit 17040212 (Upper Snake)

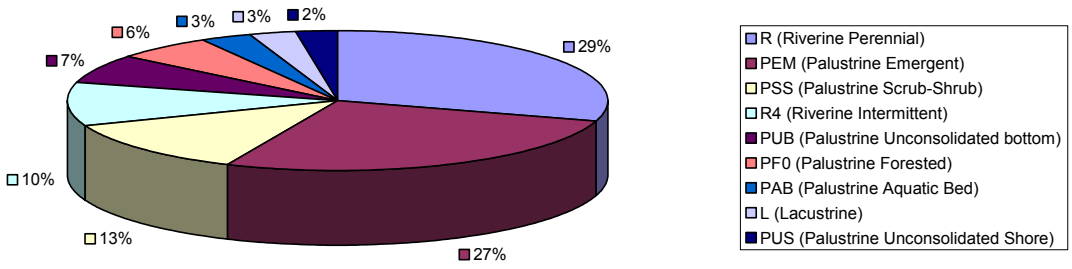


Figure 3. Acreage of wetland and deepwater habitat in Hydrologic Unit 17050101 (C. J. Strike Reservoir)

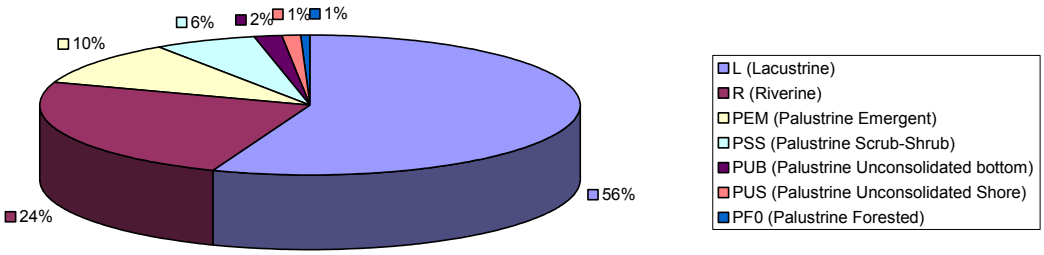
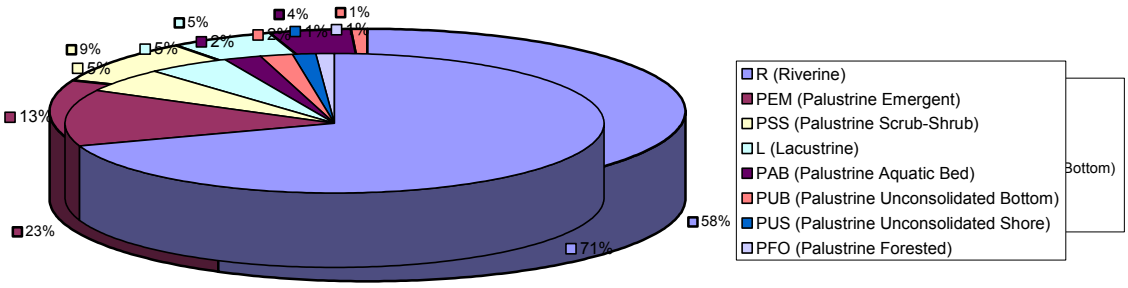


Figure 4. Acreage of wetland and deepwater habitat in Hydrologic Unity 17050103 (Middle Snake)

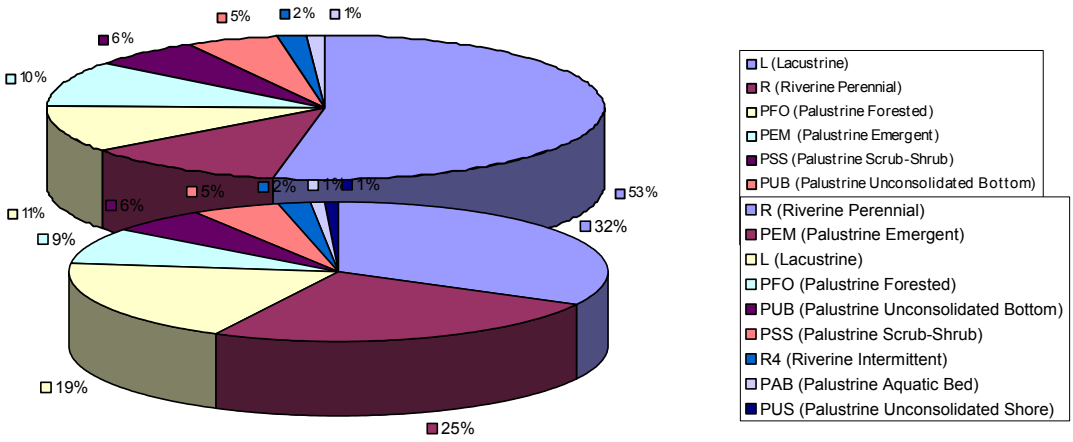
Figure 5. Acreage of wetland and deepwater habitat in Hydrologic Unit 17050115 (Middle Snake-Payette)



National Wetland Inventory Maps were also digitized for the lower Boise River downstream of Lucky Peak Reservoir and Lake Lowell (Figure 6) and the Payette River from Montour to the confluence with the Snake River (Figure 7). Major wetland and deepwater habitats on the lower Boise River are Lacustrine (53%), Riverine (12%), Forested (11%), and Emergent (10%). On the lower Payette River major wetland types are Riverine (32%), Emergent (25%), and Lacustrine (19%). Appendix F summarizes the acres and frequency of occurrence of wetland deepwater habitat by subclass for the survey area and counties.

Figure 6. Acreage of wetland and deepwater habitat in Hydrologic Unit 17050114 (Lower Boise)

Figure 7. Acreage of wetland and deepwater habitat in Hydrologic Unit 17050122 (Payette)

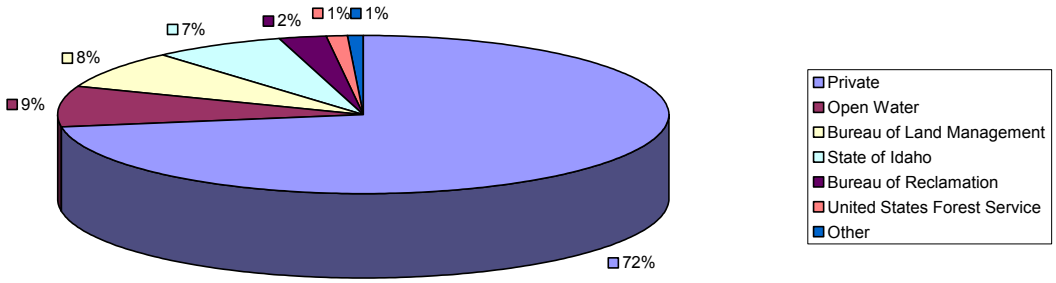


WETLAND OWNERSHIP AND PROTECTION STATUS

The ownership and level of protection for wetlands in the survey area was determined by overlaying a management layer on the NWI. The management layer included land areas administered to maintain natural resource values such as Wildlife Management Areas, Research Natural Areas, and Preserves. Seventy-two percent of the wetlands on digitized quadrangle maps along the Snake, lower Boise, and lower Payette Rivers are in private ownership (Figure 8).

Approximately 19,360 acres of wetland and deepwater habitat are currently within special management

Figure 8. Landownership of wetlands in the project area



areas in the survey area. Sixty five percent of the habitat within managed areas represents deepwater habitat within the Lacustrine limnetic subsystem. Much of this is artificially created deepwater habitat at Lake Lowell and C.J. Strike Reservoir. The acres by class of wetland and deepwater habitats within special management areas are summarized in Table 3.

Table 3. Acres of wetland and deepwater habitat and management status.

SYSTEM Class (Subsystem)	Acres within managed areas	Total Acres	% of type
PALUSTRINE			
Emergent	1537	8738	18
Scrub-shrub	1218	3711	33
Forested	896	3160	28
Aquatic bed	44	593	7
Unconsolidated bottom	238	2276	10
Unconsolidated shore	14	651	2
Total all Palustrine	**3947**	**19129**	**20**
RIVERINE			
Lower perennial	38	62	61
Upper perennial	1723	17176	10
Intermittent	2	1316	0.1
Total all Riverine	**1763**	**18554**	**10**
LACUSTRINE			
Limnetic	12634	17675	71
Littoral	1046	1447	72
Total all Lacustrine	**13680**	**19122**	**71**
TOTAL ALL TYPES	**19390**	**56805**	**34**

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, aquaculture, and development account for wetland losses. Historically drainage, land clearing, and conversion to cropland accounted for most wetland loss. As populations continue to increase and economies switch from agricultural based to service based, losses due to development including road construction, home building, and flood control are likely to exceed losses to agriculture.

The National Resource Inventory estimates that the middle and lower Snake River sub-basins were 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).

The high water quality of source springs along the middle Snake River make it an ideal location for fish production or aquaculture. Aquaculture development has eliminated a number of wetland areas. An estimate of 80 to 90 percent of the springs along the middle Snake River are used for fish production

(Idaho Department of Water Resources 1993). Springs are also used as a source for irrigation and to drive hydroelectric plants.

Urbanization along the riparian corridor of the Snake River is mostly limited to lower reaches where valleys are wider. Otherwise most development is restricted to the rim of narrow canyon reaches. In contrast along the Boise River the channel has been confined by channelization and the floodplain and former wetlands have been eliminated throughout the city. Development in former floodplain continues as agricultural lands are subdivided both up and downstream of the city of Boise. Levees are also in place along the Payette River that restrict water flow across the floodplain.

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 16 percent and 10 percent of the wetlands and deepwater habitats on non-federal wetlands in the middle and lower Snake River sub-basin are used for pastureland and rangeland, respectively (Soil Conservation Service 1992). Pasture development has included placement of ditches, reseeding or interseeding with pasture grasses and removal of native tree and shrub species. The Snake River has a long history of grazing starting in the 1860's when large cattle herds were raised to feed miners. Currently, along the middle Snake River grazing is most common on uplands on the north side of the steep canyons. The riparian bottomlands that develop where tributaries entered the Snake River provide lush vegetation that historically were used for horse grazing (Cole 1995) and continue to be used by livestock. Other wetland habitat used for rangelands includes emergent meadows and 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.

Human activities, including livestock grazing, ground disturbance, and recreational activities, may introduce exotic plant species, create suitable conditions for the increase of less desirable native species, eliminate woody tree and shrub cover, and compact wetland soils. Noxious weeds are widely distributed and are frequently dominant in wetland and riparian vegetation stands (Cole 1997 and pers. obs.). Several noxious weeds are well established in riparian areas throughout the survey area including: *Carduus nutans* (musk thistle), *Cirsium arvense* (Canada thistle), *Conium maculatum* (poison hemlock), *Dipsacus sylvestris* (teasel), *Kochia scoparia* (common kochia), *Lepidium latifolium* (perennial pepperweed), *Lepidium latifolium* (broadleaved pepperweed), *Lythrum salicaria* (purple loosestrife), and *Onopordum acanthium* (Scotch thistle).

In addition to noxious weeds a number of nonnative trees have become naturalized and dominate gallery forests. Several woody species are well established along the lower Boise, Payette and western Snake Rivers and include the following: *Acer negundo* (box elder), *Acer saccharinum* (silver maple), *Catalpa speciosa* (Catalpa), *Elaeagnus angustifolia* (Russian olive), *Fraxinus pennsylvanicus* (ash), *Robinia pseudo-acacia* (Black locust), *Populus deltoides* (Rio Grande cottonwood), *Salix alba* (white willow), and *Tamarix* sp. (saltcedar). In some areas these species dominate a floodplain that historically may have supported a cottonwood gallery forest. The majority of these exotic hardwood species are shade tolerant and the seeds are viable for long time periods. They will become established in the understory of cottonwood and shrub stands.

Operation of dams has a significant impact on riparian habitat. Regeneration of cottonwoods and other flood dependent species such as willow requires exposed alluvial surfaces at appropriate times of the year. The seeds of cottonwood are only viable for a short time period. If water levels are too high alluvial surfaces are unavailable; if water levels are too low adequate moisture is not available for seedlings to become established and grow a long enough root to access water sources later in the growing season. Reservoirs have altered the natural hydrograph that supports development and availability of alluvial surfaces for cottonwood regeneration.

The Snake River is water quality limited. Factors contributing to poor water quality include agricultural conversion to cropland, confined animal feeding operations, aquaculture, and grazing. Uplands along the middle Snake River, particularly on the south side of river, have been converted to agricultural production. Nutrient rich run-off from agricultural land enters the Snake River throughout much of its length. At Vineyard Creek agricultural return flows entered lower reaches of the spring creek. Below this point plant species composition changes and the spring creek no longer supports habitat for the species of concern *Epipactis gigantea* (giant helleborine). The return flow has recently been rerouted away from the spring creek. Confined animal feeding operations along the middle Snake River include dairies and feedlots. Waste from operations include solids, nitrogen, phosphorus, and potassium.

Type changes

Type changes occur when a wetland is converted from one vegetation type to another and results in a shift in wetland functions. This is treated by the World Wildlife Fund (1992) as a gain when the change is to a wetter type and an impairment when the change is to a drier type. Water development projects account for the majority of type changes in the survey area. Most lakes still exist but with extensive alterations. Dams altering water level fluctuations are maintained for hydroelectricity, flood control, and recreation.

Water development projects at reservoirs have 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.

On the Snake River, below Swan Falls Dam, the area occupied by riparian woodlands has quadrupled since 1939 due to the introduction and planting of exotics and reduced peak flows and low flows. Decreased peak flows reduce tree mortality due to scouring and low minimum flows have likely increased plant recruitment in the channel (Johnson *et al.* 1992). Plant recruitment may also be heightened at the mouths of reservoirs where sediments fall out and create deltas. On the lower Payette River, where gradient decreases at the mouth of Black Canyon Reservoir, sediment from activities on uplands carried downstream has settled in the reservoir and at the mouth of the reservoir. This has created a vast area of sand and gravel bars that are being colonized by willow and nonnative deciduous trees.

Open water habitat has likely increased in the vicinity of the city of Boise. Numerous gravel pits are present that are now filled with water. Typically banks are steep and unvegetated around former pits. Open water ponds are also being developed thoughout the city. For the most part these ponds are for aesthetic puposes and wetland functions provided are minimal.

Enhancements

Enhancements increase or improve wetland functions. In the survey area enhancement projects have improved water quality and species diversity. The Nature Conservancy has worked with local irrigators to develop a wetland for filtering ag run off at the Thousand Springs Preserve. The 30 acre wetland was planted by local school children and research is helping to determine how these methods can be applied to other locations to improve the quality of water returns to the Snake River. At Vinyard Creek agricultural run-off ran formerly ran into a spring creek; the run-off was diverted to a point downstream to restore water quality of the spring creek. Along the Boise River several mitigation sites exist that have included planting of native trees and shrubs. Long term monitoring will show whether these mitigation efforts are successful. Wetlands have successfully been created along the Boise River for education and other purposes including the Idaho Department of Fish and Games' Nature Center and wetlands near Warm Springs golf course. The maintenance of these wetlands is dependent on a high investment of time and labor. Water structures to maintain open water and emergent habitat have also been developed on private lands and at Wildlife Management Areas. Land management agencies also are active in weed contral including using biological and well as herbicide controls. The Idaho Department of Fish and Game has released beetles to reduce purple loosestrife at Fort Boise WMA. Idaho Department of Parks and Recreation has mapped the location of scotch thistle and are using herbicides to control and eliminate this species at Barber Pool.

WETLAND DIVERSITY

Wetland Plant Associations

Thirty-eight natural 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 Palustrine system including the forested, scrub-shrub, emergent (herbaceous), and aquatic bed classes reviewed in the following sections.

The landscape position of wetland and riparian habitat in the survey area is variable. On the Snake River riparian habitat is limited to a narrow band of vegetation along the river channel and on islands due to steep canyons and rocky shores with minimal soil development. The best developed wetlands along the middle Snake River are associated with springs, seeps, and areas where tributaries, such as the Bruneau River and Billingsley Creek, join the river (Cole 1996). This is also the case along the western Snake River though downstream of Melba bridge to the Oregon border gradient decreases and woody species such as *Salix amygdaloides* (peachleaf willow), *Elaeagnus commutata*, and *Tamarix* sp. have established. In contrast on the Boise and Payette Rivers wetland habitat is present along the river channel where the river continues to have access to the floodplain.

Forested Vegetation

Forested vegetation within the study area is limited. Broad-leaved deciduous forests are best developed along the Boise and Payette Rivers. The forests are dominated by *Populus trichocarpa* (black cottonwood) or *Salix amygdaloides* (peachleaf willow). Exotic hardwoods are common on both rivers

mixed with native species and forming naturalized communities. Some of the exotics that may be present or dominant in riverine forests include *Populus deltoides* , *Acer negundo*, *Acer saccharinum*, *Catalpa speciosa*, *Fraxinus pennsylvanica*, and *Salix alba.* On the Snake River native forested wetlands are uncommon with occasional stands of *Celtis reticulata* (hackberry) as well as stands of tree size *Betula occidentalis* (water birch). More commonly found are stands of the nonnative tree *Elaeagnus angustifolia* (Cole 1997).

Scrub-Shrub Vegetation

Shrublands dominated by willows and other shrubs occur as stringers along perennial water courses, in association with springs, and on subirrigated floodplains. Along the Snake River stands of *Salix exigua* (coyote willow) are the most common shrubland type followed by stands supporting *Rhus trilobata* (smooth sumac), and *Salix lutea* (yellow willow). *Rhus trilobata* as well as *Betula occidentalis* stands are found in association with the spring systems of the middle Snake River. Salt desert shrublands dominated by *Sarcobatus vermiculatus* (greasewood) are of occasional occurrence in alkaline areas with shallow groundwater on the middle and western Snake, lower Boise, and lower Payette Rivers.

Emergent (Herbaceous) Vegetation

Emergent wetlands are present in backwater sloughs of floodplains, in association springs, and in flat valley bottoms. Small stands of *Typha latifolia* (common cattail) and *Scirpus acutus (validus)* (hardstem and/or softstem bulrush) are frequently present along overflow channels and in backwater sloughs of the Boise and Payette Rivers. *Phragmites australis* (common reed) is a tall (2 meters) grass species that is frequently found in association with springs and along Snake River. There is some controversy concerning the native status of this species. Apparently it is part of the historic Snake River flora as evidence of this species was found at an archaeological site (Gross *et al.* 1997). Emergent wetlands are best developed in subirrigated broad valley bottoms including Billingsley Creek, C. J. Strike, Fort Boise, and Montour. The valley bottoms are often a mosiac of stands of *Typha latifolia* and *Scirpus* spp in permanently flooded areas grading into stands of *Carex* spp. (*C. lanuginosa* (woolly sedge), *C. nebrascensis* (Nebraska sedge)), *Eleocharis* spp. (*E. palustris* (creeping spikerush) and/or *E. rostellata* (wandering spikerush)). Swards of *Agropyron smithii* (western wheatgrass), *Carex praegricilis* (clustered field sedge), *Elymus triticoides* (beardless wildrye), *Juncus* spp. (*J. balticus* (Baltic rush) and *J. effusus* (common rush)), and *Phragmites australis* (common reed) are present in temporarily flooded areas. Alkaline habitats are often present with stands of *Scirpus americanus* (American bulrush) and *Distichlis stricta* (interior saltgrass).

Aquatic Bed Vegetation

The spring systems along the middle Snake River support a rich mixture of herbaceous species on poorly developed soils overlying basalt talus. Vegetation cover is variable depending on slope and water flow. On steep vertical slopes or areas with continual surface water flow, vegetation is sparse. Where gradient lessens and thin soils have developed the following species are often present; *Epipactis gigantea* (giant helleborine), *Euthamia occidentalis* (western goldentop), *Mimulus guttatus* (seep monkeyflower), *Rorippa nasturtium-aquaticum* (watercress), *Veronica anagallis-aquatica* (water speedwell), and *Festuca arundinacea* (tall fescue). This habitat is treated as the Thousand Springs Desert Aquatic Ecosystem for the purposes of tracking and a description is available in Appendix B.

Table 4. Plant communities and ranks in the middle Snake River wetlands arranged by Cowardin system, class and subclass.

Scientific Name	Common name	Rank	
PALUSTRINE FORESTED PLANT ASSOCIATIONS			
Populus trichocarpa/Crataegus douglasii	Black cottonwood/Black hawthorne	G1	S1
Populus trichocarpa/Recent alluvial bar	Black cottonwood/Recent alluvial bar	G?	SP

Populus trichocarpa/Rosa woodsii	Black cottonwood/Woods's rose	G4	S3
Populus trichocarpa/Salix lutea	Black cottonwood/Yellow willow	G?	S2
Salix amygdaloides	Peachleaf willow	G3	S2
PALUSTRINE SCRUB-SHRUB PLANT ASSOCIATIONS			
Artemisia tridentata tridentata/Elymus cinereus	Basin big sagebrush/Great basin wildrye	G2	S1
Betula occidentalis/Mesic forb	Water birch/Mesic forb	G3	S1
Cornus sericea	Red-osier dogwood	G4	S3
Crataegus douglasii/Heracleum lanatum	Black hawthorn/Cow parsnip	G1	S1
Crataegus douglasii/Rosa woodsii	Black hawthorn/Wood's rose	G2?	S1
Prunus virginiana	Common chokecherry	G4Q	S3
Rhus trilobata	Smooth sumac-Coyote willow	G2	S2
Rosa woodsii	Woods rose	G5	S4
Salix exigua/Barren	Coyote willow/Barren	G5	S4
Salix exigua/Mesic forb	Coyote willow/Mesic forb	G2?	S2?
Salix exigua/Mesic graminoid	Coyote willow/Mesic graminoid	G5	S3?
Salix lasiandra/Mesic forb	Whiplash willow/Mesic forb	G?	SP
Salix lutea	Yellow willow	G3	S3
Salix lutea/Bench	Yellow willow/Bench	G?	SP
Sarcobatus vermiculatus/Distichlis stricta	Greasewood/Interior saltgrass	G4	S1
Sarcobatus vermiculatus/Elymus cinereus	Greasewood/Great basin wildrye	G3	S2
PALUSTRINE EMERGENT PLANT ASSOCIATIONS			
Agropyron smithii	Western wheatgrass	G3G5Q	S1
Carex lanuginosa	Woolly sedge	G3?	S2
Carex nebrascensis	Nebraska sedge	G4	S3
Carex praegracilis	Clustered field sedge	G2G3Q	S2
Distichlis stricta	Interior saltgrass	G5	S4
Eleocharis palustris	Creeping spikerush	G5	S3
Eleocharis rostellata	Wandering spikerush	G2	S2
Elymus triticoides	Beardless wildrye	GU	SU
Juncus balticus	Baltic rush	G5	S4
Juncus effusus	Common rush	GU	SU
Phragmites australis	Common reed	G3G4	S4
Polygonum amphibium	Water ladysthumb	G4	S4
Scirpus acutus (validus)	Hardstem (softstem) bulrush	G5	S4
Scirpus americanus	American bulrush	G3Q	S1
Sporobolus airoides	Alkali saccaton	GU	SU
Typha latifolia	Common cattail	G5	S4
PALUSTRINE AQUATIC BED PLANT ASSOCIATIONS			
Thousand springs desert aquatic ecosystem	Thousand springs desert aquatic ecosystem	G1	S1

Rare Flora

Four rare vascular plant species are known to occur in association with wetlands or riparian habitat along the middle and western Snake River (Table 4). The rare species fall into one of two groups. *Sporobolus asper* is a species on the periphery of its range that may be more common elsewhere. The remaining 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. Plant species of special concern in the survey area, 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.

Scientific name	Common Name	Rank		INPS Category
Teucrium canadense var occidentale	American wood sage	G5T4	S2	1
Cyperus rivularis	Shining flatsedge	G5	S2	M
Epipactis gigantea	Giant helleborine	G4	S3	1
Sporobolus asper	Tall dropseed	G5	S1	1

Rare Animals

The middle and western Snake River provides breeding habitat for thirty five wetland and riparian associated animal species of concern. River corridors provide nesting habitat for bald eagles. The Snake River, Boise River, and Payette River are all bald eagle wintering areas. The Swan Falls area is reported as a probable nesting area for yellow-billed cuckoos. Trumpeter swans were observed near Bliss during mid-winter surveys in 1997. Mountain quail are known from several areas in western Idaho and are reported to prefer tall shrublands that are near water sources (Groves *et al.* 1997). The remaining bird species are known from emergent habitat and mudflats surrounding reservoirs and from islands of the Snake River.

Four fish and one amphibian species of concern are present in the area. The Shoshone sculpin is a species endemic to the middle Snake River which is restricted to the spring fed habitats mostly along the north side of the river (Griffith and Kuda 1994). Historically, white sturgeon were present throughout the Snake River with Shoshone Falls creating a barrier to further upstream migration. The construction of dams has landlocked the Snake River, Idaho population of sturgeon with the reach from C.J. Strike to Bliss supporting the highest numbers of individuals (Lepla and Chandler 1995). Redband trout are adapted to the high desert streams of southwestern Idaho and utilize habitat in tributaries, the Snake River and spring creeks downstream of Shoshone Falls. Yellowstone cutthroat are also known to occur in the area from American Falls to Twin Falls Pool. The western toad, an amphibian species of concern, is known from museum records in the vicinity of Boise; contemporary data on this species is not available.

Several mollusc species of concern including *Anodonta californiensis* (California floater), *Valvata utahensis* (desert valvata), *Lanx* sp. 1 (Banbury Springs limpet), and *Taylorconcha serpenticola* (Bliss Rapids snail) are associated with habitat provided by springs. The molluscs require cold water and are generally intolerant of pollution. The remaining molluscs typically occur on free flowing reaches of 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.

Seven bat species of concern are known from the middle and western 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. Wetland associated animal species of special concern in the survey area.

Species	Common Name	Rank	
Fish			
Cottus greenei	Shoshone sculpin	G2	S2
Acipenser transmontanus	White sturgeon	G4	S1

Oncorhynchus mykiss gairdneri	Inland columbia basin redband trout	G5T4?	S2S3
Onchorhynchus clarki bouvieri	Yellowstone cutthroat trout	G4t2	S2
Amphibians			
Bufo boreas	Western toad	G4	S4
Birds			
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
Oreotyx pictus	Mountain quail	G5	S2
Larus delawarensis	Ring-billed gull	G5	S2S3B,S3N
Larus californicus	California gull	G5	S2S3B,S3N
Coccyzus americanus	Yellow-billed cuckoo	G5	S1B,SZN
Mammals			
Corynorhinus townsendii	Townsend’s big-eared bat	G4	S2?
Euderma maculatum	Spotted bat	G4	S2
Myotis evotis	Long-eared myotis	G5	S3?
Myotis volans	Long-legged myotis	G5	S3?
Myotis ciliolabrum	Western small-footed myotis	G5	S4?
Pipestrellus hesperus	Western pipistrelle	G5	S1?
Antrozous pallidus	Pallid bat	G5	S1?
Molluscs			
Anodonta californiensis	California floater	G3	S?
Valvata utahensis	Desert valvata	G1	S1
Fluminicola fuscus	Columbia pebblesnail	G2G3	S1
Pyrgulopsis idahoensis	Idaho springsnail	G1	S1
Fisherola nuttalli	Shortface lanx	G2?	S1
Lanx sp 1	Banbury springs limpet	G1	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.

The surveys identified twenty nine wetland sites (Table 7, Figure 9.). 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

Only one site meets the richness, rarity, condition, and viability criteria to qualify as a Class I site. Other sites in the survey area that meet the richness and rarity criteria rank low on condition and viability. The definition of Class I sites could have been revised for the survey area; however, this would result in inconsistencies with wetland work occurring statewide.

Box Canyon is spring alcove along the Snake River where access is limited by steep canyon walls. It is perhaps the best remaining example of spring habitat along the middle Snake River. Impacts include a diversion and flume about 3/8 of a mile upstream of the confluence with the Snake River. The diversion structure and flume
are the only areas which are not in a natural condition. A USGS gaging station located midway up the canyon does not interfere with natural conditions. Box Canyon has been the focus of conservation interest since the 1970's. The area has been evaluated for eligibility as a National Park and nominated as a candidate National Natural
Landmark. Portions of the canyon currently managed by the Bureau of Land Management are designated ACEC. Private lands were recently acquired and are managed by Idaho Department of Parks and Recreation.

Class II Sites

The five Class II wetland sites include spring systems and riverine wetlands along the Snake River. Banbury Springs, Billingsley Creek, Malad Gorge, and Thousand Springs are all high flowing springs along the middle Snake River. Spring flows emanating from canyon walls and at the base of canyons support a repeating mosaic of wetland plant associations. Stands of greasewood, common reed, and water birch are usually present. The springs are important refuges for native fish. Banbury Springs and Thousand Springs also provide habitat for mollusc species of special concern. Billingsley Creek is a low gradient spring fed stream that extends for 8 miles before entering the Snake River. It creates extensive emergent wetlands, which are somewhat uncommon on middle reaches of the Snake River.

CJ Strike is a large alkaline wetland along the Snake River that is recognized as a globally important bird area (Idaho Important Bird Area Committee 2000) and provides habitat for 12 animal species of special concern. Wetlands include large stands of greasewood, saltgrass, and bulrush. Ponds and emergent wetland habitat have been created in the area.

All of the Class II sites are within a landscape that has been altered by agricultural use and invasion of nonnative annual grasses (cheatgrass). The hydrology of the spring systems has been impacted by development for hydropower or aquaculture. It is unknown how extensive wetlands were historically in the broad valley bottom at C. J. Strike. Current wetlands are maintained to some extent by the impoundment at C.J. Strike Reservoir.

Banbury Springs is currently unprotected. The area has been proposed as a mitigation site by Idaho Power and mitigation actions may include removal of an impoundment to restore habitat for the Banbury springs limpet. Billingsley Creek is partially protected as a Wildlife Management Area. Headwater springs remain unprotected though one tract was recently acquired by Idaho Parks and Recreation. Malad Gorge is partially protected as a State Park. Thousand Springs is currently partially protected. Private land is present in the area that should be of high priority for conservation easements or acquisition. Most of the wetlands at C. J. Strike are managed by the IDFG. Private parcels that support functional wetlands that are proximate to department managed lands should be of a high priority for cooperative agreements, acquisition, and easements.

All of the Class II sites can be enhanced by restoration of hydrology, minimizing nutrient and sediment inputs, and weed control.

Reference Sites

The middle and western Snake and its major tributaries are at low elevations that have a long history of human impacts. In wetland conservation planning projects that have taken place in previous years Reference Sites were defined as areas that represent high quality assemblages of common plant associations. Areas that support high quality plant associations are uncommon at low elevations. Thus, the definition of Reference Sites was relaxed somewhat for this survey area to include areas that continued to support remnant patches of native vegetation. These patches may be surrounded by a landscape that is fragmented by urban development, water development, agricultural use, or dominated by nonnative species.

Reference Sites were identified in association with springs and major rivers in the survey area. Devils Corral, Niagara Springs, Vineyard Creek, Shoshone Falls Park, and Twin Falls Park are all high flowing springs along the middle Snake River. Wetlands at Malad Gorge, Niagara Springs, Shoshone Falls Park, and Vineyard Creek are mostly limited to aquatic bed habitat in direct contact with flowing springs. At Bancroft Springs, upstream of King Hill, a small emergent wetland dominated by bulrush and cattail is present on a terrace just above the Snake River.

Riparian wetlands are highly fragmented throughout the survey area. On the Snake River most wetlands are limited to narrow streamside bands, islands, and the confluence with tributaries. Native wetlands dominated by bulrush and greasewood are present just upstream of Swan Falls on a parcel owned by the Nature Conservancy. The islands at Three Island Crossing includes well drained areas that are dominated by the native grasses sand dropseed and beardless wildrye as well as more permanently flooded areas with bulrush and willows. At the confluence of the Snake and Boise Rivers wetlands are associated with the river floodplain, its oxbows and sloughs, and on islands within the braided channel of the Snake River. The floodplain contains a large area of natural and human-made ponds and marshes where water levels are maintained by a network of ditches fed by irrigation return flow entering via Sand Hollow Creek. Near the city of Boise, Barber Pool and Eagle Island support areas of native emergent wetlands though the hydrology at both of these sites is highly altered. Along the Payette River wetlands are present at Montour and at Birding Islands. While these areas are highly altered they continue to support some patches of native vegetation. For some of these areas plant species lists have been compiled and are available from the Idaho Conservation Data Center.

The Reference Sites can serve as comparison areas for restoration and potential sources of donor material. The current management of these areas should maintain wetland functions. The potential for enhancement of functions is high.

Habitat Sites

The nine Habitat Sites include small spring systems along the western Snake River, riparian habitat that flows through an urban setting, and created wetlands. Thomas Flat Springs and Rabbit Creek Springs are low flowing springs along the middle Snake River that provide structure in a very arid landscape. Halverson Lake is an artificial Lake on a terrace above the Snake River that is mostly fed by irrigation run-off. Some natural springs are present in the area. Two reaches of the Boise River continue to support patches of riparian habitat that includes cottonwood, willow, cattail, and bulrush. This includes the area from Barber Pool to Warm Springs Golf Course and an area further downstream where the river flows through Garden City. Lake Lowell is an off stream impoundment that is created by water that is diverted via the New York Canal. The forests surrounding Lake Lowell are dominated by nonnative species

including plains cottonwood. Extensive emergent habitat is provided by thick stands of water smartweed. The wetlands at Hagerman WMA and Trueblood are mostly associated with artificial ponds.

As opportunities for conservation easements, management agreements, or restoration projects arise they should be actively pursued. All of the Habitat Sites have potential for restoration or enhancement due to past use by domestic animals and/or alterations of hydrologic regimes. 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 survey area 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 and wetlands in densely populated areas are vulnerable.

A network of wetland conservation sites should represent the diversity of habitats in an area. Along the middle and western Snake and its major tributaries the acreage of Lacustrine, Palustrine and Riverine wetlands are almost equal (Table 3). The acreage within special management areas however is disproportionate to actual acreage. Over 70 percent of the wetlands in special management areas are within the Lacustrine system and include artificially created deepwater habitat at Lake Lowell and C.J. Strike. Less well represented within existing managed areas are wetlands and deepwater habitat within the Riverine and Palustrine system. Ten percent of wetlands within special management areas are within the Riverine system. The remaining 20 percent of wetlands within special management areas are within the Palustrine system.

Palustrine wetlands in the survey area include forested, scrub-shrub, and emergent habitat. Currently, 3,947 acres of Palustrine wetlands are within special management areas. The majority of these wetlands are within the forested (896 acres), scrub-shrub (1218 acres), and emergent (1537 acres) classes. The forested wetlands include over 600 acres at Lake Lowell and the remaining acreage is on lower reaches of the Boise and Payette Rivers. At least 75 percent of the forested wetlands within special management areas are dominated by nonnative deciduous trees. Scrub-shrub wetlands are also well represented at impounded wetlands at Lake Lowell. Extensive areas of emergent wetlands within special management areas are present at C. J. Strike, Ft. Boise WMA, and Montour. The quality and condition of scrub-shrub and emergent habitat is also variable with areas of native habitat intermixed with patches of naturalized and/or weedy species.

Most of the wetlands within special management areas represent highly altered systems. This is somewhat representative of the overall landscape due to a long history of land use. Projects which promote the conservation and maintenance of existing wetland functions should be of high priority as all wetlands are significant on a regional scale. Emphasis may be placed on those areas supporting types, such as native deciduous forests or native emergent habitat, which are unprotected (or under-protected), declining, or rare.

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 also aid in permit review by providing a regional context for wetland significance and rarity.

Figure 9. Location of wetland sites in the survey area. Numbers correspond to those used in Table 7.

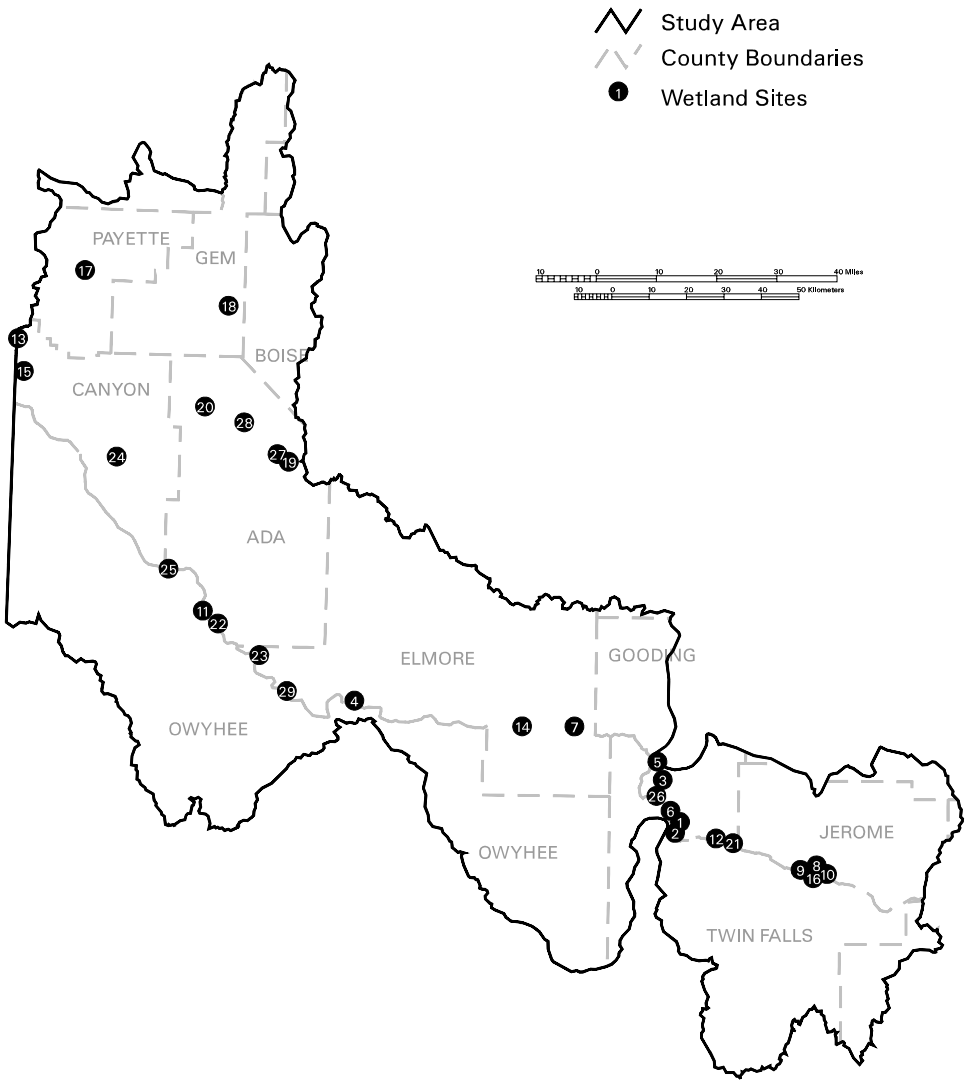


Table 7. Wetland sites along the middle and western Snake, lower Boise, and lower Payette Rivers. Management categories are defined in the text. Ownership: USFS = United States Forest Service, BLM = Bureau of Land Management, IDFG = Idaho Department of Fish and Game, IDL = Idaho Department of Lands,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

	Wetland site	Category	Protection status	Ownership	Latitude/Longitude		County
1	BOX CANYON	CLASS I	+	BLM, IPR	424230N	1144900W	Gooding
2	BANBURY SPRINGS	CLASS II	-	PRI (IPC)	424128N	1144915W	Gooding
3	BILLINGSLEY CREEK	CLASS II	p	IDFG, PRI,	424758N	1145150W	Gooding
4	C. J. STRIKE RESERVOIR	CLASS II	p	IDFG, PRI, BLM	425730N	1154730W	Elmore, Owyhee
5	MALAD GORGE	CLASS II	p	IPR, PRI	425157N	1145210W	Gooding
6	THOUSAND SPRINGS	CLASS II	p	TNC, PRI	424411N	1145029W	Gooding
7	BANCROFT SPRINGS	REF	-	PRI (IPC)	425608N	1150916W	Elmore
8	DEVILS CORRAL	REF	-	BLM, PRI	423550N	1142210W	Jerome
9	SHOSHONE FALLS PARK	REF	p	CITY	423542N	1142438W	Twin Falls
10	VINEYARD CREEK	REF	+	BLM	423511N	1142034W	Jerome
11	TNC TRACT-SNAKE RIVER BIRDS OF PREY	REF	+	TNC	431130N	1162250W	Ada

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. 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, community abstracts	IDFG CDC Information Manager

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Appendix A

Key to wetland and riparian plant associations along the middle and western Snake River and lower reaches of its major tributaries

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 (Hansen *et al*. 1995, Cole 1995, Cole 1996, Cole 1997, 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. P. trichocarpa, or Salix amygdaloides present with a canopy cover of at least 15% and not representing a sere to conifer or shrub dominated types.
   Forested plant associations

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

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

   2. 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 or aquatic bed plant associations

Key to broad-leaved deciduous forest plant associations

1. Populus trichocarpa alone or in combination with at least 25% cover. 4

1. Not as above. 10

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

   2. Not as above. 3

3. Crataegus douglasii with at least 25% cover. Populus trichocarpa/Crataegus douglasii

3. Not as above. 4

   4. Salix lutea alone or in combination with Salix lasiandra with at least 25% cover.
      Populus trichocarpa/Salix lutea

   4. Not as above. 5

5. Rosa woodsii with at least 25% cover. Populus trichocarpa/Rosa woodsii

5. Not as above. 6

6. Salix amygdaloides the dominant tree with at least 15% cover (this species can be confused with tree size willow species that are not native; be sure of the proper identification; it is distinguished by its glaucous leaves and bud scales with free overlapping margins).
Salix amygdaloides

6. Not as above. 7

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

7. Site without wetland characteristics. Upland Site

8. Overstory and understory dominated by native plant species.
Unclassified or undocumented palustrine broad-leaved deciduousforest associations

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

Key to scrub-shrub plant associations

1. Salix species dominant the overstory. 18

1. Not as above other shrub species dominanat. 2

2. Sarcobatis vermiculatus or Artemisia tridentata the dominant shrub. 4

2. Not as above. 3

3. Tall shrubs including Betula occidentalis, Cornus sericea, Prunus virginiana, Rhus trilobata or Rosa woodsii dominant. 9

3. Not as above. 28

4. Sarcobatus vermiculatus with at least 10% cover. 5

4. Not as above. 7

5. Distichlis spicata with at least 5% cover. Sarcobatus vermiculatus/Distichlis spicata

5. Not as above. 6

6. Elymus cinereus with at least 5% cover. Sarcobatus vermiculatus/Elymus cinereus

6. Not as above. 28

7. Artemisia tridentata with at least 10% cover. 8

7. Not as above 28

8. Elymus cinereus with at least 5% cover. Artemisia tridentata/Elymus cinereus

8. Not as above. 28

9. Betula occidentalis with at least 10% cover. 10

9. Not as above. 11

10. Mesic forbs including Smilacina stellata, Aquilegia formosa, and Euthamia occidentalis dominant the understory. Betula occidentalis/Mesic forb

10. Not as above. 28

11. Cornus sericea with at least 25% cover. Cornus sericea

11. Not as above. 12

12. Crataegus douglasii with at least 25% cover. 13

12. Not as above. 15

13. Heracleum lanatum alone or combination with other forbs with at least 25% cover, Crataegus douglasii/Heracleum lanatum

13. Not as above. 14

14. Rosa woodsii with at least 25% cover. Crataegus douglasii/Rosa woodsii

14. Not as above. 28

15. Prunus virginiana with at least 25% cover. Prunus virginiana

15. Not as above. 16

16. Rhus trilobata with at least 25% cover. Rhus trilobata

16. Not as above. 17

17. Rosa woodsii with at least 25% cover. Rosa woodsii

17. Not as above. 28

18. Salix lutea, S. exigua, S. bebbiana alone or in combination with at least 25% cover. 19

18. Not as above. 28

19. Salix exigua with greater cover than any of the other tall willow species. 20

19. Not as above. 23

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

20. Not as above. 21

21. Mesic graminoids including Carex lanuginosa, Juncus balticus, Cyperus spp., and others dominate the understory. Salix exigua/Mesic graminoid

21. Not as above. 22

22. Mesic forbs including Euthamia occidentalis, Urtica dioica, Verbena hastata, Lycopus asper, Smilacina stellata, and others dominate the understory. Salix exigua/Mesic forb

22. Not as above. 28

23. Salix lutea the dominant willow and alone or in combination with other shrubs with at least 15% cover. 24

23. Not as above. 26

24. Stands found on alluvial bars, islands, and terraces perched above the high water line. Salix lutea/Bench

24. Not as above. 25

25. Stands at lower elevatios along the floodplain, understory composition variable. Salix lutea

25. Not as above. 28

26. Salix lasiandra the dominant shrub with at least 15% cover. 27

26. Not as above. 28

27. Mesic forbs including Euthamia occidentalis, Urtica dioica, Verbena hastata, Lycopus asper, Smilacina stellata, and others dominate the understory. Salix lasiandra/Mesic forb

27. Not as above. 28

28. Site with wetland characteristics including hydric soils, hydrophytic vegetation, or wetland hydrology. 29

28. Site without wetland characteristics. Upland Site

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

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

Key to emergent types

1. Graminoids dominant. 2

1. Forbs dominant. 16

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

2. Not as above. 3

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

3. Not as above. 4

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

4. Not as above. 5

5. Distichlis stricta with at least 25% cover or the dominant species Distichlis stricta

5. Not as above. 6

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

6. Not as above. 7

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

7. Not as above. 8

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

8. Not as above. 9

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

9. Not as above. 10

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

10. Not as above. 11

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

11. Not as above. 12

12. Juncus effusus the dominant species with at least 25% cover. Juncus effusus

12. Not as above. 13

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

13. Not as above. 14

14. Carex nebrascensis the dominant species with at least 25% cover. Carex nebrascensis

14. Not as above. 15

15. Carex praegracilis alone or in combination with other graminoids with at least

25% cover. Carex praegracilis

15. Not as above. 19

16. Typha latifolia and/or Typha angustifolia alone or in combination with at least 50% cover. Typha latifolia

16. Not as above. 17

17. Polygonum amphibium with at least 50% cover. Polygonum amphibium

17. Not as above. 18

18. Aquatic habitats associated with permanent flowing springs along the middle Snake River. Dominant species include Mimulus guttatus, Veronica anagallis-aquatica, and Rorippa nasturtium-aquatica.

Thousand springs desert aquatic ecosystem

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 high ranking plant associations in the survey area

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FORESTED PLANT ASSOCIATIONS

Populus trichocarpa/Barren

Black cottonwood/Barren

Two observations of *the Populus trichocarpa*/Barren plant association were made at low elevations (below 2800 feet) on annually flooded alluvial point bars and islands of the Boise River. Similar stands have been documented wherever *Populus trichocarpa* is found on large river systems (e.g., Moseley and Bursik 1994, Hansen et al. 1995). These stands were mostly composed of early seral seedlings and saplings up to 3 m tall. However, at the upper high water periphery of the point bars and islands older *Populus trichocarpa* trees were widely scattered. A variety of shrubs, such as *Alnus incana, Amorpha fruticosa, Ribes aureum, Rosa woodsii, Salix exigua, and Salix lutea*, and seedlings of exotic hardwoods (e.g., *Acer negundo, A. saccharinum, Fraxinus pennsylvanica*, and *Salix alba*) were widely scattered as individuals or small patches with low total cover. The understory was diverse but total herbaceous cover was scarce. The most common species were ephemeral, often weedy, annuals or biennials such *as Conyza canadensis*, *Cyperus* spp. (especially *Cyperus aristatus*), *Eragrostis pectinacea, Gnaphalium palustre, Crypsis alopecuroides, Juncus bufonius, Melilotus spp., Lindernia dubia, Panicum capillare, Potentilla biennis, Rotala ramosior, Verbascum thapsus*, *and Veronica peregrina*. Common perennial herbs were often early seral species, such as *Agrostis exarata, A. scabra, Artemisia ludoviciana, Aster spp., Carex lanuginosa, Epilobium ciliatum, Equisetum* spp., *Euthamia occidentalis, Grindelia squarrosa, Juncus tenuis*, and *Lythrum salicaria*. These flood-scoured point bars and islands are kept barren by annual flood scouring creating shallow sandy-clay soils over river cobble. Annually flooded sites supporting the early seral *Populus trichocarpa*/Barren plant association are essential for the persistence and reproduction of riverine *Populus trichocarpa* corridors such as those found on the lower Boise, Payette, and Weiser rivers (Kaltenecker et al. 1994, Hansen et al. 1995). Unfortunately, due to dam construction which limits flood flows, constricted floodplains resulting from dike construction, and other hydrologic alterations, such sites are now very rare and the long-term persistence of *Populus trichocarpa* stands is threatened.

Populus trichocarpa/Crataegus douglasii

Black cottonwood/black hawthorn

RANGE

The association has been described from the Wallowa Mountains of northeastern Oregon. Stands may also occur in the adjacent regions of southeastern Washington and west central Idaho, along smaller tributaries of the Snake and Grande Ronde rivers. Low quality stands have been observed in Idaho on the lower Payette River at Montour. Stands have also been documented in eastern Idaho on the Henrys Fork and its low elevation, moderate gradient tributaries, and in the Coeur d'Alene drainage of northern Idaho.

ENVIRONMENT

The *Populus trichocarpa/Crataegus douglasii* association is found in the foothills zone of mountainous regions. This association occurs in riparian zones of moderate-sized streams and rivers.

SOILS

Soils are derived from stream-deposited alluvium and are shallow and rocky. Typically an A horizon 15 to 30 cm deep (occasionally up to 43 cm) is situated over an aerated horizon composed of coarse sands to larger unconsolidated cobbles. Texture of the surface horizon is silty to sandy loams, and organic matter content is high. Sometimes clay balls are interspersed throughout the coarse textured materials. Depth to the water table is usually less than 60 cm, and during spring averages 18 cm (Kauffman et al. 1985).

VEGETATION COMPOSITION

The vegetation composition and structure of this association is poorly described, but stands are apparently structurally diverse. The tree canopy is dominated by *Populus trichocarpa. Populus balsamifera* and *Populus acuminata* may be present at the southern and eastern limits of the range of black cottonwood. The needle-leaved evergreens, *Abies lasiocarpa* and *Picea engelmannii,* occur as scattered individuals at mid to upper elevations and may indicate a trend to a conifer type. Other shrubs include *Amelanchier alnifolia, Cornus sericea, Symphoricarpos albus,* and *Salix bebbiana*. Forb cover is somewhat sparse, due to shading, with minor amounts of *Smilacina stellata, Heracleum lanatum*, *Actaea rubra* ssp. *arguta*, *Galium boreale* and *Thalictrum* spp. present.

ADJACENT COMMUNITIES

Information on adjacent communities is unavailable.

MANAGEMENT CONSIDERATIONS

Stands of the *Populus trichocarpa/Crataegus douglasii* plant association may be so dense that most uses are precluded. However, livestock will eat the foliage of *Crataegus douglasii* and prefer stems that are less than 1 meter tall. *Populus trichocarpa* has been used to restore riparian areas. Rooted cuttings and nursery-grown seedlings may be established on moist, well-drained soils. Unrooted cuttings may also be propagated, but establishment is not as rapid as using rooted cuttings. Establishment of *Crataegus douglasii* is more difficult and growth is slow. Nursery stock transplants are recommended (USDA 2000).

SUCCESSIONAL DYNAMICS

Information on successional status and seral stage is not available.

WILDLIFE FUNCTIONS

Stands supporting *Crataegus douglasii* are important for nesting/brooding habitat, as well as for food sources, for many bird species. Small mammals also frequent habitat with *Crataegus*. Stands may provide hiding cover and shade for other wildlife. *Crataegus* is rated as good habitat for white tail deer, mule deer, and upland game birds.

CLASSIFICATION COMMENTS

This association was originally described from Catherine Creek in eastern Oregon (Kauffman et al. 1985). Similar stands have not been described in recent classification work (Kovalchik 1993, Crowe and Clausnitzer 1997). This may represent an association that has been sampled infrequently due to occurrence at lower elevations that are outside project areas of existing classifications or stands have been altered by cumulative effects of land use practices.

AUTHOR/DATE

Mabel Jankovsky-Jones/2000-12-27

Populus trichocarpa/Rosa woodsii

Black cottonwood/Wood's rose

RANGE

This type is known from northern Yellowstone National Park, Wyoming, the lower Clearwater River canyon in north-central Idaho, and scattered locations in southern and central Idaho.

ENVIRONMENT

This type occurs on terraces and floodplains across a wide range of elevations, from below 1,000 feet in northern Idaho to above 6,000 feet in Wyoming and central Idaho. Stands can occur along small, steep-gradient streams, but are most common on larger streams and rivers with relatively low gradients. Valley bottoms range from narrow, V-shaped canyons of small streams, to moderately wide bottoms in deep canyons, to broad floodplains in intermontane valleys.

SOILS

In Wyoming, the soils have been described as being Cryofluvents composed of shallow to deep sand layers overlying river cobbles. Roots and litter of the undergrowth eventually form darkened surface horizons. Limited data suggest that surface soils are moist in spring and early summer, and either remain moist or are dry by mid-summer (Chadde et al. 1988). In Idaho, the soils are similarly sandy alluvial deposits overlying coarse cobbles (Asherin and Orme 1978).

VEGETATION COMPOSITION

Populus trichocarpa dominates the overstory tree layer. In Yellowstone, *Picea engelmannii* and *Populus angustifolia* were incidental, while in northern Idaho, *Alnus rhombifolia* was found occasionally in the overstory. Several shrubs, most notably *Rosa woodsii*, are present and form a dense understory layer. *Rosa woodsii* generally has greater than 15% cover. Exceptions are some stands along narrow valley bottoms in canyons that are subject to frequent scouring by floods. All shrubs have low cover in these settings, and *Rosa* may have only 5% cover. The herb layer consists of a diversity of mesic-site forbs and grasses, most have low abundance values and many are exotic species.

ADJACENT COMMUNITIES

Adjacent upland sites support sagebrush-steppe and canyon grasslands. Adjacent riparian associations include other *Populus trichocarpa* types, such as *P. trichocarpa/Cornus sericea, Betula occidentalis*, and various willow-dominated associations.

MANAGEMENT CONSIDERATIONS

Prolonged ungulate use results in a loss of some of the palatable shrubs and possibly an initial increase in *Rosa*. Continued use may result in an eventual conversion to structurally depauperate stands with few shrubs and high cover of *Poa pratensis.*

SUCCESSIONAL DYNAMICS

The *Populus trichocarpa/Rosa woodsii* plant association has been considered a long-lived seral association, possibly resulting from heavy use by cattle (Asherin and Orme 1978) or native ungulates (Chadde et al. 1988). It is less clear that stands sampled in southwestern Idaho resulted from heavy grazing. Asherin and Orme (1978) suggested that this may be a seral stage of Daubenmire's (1970) *Populus trichocarpa/Cicuta douglasii* habitat type. Chadde et al. (1988) suggests that conifers may eventually form stable associations on sites in Yellowstone.

WILDLIFE FUNCTIONS

The *Populus trichocarpa/Rosa woodsii* association provides browse and forage for numerous mammals and bird species. Structural diversity is typically high due to multi-layered vegetation, although it can be only moderate in stands with low shrub cover. Rosehips are an important source of food for bears during the late summer and fall.

CLASSIFICATION COMMENTS

This association is quantitatively defined by seven plots in Yellowstone National Park Park (Chadde et al. 1988), four plots in southwest Idaho (Moseley 1999) and two plots in northern Idaho (Asherin and Orme 1978), supplemented with additional plots and observations from southern Idaho.

AUTHOR/DATE

Bob Moseley/1998-12-02

Populus trichocarpa/Salix lutea

Black cottonwood/yellow willow

RANGE

This type has been documented in central Nevada, northern Nevada, southwest Idaho, and central Idaho. This type may also occur in northeastern Oregon.

ENVIRONMENT

Stands occupy stream bars and low benches that are generally flooded annually at spring high water. It can occur along small streams as well as large rivers. Consequently, valley bottom widths range from narrow to broad (<50 m to over 300 m).

SOILS

Soils are young alluvial deposits, often with greater than 35% coarse fragments. The presence of *Salix lutea, Salix exigua,* and *Cornus sericea* reflects high soil moisture, at least early in the growing season. These sites typically dry out as the stream level drops in late summer (Manning and Padgett 1995).

VEGETATION COMPOSITION

Populus trichocarpa dominates the overstory, with *Salix lutea* dominating a structurally complex and usually dense understory layer. Other tall shrubs that occur in this layer include *Salix lasiandra, Cornus sericea, Salix exigua, Salix geyeriana, Amelanchier alnifolia*, and *Alnus incana,* among others. Beneath the tall shrubs is a diverse layer of shorter shrubs, including various *Ribes* spp. and *Rosa woodsii.* The herbaceous layer is sparse, probably because of the dense shade.

ADJACENT COMMUNITIES

Adjacent upland sites support sagebrush-steppe, *Juniperus scopulorum* woodlands, and pinyon-juniper woodlands. Adjacent riparian communities include other *P. trichocarpa* types and various willow-dominated communities.

MANAGEMENT CONSIDERATIONS

The high shrub density typically limits livestock access. Though livestock will tend to use narrow corridors that pass through this association.

SUCCESSIONAL DYNAMICS

The successional dynamics in this association are unclear. Kauffman et al.'s (1985) gravel bar/*Salix* spp./mixed forb plant association may represent an early seral stage of the *P. trichocarpa/Salix lutea* association.

WILDLIFE FUNCTIONS

This structurally diverse type provides habitat for wildlife and avian species.

CLASSIFICATION COMMENTS

Manning and Padgett (1995) described a *Populus/Salix* plant association from Nevada, which

is dominated by either *P. angustifolia* or *P. trichocarpa*, depending on the geographic region of the state. *Salix lutea* is the shrub dominant in all but a single stand. Their broad type includes the *Populus trichocarpa/Salix lutea* association described here.

AUTHOR/DATE

Bob Moseley/1998-12-02

Salix amygdaloides

Peachleaf willow

RANGE

The *Salix amygdaloides* plant association is reported from South Dakota, Colorado, Montana, Idaho, and Wyoming.

ENVIRONMENT

Stands of *Salix amygdaloides* are found in lower elevation riparian habitats including backwater areas, overflow channels, and terraces of large rivers. It is also found on narrow floodplains of small creeks, in moist ravines and ditches, and at the edge of ponds or lakes (USDA 2000).

SOILS

Soil textures are variable but most commonly stands are found on sandy or silty alluvium and can tolerate saline or alkaline soils

VEGETATION COMPOSITION

Salix amygdaloides dominates the overstory with over 20 percent cover. *Populus trichocarpa* or *Populus deltoides* may be present with less than 10 percent cover as the tallest tree. Other native shrubs include *Salix lutea, Salix exigua*, and *Cornus sericea*. Native herbaceous species include *Equisetum* spp., *Smilacina stellata, Agropyron smithii, Elymus triticoides*, and *Carex lanuginosa*. Exotic plant species usually dominate the understory and may include high cover of *Agropyron repens, Agrostis stolonifera, Bromus tectorum, Cardaria draba, Cirsium arvense, Melilotus* spp., and *Poa pratensis*.

ADJACENT COMMUNITIES

Adjacent stands of riparian vegetation may include stands dominated by *Carex* spp., *Phalaris arundinacea*, or *Populus* spp. Uplands are usually sagebrush steppe.

MANAGEMENT CONSIDERATIONS

Non-native species that are already present in stands will increase with disturbance. Grazing will decrease vigor of *Salix amygdaloides* and stems may be knocked over by livestock. Stands do recover rapidly when livestock are excluded. Cuttings may be used for revegetation and will stabilize disturbed alluvium (USDA 2000).

SUCCESSIONAL DYNAMICS

Salix amygdaloides is a rapidly growing, early successional species that becomes established on alluvial deposits. Regeneration is primarily by seeds that are only viable for a few days. It does not produce suckers, but will resprout from the root crown or stem base if cut or burned. Broken pieces of stem or root that are transported by floodwaters may also sprout. Trees are reported to live for about 30 years until it is shaded out by other riparian forest trees (USDA 2000). In Montana it is considered a successional stage of *Fraxinus pennsylvanicus* and *Acer negundo* dominated associations (Hansen et al. 1995). In Idaho and other states it may be seral to cottonwood stands dominated by *Populus angustifolia, P. deltoides,* or *P. trichocarpa* (Hall and Hansen 1995).

WILDLIFE FUNCTIONS

Stands have high structural diversity, which provides shade and hiding cover for a variety of wildlife species (Hansen et al. 1995). *Salix amygdaloides* is rated as providing good habitat for white-tailed deer, small nongame birds, and upland game birds (USDA 2000).

CLASSIFICATION COMMENTS

The *Salix amygdaloides* plant association has been described as a dominance type or cover type in Idaho, Montana, Wyoming, and South Dakota (Hansen et al. 1995, Hall and Hansen 1997). The dominance type includes Kituku's (1995) *Salix amygdaloides/Rhus trilobata/ Dipsacus fullonum* association. Stands are usually at lower elevations with numerous impacts. The poor condition of stands complicates classification.

AUTHOR/DATE

Mabel Jankovsky-Jones/2000-11-16

Forested Plant associations expected to occur or noted but not sampled

A number of other other riparian plant associations dominated by *Pinus ponderosa, Populus tremuloides, Populus trichocarpa*, and *Pseudotsuga menziesii* are also expected (Crowe and Clausnitzer 1997). Human-induced forested riparian plant associations were observed but not sampled (Johnson 1995, Jankovsky-Jones et al. 2000). These included the following stands:

**Eleagnus angustifolia* (often *with Phalaris arundinacea* and other exotic weedy spp. in understory)—common along Snake River and elsewhere

*Exotic Hardwood Bottomland and Riparian Forest (composed of *Acer negundo, A. saccharinum, Fraxinus pennsylvanica, Juglans spp., Morus alba, Populus deltoides, P. fremontii, Salix alba, Ulmus* spp., and other spp. with exotic *Prunus* spp., *Rosa* spp., and herbs in the understory)—common along lower Boise, Payette, and Snake rivers (near Weiser)

**Populus alba* (including "Lombardy poplar")—common around ranches, agricultural fields, and old homesteads

**Populus deltoides*—known from Lake Lowell and other locations on lower Boise and Snake rivers near Weiser)

*Robinia pseudo-acacia—common around ranches, agricultural fields, and old homesteads

SCRUB-SHRUB PLANT ASSOCIATIONS

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 has also 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 soil 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. On deep alluvial terraces along larger rivers, this depth may be as much 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 Moseley 1997).

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 canopy cover over 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 less than 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* associations. 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 antelope 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 described in 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 Western Regional 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/DATE(UPDATE)

Bob Moseley/1998-01-05(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 50 cm 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, Chamerion 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 this association 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 one to two 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 streambanks 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 5 cm 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 2.5 m Underlying layers are typically coarse sands, gravels, and cobbles that facilitate the movement of aerated groundwater through the subsurface layers. This 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 can occur in 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). Palatability ratings reported for *Cornus sericea* range from low (Manning and Padgett 1995, Crowe and Clausnitzer 1997) to "ice cream" (Hansen et al. 1995, Hall and Hansen 1997). However, the stands are often so dense that they limit grazing. 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 its 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. Regular flooding 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 due to shading and scouring, 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)

Crataegus douglasii/Heracleum lanatum

Black hawthorne/cow parsnip

RANGE

Found in the Columbia Basin within the Palouse grassland zone, of southeastern Washington, northeastern Oregon and into western Idaho.

ENVIRONMENT

Elevations range from 1,800 to 2,600 feet in the semi-arid steppe region of eastern Washington. Stands are typically found on aggraded valley floors (locally called "flats") which border intermittent or permanent streams and often extend up contiguous north-facing slopes where there is seepage providing constant moisture.

SOILS

Stands are typically in valleys which have accumulated glacial outwash materials of fine silts and clays. Soils are usually moist through the middle of the growing season.

VEGETATION COMPOSITION

This is a dense thicket of the broad-leaved, deciduous shrub *Crataegus douglasii* of 5 to 7 meters height with minor amounts of the low shrubs *Rosa woodsii* and *Symphoricarpos albus*. The understory is dominated by a lush layer of a combination of the tall (up to 2 m tall) perennial forbs *Heracleum lanatum, Hydrophyllum fendleri* or *Urtica dioica*. The dense herbaceous layer provides so much shade that few shorter species are able to establish, unless they have a growth peak in the spring before the *Heracleum* develops. A few locations have a tree layer of *Populus tremuloides*, but apparently do not differ in environmental characteristics.

ADJACENT COMMUNITIES

Information not compiled

MANAGEMENT CONSIDERATIONS

The diadgnostic understory species, *Heracleum lanatum,* is very palatable to livestock and can be eliminated and replaced by *Poa pratensis*. Additionally, the flat valley bottoms with deep soils and good soil moisture has resulted in many stands being eliminated for pasturage and grain cropping.

SUCCESSIONAL DYNAMICS

This is a climax plant association. With disturbance and opening of the canopy *Rosa woodsii* and/or *Poa pratensis* may become established.

WILDLIFE FUNCTIONS

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

CLASSIFICATION COMMENTS

This association was originally described by Daubenmire (1970). In recent years stands have been sampled in Idaho

AUTHOR/DATE(UPDATE)

Marion Reid/1993-06-10(2001-07-09)

Crataegus douglasii/Rosa woodsii

Black hawthorn/Wood's rose

RANGE

The *Crataegus douglasii/Rosa woodsii* association may have formerly been widespread in eastern Oregon and Washington. It is primarily in the Columbia Basin and the Blue Mountains of southeastern Washington, northeastern Oregon, and west-central Idaho. Now it is limited to just a few scattered occurrences in this range (Grossman et al. 1994).

ENVIRONMENT

This association is found on riparian sites along low elevation, low to moderate gradient streams. Stream type is variable and includes intermittent, perennial, and spring fed streams. In Idaho, stands are present in drainage bottoms of small tributaries to larger streams in shallow, open valleys (Moseley 1998). Washington stands were reported in narrow canyons (Crawford 1999). These sites occasionally flood seasonally, but due to the low gradients they are rarely scoured.

SOILS

Detailed soil survey information is not available. Available information indicates soils are widely variable and include both deep, fine-textured soils (Kovalchik 1987) and well drained, coarse textured soils (Crawford 1999).

VEGETATION COMPOSITION

This association is composed of a partially closed canopy of the broad-leaved, deciduous tall shrub *Crataegus douglasii*. Occasional individuals of the broad-leaved deciduous trees and tall shrubs *Populus tremuloides, P. trichocarpa, Salix lasiolepis, Betula occidentalis,* or *Alnus incana* may occur, but they never dominate the stand. A broad-leaved, deciduous short shrub layer is present, with varying amounts of cover. Common species include *Prunus virginiana, Rosa woodsii, Ribes aureum, Symphoricarpos albus, Salix exigua,* and *Amelanchier alnifolia.* The herbaceous layer is composed of perennial grasses, such as *Elymus cinereus, Deschampsia cespitosa,* and *Elymus glaucus* along with the forbs *Smilacina stellata, Galium aparine,* and *Urtica dioica.*

ADJACENT COMMUNITIES

Adjacent riparian vegetation may include stands of *Salix amygdaloides, Salix lutea,* or *Salix exigua.*

Uplands are mostly dominated by *Artemisia tridentata* stands.

MANAGEMENT CONSIDERATIONS

Forage production is moderate in stands of *Crataegus douglasii.* However, stands may be so dense as to preclude most livestock use. Livestock will, however, readily eat foliage when it is accessible and it has been found to be moderately palatable to livestock. Stems less that 1 m tall are preferred. *Crataegus douglasii* is an excellent soil and streambank stabilizer. Seedling establishment, however, is difficult, and growth rates are slow. The use of transplanted nursery stock is recommended (USDA 2000).

SUCCESSIONAL DYNAMICS

The successional status of the *Crataegus douglasii/Rosa woodsii* plant association is not clear. Hansen et al. (1995) indicates that the *Crataegus succulenta* dominance type (which includes stands of *Crataegus douglasii*) is a mid-seral grazing disclimax and may be seral to stands dominated by *Fraxinus pennsylvanica, Acer negundo, Populus tremuloides,* and *Pinus ponderosa*. However, the Fire Effects Informations System indicates that *Crataegus douglasii* does not occupy disturbed sites and disturbance from fire, agricultural cropping, or flooding seems to inhibit reproduction. (USDA 2000).

WILDLIFE FUNCTIONS

Stands of *Crataegus douglasii/Rosa woodsii* provide hiding and thermal cover and an abundance of food for a variety of wildlife. Forage production is usually low from black hawthorn thickets. Dried fruits of both *Crataegus* and *Rosa* provide autumn food for birds such as blue and sharp-tailed grouse. Mule deer and small mammals may also consume dry fruits (USDA 2000).

CLASSIFICATION COMMENTS

This plant association has been reported from Idaho, Washington, and Oregon (Reid et al. 2000), but it has very little documentation. Kovalchik (1987) includes it as an incidental association but has little information on stand structure and composition. This association was documented with plot data in 1999 in Washington (Crawford 1999) and Idaho (Moseley 1999). A *Crataegus succulenta* dominance type is described in Montana that includes all combinations of *Crataegus succulenta* and *Crataegus douglasii.* The Montana stands have *Rosa woodsii* in half of the 22 stands that were sampled (Hansen et al. 1995).

AUTHOR/DATE(UPDATE)

Marion Reid/1994-01-27(2000-12-28)

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). 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 4,600 and 4,900 feet elevation, but has been observed as low as 3370 feet and as high as 6435 feet (Hall and Hansen 1997, Moseley 1999). 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. Several tall understory shrubs may occur, such as *Salix lutea, Crataegus douglasii,* and *Ribes aureum*, each with 10% or less cover (Moseley 1999). *Juniperus scopulorum* may occasionally be observed with trace cover (Hall and Hansen 1997). 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). 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). 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).

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).

MANAGEMENT CONSIDERATIONS

Though *Prunus virginiana* is only moderately palatable for livestock, it is quite nutritious (USDA 2000). It is occasionally browsed, and the foliage can be poisonous to livestock in large amounts (Hansen et al. 1995, USDA 2000). 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). 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 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). In southeastern Idaho *Prunus virginiana* stands may be an earlier seral stage of *the Juniperus scopulorum/Cornus stolonifera* or *Pseudotsuga menziesii/Cornus stolonifera* 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). 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. Along channels *Prunus virginiana* shades streams, protects banks and helps 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). 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). 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, 1999, Oregon Natural Heritage Program 1999, Crawford 2000). However, 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

Rhus trilobata shrubland

Skunkbush sumac

RANGE

The *Rhus trilobata* plant association has been described in western Colorado and southern Idaho. In Idaho it is especially common along the middle Snake River.

ENVIRONMENT

Stands of *Rhus trilobata* occur in both riverine and non-riverine wetlands. Along rivers stands of *Rhus* are present just above the annual average high water mark where floodplain development is minimal due to bedrock confinement. *Rhus trilobata* stands may also occur on hillsides and swales in association with springs or seeps. Stands have also been observed in intermittent drainages.

SOILS

Soils are shallow sandy loams and silty loams overlying coarse alluvium or bedrock. Sometimes stems of *Rhus trilobata* occur on soil between boulders.

VEGETATION COMPOSITION

Rhus trilobata forms dense, near monocultures with few associates having high cover or constancy. Species that sometimes may be present include *Ribes aureum, Salix exigua, Salix lutea, Salix lasiolepis,* and *Toxicodendron rydbergii*. Herbaceous undergrowth is minor though *Agropyron smithii, Elymus cinereus,* and *Phragmites australis* may sometimes be present.

ADJACENT COMMUNITIES

Along the Snake River, adjacent communities may be dominated by *Sarcobatus vermiculatus/ Distichlis spicata, Phragmites australis,* or *Betula occidentalis.*

MANAGEMENT CONSIDERATIONS

Rhus trilobata is tolerant of seasonal drawdown as roots are able to penetrate to the water table through cracks in bedrock (Kittel et al. 1999). *Rhus trilobata* has potential as a species for erosion control and may be used for streambank restabilization. This species will regenerate from sprouts and will resprout after fire. Seed dormancy in *Rhus trilobata* is released by scarification and plants may be used in restoration projects (Shaw and Hurd 2000).

SUCCESSIONAL DYNAMICS

The successional status of the *Rhus trilobata* plant association is unclear. Hall and Hansen (1997) suggest that it may represent climax vegetation along narrow floodplains or is a seral state of the *Juniperus scopulorum/Cornus sericea* association. Kittel et al. (1999) indicate that it appears to be a late seral association since it occurs at or above the high water mark of the channel.

WILDLIFE FUNCTIONS

The dominant shrub is only moderate browse for wild and domestic ungulates (Hansen et al. 1995).

CLASSIFICATION COMMENTS

Numerous stands of *Rhus trilobata* have been sampled in Idaho (Cole 1995, Cole 1996, Hall and Hansen 1997), Montana (Hansen et al. 1995), and Colorado (Kittel et al. 1999). However, the *Rhus trilobata* stands occur in two distinct environmental settings; on banks of large rivers and on seeps or

springs in canyons. Stands are typically so thick that herbaceous undergrowth is poorly developed and diagnostic plant species distinguishing the two associations are unclear.

AUTHOR/DATE

Mabel Jankovsky-Jones/2000-01-20

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 actively flooded streambanks, pointbars, islands, 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 narrow to wide valley bottoms with very low to moderate gradients. 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 1 m below the surface (Padgett et al. 1989).

VEGETATION COMPOSITION

An open to 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 have 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 exigua/Mesic graminoid

Sandbar willow/Mesic graminoid

RANGE

Stands occur throughout Utah in extreme western Colorado (Padgett et al. 1989) and throughout Idaho (Padgett et al. 1989, Jankovsky-Jones 1996, 1997a, 1997b, 1997c, Moseley 1998).

ENVIRONMENT

This type occurs on stream terraces and in meadows associated with stream channels from 2,000 to 7,700 feet. Valley bottoms may be narrow to very wide and of low to moderate gradient. This association is usually not in the most dynamic portion of the floodplain, as are some of the other *Salix exigua* types (Padgett et al. 1989).

SOILS

Water tables range from the surface to over 1 m below the surface. Distinct and prominent mottles are common within 10 cm of the surface, indicating a seasonally high water table. Soils indicate a broad range of development, from the well-developed Terric Borohemists, Cumulic Haploborolls, Typic Cryaquolls, and Pachic Cryoborolls to less-developed Aquic Cryofluvents and Fluvaquentic Haploxerolls. Soils develop on alluvial depositions of varying ages. Particle-size classes were highly variable, with estimated available water-holding capacity from low to moderate (Padgett et al. 1989).

VEGETATION COMPOSITION

Salix exigua dominates the overstory of this type. *Salix lutea* and/or *S. lasiandra* may also be prominent in the overstory and, in some instances, may co-dominate. Other shrubs are typically minor components of this type. The undergrowth is characterized by moderate to dense cover of graminoid species, including *Carex nebrascensis, C. lanuginosa, Juncus balticus, Eleocharis palustris, Agrostis stolonifera, Scirpus pungens, Agropyron repens*, and, in one Idaho stand, *C. sheldonii.* Forb cover is typically sparse (Padgett et al. 1989), although *Equisetum* spp. (*E. arvense* and *E. laevigatum*) and *Euthamnia occidentalis* can occasionally occur with relative high cover.

ADJACENT COMMUNITIES

Because of the wide elevational gradient over which this type occurs, adjacent upland associations can range from sagebrush-steppe to coniferous forest associations.

MANAGEMENT CONSIDERATIONS

The rhizomatous graminoid cover in this association results in high soil-holding and streambank stabilization ability. Should the stands become drier and/or grazing levels increase, this type might be replaced by the *Salix exigua/Poa pratensis* or possibly the *S. exigua*/Barren association.

SUCCESSIONAL DYNAMICS

In most situations, the *Salix exigua*/Mesic graminoid association is considered an early successional type pioneering sand and gravel bars. However, it may be persistent in certain instances. This type appears in general to be wetter than other *Salix exigua* types and the environment is likely to be more favorable to the establishment of rhizomatous graminoids (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 tend to utilize *Salix exigua* heavily (Hansen et al. 1995).

CLASSIFICATION COMMENTS

Classification is based on seven plots from Utah and adjacent southeastern Idaho and western Colorado (Padgett et al. 1989) and seven plots in southwestern Idaho.

AUTHOR/DATE(UPDATE)

Bob Moseley/1997-12-31(1998-12-01)

Salix lasiandra/Mesic forb

Whiplash willow/Mesic forb

The *Salix lasiandra*/Mesic forb plant association was observed twice on the Payette River at Montour. This low elevation community (2505 feet) is probably also found on the lower Boise, Snake, and Weiser rivers in southwest Idaho. The plant association is known from higher elevations across the Snake River Plain of Idaho (Jankovsky-Jones 1996, 1997c) and Nevada (Manning and Padgett 1995, Weixelman et al. 1996). Similar communities, such as the *Salix lasiandra*/Mesic graminoid-forb from southeastern Oregon (Evenden 1989) and the *Salix lasiandra* dominance type from Montana and southeast Idaho (Hansen et al. 1995, Hall and

Hansen 1997), have also been described. Stands of *Salix lasiandra*/Mesic forb were dominated by 2 to 6 m tall *Salix lasiandra* which had moderate cover . Other common shrubs, all with low cover, were *Amorpha fruticosa, Ribes aureum, Rosa woodsii*, and *Salix* spp. (e.g., young *Salix alba, S. exigua*, and *S. lutea*). *Equisetum arvense, E. hyemale, Euthamia occidentalis*, and *Solidago gigantea* were all abundant while weedier forbs, including *Aster ascendens, Chenopodium botrys, Epilobium ciliatum, Gnaphalium palustre, Polygonum hydropiper, Solanum dulcamara*, and *Xanthium strumarium*, were also common. *Eleocharis palustris* was the most common graminoid, although *Agrostis repens, Carex lanuginosa, C. lenticularis, Juncus* spp. *Leersia oryzoides, Phalaris arundinacea*, and *Scirpus* spp. (e.g., *Scirpus microcarpus* and *S. pallidus*) were also noticeable. The stands observed were on annually flood-scoured alluvial bars, islands, and riverbanks with shallow sandy soils over river cobble. Stands were slightly more stable than adjacent *Salix exigua*/Barren stands. The presence of *Populus trichocarpa* seedlings in both stands observed indicate the likely successional trend.

Salix lutea/Barren

Yellow willow/Barren

The *Salix lutea*/Barren plant association is a tentative type observed on the Boise River (e.g., Barber Pool). Though formerly undescribed, it is most similar to the *Salix exigua*/Barren plant association (e.g., Padgett et al. 1989, Moseley 1998), within which stands of *Salix lutea* are sometimes lumped, and the *Salix lutea* dominance type described by Crowe and Clausnitzer (1997) for eastern Oregon. The *Salix lutea*/Barren plant association is characterized by thickets of young *Salix lutea* intermixed with lesser amounts of *Salix exigua, Populus trichocarpa* (seedlings and saplings), *Betula occidentalis, Salix lasiandra*, and *Rosa woodsii* (in order of importance) The annual flood scouring and deposition of coarse alluvium that these stands experience keep the herbaceous understory sparse in total cover but diverse in species (especially early seral species). The most common species include *Carex lanuginosa, Euthamia occidentalis, Agrostis scabra, Muhlenbergia richardsonis, Juncus* spp*., Panicum capillare, Artemisia ludoviciana*, and *Eragrostis pectinacea* (in order of importance). Other species commonly seen but with only trace cover, include *Cyperus* spp., *Eleocharis palustris, Gnaphalium palustre, Polygonum* spp., *Potentilla biennis, Rumex crispus*, and *Solidago canadensis*. The *Salix lutea*/Barren plant association is found on recently deposited sand, gravel, and cobble alluvium of point bars, channel banks, and islands. This type is expected to occur in similar fluvial settings on the Snake, Payette, Weiser, and other rivers and streams of southwest Idaho.

Salix lutea/Bench

Yellow willow/Bench

Several stands of *Salix lutea* on the lower Boise, Payette, and Snake rivers were observed on high alluvial bars and benches, as well as on banks of backwater sloughs, swales, flood channels, and ditches, at or slightly above the average annual high water line. These fluvial settings either flood each year for short periods with minimal scouring or only flood in very high flow years. These sites are relatively stable due to inconsistent flooding and the sandy loam soils, occasionally with much gravel and cobble, are well drained. The vegetation is heterogeneous and somewhat weedy, reflecting both slightly drier wetland conditions and historic grazing disturbance. The fluvial settings and heterogeneous vegetation of these stands fit best with the *Salix lutea*/Bench plant association described by Manning and Padgett (1995) in Nevada, though these stands in southwest Idaho are from much lower elevations (below 2800 feet). The stands observed in Idaho do not align well with moister *Salix lutea* plant associations (e.g., *Salix lutea*/Mesic graminoid and *S. lutea*/Mesic forb described by Manning and Padgett (1995) and Weixelman et al. (1996)). They are more closely related to *the Salix lutea/Rosa woodsii* (Evenden 1989, Manning and Padgett 1995, Oregon Natural Heritage Program 1999) and *Salix lutea/Poa pratensis* (Manning and Padgett 1995, Weixelman et al. 1996) plant associations but lack consistently high cover of those understory indicator species. It is likely that some stands of *Salix lutea*/Bench have been lumped into the more general *Salix lutea* dominance type by other researchers (e.g., Youngblood et al. 1985, Hansen et al. 1995, Crowe and Clausnitzer 1997, Hall and Hansen 1997, Moseley 1998). The *Salix lutea*/Bench plant association observed on the Boise and Payette rivers was dominated by 30 to 70% cover of 3 to 5 m tall *Salix lutea*. *Populus trichocarpa* saplings and seedlings were always present, indicating likely succession to the *Populus trichocarpa/Salix lutea* plant association. Numerous other species of

shrubs and young trees were present, each with varying cover ranging from trace to 30%, including *Alnus incana, Amorpha fruticosa, Betula occidentalis, Ribes aureum, Rosa canina, R. woodsii, Salix alba, S. amygdaloides, S. exigua, S. lasiandra*, and *Toxicodendron rydbergii*. The herbaceous understory was highly variable but total cover usually high. The most common graminoids, in order of importance, were *Carex lanuginosa, Agrostis stolonifera, Phalaris arundinacea, Carex athrostachya, Poa pratensis, Juncus* spp. (e.g., *Juncus effusus, J. ensifolius, J. tenuis*), *Echinochloa crus-galli, Muhlenbergia* spp., and *Bromus tectorum*. In general, mesic forb cover was greater than that of mesic graminoids. The most common forbs, in order of importance, were *Euthamia occidentalis, Equisetum* spp., *Solidago* spp., *Lythrum salicaria, Artemisia ludoviciana, Apocynum cannibinum, Smilacina racemosa, Solanum dulcamara*, and *Epilobium ciliatum*.

Sarcobatus vermiculatus/Distichlis spicata

Greasewood/saltgrass

RANGE

This association occurs in Colorado, Idaho, Montana, Washington, and Oregon (Bourgeron and Engelking 1994), and possibly also Wyoming, Nevada, and Utah (Daubenmire 1970).

ENVIRONMENT

The *Sarcobatus vermiculatus/Distichlis spicata* association occurs in broad, level to gently sloping bottomlands and terraces, either along low-gradient creeks and rivers or as internally drained basins. These depositional areas have deep alluvial soils with a water table that is 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 *Distichlis spicata* over which are scattered bushes of *Sarcobatus vermiculatus* growing 1 to 2 m tall. Species richness is very low. *Suaeda occidentalis* and *Atriplex* spp. commonly occur in southwest Idaho stands.

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 stands of *Distichlis spicata, Juncus balticus, Eleocharis palustris, Elymus triticoides, Agropyron smithii,* and *Sporobolus airoides.*

MANAGEMENT CONSIDERATIONS

Ordinarily, *Sarcobatus vermiculatus* is little used by livestock, but under heavy grazing pressure the shrubs become smaller and develop a compact canopy. In disturbed stands *Bromus tectorum* will replace *Distichlis*. In a *Sarcobatus* stand where *Distichlis* 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). *Distichlis spicata* 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 *Distichlis* 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 (Mueggler 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)

Sarcobatus vermiculatus/Elymus cinereus

Greasewood/great basin wildrye

RANGE

This association is a minor type at lower elevations in Montana, Idaho, Oregon, and Washington, and possibly Nevada and California.

ENVIRONMENT

The *Sarcobatus vermiculatus/Elymus cinereus* association occurs as narrow bands along low-gradient creeks and rivers, in internally drained basins, and occasionally in association with seeps at the base of talus slopes. These depositional areas often have deep alluvial soils. The water table is generally within a few centimeters of the soil surface throughout the growing season. Elevations are generally less than 6,500 and the climate is arid. Salts often accumulate in the soils as inflowing surface waters evaporate.

SOILS

The type occurs on poorly drained, saline or alkaline clay soils.

VEGETATION COMPOSITION

The *Sarcobatus vermiculatus/Elymus cinereus* association is comprised of approximately equal cover of *Sarcobatus vermiculatus* and *Elymus cinereus.* The shrub *Chrysothamnus nauseosus* (and/or *C. viscidiflorus*) is frequently present with high cover indicative of disturbance. Forbs and grasses are sparse and bare ground is usually present. *Crepis runcinata, Haplopappus uniflorus, Phlox kelseyi* var. *kelseyi, Sisyrinchium idahoense, Agropyron smithii, Juncus balticus,* and *Poa juncifolia* are often present.

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 wetlands may be dominated by graminoids (e.g. *Carex aquatilis, Juncus balticus, Deschampsia cespitosa*) or shrubs (*Pentaphylloides floribunda*).

MANAGEMENT CONSIDERATIONS

Both of the diagnostic species are palatable early in the growing season. Spring grazing of *Elymus cinereus* is very harmful to this grass species and at least 10 to 12 inches of stubble should be left. *Sarcobatus vermiculatus* is moderately poisonous to cattle and sheep, but will be browsed in the spring (Ogle 1997). Heavy spring and summer grazing will result in a decrease in *Sarcobatus* (Hansen et al. 1998). *Bromus tectorum* can replace *Elymus cinereus* in overgrazed stands.

SUCCESSIONAL DYNAMICS

Fire kills *Sarcobatus vermiculatus* back only to the ground surface, and it resprouts from the root crown promptly afterward (Daubenmire 1970).

WILDLIFE FUNCTIONS

Sarcobatus vermiculatus may be utilized by cattle, deer, and antelope in the winter, but it is poisonous to sheep (Mueggler 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/Elymus cinereus* association is found where surface soils are less saline than sites supporting the *Sarcobatus vermiculatus/Distichlis spicata* association. *Elymus cinereus* is diagnostic of the *Sarcobatus vermiculatus/Elymus cinereus* association and Distichlis spicata is not reported to occur in the stands. A less saline *Sarcobatus vermiculatus/Agropyron smithii* association is reported by Hansen et al. (1995) and Mueggler and Stewart (1980).

AUTHOR/DATE(UPDATE)

Mabel Jankovsky-Jones/1998-06-03(2000-02-22)

EMERGENT PLANT ASSOCIATIONS

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). 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 nitida,* and *Poa nevadensis* may be locally abundant. *Artemisia ludoviciana, Stipa viridula,* and *Stipa comata* may also be present throughout the range of the association. In southwest Idaho *Distichlis spicata, Sporobolus airoides,* and *Carex praegracilis* are associated.

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 in 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.

AUTHOR/DATE(UPDATE)

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

Carex lanuginosa

Woolly sedge

RANGE

The *Carex lanuginosa* plant association is a minor type in Colorado, Utah, Idaho, Montana, British Columbia, Washington, and Oregon. *Carex lanuginosa* is a common sedge that occurs throughout the northern and western United States. It is likely that this or a closely related association occurs in Wyoming, California, and New Mexico. Small patches of this association are somewhat common on the lower Boise and Payette rivers.

ENVIRONMENT

The association usually occupies former active fluvial surfaces along low to moderate elevation floodplains and headwater basins or meadows. Stands may occur in depressions and swales at the saturated edge of stream channels or in seasonally standing water.

SOILS

Surface textures range from fine sandy to sandy clay loams on floodplains, to organic loam in the basins (Kovalchik 1987). Floodplain soils are often flooded during spring runoff and the water table is well down in the rooting zone (within 1 m of the surface) by mid summer. The basin sites have higher water tables and are moist through most summers (Kovalchik 1987).

VEGETATION COMPOSITION

Carex lanuginosa clearly dominates stands with 30 to 80% cover. Low species diversity, with few associates having high constancy, is characteristic. *Deschampsia cespitosa, Carex microptera, Carex nebrascensis, Juncus balticus* and *Poa pratensis* are occasionally present. In southwest Idaho, *Scirpus* spp., *Juncus effusus,* and *Carex praegracilis* have been recorded in stands. Hansen et al. (1988) reports that *Carex lasiocarpa* may be codominant in some stands in Montana. This has not been observed in Idaho stands.

ADJACENT COMMUNITIES

Wetter associations may include those dominated by *Carex utriculata, Typha latifolia,* and other mesic graminoids. Drier sites may include riparian forests with *Salix amygdaloides* or *Populus* spp. in the overstory or herbaceous wetlands dominated by *Deschampsia cespitosa*. Uplands are typically dominated by *Artemisia tridentata* or *Artemisia cana* at lower elevations and *Pinus contorta, Abies lasiocarpa,* or *Populus tremuloides* at higher elevations (Hansen et al. 1995).

MANAGEMENT CONSIDERATIONS

Carex lanuginosa appears able to withstand moderate grazing pressures, though overuse of stands may increase the presence of invasive species such as *Agrostis stolonifera, Poa pratensis,* or *Juncus balticus*. Trampling by livestock as well as heavy machinery use may result in compaction or displacement of soils (Padgett et al. 1989). Vegetation composition and structure can be altered due to impacts such as water development, recreational activities, or agriculture. With management intervention such as grazing schedules, fencing, education, and stream rehabilitation to elevate water tables, moderately disturbed stands recover rapidly due to the rhizomatous habit of the sedge (Kovalchik 1987, Hansen et al. 1988). Prescribed fire is a useful tool on this type. Fire can be used in spring or late summer to help reduce litter accumulation and competitors. Woolly sedge should be very resistant to damage by ground fire (Kovalchik 1987, Hansen et al. 1988). This species is useful for improving degraded riparian sites. Long, creeping rhizomes form a dense mat, effectively stabilizing streambank soils (Hansen et al. 1988). Revegetation with woolly sedge and other species, over time, can stabilize streambanks and improve fish habitat (Kovalchik 1987).

SUCCESSIONAL DYNAMICS

The *Carex lanuginosa* plant association appears to be a fairly stable type because of its strongly rhizomatous nature and occurrence on well developed soils. The type may replace the *Deschampsia cespitosa* association under moderate to heavy grazing pressures (Padgett et al. 1989), or an increase in species such as *Agrostis stolonifera, Poa pratensis,* or *Juncus balticus* may be evident. On drier floodplain landforms, overgrazing changes the site potential towards the Kentucky bluegrass community. Kovalchik (1987) reports that on sites where streambed downcutting has occurred, lowered water tables have changed the site potential to the sagebrush/Cusick bluegrass association.

WILDLIFE FUNCTIONS

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

CLASSIFICATION COMMENTS

Hansen et al. (1995) included all combinations of *Carex lanuginosa, Carex lasiocarpa,* and *Carex buxbaumii* in the *Carex lasiocarpa* habitat type. There may be some similarities between sites supporting *Carex lanuginosa, Carex lasiocarpa*, and *Carex buxbaumii* plant associations. However, *Carex lanuginosa* stands typically occur along run-off dominated stream channels or headwater basins while *Carex lasiocarpa* and *Carex buxbaumii* occur in association with saturated spring-fed or groundwater driven wetlands. From a biodiversity conservation standpoint, the three associations should be recognized as distinct types. A distinct *Carex lanuginosa* plant association has been recognized and described in Oregon, Montana, Idaho, Utah, and Colorado.

AUTHOR/DATE

Mabel Jankovsky-Jones/2000-01-23

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 it is also found 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). 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. Forb 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. It is 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.

AUTHOR/DATE

Bob Moseley/1998-12-08

Carex praegracilis

Clustered field-sedge

RANGE

The *Carex praegracilis* plant association is reported from Idaho, Oregon, Colorado, Wyoming, Montana, and California. It is a frequently encountered association on the lower Boise and Payette rivers.

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 dry at the surface by mid-summer.

VEGETATION COMPOSITION

Carex praegracilis is the dominant graminoid on high quality sites with continuous (90%) cover in some locations. Other species that may be present include *Carex nebrascensis, Eleocharis palustris, Juncus balticus,* 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, Carex lanuginosa, Distichlis spicata, Agropyron smithii, Elymus triticoides, Juncus balticus,* and *Pentaphylloides floribunda.*

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. praegracilis* 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 1999).

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 1999). Meadows supporting *Carex praegracilis* provide nesting habitat for wrens, rails, and other birds.

CLASSIFICATION COMMENTS

The *Carex praegracilis* plant association is classified by 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)

Distichlis spicata

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. It is known from the western Great Plains, Intermountain Region and southwestern U.S. from New Mexico to Montana and west to Washington, Oregon and California. It is also likely to occur in Mexico (from Reid et al. 1999). It is a frequently

encountered association on the lower Snake, Boise, and Payette Rivers.

ENVIRONMENT

Stands of *Distichlis spicata* occupy saline or akaline basins, swales, pond and lake margins, river terraces, and seep areas that are intermittently 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 positively 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 nuttalliana, Triglochin maritimum, Salicornia rubra,* and *Suaeda* spp. 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).

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 tridentate,* or other upland types (Hansen et al. 1995). *Agropyron smithii, Elymus triticoides, Carex praegracilis,* and *Sporobolus airoides* have been observed adjacent to this type in southwest Idaho.

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). *Bromus tectorum, Hordeum jubatum,* and weedy forbs (e.g., *Atriplex* spp., *Bassia hyssopifolia)* can invade on slightly drier degraded sites.

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 tolerance. 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 *Distichlis spicata* is difficult for two reasons. First, *D. spicata* is a widespread halophytic grass species that dominates or codominates the herbaceous layer of 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 (Reid et al. 1999). A related *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)

Mabel 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 (Bourgeron and Engelking 1994, Anderson et al. 1998).

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 asociation 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 arvensis, Rumex crispus, Eleocharis acicularis, Carex utriculata, C. lanuginosa, 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 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 at al. (1989) suggest that *Eleocharis palustris* is 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. They 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 drastically shifts 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 valuable sources 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

Beaked spikerush

RANGE

Eleocharis rostellata is widespread from 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, Wyoming, and may occur in Washington, British Columbia, and Colorado.

ENVIRONMENT

This association occurs in thermal areas or areas with alkaline or calcareous soils, especially at the northern edge of its 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 ranging 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 stands 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 communiti: stands with 90% cover of *E. rostellata*, occurring on relatively deep organic soils and sometimes forming a quaking mat; and stands with less than 70% cover that are more open, with considerable 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, Pentaphylloides floribunda, 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., *Pentaphylloides floribunda,* and *Deschampsia cespitosa.* In southwest Idaho *Distichlis spicata* has been observed as an adjacent association.

MANAGEMENT CONSIDERATIONS

This association is threatened by development of thermal areas for recreation (Lesica 1990). Because of the wet, often unstable nature of the substrate, soil disturbance and grazing by livestock is probably minimal. Yet trampling damage of wet, organic soils in this association occurs with any livestock utilization. Livestock may graze 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 the dominant species (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. Observations in Montana by Lesica (1990) indicate that 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(2001-01-05)

Elymus triticoides

Beardless wildrye

Two occurrences of the tentatively classified *Elymus triticoides* plant association were documented in southwest Idaho. One plot was sampled on an island at Three Island Crossing on the Snake River at Glenns Ferry. The community was also observed on islands and terraces of the lower Payette River (at Birding Islands). Though not formerly described, the *Elymus triticoides* plant association is known from Nevada (Manning and Padgett 1995) and elsewhere on the Snake River Plain of southern Idaho (e.g., above American Falls Reservoir). Very similar communities, the *Elymus triticoides-Carex* spp. and *Elymus triticoides-Poa secunda* associations, are known from Nevada and northeastern California (Reid et al. 2000). In southwest Idaho, the *Elymus triticoides* plant association is found on well-drained sandy silt loam soil of alluvial origin that may be ephemerally moist and slightly alkaline. It is found in swales, often formed by ancient flood channels, on islands, floodplains, and terraces that are flooded only in extreme runoff events. *Elymus triticoides* forms dense swards with 80 to 90% cover with a high diversity of herbs intermixed. The most commonly observed graminoid species, all with trace cover, are *Agropyron smithii*, *A. elongatum*, annual *Bromus* spp., *Carex douglasii, C. praegracilis, Distichlis spicata, Elymus cinereus*, and *Sporobolus airoides*. The forb species were generally weedy but none had more than trace cover. The most commonly observed forbs were *Achillea millefolium, Asclepias speciosa, Artemisia ludoviciana, Atriplex* spp., *Cirsium arvense, Conium maculatum, Conyza canadensis, Dipsacus sylvestris, Helianthus annuus, Lepidium latifolium, Rumex crispus*, and *Solidago gigantea*. The *Elymus triticoides* plant association is found in a mosaic with several other related plant communities including those dominated *by Agropyron smithii, Artemisia tridentata* ssp. *tridentata, Carex douglasii, C. praegracilis, Sarcobatus vermiculatus/Distichlis spicata*, and *Sporobolus airoides*.

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 and Idaho 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. Horizon "A" 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. In southwestern Idaho *Carex nebrascensis* and *Muhlenbergia richardsonis* are common associates. 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 expected with an association distributed over the western United States and having at least a 7,000-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 elevations.

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 flood plain 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). 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. They contain extensive near-monocultures of *Juncus balticus* and have significant hummocking created by freezing and thawing (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 *Carex nebrascensis, Deschampsia cespitosa, Calamagrostis canadensis,* and possibly other species 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)

Juncus effuses
Common rush

The *Juncus effusus* plant association was observed in wet pastures on the floodplain of the lower Payette River at Montour. Small patches dominated by *Juncus effusus* were also anecdotally noted on the lower Boise River (e.g., Barber Park area and Eagle Island State Park). In Idaho, the *Juncus effusus* plant association is also known from the panhandle of northern Idaho (Jankovsky-Jones 1997b). The *Juncus effusus* association observed on the Payette River floodplain was dominated by *Juncus effusus* with about 70% cover, though *Carex*

vulpinoidea was common with up to 20% cover. *Agrostis stolonifera, Carex lanuginosa, Glyceria grandis*, and *Phalaris arundinacea* were all noticeable with 1 to 5% cover each. *Polygonum hydropiper* and *Myosotis laxa* were both abundant with up to 15% cover each. *Epilobium ciliatum, Lemna minor*, and *Veronica americana* were also noticeable with 3 to 8% cover each. In contrast, a *Juncus effusus* stand sampled from a meadow in northern Idaho had moderate cover of *Agrostis stolonifera, Carex bebbii*, and *Glyceria elata* but no forbs of significance (Jankovsky-Jones 1997). The range of *Juncus effusus* is widespread and it forms communities in coastal tideland marshes, in seasonally flooded pastures, and on the edges of ponds, lakes, and rivers (Elzinga and Rosentreter 1999). Though preferring moist soils in the growing season, *Juncus effusus* is not tolerant of summer flooding. Soils are typically fine-textured or loamy, though stands on the Payette River had significant amounts of organic matter intermixed. Elzinga and Rosentreter (1999) note that *Juncus effusus* is rarely found in large stands or as a dominant but increases with grazing. The stands of *Juncus effusus* observed at Montour and Eagle Island are found in cattle pastures that are periodically flooded by both sub-irrigation and surface flows from irrigation ditches (but not often flooded by rivers). At these sites, *Juncus effusus* forms patch mosaics or mixed mesic graminoid meadows with *Agrostis stolonifera, Carex* spp. (*Carex lanuginosa, C. utriculata, C. vulpinoidea*), annual *Eleocharis* spp., *Eleocharis palustris, Glyceria borealis, Juncus balticus, Lythrum salicaria, Scirpus* spp. (*Scirpus microcarpus, S. pallidus, S. validus* or *acutus*), and *Typha latifolia*. Its dominance over other mesic graminoid species may be grazing induced.

Phragmites australis

Common reed

RANGE

This plant association is known from throughout the west and northwest. It is documented from Montana (Hansen et al. 1995), Colorado (Kittel et al. 1999), Idaho (Huschle 1975, Hall and Hansen 1997), Utah, Oregon, and California.

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 1999b).

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 (2 to 3 m), dense stands that appear as monocultures. Some stands may be quite extensive in size. Most stands have few associated species which generally occur in only trace amounts. Some exceptions include *Toxicodendron rydbergii*, which may form a continuous understory (Asherin and Claar 1976). *Agrostis stolonifera* and *Scirpus acutus* had high cover in a stand in eastern Idaho (Hall and Hansen 1997). Around undisturbed springs in southwestern Idaho *Aster hesperius* and *Angelica kingii* had relatively high cover (10% and 30%, respectively) (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, *Sarcobatus vermiculatus, 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 outcompete 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).

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 synonymous with the *Phragmites australis* plant association: *Phragmites australis/ Toxicodendron rydbergii* (Huschle 1975, Asherin and Claar 1976), and *Phragmites australis/Scirpus lacustris* (Johnston 1987). *Phragmites communis* is a synonym for *Phragmites australis.*

WILDLIFE FUNCTIONS

Phragmites australis is highly palatable to both livestock and wildlife, especially when the plants are young and growing vigorously. The 3 m 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).

AUTHOR/DATE(UPDATE)

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

Polygonum amphibium (coccineum)

Water smartweed

RANGE

The *Polygonum amphibium* plant association is found in Idaho, California, Oregon, Washington, Montana, and Colorado.

ENVIRONMENT

Polygonum amphibium is an aggressive invader of shallow water and exposed mudflats where there is minimal wave action, forming dense, monotypic stands (Hansen et al. 1995). This species spreads rapidly if it is exposed to eutrophic (nutrient rich) conditions and can completely cover water bodies greatly reducing diversity of aquatic species (Guard 1995). The association occurs in shallow backwater sloughs and along shorelines of reservoirs, lakes, ponds and marshes.

SOILS

This plant association type occurs on most soil textures from fine clay to sandy loam, and is intolerant of saline or alkaline conditions (Hansen et al. 1995).

VEGETATION COMPOSITION

Polygonum amphibium occurs as a near monoculture with 98% cover. *Lemna minor, Potamogeton natans, Spirodela polyrhiza,* and *Wolffii* spp. are occasionally present (Hansen et al. 1995).

ADJACENT COMMUNITIES

Adjacent associations may include those dominated by *Carex* spp., *Typha latifolia,* or *Scirpus* spp., aquatic beds, or open water. Adjacent drier associations are a wide variety of types including upland types (Hansen et al. 1995).

MANAGEMENT CONSIDERATIONS

Herbage production of this plant association rates from low to moderate and is of low palatability to livestock (Hansen et al. 1995).

SUCCESSIONAL DYNAMICS

Shoreline vegetation around reservoirs is composed primarily of early successional species that become established during either the fall or the spring when

water levels are low. Repeated annual drawdown perpetuates this disturbance and associated weedy vegetation (Hansen et al. 1995). *Polygonum amphibium* is adapted to a variety of conditions; it can grow prostrate, creeping on land, or in several meters of water (Guard 1995).

WILDLIFE FUNCTIONS

The seeds of *Polygonum amphibium* are important food for ducks, geese, marsh birds, shorebirds, upland game birds, and small mammals (Guard 1995). *Polygonum amphibium* is used by a wide variety of waterfowl for nesting or nest building and the plants provide shelter for a variety of aquatic life forms. Shore vegetation provides habitat for terrestrial wildlife and certain fish species (Hansen et al. 1995).

CLASSIFICATION COMMENTS

Some taxonomic issues need to be understood before description of this plant association can be fully developed. Some sources consider *Polygonum amphibium* and *Polygonum coccineum* synonymous. The two species can be distinguished by characteristics of the panicle with *Polygonum amphibium* having a shorter, more compact inflorescence while *Polygonum coccineum* has an inflorescence that is elongate (4 cm). *Polygonum coccineum* is an aggressive species that is considered a noxious weed in California. Kartesz (1994) recognizes *Polygonum amphibium* as a full species and considers *Polygonum amphibium* var. *emersum* and *Polygonum coccineum* synonymous.

AUTHOR/DATE(UPDATE)

Linda Williams/1995-12-26(2000-01-30)

Scirpus acutus (validus)

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, springs, and reservoirs, as stringers paralleling stream and river channels, or broad swaths in backwater marshes and sloughs. It is found at low to mid-elevations, from less than 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. The textures of surface horizons in long-lived stands are predominantly fines, which appear as black or gleyed, mucky clay or silty loam soils. Soils have 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. 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 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 dominate a site at a particular point in time (Hall and Hansen 1997). Cole (1995) discusses tentative successional relationships of *Scirpus acutus* types.

WILDLIFE FUNCTIONS

Scirpus acutus provides valuable nesting and roosting cover for a variety of songbirds and waterfowl, notably red-winged blackbirds, yellow-headed blackbirds, and marsh 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 for these reasons. 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 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, Utah, Montana, and Oregon. It is widely scattered throughout the lower elevations of southwest Idaho.

ENVIRONMENT

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

SOILS

Soils are variable, ranging from relatively deep and organic, to alkaline and calcareous clay soils, to coarse 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 to nearly 100% cover. Stems of *Scirpus americanus* can reach over 3 m tall. Low species diversity is characteristic. Minor amounts of *Eleocharis palustris, Carex nebrascensis, 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 nuttallii* and *Epilobium ciliatum* were present in association with the type at hot springs.

ADJACENT COMMUNITIES

Adjacent associations may be dominated by *Carex* spp., *Eleocharis* spp. (*E. palustris* or *E. rostellata*), *Pentaphylloides floribunda, 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 readily occurs with any livestock utilization. Livestock may graze 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)

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*. Common associates reported from Great Plains states include *Buchloe dactyloides, Bouteloua gracilis, Schizachyrium scoparium, Hordeum pusillum,* 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.* 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. that may be growing nearby. Cattle 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/2000-3-13

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. It is probably the most commonly “created” wetland type as well.

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 up to 1 m 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 wetland species, eg,, *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. Livestock 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; they 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 as well as marsh wrens (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-Sagittaria 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)

AQUATIC BED PLANT ASSOCIATIONS

Thousand Springs Desert Aquatic Ecosystem

RANGE

Spring fed alcoves and discharge springs occur along the north side of the middle Snake River between American Falls and the mouth of the Big Wood River in south central Idaho.

ENVIRONMENT

The spring features are likely remnants of ancient canyon entrenchment by the Snake River. The course of the Snake River has progressively been shifted northward by successive lava flows. The flows would fill the early canyon, forcing the river to cut a new canyon along the margin. Sometimes dams would be formed or the course would be altered, leaving downriver segments dry as a new course was sought. The Snake River began the entrenchment process, but may have been diverted by a lava flows which changed its course leaving canyons essentially as they are today (Bowler 1981). Upon emerging from basalt flows, the springs cascade over steep talus and boulder fields, and flow into clear channels that extend to the Snake River. Analysis of stream flows at Box Canyon, from 1951 to 1997, reveal average annual low flows in April to average annual high flows in October. The slight seasonal changes are likely due to the influence of irrigation recharge to the aquifer with irrigation flows beginning in April taking until October to seep into the springs.

SOILS

Soils are typically shallow overlying basalt boulders.

VEGETATION COMPOSITION

This association is dominated by herbaceous species on poorly developed soils overlying basalt talus. Cover of diagnostic species is variable depending on slope and water flow. On steep vertical slopes or areas with continual surface water flow, vegetation is sparse. Where gradient lessens and thin soils have developed the following species are usually present; *Epipactis gigantea, Euthamia occidentalis, Mimulus guttatus, Rorippa nasturtium-aquaticum, Veronica anagallis-aquatica*, and *Festuca arundinacea.*

ADJACENT COMMUNITIES

Spring alcoves and canyon walls are typically a mosaic of vegetation communities dominated by *Rhus trilobata, Phragmites australis*, and *Betula occidentlis.*

MANAGEMENT CONSIDERATIONS

Non-native species that may become established include *Cirsium vulgare, Dipsacus sylvestris. Rorippa nasturtium aquaticum* and *Festuca arundinacea* are also a non-native species that are frequently present and sometimes dominant in spring habitats.

SUCCESSIONAL DYNAMICS

This is a long lived stable community that will likely persist if water quality and quantity are maintained.

WILDLIFE FUNCTIONS

The springs are habitat for several mollusc species of concern including *Anodonta californiensis* (California floater), *Valvata utahensis* (desert valvata), *Lanx* sp. 1 (Banbury Springs limpet), and *Taylorconcha serpenticola* (Bliss Rapids snail). The molluscs require cold water and are generally intolerant of pollution. Springs also support *Cottus greenei* (Shoshone sculpin). The sculpin is normally associated with cover in the form of rocks, cobble, gravel, and/or vegetation (Cazier and Meyers 1995).

CLASSIFICATION COMMENTS

Classification is based on field data collected in 1999 from 6 locations along the middle Snake River in Idaho. Additional information was obtained by

summarizing data associated with occurrences of the species of concern *Epipactis gigantea* along the middle Snake River.

This association may be similar to other saturated associations supporting *Mimulus guttatus*, *Veronica anagallis-aquatica*, and *Rorippa nasturtium-aquatica*.

AUTHOR/DATE

Mabel Jankovsky-Jones/2000-01-09

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Appendix C

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

Cyperus rivularis Torr.

CURRENT STATUS

BLM - None
USFS R4 – None
USFWS – None
Idaho Native Plant Society – Monitor
CDC Rank – G5 S2

TAXONOMY

Family: Cyperacea

Common Name: Shining flatsedge

Citation: Enum. Pl. 2:6. 1837

Technical Description: Tufted annual; culms slender, 0.5-2 (3) dm tall; leaves few, all borne near the base, slender and more or less elongate, 0.5-2 mm wide; involucral bracts elongate, unequal, at least one of them much surpassing the inflorescence; spikelets in 1-several capitate clusters, the primary cluster sessile, the others (if present) on slender rays up to 3 (7) cm long; spikelets 3-15 mm long; scales mostly 2-2.5 mm long, blunt, with prominent, pale midrib, otherwise usually more or less strongly anthocyanic, deciduous at maturity from the persistent, wingless rachilla; stamens 2, rarely 3; deeply bifid; achenes lenticular, 1.0-1.3 mm long, olivaceous to blackish, becoming minutely roughened or cross-ridged at maturity (Cronquist et al. 1977).

Nontechnical Description: Shining flatsedge is a grass-like annual that forms tufts of slender stems which are 5-20 cm high. The few leaves occur near the base of the plant and are 1-2 mm wide. The flowers consist of a small, blunt scale with a pale, ca 2-3 mm long midrib, that subtends a single stamen and ovary. The flowers are crowded opposite each other into flattened spikelets that are 3-15 mm long. Spikelets occur in open clusters borne on very short to long stalks arising from the stem tips. The inflorescence is subtended by 2-4 leaf-like bracts, at least one of which is longer than the inflorescence. The seed is lens shaped and fruits are mature in August to September (from Montana Heritage Program 2001),

Distinguishing Features and Similar Species: Other species in this genus have scales that are pointed or awn tipped unlike the blunt scale found in C. rivularis.

DISTRIBUTION

Range: Widespread in the United States and Canada and more common eastward. In Idaho populations are known from the Snake, Payette, and Boise Rivers.

Habitat and Associated Species: This plant typically occurs near the the low water mark on sandy alluvium along major rivers. Several other Cyperus species are known to occur in association with C. rivularis including C. accuminatus, C. aristatus, C. difformis, C. erythrorhizos, C. esculentus, C. odoratus, and C. strigosus. Other associates include Heleochloa alopecuroides,
Eleocharis bella, Eragrostis hypnoides, Gnaphalium palustre, Lycopus americanus, Muhlenbergia richardsonis.

MANAGEMENT

Threats Cyperus rivularis occurs in areas with a fluctuating water table. In particular it is found in the zone that is saturated when river flows are at their lowest. It may be somewhat tolerant of hydrologic alteration though permanent inundation would eliminate populations. Exotic species which may threaten populations include C. esculentus, C. difformis, Heleochloa alepecuroides, Leptochloa fascicularis, Lythrum salicaria, and Xanthium strumarium.

Epipactis gigantea Dougl. Ex Hook.

CURRENT STATUS

BLM - Sensitive
USFS R4 - None
USFWS - None
Idaho Native Plant Society - Priority 1
CDC Rank - G4 S3

TAXONOMY

Family: Orchidaceae (Orchid)

Common Name: Giant helleborine

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

Technical Description: Stems 1 to many from short rhizomes, mostly 3-7 (up to 12) dm tall leaves numerous, sheathing, the lowest blades almost lacking, gradually enlarged upwards, almost glabrous to scabridulous-puberulent, broadly elliptic-lanceolate, mostly 7-14 (19) cm long and 1.5-5 (7) cm broad; flowers 3-15 rather showy, raceme usually secund, bracts usually reduced upwards, but even the uppermost one usually exceeding the ovary; sepals coppery-green, lightly brownish-veined, 2-16 mm long; petals similar to the sepals but thinner, and (at least venation) more brownish-purple; lip 15-20 mm long, the sac with prominent, raised purplish lines leading to the base, three lobed, outer (basal) lobes prominent, the blade (central lobe) about as long as the basal lobes, curved downward somewhat, triangular-ovate, tip flattened but with uprolled margins, greenish-yellow, the margins thickened and erect, with numerous callosities leading into the sac; column 6-9 mm long; anther 4-5 mm long; capsule reflexed, 2-3.5 cm long (from Hitchcock et al. 1964).

Nontechnical Description: Giant helleborine is a tall orchid with leafy stems, which reach 3 feet in height. Abundant sword-shaped leaves, up to 8 inches long, clasp the tall, usually unbranched stems. Numerous flowers are borne in a leafy-bracted inflorescence at the tops of the stems. Flowers have a sac-like lip petal that is reddish-brown. The two upper lance-shaped petals are also reddish-brown, but with a greenish tinge. Three lance-shaped sepals subtend the flowers and are light green with a brownish tinge. Epipactis gigantea is a perennial plant that grows from a rhizome each year (from Schassberger 1988).

Distinguishing Features and Similar Species: Epipactis gigantea is distinguished by its tall leafy stems and numerous-flowered racemes. The reddish-green flowers blend in with background vegetation and are not easily noticed. Except for Epipactis helleborine, no other species resembles E. gigantea. E. helleborine has escaped from cultivation in Montana. It is unknown if this has occurred in Idaho. E. helleborine is distinguished from E. gigantea by its smaller flowers and a smaller unlobed lip (Schassberger 1988). Once a search image is refined this species can be spotted in canyons with binoculars.

DISTRIBUTION

Range: Epipactis gigantea is widely distributed from British Columbia south to Baja California, east to the Rocky Mountains and south to Mexico.

Habitat and Associated Species: Epipactis gigantea occurs in moist areas along streambanks, lake margins, seeps, and springs. Populations along the middle Snake River are associated with cold springs and may occur on spring creeks or on nearly vertical talus slopes with constant water flow. Soils are often shallow sands and gravels overlying basalt talus. Associated species may include Aquilegia formosa, Betula occidentalis, Euthamia occidentalis, Mimulus guttatus, Phragmites australis, Rhus trilobata, Rorippa nasturtium-aquatica, Rumex crispus, Toxicodendron radicans, and Urtica dioica

MANAGEMENT

Threats: In Idaho, habitat at almost all known sites has been altered and several populations are known to be extirpated or at critically low numbers. On the middle Snake River hydrologic manipulation and poor water quality are a threat to populations. As an example, at Vinyard Creek Epipactis is found along the spring creek but is absent below the point of irrigation return flow. The irrigation return flows were routed out of the spring creek in 1996 by Idaho Power and it will be interesting to monitor the effects of this management action on the Epipactis population.

Sporobolus asper (Michx.) Kunth

CURRENT STATUS

BLM - Sensitive
USFS R4 – None
USFWS – None
Idaho Native Plant Society – State Priority 1
CDC Rank – G5 S1

TAXONOMY

Family: Poaceae (Grass)

Common Name: Tall dropseed

Citation: Revision Gram. 1:68. 1829

Technical Description: Stout, tufted perennials; culms 5-12 dm tall, glabrous, sulcate, more or less solid; sheaths glabrous, overlapping, usually pilose at the throat and around the collar; ligules very short, less than 0.5 mm long, a thick, but low truncate, ciliolate crown; blades flat, becoming involute, 1-4.5 (5.5) mm broad, elongate tapering to a scabrous point, pilose near the base on the upper surface, occasionally pilose beneath at the base; panicles 10-17 (27) cm long, spike-like, partially or mostly enclosed in an inflated sheath; spikelets strongly flattened, glabrous, usually pale or green, sometimes purplish tinged; glumes blunt, carinate keeled, 1-nerved, smooth but sometimes scabrous on the keel; palea about the same length as the lemma; lodicules about 0.5 mm long; anthers large, (1.5) 2-2.5 mm long (from Cronquist et al. 1977).

Nontechnical Description: Sporobolus asper is a perennial grass from 5 to 12 dm tall. Spikelets are one flowered and 3.5 to 6 mm long. Glumes are shorter than the awnless lemma. The 5 to 15 cm long panicle is terminal and axillary.

Distinguishing Features and Similar Species: No close relatives are reported in Idaho or the vicinity. Apparently it is somewhat difficult to distinguish from S. cryptandrus, which is generally smaller in height and other morphological features.

DISTRIBUTION

Range: Rare in eastern Washington, Oregon, Idaho, Utah and Arizona. More common east of the Rocky Mountains. In Idaho it is known from only two locations on the Snake River Plain.

Habitat and Associated Species: This species is only marginally riparian, Rangewide, Sporobolus asper is reported from dry sandy soils of prairies and foothills. In Idaho occurrences are known from a basalt terrace along the Snake River; from the river edge to nearby Juniper uplands and in a small side drainage. Associated species include Aristida purpurea, Artemisia ludoviciana, Oryzopsis hymenoides, Poa compressa, S. cryptandrus, and Stipa comata.

MANAGEMENT

Threats: Sporobolus asper is a very rare species in Idaho known from only two locations. Known populations are threatened by invasion by Bromus tectorum, grazing, trampling, and impacts from motorized vehicles.

Teucrium canadense var. occidentale

CURRENT STATUS

BLM - None
USFS R4 – None
USFWS – None
Idaho Native Plant Society – State Priority 1
CDC Rank – G5 T5? S2

TAXONOMY

Family: Lamiaceae (Mint)

Common Name: American wood sage

Citation: Brittonia 5:499. 1946

Technical Description: Flowers in terminal, bracteate spikes or racemes, or solotary in the axils of modified upper leaves; calyx 10-nerved, with 5 scarcely to evidently unequal teeth; corolla seemingly one lipped, the upper lip represented only by its two lobes, which are separated and displaced so as to arise from the lateral margins of the well-developed, decline, otherwise 3-lobed lower lip, of which the central lobe is much the largest; stamens 4, exserted, the lower pair the longer; pollen sacs sstrongly divergent, often confluent in dehiscence; ovary merely 4-lobed, the nutlets laterally atttached and almost completely united; herbs or rarely shrubs with entire to deeply lobed leaves (Hitchcock et al. 1959).

Nontechnical Description: Information not compiled.

Distinguishing Features and Similar Species: This species is distinguished from others in the mint family by its well separated upper lip of the corolla and a lower lip much larger than any of the other 4 corolla lobes.

DISTRIBUTION

Range: This species has a widespread distribution throughout most of the United States parts of Idaho and Mexico. In Idaho its' distribution is limited to a few occurrences in the western part of the state.

Habitat and Associated Species: This plant grows in moist meadows and along the banks of channels and islands. It typically occurs in association with a number of mesic herbaceous species including Scirpus acutus, Phalaris arundinacea, Typha latifolia, Apocynum cannibinum, Cirsium vulgare, Urtica dioica, Euthamia occidentalis, Helenium autumnale, Verbena hastata, and Asclepias incarnata.

MANAGEMENT

Threats: This is a very rare species in Idaho. Only 3 of the 8 known populations have been located in the last 25 years. Noxious weed invasion by purple loosestrife is a threat to this species. It is present at the high water line and reservoir operations and other factors altering hydrology may be a threat.

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Appendix D.

Not included in CDC homepage version

Appendix E

Site summaries for wetlands along the middle and western Snake River and its major tributaries

BOX CANYON

Location:

Box Canyon is on the northeast shore of the Snake River between Hagerman and Buhl. The mouth of the canyon is 12.5 miles southwest of Wendell and 588.3 miles upstream from the mouth of the Snake River. Box Canyon may be accessed from the town of Wendell. From the central intersection in Wendell, travel on the Vader Grade Road toward the town of Hagerman for ca. 4.5 miles. Turn left (south) on the Clear Lakes Road toward the town of Buhl. Continue on Clear Lakes Road for ca. 3.3 miles. After descending a small rise (3200 feet to 3190 feet elevation), note a house on the left and a marshy vernal lake on the right. Take the unmarked, unpaved road on the right about 0.1 mile after the vernal lake and proceed an additonal 1.1 miles. This road intersects a gravel road which extends from the head of Box Canyon past the trailhead into Box Canyon, eventually descending a grade down Blind Canyon to the diversion works on Box Canyon. If you miss the turnoff to Box Canyon, within 0.5 miles you will come to the intersection of the Bob Barton Highway with Clear Lakes Road.

Richness:

Box Canyon is a moderately wide canyon (1500 to 3000 feet) that winds for approximately 1.5 miles before entering the Snake River Canyon. The scenic canyon has basalt cliffs and talus slopes that range from 60 to 200 feet above the canyon bottom. Springs emerge from the canyon side walls as well as from springs along the ampitheater-shaped head wall to create a channel supporting a large volume of water (700 cfs). The channel ranges in width from 70 feet to 30 feet where talus slopes have confined the channel. Perennial flows have little seasonal variation. At the head of the canyon two headwater pools are present with a bottom substrate of white sand, black basaltic sand, gravels, and whitened fragments of snail shells. Downstream of the headwater pools, the stream channel descends for approximately 0.5 miles to a 12 foot waterfall. Below the waterfall the spring continues its descent to a second set of two lakes, the second of which is a point of diversion (Bowler 1981, Rabe and Savage 1976).

Box Canyon supports a rich aquatic ecoystem. Watercress (Rorippa nasturtium- aquatica) and water hemlock (Cicuta douglasii) are present at spring heads, on small vegetated islands, and on shallow stream margins. The springs contain populations of Shoshone sculpin (Cottus greenei), Bliss Rapids Snail (Taylorconcha serpenticola), desert valvata (Valvata utahensis), and Banbury Springs limpet (Lanx sp. 1), all species of special concern (Bowler 1981, Steele 1976).

In addition to unique aquatic habitats, Box Canyon contains relatively undisturbed examples of riparian-wetland, alkaline, and upland habitat. High quality riparian and wetland vegetation occurs along the stream channels and at springs. Smooth sumac (Rhus trilobata), the most abundant riparian shrub, is present as dense thickets along channels, in association with seeps, and on the margins of ponds. Patches of water birch (Betula occidentalis) and common reed (Phragmites australis) are also present on moist sites. Areas with high pH support halophytes, plant species that are able to tolerate saline-alkaline soils, including small stands of alkali saltgrass (Distichlis stricta), basin

wild rye (Elymus cinereus) and scattered stems of greasewood (Sarcobatus vermiculatus). Upland and talus slopes in Box Canyon are sparsely vegetated with occasional stands of big sagebrush (Artemisia tridentata ssp. tridentata) and stems of basin wild rye and spiny hopsage (Atriplex spinosa) (Steele 1976).

Rarity:

The Middle Snake River, including Box Canyon, has been identified as a high priority conservation site in the Columbia Plateau ecoregional plan for aquatic values. All of the springs along the Snake River are considered key tracts within the Middle Snake due to the positive benefit they provide to water quality. The springs are refugia within the river where sculpin, snails, and trout still exist. Box Canyon is possibly the best remaining example of Thousand Springs formation habitats and is reported to be the 11th largest spring in the United States. The topographic isolation from the surrounding farmland and other land uses along with exceptional water quality and constancy of spring flows provides a stable relict of native aquatic and terrestrial habitat limited to the Thousand Springs area. The springs contain populations of Shoshone sculpin (Cottus greenei), Bliss Rapids Snail (Taylorconcha serpenticola), desert valvata (Valvata utahensis), and Banbury Springs limpet (Lanx sp. 1), all species of special concern. Terrestrial communities include the globally rare Rhus trilobata community. Box Canyon has exceptional values as a scientific classroom for research and education and is an inspiring remnant of our natural heritage. As a stable undisturbed landscape and because of the value of habitat for ecologically restricted or threatened/endangered species, the site forms a natural yardstick to gauge natural process and conditions in similar habitats.

Condition:

A diversion and flume diverting approximately one half of the stream flow to Clear Springs Hatchery is present about 3/8 of a mile upstream of the mouth of the canyon. The diversion to the hatchery is a licensed water right (#36-07040) for 300 cfs. The diversion structure and flume are the only areas which are not in a natural condition. A USGS gaging station located mid-way up the canyon does not interfere with natural conditions. The State of Idaho holds a minimum instream flow with a priority date of October 16, 1987 for 162 cfs in the lower end of Box Canyon (water right #36-08337). This is a variable flow water right with 75 cfs at the upstream end of the reach and increasing flows to 162 cfs at the confluence of Boc Canyon Creek and the Snake River. A foot trail has been constructed to provide access to the gaging station. Apparently irrigation return flow has been channeled to the head of the canyon and allowed to cascade into the head water pool. This should be avoided and return flows rerouted to Blind Canyon or another location.

A number of nonnative species are present in Box Canyon (see species list in Steele 1976). Monitoring of exotics should take place to determine if a weed control plan is necessary.

Viability:

Information not compiled at this time.

Key Environmental Factors:

A series of spring coves occur along the north side of the Snake River between American Falls and the mouth of the Big Wood River. Box Canyon is the location of one spring and is likely a remnant of ancient canyon entrenchment by the Snake River. The course of the Snake River has progressively been shifted

northward by successive lava flows. The flows would fill the early canyon, forcing the river to cut a new canyon along the margin. Sometime dams would be formed or the course would be altered, leaving downriver segments dry as a new course was sought. The Snake River began the entrenchment process, but may have been diverted by a lava flow which changed its course leaving Box Canyon essentially as it is today (Bowler 1981). Analysis of stream flows from 1951 to 1997 reveal an average annual low flow of 362 cfs in April to an average annual high flow of 419 cfs in October. The slight seasonal changes are likely due to the influence of irrigation recharge to the aquifer with irrigration flows beginning in April taking until October to seep into the springs.

Other Values:

Cliff faces and the lack of disturbance make Box Canyon attractive for raptor and other bird use. Golden eagles, redtailed hawks, marsh hawks, sparrow hawks, prairie falcons, and owls are reported from the canyon. A number of small mammals are also known to occur in Box Canyon. Partial lists of bird, mammal, and aquatic species are available in Bowler (1981). At the present time recreational use of the canyon includes fishing, picnicking, site-seeing, and possibly seasonal hunting.

Conservation Intent:

Box Canyon has been the focus of conservation interest since the 1970's. The area has been evaluated for eligibility as a National Park and nominated as a candidate National Natural Landmark. Portions of the canyon currently managed by the Bureau of Land Management are designated ACEC. Private lands are currently unprotected and opportunities for protection should be actively pursued.

Management Needs:

Information not compiled at this time.

Information Needs:

Information not compiled at this time.

Plant Community Occurrences:

SARCOBATUS VERMICULATUS/DISTICHLIS STRICTA	G4	S1
THOUSAND SPRINGS DESERT AQUATIC ECOSYSTEM	G1	S1
BETULA OCCIDENTALIS/MESIC FORB	G3	S1
RHUS TRILOBATA	G2	S2
PHRAGMITES AUSTRALIS	G4	S4

Rare Animal Occurrences:

VALVATA UTAHENSIS	G1	S1
LANX SP 1	G1	S1
TAYLORCONCHA SERPENTICOLA	G1	S1

Author:

M. Jankovsky-Jones

BANBURY SPRINGS

Location:

Banbury Springs are located about 10 miles south-southwest of Wendell, Idaho on the east side of the Snake River. From Wendell, travel south 10 miles on 1500 East Road to the Bob Barton Highway. At the intersection with the Bob Barton Highway, travel west 1.5 miles. Continue west down the grade into the Snake River Canyon. The grade is rough in places and a high clearance vehicle is recommended.

Richness:

Banbury Springs supports a high quality shrubland with extensive stands of Betula occidentalis with a rich mesic forb understory. The stands of water birch lining the lower valley wall are interpersed with small stands of Phragmites australis and beds of aquatic species in spring creeks. The upper canyon where springs emerge is a mosaic of Phragmites australis, Rosa woodsii, and Clematis ligusticifolia with small patches of Rhus trilobata. Rhus trilobaba is also present around Morgan Lake along with small patches of Scirpus acutus, Typha latifolia, and Salix exigua.

Rarity:

Banbury Springs provides habitat for five animal species of concern (California floater, Bliss Rapids snail, desert Valvata, Banbury Springs limpet, and Shoshone sculpin) and one plant species of concern (Epipactis gigantea). The water birch community on the canyon face is of high quality due to size and condition.

Condition:

Banbury Springs are only partially diverted for irrigation, domestic use, recreation, and a small private hydro plant. The general area has been used for a scout camp with developments including small buildings, roads, and a fishing pond.

The exotic shrub, Elaeagnus angustifolia, is present around Morgan Lake. Several other nonnatives including Cirsium arvense, Poa pratensis, Bromus tectorum, Cirsium vulgare are present on lower slopes above the lake and around the lake.

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 head-wall springs should be left in their natural state. The area is proposed as a mitigation and enhancement project by the Idaho Power Company (Cole et al. 1998).

Management Needs:

This site has been identified by Idaho Power as a mitigation site for Upper and Lower Salmon Falls and Bliss Hydro Project. Mitigation will include restoring wetlands including scrub-shrub habitat inundated by Morgan Lake.

Information Needs:

Information not compiled at this time.

Plant Community Occurrences:

BETULA OCCIDENTALIS/MESIC FORB	G3	S1
THOUSAND SPRINGS DESERT AQUATIC ECOSYSTEM	G1	S1
RHUS TRILOBATA	G2	S2
PHRAGMITES AUSTRALIS	G4	S4

Rare Plant Occurrences:

EPIPACTIS GIGANTEA	G3	S3

Rare Animal Occurrences:

BUFO BOREAS	G4	S4
ANODONTA CALIFORNIENSIS	G3	S?
VALVATA UTAHENSIS	G1	S1
LANX SP 1	G1	S1
TAYLORCONCHA SERPENTICOLA	G1	S1

Author:
M. Jankovsky-Jones

BILLINGSLEY CREEK

Location:
Billingsley Creek is located in southern Gooding County approximately 1.5 miles northwest of Hagerman. Access is via 1050 East Road, which can be accessed from the northern edge of town (via the road that runs past the cemetery) and the southern end of town (via 2700 South Road).

Richness:
Billingsley Creek is a highly sinuous spring-fed stream in the Hagerman Valley. The low gradient stream supports just over 80 acres of emergent marsh habitat dominated by common cattail (Typha latifolia) and hardstem bulrush (Scirpus acutus) with lesser amounts of common reed (Phragmites australis). Five springs flow from the basalt rim rock into Billingsley Creek. Spring seeps are vegetated with skunkbush sumac (Rhus trilobata) and greasewood (Sarcobatus vermiculatus). Spring channels are typically lined with Russian olive (Elaeagnus angustifolia). The drier canyon slopes support annual grasslands (dominated by cheatgrass) with some big sagebrush (Artemisia tridentata tridentata) below basalt rimrock and talus.

Rarity:
Billingsley Creek remains ice-free during winter months and is attractive to waterfowl during cold spells. The low gradient stream creates extensive emergent wetlands, which are somewhat uncommon on middle reaches of the Snake River.

Condition:
Numerous exotic species are well established including annual herbaceous species (Bromus tectorum, Elymus caput-medusae, and Lepidium perfoliatum) and woody species (Elaeagnus angustifolia, Ulmus americana and Robinia pseudo-acacia). Purple loosestrife (Lythrum salicaria) was not observed, but it is present

nearby.

Viability:
Adjacent lands to the southwest are cultivated agricultural lands, and run-off and nutrient loading may be a consideration.

Key Environmental Factors:
Five springs flow from the basaltic rimrock into Billingsley Creek. The creek, being spring fed, remains a constant 58 degrees F, though slow moving, and remains open throughout the winter. In the lowland marsh, which has little water flow, ice depths range from 16 inches to occasionally none from mid-December into February.

Other Values:
Billingsley Creek's public use includes fishing, waterfowl hunting, game bird hunting, and rabbit hunting. Sightseeing, bird watching, dog training, horse riding, and photography are also significant uses of the area.

Conservation Intent:
The northwestern portion of the site is within an established WMA. Portions of the headwater springs were recently aquired by the Idaho Department of Parks and Recreation. Protection of springs on adjacent private land should also be pursued.

Management Needs:
Restoration of nonnative woody vegetation stands with natives (such as, water birch) would be a worthwhile but probably a costly venture. Noxious weed populations (in particular, purple loosestrife) if found should be controlled while small.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

RHUS TRILOBATA	G2	S2
PHRAGMITES AUSTRALIS	G4	S4
JUNCUS BALTICUS	G5	S5
SCIRPUS ACUTUS	G5	S4
TYPHA LATIFOLIA	G5	S4
SARCOBATUS VERMICULATUS/ELYMUS CINEREUS	G3	S2

Author:
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C. J. STRIKE RESERVOIR

Location:
C. J. Strike Reservoir is located along a portion of the lower Snake River and a portion of the Bruneau River. The Snake River arm of the site is 14 miles south of Mountain Home on Highway 51. The Bruneau arm is another 10 miles south and east on Highway 78. To reach the WMA headquarters from Mountain Home, travel south on Highway 51 for about 15 miles to the Snake River at Loveridge Bridge. Just south of the bridge, the highway will join Highway 78. Follow Highway 51/78

southwest through the town of Bruneau to the second junction of Highway 51 and 78. Take Highway 78 west for 2.5 miles to the WMA headquarters.

Richness:

The Snake River and the impoundment created by the C. J. Strike Dam are the dominant features of the site. Around those waters, the area's semiarid climate, alkaline soils and elevation combine to create a desert-like environment for plant and animal life. In areas irrigated by the Snake and Bruneau Rivers, lush croplands, shrubs and trees harbor a variety of wildlife species. The vegetation on the drier sites is dominated by shrubs (i.e., big and low sagebrush, greasewood, four-wing saltbush, and rabbitbrush). In wetlands along the Snake River and the reservoir, the vegetation includes stands of cattail, bulrush, Russian olive, and willows. Approximately 230 acres are irrigated to provide food and cover for waterfowl and upland game birds. Several hundred acres of ponds and marshes have been developed. (The soils of the Snake and Bruneau River watersheds are derived from lake and stream deposits of the old Payette Lake formation. These soils, developed under a semiarid climate, are light in color and low in organic matter.) Basaltic lava flows and other volcanic rocks are scattered throughout the area.

Rarity:

Several species of special concern occur on the C. J. Strike site including Clark's grebes, western burrowing owls, ferruginous hawks, great egrets, snowy egrets, cattle egrets, bald eagles, long-billed curlews, black-crowned night-herons, merlins, loggerhead shrikes, American white pelicans, and double-crested cormorants. Other animal species of special concern are the spotted bat, small-footed myotis, long-eared myotis, long-legged myotis, fringed myotis, Yuma myotis, Townsend's big-eared bat, river otter, western ground snake, longnose snake, white sturgeon, Idaho springsnail, and Idaho dunes tiger beetle. Astragalus purshii ophiogenes, a plant species of special concern, occurs in the area. Two hundred forty species of birds are known to use the C. J. Strike Reservoir site annually. Ninety-eight species breed in the area and 105 species commonly winter in the area. Large numbers of passerines move through the area during spring migration and the site is an important feeding area for passerines after they have crossed the Nevada desert. The reservoir is a nursery for several hundred western and Clark's grebes. Because this valley is warmer than the surrounding area many half-hardy species like the American white pelican, double-crested cormorants, yellow-rumped warblers and loggerhead shrikes winter here. There is always a small population of merlins, goshawks, and ferruginous hawks during the winter.

Condition:

The C. J. Strike Reservoir site is primarily used for wildlife conservation. Secondary uses include production of electricity, irrigation and agriculture, camping, boating, fishing, hunting, bird watching, waterskiing, and sailing. Some of the agriculture practices are used to enhance upland game populations.

Cheatgrass dominates uplands that have burned. Russian olive occurs in the riparian zone and also dominates some of the grass fields. Purple loosestrife is invading waterways and sites dominated by Typha latifolia and Scirpus acutus. Lepidium latifolium is also abundant in moist emergent wetlands.

Viability:
Lands adjacent to the C. J. Strike Reservoir site are used for farming and grazing.

Key Environmental Factors:
Information not compiled at this time.

Other Values:
C. J. Strike Reservoir is recognized as a Global Important Bird Area by the National Audubon Society and the American Bird Conservancy. The area provides habitat for large numbers of nesting and migratory waterfowl. Recreational uses include camping, boating, water-skiing, hunting, fishing, wildlife observation and photography, and sailing. A Mountain Home Air Force Base resort and a commercial resort are located on the shore of the reservoir.

Conservation Intent:
C. J. Strike Reservoir is a WMA established in 1953 and its jurisdiction is with the Idaho Department of Fish and Game.

Management Needs:
Grazing at C. J. Strike Reservoir is used only to improve wildlife habitat. Pesticide applicators are trained and licensed by the state. Use of physical, biological, and chemical controls of pest plants are in progress.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

SARCOBATUS VERMICULATUS/DISTICHLIS STRICTA	G4 S1
PHRAGMITES AUSTRALIS	G4 S4
DISTICHLIS STRICTA	G4 S4
SCIRPUS ACUTUS	G5 S4
SCIRPUS AMERICANUS	G3Q S1
TYPHA LATIFOLIA	G5 S4

Rare Plant Occurrences:

ASTRAGALUS PURSHII VAR OPHIOGENES	G5T3 S3

Rare Animal Occurrences:

AECHMOPHORUS CLARKII	G5 S2B,SZN
ARDEA ALBA	G5 S1B,SZN
EGRETTA THULA	G5 S2B,SZN
BUBULCUS IBIS	G5 S2B,SZN
NYCTICORAX NYCTICORAX	G5 S3B,SZN
BUTEO REGALIS	G4 S3B,SZN
FALCO PEREGRINUS ANATUM	G4T3 S1B,SZN
NUMENIUS AMERICANUS	G5 S3B,SZN
ATHENE CUNICULARIA HYPUGAEA	G4TU S3S4
EUDERMA MACULATUM	G4 S2
RHINOCHEILUS LECONTEI	G5 S3
PYRGULOPSIS IDAHOENSIS	G1 S1
SONORA SEMIANNULATA	G5 S3

Author:

MALAD GORGE

Location:

Malad Gorge is located within Malad Gorge State Park ca 36 miles northwest of Twin Falls, Idaho, and 1 mile northwest of Tuttle, Idaho. Access is provided by taking the Tuttle exit, traveling a short distance south and entering the State Park.

Richness:

The Big Wood (Malad) River carved a deep canyon at its confluence with the Snake River. Downstream of Interstate 84, the river plunges over a 60-foot waterfall and extends for approximately 2.5 miles before reaching the Snake River. Springs emerge along the south side of the canyon bottom near the annual high water mark. Where springs emerge above the high water mark, mesic forbs including Veronica anagallis-aquatica, Epipactis gigantea, Urtica dioica, and Euthamia occidentalis and the shrub Ribes aureum are present. The best developed springs are along the Big Wood River just upstream of the irrigation return flow. Patches of Phragmites australis, Smilacina stellata, and Betula occidentalis (one tree) are of occasional occurrence. The west canyon supports a small pond (Cove Lake) that runs for approximately 1/2 mile before entering the Big Wood River. The pond has a well developed aquatic bed dominated mostly by V. anagallis-aquatica and Mimulus guttatus. Scattered trees of Betula occidentalis are present on the margins of the pond. The lower moist slopes are dominated by stands of Rhus trilobata with scattered stems of Phragmites australis. The creek flows under basalt boulders for a short distance and re-emerges before its confluence with the Big Wood River. A diversion structure is in place at the confluence of the two channels. The site also includes an isolated small alcove, Woody's Cove, to the south. Birch Creek originates in Woody's Cove and supports unsurveyed stands of Juniperus scopulorum and Betula occidentalis. Birch Creek flows less than 1/4 of a mile through the alcove before being partially diverted into a fish rearing structure.

Rarity:

The plant species of concern Erigonum shockleyi shockleyi and Epipactis gigantea are present. A few shells of Anodonta californiensis were reported from this area (Bowler 1981).

Condition:

Two impoundments are managed by Idaho Power Company below the confluence of the Big Wood River and Cove Creek. A flume transports water from the upper impoundment to a hydro installation at the lower impoundment. A second flume diverts water to the Malad Power Plant. Idaho Parks and Recreation operates Malad Gorge State Park in the area, but few if any visitors venture to the springs.

Several introduced aquatic species are present including the mollusc Radix auricularia, smallmouth bass (Micropterus dolomieui), carp (Cyprinus carpio) and bullhead (Ictarus sp.).

Viability:

Water quality in the main channel is poor due to irrigation return flows via the Big Wood River. The presence of the green algae, Spirogyra sp., is indicative of irrigation enrichment.

Key Environmental Factors:
Information not compiled at this time.

Other Values:
The canyon is a spectacular gorge that has long been recognized as a scenic attraction. The site has been evaluated as a National Natural Landmark and it was found to be nationally significant for several geologic themes: sculpture of land, river systems and lakes, and caves and springs.

Conservation Intent:
Partially within a State Park. Other areas are managed by Idaho Power and private landowners. Designations to protect aquatic values should be pursued.

Management Needs:
Bowler (1981) suggests that all of the Big Wood River runoff (except enough to maintain the waterfall) be diverted to the Snake River Canyon to allow the main gorge aquatic ecosystem to recover from input of organic nutrient-rich water. This would result in successful restoration of the spring ecology.

Information Needs:
Upland vegetation is unsurveyed. It is likely that some remnant stands of sagebrush are present due to the inaccessibility of portions of the canyon.

Plant Community Occurrence:

THOUSAND SPRINGS DESERT AQUATIC ECOSYSTEM	G1 S1
RHUS TRILOBATA	G2 S2

Rare Plant Occurrences:

ERIOGONUM SHOCKLEYI VAR SHOCKLEYI	G5T4 S2
EPIPACTIS GIGANTEA	G3 S3

Rare Animal Occurrences:

MYOTIS CALIFORNICUS	G5 S1?

Author:
M. Jankovsky-Jones

THOUSAND SPRINGS, GOODING COUNTY

Location:
From Hagerman, proceed two miles south on U.S. Highway 30; turn left (east) on the road to Vader Grade. From the top of the Vader Grade, continue east about 3.5 miles to an intersection with a hard-surface, secondary highway running north-south. Turn right (south) and proceed 2.5 miles to a light duty road and turn right again. In 2.0 miles, at a "T" intersection, turn left. From this point, two approaches lead to the property, one is a road about 200 feet ahead and

to the right. It is marked with a sign indicating that it is the road to the Idaho Power Company Thousand Springs Picnic Area. Access to the site is by a locked gate at the Picnic Area. The second approach leads to the south end of the site and is reached by continuing south past the turnoff to the Picnic Area. In about 2/3 of a mile, take the right branch at the "Y" intersection, pass through the Sand Springs Ranch, and descend to the river by an unpaved road in a small ravine.

Richness:

Thousand Springs border the Snake River in the Hagerman Valley of southern Idaho. The area contains two of the last remaining undeveloped canyon wall springs of the Snake River Plains aquifer. The springs emerge from basalt flows that cascade over steep vegetated and unvegetated talus and boulderfields to deep, crystal clear channels leading to the Snake River. Canyon slopes are vegetated with a diverse mix of mesic forbs at spring heads and includes water birch (Betula occidentalis), smooth sumac (Rhus trilobata), and common reed (Phragmites australis). The stream channels at the base of the spring systems support the largest known population of the globally rare fish, Shoshone sculpin.

Rarity:

Thousand Springs provides habitat for the largest known population of Shoshone sculpin. The stream channels at the base of the spring system provide habitat for the desert valvata snail and Banbury Springs limpet. Giant helleborine is known to occur on canyon walls.

Condition:

Recorded history of the area began with the arrival of French trappers in the early 1800's. Pioneers began travelling the Oregon Trail in the 1840's. Springs were tapped for irrigation and hydro-power. The Thousand Springs Power Plant was completed by 1913. In the 1970's, trout farms were developed along the Thousand Springs reach.

Box elder, honey locust, black locust, blue spruce, weeping willow, lodgepole pine, Ponderosa pine, and Russian olive have been planted on the Ritter Ranch and the Idaho Power picnic area. Any of these species may be problematic, but the box elder, locust, and Russian olive all have the propensity to become established along riparian corridors. Tamarisk was reported on the Ritter Ranch in the 1980's and observed near the house at Sand Springs Creek in 1999. This weed should be eliminated. Bull thistle, teasel, and mullein are distributed along slopes and disturbed waterways. Bull thistle appears to be abundant on portions of the canyon wall seeps.

Viability:

Information not compiled at this time.

Key Environmental Factors:

Springs fed by the Snake River aquifer emerge along the northern side of the Snake River between Twin Falls and Bliss. Thousand Springs gush from the canyon wall via pervious strata beneath the rim. The springs appear and disappear several times through the talus. The position of the highest line of vegetation typically marks spring sources. Sand Springs emerge above the Snake River Canyon, but flows are augmented by springs at the base of the canyon which may indicate the beginning of a spring-fed alcove.

Other Values:
The constructed wetland at Thousand Springs serve as a model for farmers, dairy operators, fish farmers and municipal sewage plants for wetland design. The wetland is also an outdoor classroom and local students have planted over 20,000 wetland plants. The area has a rich human history preserved in the buildings and grounds that were developed in 1920 as a Guernsey breeding farm.

Conservation Intent:
Partially within an established Nature Conservancy Preserve. Portions of Sand Springs Creek are unprotected.

Management Needs:
Aquaculture and agricultural run-off have degraded the Snake River. A 30-acre wetland above the canyon rim was constructed by the North Side Canal Company to filter sediments and absorb nutrients from irrigation water, which previously entered spring creeks directly. The series of ponds and marshes have allowed TNC staff to experiment with the best ways to remove sediments and nutrients.

Information Needs:
Sand Springs Creek is unsurveyed above the rim of the Snake River Canyon.

Plant Community Occurrences:

BETULA OCCIDENTALIS/MESIC FORB	G3	S1
RHUS TRILOBATA	G2	S2
PHRAGMITES AUSTRALIS	G4	S4
SCIRPUS ACUTUS	G5	S4
THOUSAND SPRINGS DESERT AQUATIC ECOSYSTEM	G1	S1

Rare Plant Occurrences:

EPIPACTIS GIGANTEA	G3	S3

Rare Animal Occurrences:

VALVATA UTAHENSIS	G1	S1
LANX SP 1	G1	S1

Author:
Jankovsky-Jones, M.

BANCROFT SPRINGS

Location:
Bancroft Springs are located ca 5 miles S (upstream) of King Hill. On Interstate 84, take the W King Hill exit. Travel S on the Park Loop Road to pavement end. Continue on the gravel road ca 1 mile to the intersection with several gravel roads. Continue S on the W-most road paralleling the railroad tracks for ca 0.5 mile. This road continues across the railroad tracks for ca 0.25 miles before dropping down a rocky grade (passable to high clearance 4-wheel drive vehicles) to the Snake River Canyon. Continue N on this road by foot or 4-wheel drive for ca 0.5 mile to the road end. At this point game trails are present leading to

Bancroft Springs.

Richness:

Bancroft Springs emanate near the base of the Snake River Canyon. The upper canyon walls are little vegetated basalt cliffs and talus slopes. The lower canyon, where low flowing seeps emerge, supports stands of Sarcobatus vermiculatus and Chrysothamnus nauseosus with scattered Elymus cinereus. Spring heads and lower slopes are vegetated with dense bands of Urtica dioica. The terrace above the Snake River supports scrub-shrub and emergent wetlands, the most notable being a 6-acre Typha latifolia dominated wetland. In addition to stands of cattails, the emergent wetland includes open water surrounded by Veronica anagallis-aquatica and Rorippa nasturtium-aquatium and a raised bench with Sarcobatus vermiculatus and Chrysothamnus nauseosus. Scrub-shrub wetlands are present upstream and include a fringe of Salix exigua on channel banks. Several other shrubs are present away from the channel including Celtis reticulata, Ribes aureum, Rhus rydbergii and Clematis ligusticifolia. A patch of nonnative trees including Acer negundo, Robinia pseudoacacia and Catalpa speciosa is also present.

Rarity:

Bancroft Springs is of regional significance due to the presence of emergent habitat. This is somewhat uncommon along the middle Snake River. Communities that occur in this area are Typha latifolia and Sacrobatus vermiculatus/Elymus cinereus. The springs also provide habitat for several mollusc species of concern.

Condition:

The understory of Sacrobatus stands is mostly dominated by Bromus tectorum. A stand of trees in the middle of the site includes stems of the nonnative Acer negundo, Tamarisk chinensis, Catalpa speciosa and Robinia pseudoacacia.

Viability:

Information not compiled at this time.

Key Environmental Factors:

Springs emanating from the base of the Snake River Canyon create a 20 acre wetland. The springs are undeveloped and have a minimum stream flow water right of 17 cfs.

Other Values:

Bancroft Springs supports 4 wetland types forested (nonnative), scrub-shrub, emergent and open water. This structure provides habitat for a variety of species from deer to song birds. The Bancroft Springs area has been designated as having outstanding scenic values by the Idaho Department of Water Resources (1993).

Conservation Intent:

The area is proposed as a mitigation and enhancement project by Idaho Power Company (Cole et al. 1998)

Management Needs:

It would be worthwile to remove nonnative woody species especially the agressive Tamarisk chirensis.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

TYPHA LATIFOLIA	G5 S4
SARCOBATUS VERMICULATUS/ELYMUS CINEREUS	G3 S2

Rare Animal Occurrences:

ANODONTA CALIFORNIENSIS	G3 S?
PYRGULOPSIS IDAHOENSIS	G1 S1
FISHEROLA NUTTALLI	G2 S1
PHYSA NATRICINA	G1 S1
TAYLORCONCHA SERPENTICOLA	G1 S1

Author:
M. Jankovsky-Jones

DEVILS CORRAL

Location:
Devils Corral is located along the N side of the Snake River approximately 4.1 miles N of the town of Kimberly. Access is via unnamed dirt roads between the Snake River and Interstate 84.

Richness:
Devils Corral is an extensive alcove on the N side of the Snake River near Twin Falls. The alcove was apparently created by catastrophic flows from Lake Bonneville. The canyon includes steep basalt cliffs and talus, sagebrush, and springs. Basin big sagebrush (Artemisia tridentata tridentata) is present on terraces and gently sloping canyon sides. Springs emerge from both the canyon side walls and canyon bottom to create pools, waterfalls, and streams. Two spring creeks are present, one flowing to the west and the other flowing to the south. The west flowing spring creek includes mostly narrow high gradient reaches that originate from seeps on the canyon wall. Canyon walls support occasional patches of shrubs dominated by smooth sumac (Rhus trilobata) and western white clematis (Clematis ligusticifolia). Vegetation along high gradient reaches is dominated by smooth sumac with small patches of water birch (Betula occidentalis). Patches of common chokecherry (Prunus virginiana) are present on lower canyon slopes along this reach also. Slightly lower gradient reaches support common reed (Phragmites australis) and localized patches of common cattail (Typha latifolia). Two small pools in the northern portion of Devils Corral lack inlets or outlets, but are likely connected via underground flows to the southerly trending spring creek. The pools are mostly lined with hardstem bulrush (Scirpus acutus) with a localized patch of coyote willow (Salix exigua) at the uppermost pool. The south flowing spring creek starts out as a small hardstem bulrush lined pond and flows as a low gradient channel for approximately 1000 feet before dropping over a small fall and flowing through a narrow valley for approximately 1500 feet to the Snake River. The lower reach has smooth sumac on canyon sides with small islands of mesic forbs including

western goldentop (Euthamnia occidentalis), stinging nettle (Urtica dioica) and water hemlock (Cicuta douglasii).

Rarity:

Devils corral includes two aquatic springs with spring creeks, waterfalls and pools. Large occurrences of Epipactus gigantia are known from both spring creeks at Devils Corral. The fishery contains rainbow trout and cutthroat trout, and habitat is described as superior (Idaho Water Resources 1993). Wildlife use is high and includes numerous raptors, song birds, and small mammals.

Condition:

The area is used by hikers, fishermen and off-road vehicle (ORV) users. Most of the canyon has been grazed in the past decade. However, the disturbance is confined to the upper canyon and has minimal effects on aquatic systems.

Most of Devils Corral was heavily grazed over a long period and cheatgrass (Bromus tectorum) is ubiquitous. White poplar (Populus alba), lilac, cultivated iris, and Russian olive (Elaeagnus angustifolia) are present and established in an area which may have once housed home sites near the divide between the two streams. Other nonnative species including Canada thistle (Cirsium arvense) and salt cedar (Tamarix chinensis) are present yet overall exotics have minor impact on the aquatic habitats.

Viability:

Information not compiled at this time.

Key Environmental Factors:

Information not compiled at this time.

Other Values:

Devils Corral is a geological wonder. The force of Lake Bonneville floodwaters formed the canyons in only a few days or weeks. The area has high potential for development of interpretive materials due to its rich colorful history, ecological and geological features, and proximity to the city of Twin Falls.

Conservation Intent:

Devils Corral is part of the Dry Cataracts Potential National Natural Landmark that was recommended because of national signifance without reservation in 1978. No action has taken place on this. Devils Corral is an aquatic remnant that should be given high priority for voluntary protection or acquisition.

Management Needs:

Information not compiled at this time.

Information Needs:

Information not compiled at this time.

Plant Community Occurrences:

THOUSAND SPRINGS DESERT AQUATIC ECOSYSTEM	G1 S1
PRUNUS VIRGINIANA	G4Q S3
RHUS TRILOBATA	G2 S2
PHRAGMITES AUSTRALIS	G4 S4
SCIRPUS ACUTUS	G5 S4

Rare Plant Occurrences:
EPIPACTIS GIGANTEA G3 S3

Author:
M. Jankovsky-Jones

SHOSHONE FALLS PARK

Location:
Shoshone Falls Park is ca 2 miles northeast of Twin Falls on the south side of the Snake River Canyon

Richness:
Shoshone Falls Park is located in a steep, north-facing canyon side with numerous seeps and springs that provide surface and groundwater for extensive riparian vegetation. The canyon is a relic of the Bonneville Flood, a catastrophic torrent that ripped through the canyon about 15,000 years ago. Artemisia tridentata wyomingensis vegetation dominates the dry portions of the canyon including some sandy deposits that have nice stands of A. tridentata wyomingensis/Stipa comata. Canyon side riparian vegetation on the very steep slopes is dominated by Rhus trilobata, which sometimes cascades over cliff bands. Seepy cliff faces are dominated by Aquilegia formosa hanging gardens. Epipactis gigantea, a rare orchid, occurs at springs heads often on travertine.

Rarity:
There are extensive stands of Rhus trilobata and Artemisia tridentata wyomingensis/Stipa comata communities and a rare orchid, Epipactis gigantea.

Condition:
There were no land uses observed that threaten site viability.

The locally common exotic species, Cirsium arvense, is present.

Viability:
Information not compiled at this time.

Key Environmental Factors:
Extensive canyon springs and seeps maintain constant hydrology to maintain riparian vegetation and species.

Other Values:

Conservation Intent:
The site has benign protection within a city park.

Management Needs:
There are no management needs.

Information Needs:

Need to determine origin of spring water.

Plant Community Occurrences:

ARTEMISIA TRIDENTATA WYOMINGENSIS/STIPA COMATA	G2	S2
RHUS TRILOBATA	G2	S2

Rare Plant Occurrences:

EPIPACTIS GIGANTEA	G3	S3

Author:
R. K. Moseley

VINEYARD CREEK

Location:
Vineyard Creek lies off Interstate 80, about 2 miles west of the intersection with Highway 50, on the north side of the Snake River.

Richness:
Vineyard Creek is part of the great Snake River system which was produced about 30,000 years ago when ancient Lake Bonneville overflowed at Red Rocks Pass, Idaho and produced a tremendous catastrophic flood down the Snake River Canyon. Vineyard Creek lies on the basalt of Hansen Butte, and represents a typical yet spectacular box canyon with springs, a stream, lake, and waterfalls. The lake itself did not come into existence until Milner Dam was built and changed the water tables. Spring channels are mostly lined with Ribes aureum with lesser amounts of Rhus trilobata. A dense shrubland of Ribes aureum with Toxicodendron rydbergii in the understory is present in a seasonally moist swale southeast of Vineyard Lake. A stand of Artemisia tridentata tridentata/Elymus cinereus is present on a bench above lower reaches of Vineyard Creek. Artemisia tridentata tridentata/Stipa comata and Artemisia tridentata tridentata/Agropyron spicatum community types are in the uplands. The site contains a population of Epipactis gigantea (special status plant species) around lakes and ponds and along spring creeks. Spawning habitat for a unique cutthroat/rainbow hybrid trout, and habitat for the Bliss Rapids Snail are provided within the site.

Rarity:
Aquatic habitats are the principal ecological feature of the Vineyard Creek area and include the headwater springs, the spring creek, Vineyard Lake and the waterfall exiting the lake. Epipactis gigantea occurs along the creek, springs and on cliff walls. Riparian areas provide spawning habitat for a unique cutthroat/rainbow hybrid trout, and habitat for the Bliss Rapids snail.

Condition:
Cirsium arvense is widespread in stands of Ribes but seems to pose minimal threats. Dipsacus sylvestris and Elaeagnus angustifolia are abundant along the channel fed by irrigation return flow and in the backwater created by Twin Falls dam. Sagebrush dominated vegetation within the area is disturbed and Bromus tectorum is the dominant understory grass.

Viability:
Most of the Snake River Canyon system has been exploited and developed for hydroelectric power, irrigation, fish hatcheries, recreation, and other uses. The flows at Vinyard Creek have not been tapped.

Key Environmental Factors:
Information not compiled at this time.

Other Values:
A number of box canyons occur along the Snake River, but many of them are dry or have been developed, which makes this undeveloped tract even more valuable. The canyon with its water features is of considerable geologic interest.
Recreational values are high because of the scenic quality of the area and its proximity to the Twin Falls population center.

Conservation Intent:
Vineyard Creek is an established BLM RNA/ACEC. It is also an Idaho Power Mitigation site for Twin Falls Hydro Relicensing. Irrigation return flows were routed away from Vineyard Creek in 1996 as part of the mitigation.

Management Needs:
Irrigation return flow is routed into the box canyon just west of Vineyard Lake. The flows previously entered Vineyard Creek but have been rerouted with some success.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

ARTEMISIA TRIDENTATA TRIDENTATA/STIPA COMATA	G4Q S4
ARTEMISIA TRIDENTATA TRIDENTATA/ELYMUS CINEREUS	G2 S1
ARTEMISIA TRIDENTATA TRIDENTATA/AGROPYRON SPICATUM	G2G4 S1
THOUSAND SPRINGS DESERT AQUATIC ECOSYSTEM	G1 S1

Rare Plant Occurrences:

EPIPACTIS GIGANTEA	G3 S3

Author:
S. Rust and M. Jankovsky-Jones

TNC TRACT-SNAKE RIVER BIRDS OF PREY

Location:
About 2.5 miles SE of Sinker Butte; ca 0.5 mile north of the mouth of Sinker Creek; on the E side of the Snake River, between river mile 459 and 460.

Richness:
The site is a river terrace adjacent to the dam pool behind Swan Falls Dam in the Snake River canyon. The shoreline is meandering and creates embayments largely dominated by Scirpus acutus. Most of the terrace is habitat for the Sarcobatus vermiculatus/Distichilis stricta community. Extensive stands of Salix

exigua/Barren occur along the river edge. Adjacent canyon slopes are dominated by Atriplex confertifolia communities.

Rarity:
Contains an excellent, undisturbed example of the Sarcobatus vermiculatus/Distichilis stricta community. The rare plant, Teucrium canadense, also occurs here.

Condition:
Light recreational use.

Dense stands of Russian olive tress occur in a few areas around the site. They should be monitored and controlled if they increase much more than they already are.

Viability:
Information not compiled at this time.

Key Environmental Factors:
Fluctuations of the dam pool control the hydrology of the site. Fire burned a portion of the Sarcobatus community and most of the upland canyon sides within the last few years.

Other Values:
The site is sometimes used by floating recreationists. Waterfowl and shorebirds use the site for loafing, feeding, and possibly nesting.

Conservation Intent:
The area is an established preserve managed by the Nature Conservancy.

Management Needs:
Monitoring of fire recovery and Russian olive population.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

SALIX EXIGUA/BARREN	G5 S4
SARCOBATUS VERMICULATUS/DISTICHLIS STRICTA	G4 S1
SCIRPUS ACUTUS	G5 S4

Rare Plant Occurrences:

TEUCRIUM CANADENSE VAR OCCIDENTALE	G5T5?S2

Author:
R. K. Moseley

NIAGARA SPRINGS

Location:

Niagara Springs is located about 9 miles southeast of Wendell, Idaho. From Wendell, travel south for approximately 8 miles on the Rex Lelend Highway to the Niagara Springs Grade. Continue down the rim of the Snake River Canyon and travel east approximately 1.5 miles to Niagara Springs.

Richness:

Niagara Springs includes magnificent cascades emanating from the lower Snake River Canyon wall. The springs are the sixth largest spring system in the Thousand Springs complex and one of the few springs that have only been moderately developed. The springs are vegetated with a rich mix of mesic forbs including Mimulus guttatus and Veronica anagallis-aquatica on small islands scattered amongst the rushing water. Stands of Betula occidentalis are also present on margins of the springs. Upper slopes are basalt cliffs and talus with patches of Rhus trilobata and Sarcobatus vermiculatus on lower slopes.

Rarity:

Niagara Springs have an average flow of 250 cubic feet per second and remain as one of the largest moderately developed springs along the Snake River.

Condition:

No exotics were observed.

Viability:

Pugmire and Crystal Springs State Parks and Idaho Power's Niagara Springs Hatchery are adjacent. These areas likely draw additional visitors to the area.

Key Environmental Factors:

Water draining the mountains of Central Idaho soaks into the basalt of the northern Snake River Plain. This water percolates to the south and reemerges in springs along the northern canyons of the Snake River. From Twin Falls to King Hill, about 160 billion cubic feet of natural flowing water entered the Snake River Canyon. Since irrigation of the plain began, this has increased to about 200 cubic feet per year.

Other Values:

Niagara Springs are recognized as one of the best remaining examples of cascading springs along the middle Snake River. The springs have very high scenic values.

Conservation Intent:

Niagara Springs are designated as a National Natural Landmark. This designation is compatible with maintaining biodiversity values.

Management Needs:

The area should be managed to maintain water quality and quantity.

Information Needs:

Information not compiled at this time.

Plant Community Occurrences:

BETULA OCCIDENTALIS/MESIC FORB	G3	S1
THOUSAND SPRINGS DESERT AQUATIC ECOSYSTEM	G1	S1

Rare Plant Occurrences:

EPIPACTIS GIGANTEA G3 S3

Author:
M. Jankovsky-Jones

FORT BOISE

Location:
Fort Boise is located northwest of Parma, Idaho. Take Interstate 84 from Boise to exit 26 (Notus-Parma) and go west on Highway 20-26 through Parma. Three miles past Parma turn left onto Old Fort Boise Road. Go 2 miles west to the WMA entrance.

Richness:
Fort Boise is located at the confluence of the Snake River, Boise River, and Owyhee River. Wetlands are associated with the river floodplain, its oxbows and sloughs, and with islands within the braided channel of the Snake River. The floodplain contains a large area of natural and human-made ponds and marshes. The water levels are maintained by a network of ditches that are fed by irrigation return flow entering via Sand Hollow Creek. The ponds have steep or moderately sloped banks with stands of the tall emergent species Scirpus acutus and Typha latifolia in permanently flooded sites. Over a dozen large ponds and numerous smaller ponds, ditches, and swales support stands of the latter emergent species. The noxious weed, Lythrum salicaria, is interspersed and locally dense in cattail and bulrush stands. Between ponds and ditches on the former floodplain, seasonally flooded and intermittently flooded areas support mostly exotic vegetation including patches of Elaeagnus angustifolia and Lepidium perfoliatum, and stands of Conium maculatum, and Kochia scoparia. Some of the drier meadows have been seeded with Agropyron elongatum, other areas have been planted with wildlife food crops including corn, milo, wheat, and sunflowers. Some remnant patches of native vegetation included those dominated by Phragmites australis, Agropyron smithii (with Elymus triticoides), Sarcobatus vermiculatus, and Distichlis spicata. The other major wetland area is the floodplain of the Boise River and delta and the channel of the Snake River including its islands. Most of this area is flooded annually. The islands and river channel banks are mostly dominated by exotic trees and shrubs including the following species: Populus deltoides, P. fremontii, Acer spp., Salix alba, Ulmus spp., and Elaeagnus angustifolia. While the native shrubs Rosa woodsii and Ribes aureum are present in the understory, the herbaceous layer is dominated by exotic herbaceous species. Small patches of Salix exigua and Salix lasiandra are along riverbanks, point bars, or flood channels. Small scrub-shrub patches in gaps between trees are a mix of Rosa woodsii, Ribes aureum, Salix lutea, Amorpha fruticosa, and Salix exigua, with weedy understories. River banks and mud flats that are exposed at the end of the growing season support Polygonum spp., Cyperus spp., exotic annuals (Echinochloa crus-galli and Heleochloa alopecuroides), and Lythrum salicaria.

Rarity:
Canada geese, mallards, gadwalls, cinnamon teal, and wood ducks commonly nest at Fort Boise. Shorebirds include great and snowy egrets, black-crowned night herons, and greater yellowlegs. Larger water birds include American white

pelicans, double-crested cormorants, and ring billed gulls. Upland game birds include ring-necked pheasants, California quail, and wild turkeys. Big game includes mule and white tail deer. Numerous small mammals and raptors are also reported in the area.

Condition:

Management of the area as a Wildlife Management Area for waterfowl habitat improvement began in the 1960's. Both natural and enhanced/created wetlands are within the site. Water development includes dredged ponds, dikes, and ditches. Food plots are developed for wildlife and uncut alfalfa fields provide habitat for upland game birds.

Widespread noxious weeds include Lepidium latifolium and Lythrum salicaria. There are many other noxious weeds and exotics including Conium maculatum, Cirsium arvense, Chenopodiaceae spp., Cirsium vulgare, Bromus spp., and many exotic woody species.

Viability:

Irrigation return water polluted by fertilizers, pesticides, herbicides, and excessive siltation is a source of pollution. Aerial drift chemicals sprayed on adjacent farms may be a potential problem.

Key Environmental Factors:

Managed water system and "natural" floodplain regime.

Other Values:

The area provides public access for hunting, fishing, hiking, and wildlife viewing. Fort Boise is recognized as a State Important Bird Area by the National Audubon Society and the American Bird Conservancy.

Conservation Intent:

Established Wildlife Management Area.

Management Needs:

Exotic species, mainly Lythrum salicaria and Lepidium latiforium, should be controlled where they threaten to invade native communities. Restoration of meadows to native mesic shrubs and graminoids should be considered.

Information Needs:

Information not compiled at this time.

Plant Community Occurrences:

SALIX EXIGUA/BARREN	G5 S4
SALIX LASIANDRA/MESIC FORB	? SP
SARCOBATUS VERMICULATUS/DISTICHLIS STRICTA	G4 S1
PHRAGMITES AUSTRALIS	G4 S4
AGROPYRON SMITHII	G3G5QS1
DISTICHLIS STRICTA	G5 S4
SCIRPUS ACUTUS	G5 S4
TYPHA LATIFOLIA	G5 S4

Rare Animal Occurrences:

HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N

Author:
C. Murphy

THREE ISLAND CROSSING

Location:

Three Island Crossing is located south of Interstate 84 (Glenns Ferry exit) along the Snake River, near Glenns Ferry. The site consists of three primary segments: a large contiguous parcel located between the south bank of the Snake River and the southern portion of Three Island Crossing State Park; the three islands within the river corridor that somewhat connect the north and south banks of the Snake River; and a narrow parcel following the south bank of the Snake River for about 0.6 mile downstream of the islands.

Richness:

Three Island Crossing includes a stretch of land bordering the south bank of the Snake River for 2.2 miles, and the islands within the river corridor. The site provides values as a historical river crossing as well as values for a variety of wildlife, some of which are special status species. For the purpose of describing the ecological features, the property can be divided into five general areas: the upland irrigated agricultural ground, the upland rangeland, the riparian vegetation along Deadman Creek, the emergent wetland at the mouth of Deadman Creek, and the riparian vegetation along the Snake River and its islands. Currently, the upland agricultural ground is sprinkler irrigated and used for growing alfalfa. The upland range habitat is dominated by cheatgrass with greasewood interspersed. The riparian corridor formed by Deadman Creek is characterized by an overstory of willow trees with a small group of old and decadent Lombardy poplars and a minor composition of Russian olive, especially at the north end. The understory along Deadman Creek is dominated by annual weeds, with residual Great Basin wild rye, quack grass, and some young willow, which have been suppressed by browsing. The emergent wetland habitat at the mouth of Deadman Creek is dominated by bulrush and cattail. Dominant riparian species along the Snake River and its islands include greasewood, rose, coyote willow, yellow willow, saltgrass, beardless wildrye, common reed, Great Basin wildrye, and significant amounts of kochia in the disturbed areas. The riparian zone west of the Deadman Creek wetland has a number of box elder and Siberian elm trees. Russian olive cover is 1% or less of the riparian habitat.

Rarity:

This stretch of the Snake River is in the delineated habitat of the Idaho springsnail (Pyrgulopsis idahoensis). Bald eagles (Haliaeetus leucocephalus) are known to winter in the area. Other special status species in the vicinity (downstream) of the site are a freshwater mussel called the California floater (Anodonta californiensis), and the white sturgeon (Acipenser transmontanus). Trumpeter swans (Cygnus buccinator), American white pelican (Pelecanus erythrorhynchos), long-billed curlew (Numenius americanus), western burrowing owl (Athene cunicularia hypugaea), Brewer's sparrow (Spizella breweri), sage sparrow (Amphispiza belli), and western toad (Bufo boreas) have been observed in the area. Four special status plant species, Astragalus purshii ophiogenes, Penstemon janishiae, Eriogonum shockleyi shockleyi, and Cyperus rivularis are known from the area as well.

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:
The site is adjacent to Three Island State Park and is a historical Oregon Trail river crossing. Upland game birds, waterfowl, and a variety of common birds benefit from the area habitat.

Conservation Intent:
The area is managed as a state park.

Management Needs:
Information not compiled at this time.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

SALIX EXIGUA/BARREN	G5	S4
PHRAGMITES AUSTRALIS	G4	S4
SCIRPUS ACUTUS	G5	S4

Rare Animal Occurrences:

PYRGULOPSIS IDAHOENSIS	G1	S1

Author:
L. Williams

ROSWELL MARSH

Location:
Roswell Marsh is ca 3 miles southwest of Parma, Idaho. From Boise, drive west on Interstate 84 to the Notus-Parma exit (Highway 20-26). Travel west on Highway 20-26 to Parma. Turn Left on State Highway 18 and travel south ca 3 miles to Roswell. Turn right and travel west on Adrian Road for ca 1.75 miles to Roswell Slough Marsh.

Richness:
Roswell Marsh occupies an undeveloped alkaline wetland remnant in an old oxbow of the Snake River. The area is currently used as a drain receiving return irrigation water. Water is channeled through a series of ditches between low dikes and into three small ponds. These ponds are in the "south unit" (south of Adrian Road); the "north unit" is separated by private land (see land ownership map). The south unit occupies a marshy, low area with extensive Typha latifolia

(mixed with Scirpus acutus) around the pond margins, banks, and sometimes in ditches with deeper water. Dikes are the highest wetland elevation areas here and support weedy species (e.g. Phalaris arundinacea, Lepidium latifolium, Kochia scoparia, Cirsium spp., Atriplex spp., etc.), Distichlis spicata, Phragmites australis, and a few exotic species (e.g. Populus deltoides, Ulmus pumila, Elaeagnus angustifolia, Robinia pseudoacacia). The dikes receive land manager vehicle use and hunter/birdwatcher foot traffic. Wetlands that are slightly lower in elevation have scattered Sarcobatus vermiculatus/Distichlis spicata stands. The lower elevation wetlands also have mostly alkaline encrusted soils with large stands of Distichlis spicata where wetlands are ephemerally flooded and saturated into the fall. Scirpus americanus, Juncus balticus, and Distichlis spicata (often with Scirpus nevadensis) occupy the shallow ditches and swales (some have shallow standing water in fall). Eleocharis rostellata is found in similar areas but nearly always in sub-irrigated standing-water areas. There are some large stands of weedy forbs mixed with Eleocharis rostellata and Juncus balticus near Adrian Road including Solidago sp., Asclepias incarnata, Cirsium arvense, Lepidium latifolium, Lythrum salicaria, Cirsium vulgare, and Kochia scoparia, which all are common. The north unit has slightly higher elevation and is mainly composed of fair to good quality Sarcobatus vermiculatus/Distichlis spicata with some large weedy patches near the Alkali Drain (e.g., Kochia scoparia and Lepidium latifolium). The Alkali Drain and Scott Drain are steep-banked canals with poor quality, weedy riparian species (e.g. Salix alba x fragilis, Elaeagnus angustifolia, Phalaris arundinacea). There are two alkaline vernal pools in potholes with standing water. They are ringed by saturated alkaline soil with stands of mixed Scirpus nevadensis and Distichlis spicata (with S. vermiculatus/D. spicata) growing around them. The surrounding private parcels (e.g. units 9 and 4, which link the north and south units), and 8, 10, 11, and 12 (see ownership map) are all similar vegetation and suitable for conservation.

Rarity:

Roswell Marsh supports a high quality and extensive (250 acres) stand of a Sarcobatus vermiculatus community.

Condition:

Recreation and manager travels are confined to dikes and should remain so. Water levels should be maintained, as they are to date in order to maintain Eleocharis rostellata and Scirpus spp. Cattle and off-road vehicles can access unfenced west portion of the "north unit", causing degradation.

Lythrum salicaria, Cirsium arvense, Kochia scoparia, Lepidium latifolium are all established and locally dense.

Viability:

Aerial pesticide/herbicide application on farms polluted irrigation water and changes in irrigation return flow are all threats.

Key Environmental Factors:

Information not compiled at this time.

Other Values:

Information not compiled at this time.

Conservation Intent:

Portions of the marsh are managed as a Wildlife Management Area or have conservation easements. Voluntary protection of other private lands or acquisition should be pursued.

Management Needs:
Exotic species need to be monitored and controlled.

Information Needs:
Information not compiled at this time.

Plant Community Occurrence:

SARCOBATUS VERMICULATUS/DISTICHLIS STRICTA	G4 S1
DISTICHLIS STRICTA-SCIRPUS NEVADENSIS	G4 SP
PHRAGMITES AUSTRALIS	G4 S4
DISTICHLIS STRICTA	G5 S4
JUNCUS BALTICUS	G5 S5
SCIRPUS ACUTUS	G5 S4
SCIRPUS AMERICANUS	G3Q S1
TYPHA LATIFOLIA	G5 S4
ELEOCHARIS ROSTELLATA	G2 S2

Author:
C. Murphy

TWIN FALLS PARK

Location:
Twin Falls Park is approximately 5 miles east of the city of Twin Falls. The site includes the canyon walls and spring creeks on the south side of the Snake River.

Richness:
Springs emerge along the south side of the Snake River Canyon at Twin Falls Park. Seepy areas above the main springs are dense thickets of Rosa woodsii, Rhus trilobata and Ribes aureum. Springs include poorly vegetated basalt strewn channels and areas vegetated with Urtica dioica, Rorippa nasturtium-aquaticum, Rumex crispus and Epipactis gigantea.

Rarity:
Twin Falls Park contains a large population of Epipactis gigantea. It is also somewhat unique as it represents one of the larger springs that emerge on the south side of the river. (Most Middle Snake River springs are fed by aquifers north of the Snake River.)

Condition:
The springs are adjacent to a fully developed park and most recreational use occurs in the developed areas. Some collection of the nonnative spring species Rorippa nasturtium-aquatium does occur.

No exotic impacts on spring habitat observed.

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:
Currently managed by Idaho Power Company as a park. Springs should be managed to maintain water quality and water quantity.

Management Needs:
Information not compiled at this time.

Information Needs:
The hydrology of spring systems on the south side of the Snake are poorly described and some even speculate that they are driven by agricultural run-off. This seems unlikely at Twin Falls Park due to water quality and species composition at the springs.

Plant Community Occurrences:

THOUSAND SPRINGS DESERT AQUATIC ECOSYSTEM	G1	S1

Rare Plant Occurrences:

EPIPACTIS GIGANTEA	G3	S3

Author:
R. K. Moseley and M. Jankovsky-Jones

BIRDING ISLANDS

Location:
Birding Islands is located just northeast of the town of New Plymouth in west-central Idaho's Payette County. From Boise, drive west on Interstate 84 to exit 9 and travel 4.5 miles on State Highway 30 through the town of New Plymouth. Just past the New Plymouth Post Office look for the Birding Island South Sign. Turn east onto Idaho Street and drive 0.5 miles to Holly Avenue. Turn north and follow Holly Avenue 1.5 miles to NW Second Avenue. Turn east and follow this road 0.7 miles to the south access to Birding Island. To access the north side of Birding Island, turn right on Northeast First Avenue, which is less than 1 mile north of New Plymouth on Holly Ave. Follow the road as it turns north onto Willow Creek Road and cross the Payette River on Black Bridge Road. Turn left on Highway 52 for about 2 miles and turn left on the road marked Birding Island North.

Richness:
Birding Islands consists of a scattered group of islands along the lower Payette River. The islands split the river into 2 to 4 distinct channels. Overbank flooding does occur within the area. Low lying alluvial bars, point bars, and

overflow channels are scoured annually with sand and silt deposits supporting stems of Salix exigua and other woody species such as S. lutea, S. lasiandra, Amorpha fruticosa, Populus trichocarpa and P. deltoides saplings. While cover of understory species is low, diversity is high including numerous ephemeral annual species such as Cyperus spp., Eleocharis spp., Eragrostis spp., Gnaphalium palustre, Veronica peregrina, and others. Vernal pools supporting the previously mentioned species are also present in swales where alluvial deposits have greater amounts of silt and clay. Higher bars subject to only occasional flooding are dominated by shrubs including Salix exigua, Amorpha fruticosa, or Ribes aureum with a barren understory or with species tolerant of dry well drained soils. Patches of Eleocharis palustris and Scirpus tabernaemontani are present in areas with permanent water such as backwater sloughs and along channel banks. Alluvial terraces are present at or just above the annual highwater mark with lush stands of tall shrubs and trees including Salix lutea, Populus trichocarpa, P. deltoides or Salix amygdaloides. Exotic hardwoods such as Ulmus, Catalpa, Acer saccharum, Salix alba, and Fraxinus pennsylvanica are also abundant. The understories of shrub and forest stands are frequently dominated by nonnative species such as Phalaris arundinacea but some stands have an abundance of native species including Solidago gigantea, Euthamia occidentalis, Smilacina sp., and Carex lanuginosa. Forest and shrub stands are also found on the highest deposits of smaller islands. A managed water system where canals carry irrigation return water from neighboring farms to human created ponds are present on the floodplain. The ponds are dominated by a matrix of Typha latifolia with patches of Scirpus acutus and Lythrum salicaria. Some areas adjacent to the ponds are alkaline and support Scirpus americanus. The driest and highest elevation portions of the floodplain and the two largest islands are dominated by mostly high quality stands of Sarcobatus vermiculatus/Distichlis spicata. Small inclusions of the grasses Carex praegracilis and Elymus triticoides are also present.

Rarity:

Possibly one of the largest stands of Sarcobatus vermiculatus in the state is in this area. There are unusual vernal pools and the formerly tracked Cyperus rivularis is present.

Condition:

Recognizing the importance of the Payette River for nesting waterfowl Idaho Department of Fish and Game began acquiring tracts for management as a Wildlife Management Area in 1960. The area is primarily managed to benefit waterfowl. Management practices include maintaining goose platforms, establishment of brood ponds and nesting islands, and developing goose pasture. The pasture is planted with alfalfa and a mix of grasses and is grazed seasonally by cattle to maintain an open condition. Food plots for wildlife have also been planted in corn, milo, and wheat. Thick, dense plots of wheatgrass and alfalfa provide hiding, nesting, and winter habitat. Tree and shrub stands have also been planted to provide additional structure and habitat diversity. To provide cover for game fish and increase insect numbers aquatic vegetation has been planted and trees have been submerged in some of the ponds.

Control of Lythrum salicaria is needed; other exotic species including Phalaris arundinacea, Cirsium arvense, Lepidium latifolium, Conium maculatum, and Bromus tectorum are common and spread by ground disturbing activities.

Viability:

Neighboring property owners have placed bank stabilizing rip-rap. Herbicides, pesticides, and fertilizers enter via canal water or by aerial drift.

Key Environmental Factors:

The Payette River is free flowing with the majority of its channel area unconfined and with an active floodplain.

Other Values:

Birding Islands provide prime nesting habitat for Canada geese and other waterfowl. The WMA is a spring resting and feeding area for sandhill cranes heading to nesting areas further north. The river is habitat for a variety of other wading and shorebirds including snowy egret, great blue herons, black-crowned night heron, American bitterns, white pelicans, and long bill curlews. Bald eagles winter in the area and a number of other raptors use the area for all or part of the year. Water loving songbirds including marsh wrens, yellow and Wilson's warblers, lazuli buntings, northern orioles, and yellow-breasted chats. Mule and white tail deer feed in open field near cover in the mornings and at dusk. Small mammals are common at Birding Island and include muskrat, mink, beaver, raccoon, skunk, red fox, and coyote. Reptiles and amphibians include gopher snakes, rubber boas, racers, short-horned lizards, bullfrogs, and western toads.

Conservation Intent:

Birding Islands is mostly within an established Wildlife Management Area. There is potential for projects to enhance habitat values on adjacent private lands.

Management Needs:

Information not compiled at this time.

Information Needs:

Information not compiled at this time.

Plant Community Occurrences:

SALIX EXIGUA/BARREN	G5 S4
SARCOBATUS VERMICULATUS/DISTICHLIS STRICTA	G4 S1
SALIX LUTEA/BENCH	? SP
POPULUS TRICHOCARPA/ROSA WOODSII	G4 S3
DISTICHLIS STRICTA	G5 S4
CAREX PRAEGRACILIS	G2G3QS2
ELEOCHARIS PALUSTRIS	G5 S3
SCIRPUS ACUTUS	G5 S4
SCIRPUS AMERICANUS	G3Q S1
TYPHA LATIFOLIA	G5 S4
SCIRPUS VALIDUS	G4 S2

Rare Plant Occurrences:

CYPERUS RIVULARIS	G5 S2

Author:

C. Murphy

MONTOUR

Location:

From Boise, drive either to Emmett or Horseshoe Bend. From Emmett, take Highway 52 east for about 13 miles past Black Canyon Reservoir to the Sweet-Ola road junction. From Horseshoe Bend, take Highway 52 west to the Sweet-Ola road junction, which is about 10+ miles. Turn south on Sweet-Ola road for 1 mile to the north boundary of the Montour Wildlife/Recreation Area.

Richness:

The Montour Valley is a lush valley in contrast with the adjacent sagebrush covered uplands. Historically, the valley was a small town site with homesteads, hay fields, and ranches. With the closure of Black Canyon Dam sediment began filling the upper end of the reservoir reducing the capacity and eventually inundating the community of Montour. The majority of the valley is dominated by herbaceous emergent species. Wetter areas support stands of Carex lanuginosa, C. nebrascensis, C. praegracilis, C. vulpinoidea, Eleocharis palustris, Juncus balticus, J. effusus, and Scirpus pallidus. Slightly alkaline intermittently flooded sites support stands of Distichlis spicata. Most of the emergent wetlands grade into old hay fields and pasture dominated by the grasses Phalaris arundinacea, Festuca arundinacea, Poa pratensis, Agrostis stolonifera and other nonnative pasture grasses. Ponds, ditches and sloughs that are flooded for most of the year support stands of Typha latifolia with occasional patches of Scirpus validus. In the higher floodplain around ponds, ditches, and sloughs Salix exigua and Salix amygdaloides are present. Stands of Populus trichocarpa line elevated alluvial bars and low dikes. With the exception of sandy areas where the understory supports native forbs, most Populus trichocarpa stands are in poor condition with Phalaris arundinacea, Agrostis stolonifera, and Poa pratensis in the understory. Some backwater sloughs are present within the Populus stands and support native species such as Sagittaria cuneata, Carex spp., Scirpus spp., Sparganium emersum, and Alisma plantago-aquatica. The Payette River is mostly within a confined channel due to levees. The channel has steep banks below the annual high water mark, though some recent point bars and islands are present. The youngest alluvial deposits support stands of Salix exigua with some S. lutea, S. lasiandra, and Amorpha fruticosa. The understory of the stands is barren or supports annual species with low cover. Higher bars and islands support stands of Salix lasiandra with mesic forbs (Euthamia occidentalis, Solidago sp., and Equisetum spp.,) and mesic graminoids (Carex spp., Eleocharis palustris, and Phalaris arundinacea).

Rarity:

The natural diversity of vegetation, an abundant supply of water, moderate climate, and the presence of farmlands combine to provide optimum conditions for upland game, waterfowl and other wildlife. Ring-necked pheasants, gray partridge, and California quail are the most common upland birds while Canada geese, mallard, pintail, wood duck, and cinnamon, blue and green-winged teal are the most common waterfowl. The wetlands provide ideal habitats for other water-based birds such as great blue herons, snipe, coots, killdeer, and red-winged and yellow-headed blackbirds. Red-tailed hawks, northern harriers, bald eagles, barn owls, and kestrels also use this area. The thick riparian vegetation provides habitat for mammals including mule deer, cougars, coyotes, muskrats, beavers, skunks, mink, raccoons and cottontail rabbits.

Condition:

The Montour Valley has been managed as a Wildlife/Recreation area since 1983. The goal is to protect and enhance wildlife habitats and to provide a variety of recreation experiences. Shallow water impoundments with nesting islands were constructed to improve waterfowl habitat. Nesting boxes and platforms were also installed. Portions of the valley continue to be farmed to provide standing corn or grains for wildlife. Livestock grazing is used to remove undesirable vegetation and provide goose grazing areas. Riparian areas are fenced to keep cattle out of sensitive wildlife habitat.

Viability:

Information not compiled at this time.

Key Environmental Factors:

The free flowing Payette River runs through Montour; however, remaining old dikes, berms, and bars mostly inhibit water from entering its floodplains. Occasionally, low-lying old hay fields, wetlands, backwater sloughs and ditches, and wetland forest behind the dikes, berms and bars are flooded during peak runoff events.

Other Values:

Recreational activities at Montour include game bird hunting, wildlife viewing and camping.

Conservation Intent:

The area is managed as a Wildlife/Recreation area.

Management Needs:

Information not compiled at this time.

Information Needs:

Information not compiled at this time.

Plant Community Occurrences:

SALIX EXIGUA/BARREN	G5 S4
POPULUS TRICHOCARPA/ROSA WOODSII	G4 S3
SALIX LASIANDRA/MESIC FORB	? SP
DISTICHLIS STRICTA	G5 S4
CAREX LANUGINOSA	G3 S2
CAREX NEBRASCENSIS	G4 S3
CAREX PRAEGRACILIS	G2G3QS2
ELEOCHARIS PALUSTRIS	G5 S3
JUNCUS BALTICUS	G5 S5
TYPHA LATIFOLIA	G5 S4
SCIRPUS VALIDUS	G4 S2
ELEOCHARIS ROSTELLATA	G2 S2
JUNCUS EFFUSUS	U SU

Rare Plant Occurrences:

CYPERUS RIVULARIS	G5 S2

Rare Animal Occurrences:

HALIAEETUS LEUCOCEPHALUS	G4 S3B,S4N

Author:
C. Murphy

BARBER POOL

Location:

Access to Barber Pool is restricted and permission should be obtained from Idaho Department of Parks and Recreation. Barber Pool is located along the Boise River ca 7 miles east (upstream) of the City of Boise. The series of islands on The north side of the site are best accessed by canoe. Launch is possible at the Idaho Shakespeare Festival grounds with permission. Access to the main area is via Boise River Lane (aka New York Canal Road). From Boise, travel east to Eckert Road; turn south on Eckert road and travel 0.5 miles. Shortly after crossing the Boise River, turn east on Boise River Lane. If the canal road gate is locked, travel on the private road just north of the canal road. The best access is at the east side of the pool area.

Richness:

The Barber Pool area includes a one-mile reach of the Boise River extending from Diversion Dam to Barber Dam. The area was identified by the Bald Eagle Task Force (Kaltenecker and Tiedemann 1994) as one of the largest contiguous blocks of remaining riparian habitat along the Boise River in Ada County. Riparian vegetation is best developed along the Boise River and its islands and in side channels and sloughs. Forested habitat dominated by Populus trichocarpa (black cottonwood) is present on banks of channels, sloughs, and islands along with stands of Salix amygdaloides (peachleaf willow). Scattered individuals of S. amygdaloides are also present on well-drained terraces that are elevated above the current floodplain. Common riparian shrubs include Salix lutea (yellow willow) and Salix exigua (coyote willow) and occasional stringers of Alnus incana (mountain alder). The most extensive emergent habitat is present near Barber Dam and hydrology is likely an artifact of dam operations. Emergent wetlands are mostly dominated by Typha latifolia (common cattail), Carex lanuginosa (woolly sedge), Carex nebrascensis (Nebraska sedge), and Juncus balticus (Baltic rush). Terraces that are elevated above the floodplain are mostly dominated by Chrysothamnus nauseosus (gray rabbit brush) and C. viscidiflorus (green rabbit brush) with lesser amounts of Artemisia tridentata (big sagebrush). The understory of rabbit brush stands is mostly dominated by Bromus tectorum (cheatgrass) and other exotic annuals.

Rarity:

Barber Pool is one of the largest blocks of riparian habitat in Ada County. It is regularly used by wintering bald eagles for perching and possibly night roosting.

Condition:

The area has a long history of use that started in the early 1900's. The closure of Barber Dam in 1904 created a pool that was used to hold logs for the mill at the townsite of Barber Pool. A number of noxious weeds are present including Lythrum salicaria (purple loosestrife) and Onopordum aucanthium (Scotch thistle). daho Parks and Recreation is actively involved in control of patches of Scotch thistle.

Viability:
Current management as a State Park will maintain habitat values at the site.

Key Environmental Factors:
The riparian corridor of the Boise River was historically maintained by frequent flooding events. The current hydrograph is impacted by the operation of upstream dams and diversions. In the Barber Pool area considerable sedimentation has occurred due to operation of the Mill Pond.

Other Values:
The site is recognized by the National Audubon Society and American Bird Conservancy as a State Important Bird Area. The area is a refuge for songbirds, small mammals, and large mammals in an increasingly urban landscape.

Conservation Intent:
Most of the area is owned by Idaho Parks Foundation. In addition portions are owned by Idaho Department of Parks and Recreation, Shakespeare Festival, Ada County, and private landowners. Easements to maintain habitat values associated with privately owned parcels would be appropriate.

Management Needs:
Inventory and site analysis conducted by Kading (1984) identified that priority for management of Barber Pool area should be to protect the area and allow natural processes to take place. A master plan for the area is being developed by Idaho Department of Parks and Recreation.

Information Needs:
A copy of the management plan, being drafted in 2000, should be obtained when it is available.

Plant Community Occurrences:

SALIX LUTEA/BENCH	G?	SP
SALIX EXIGUA/MESIC FORB	G2?	S2?
POPULUS TRICHOCARPA/RECENT ALLUVIAL BAR	G?	SP
POPULUS TRICHOCARPA/SALIX LUTEA	G?	S2
CAREX LANUGINOSA	G3	S2
TYPHA LATIFOLIA	G5	S4
SALIX AMYGDALOIDES	G3	S2
SALIX LUTEA	G3	S3

Rare Plant Occurrences:

CYPERUS RIVULARIS	G5	S2

Author:
M. Jankovsky-Jones

EAGLE ISLAND

Location:
Eagle Island is located on the Boise River ca 10 miles downstream of the City of Boise in northwestern Ada County. Permission to access undeveloped portions of the park is required.

Richness:

Eagle Island extends for ca 5.5 miles between the channels of the Boise River. The island is over 1 mile wide throughout much of its reach. The river channel supports stands of exotic hardwoods including Acer negundo, Salix alba, and Acer saccharinum with lesser amounts of Populus trichocarpa. The island has a long history of human use. Much of the island has been managed for hay pasture and grazing land. Meadows in the vicinity of Eagle Island State Park include vast areas dominated by pasture grasses as well as stands of native graminoids. The stands of native graminoids include patches of near monocultures of Carex lanuginosa, C. praegracilis, Juncus balticus, Eleocharis palustris, and Scirpus microcarpus. In addition, these species are present in stands where none are clearly dominant. The native graminoid species are associated with wetter sites in the meadow. The site hydrology is influenced by flood irrigation, drainage ditches, and canals making the delineation between natural and ag-influenced wetlands difficult to infer.

Rarity:

Eagle Island continues to have large tracts of open space and moist meadow habitat. The area is of general interest for habitat values associated with the meadows and riparian corridors.

Condition:

Areas of the park not used for swimming are leased for grazing and cultivating hay. Goals and objectives for the park are outlined in the Eagle Island State Park Master Plan (Beck and Baird 2000).

Exotic species are abundant. The black cottonwood forest along the Boise River has nearly been replaced by exotic hardwoods. Pasture grasses in the meadows on the island include Festuca arundinacea, Phalaris arundinacea, Agropyron repens, and Agrostis stolonifera. Lythrum salicaria is present in moist meadows and in areas supporting Typha latifolia and Scirpus validus. Myriophyllum spicatum is present in the open water pond. Other noxious weeds include Conium maculatum, Chondrilla juncea, Carduus nutans, and Cirsium arvense.

Viability:

Private lands adjacent to the State Park have been used for agriculture. In recent years, upscale homes and urban uses are replacing traditional use.

Key Environmental Factors:

Eagle Island is on the 100-year floodplain of the Boise River. The flooding hazard has been much reduced by upstream reservoirs. Groundwater levels are influenced by irrigation and drainage ditches.

Other Values:

The area is a popular summer recreation area with a swimming pond, water slide, and picnic areas. The park is one of the few publicly owned parcels west of Boise that provides access to the Boise River. Portions of the park are currently wetland mitigation sites for the Idaho Department of Transportation and the Ada County Highway District. The site is recognized by the National Audubon Society and the American Bird Conservancy as a State Important Bird Area.

Conservation Intent:

Most of the area is currently managed as a State Park.

Management Needs:
Information on management needs is summarized in the Eagle Island State Park Master Plan.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

CAREX LANUGINOSA	G3 S2
CAREX PRAEGRACILIS	G2G3QS2
ELEOCHARIS PALUSTRIS	G5 S3
TYPHA LATIFOLIA	G5 S4
SCIRPUS MICROCARPUS	U SU

Author:
C. Murphy

CRYSTAL SPRINGS

Location:
Crystal Springs is located approximately 9 miles southeast of Wendell, Idaho. From Wendell, travel south for approximately 8 miles on the Rex Leland Highway to the Niagara Springs Grade. Continue down the rim of the Snake River Canyon and travel east approximately 2.5 miles past Niagara Springs. The best access to the springs is via foot on a road just west of Crystal Lake.

Richness:
Crystal Springs emanate from the lower valley walls of the Snake River. The canyon includes a band of basalt cliffs and talus which grade into extensive stands of Sarcobatus vermiculatus. Springs support a rich mix of moist-site herbs and shrubs including Mimulus guttatus, Rorippa nasturtium-aquaticum, Euthamia occidentalis, Betula occidentalis, and Salix exigua. Small stands of Phragmites australis and Rhus trilobata are also present.

Rarity:
The area supports extensive stands of the Sarcobatus vermiculatus/Elymus cinereus community. The rare plant, Epipactis gigantea, is known from aquatic springs.

Condition:
Crystal Springs are developed for fish farming and irrigation. The springs supply water to a large federal steelhead hatchery and a private fish farm. Applications are pending for fish farms and hydropower.

Cirsium vulgare is present in aquatic springs. The understory of Sarcobatus stands is dominated by Bromus tectorum. One stem of Tamarix chinensis was observed along the diversion. Elaeagnus angustifolia is well established around Crystal Lake.

Viability:
Information not compiled at this time.

Key Environmental Factors:
Information not compiled at this time.

Other Values:
The springs along the Middle Snake are important to the local economy for irrigation, hydroelectric and fish farms. The picturesque springs also attract tourists to the area.

Conservation Intent:
Springs should be managed to maintain (and possibly restore) both water quality and water quantity.

Management Needs:
Information not compiled at this time.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

SARCOBATUS VERMICULATUS/ELYMUS CINEREUS	G3	S2
THOUSAND SPRINGS DESERT AQUATIC ECOSYSTEM	G1	S1

Rare Plant Occurrences:

EPIPACTIS GIGANTEA	G3	S3

Author:
M. Jankovsky-Jones

THOMAS FLAT SPRINGS

Location:
Thomas Flat Springs is located on the north side of the Snake River at River Mile 465, ca 5 miles south-southeast of Swan Falls.

Richness:
Several small springs emerge along the north side of the Snake River Canyon at Thomas Flat Springs. The spring sources support stands of Scirpus americanus and Phragmites australis with small patches of Juncus balticus, Typha latifolia, and Carex lanuginosa. Ephemeral spring creek channels support stands of Salix amygdaloides with a somewhat weedy understory. Terraces above the channel have stems of Rhus trilobata that occasionally form continuous stands. Scirpus acutus is occasionally present at springs and most well developed stands are along the Snake River. Benches adjacent to spring creeks and along the Snake River support stands of Sarcobatus vermiculatus/Distichlis spicata. Uplands are dominated by Artemisia tridentata wyomingensis.

Rarity:
Structural diversity is provided by wooded channels, shrublands, and stands of

emergent vegetation in an arid desert landscape.

Condition:
The area has been grazed in the past. It is unknown if it is within a current allotment. A rock structure was observed around one of the springs that may have been used to divert or capture flows in the distant past.

Numerous exotic species are present. Elaeagnus angustifolia is present in channels and surrounds patches of Scirpus americanus. Bromus tectorum is present in Sarcobatus vermiculatus stands and on uplands. Lythrum salicaria is present but not abundant along the Snake River.

Viability:
Uplands are in cultivated agriculture and runoff may contribute sediment and nutrients. Irrigation also has impacts on site hydrology.

Key Environmental Factors:
The hydrology at the site is tied to groundwater inputs, which may pulse early in the growing season but persists throughout the year. In addition, localized rainfall events likely fill ephemeral creek channels.

Other Values:
Information not compiled at this time.

Conservation Intent:
Area is within two ACECs.

Management Needs:
This area should be left alone as much as possible. If the area is grazed, the best management would include fencing springs and watering off-site. Lythrum salicaria was not observed at the springs and it would be beneficial to monitor and control this species if necessary.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

SARCOBATUS VERMICULATUS/DISTICHLIS STRICTA	G4 S1
SALIX AMYGDALOIDES	G3 S2
RHUS TRILOBATA	G2 S2
PHRAGMITES AUSTRALIS	G4 S4
SCIRPUS ACUTUS	G5 S4
SCIRPUS AMERICANUS	G3Q S1

Rare Plant Occurrences:

CHAENACTIS STEVIOIDES	G4 S2

Rare Animal Occurrences:

BUTEO REGALIS	G4 S3B,SZN
SOREX MERRIAMI	G5 S2?

Author:
M. Jankovsky-Jones

RABBIT CREEK SPRINGS

Location:

Rabbit Creek Springs is located on the north side of the Snake River (River Mile 475) near Jackass Butte. Access can be obtained via what appears to be good roads or via boat on the Snake River.

Richness:

A series of springs emerge from the lower south facing canyon of the Snake River for ca 0.5 mile and along lower Rabbit Creek near Jackass Butte. Small patches of Scirpus validus, Rhus trilobata, and Phragmites australis are present at springs. Terraces above the Snake River and benches between springs are dominated by stands of Sarcobatus vermiculatus. The channel banks at Rabbit Creek are dominated by Salix amygdaloides with patches of Salix lutea and Rhus trilobata. The intermittent channel is filled with Typha latifolia, which indicates subterranean flows throughout the growing season.

Rarity:

The springs are an oasis in an arid environment, providing habitat for songbirds, small mammals, and deer.

Condition:

The area was likely a homestead and a rock cabin still stands in the lower Rabbit Creek drainage.

Several exotic species are present including the woody species Juglans nigra, Populus deltoides, P. nigra, Robinia pseudoacacia, Fraxinus pennsylvanica, and Salix alba. The trees are mostly confined to small patches around former homesteads and lower springs and do not seem to be spreading. Bromus tectorum is abundant in drier sites and on uplands. Other patch forming exotics include Atriplex patula, Centaurea repens, and Dipsacus sylvestris.

Viability:

Uplands are cultivated agricultural land and runoff may contribute sediment and nutrients. Irrigation also has impacts on site hydrology.

Key Environmental Factors:

Information not compiled at this time.

Other Values:

Information not compiled at this time.

Conservation Intent:

Area should be managed to maintain hydrology and to prevent further degradation of vegetation.

Management Needs:

Numerous exotics are present in nearly all the wettest communities. It is unknown if weed control measures would be effective and perhaps efforts should focus on management of a few key species.

Information Needs:
Information not compiled at this time.

Plant Community Occurrences:

SARCOBATUS VERMICULATUS/DISTICHLIS STRICTA	G4	S1
PHRAGMITES AUSTRALIS	G4	S4
SCIRPUS ACUTUS	G5	S4

Rare Plant Occurrences:

LYPTOPLEURA MARGINATA	G4	S3

Author:
M. Jankovsky-Jones

LAKE LOWELL

Location:
Lake Lowell is located approximately 3 miles southwest of Nampa. From Nampa, travel south on State Highway 45 4.5 miles to Upper Shore Drive. Turn west on Upper Shore Drive to access the south shore of the lake. Several parking areas and access points are present on the south shore.

Richness:
Lake Lowell is an off-stream impoundment created by water diverted from the Boise River via the New York Canal. The lake includes a central body of open water nearly surrounded by emergent, scrub-shrub and forested wetlands. Dense stands of water smartweed (Polygonum amphibium) are present adjacent to open water. Slightly higher ground supports shrublands dominated by a mix of willows including coyote willow (Salix exigua), whiplash willow (Salix lasiandra), yellow willow (Salix lutea) and peachleaf willow (Salix amygdaloides). Plains cottonwood (Populus deltoides) stands with a mixed shrub understory are present adjacent to uplands.

Rarity:
Lake Lowell provides habitat for high concentrations of waterfowl, nesting marsh and water birds and shorebirds. The bird species of concern (western grebe, black-crowned night heron and bald eagle) are known to occur at Lake Lowell.

Condition:
Numerous nonnative species are present including the trees, Plains cottonwood (Populus deltoides), ash (Fraxinus pennsylvanica), and Russian olive (Elaeagnus angustifolia). Nonnative shrubs, false indigo (Amorpha fruticosa) and salt cedar (Tamarix chinensis), are also present. Exotic graminoids and forbs are abundant with purple loosestrife (Lythrum salicaria) probably being the most troublesome herbaceous species. Control of exotics at this site would be difficult if not impossible.

Viability:
Information not compiled at this time.

Key Environmental Factors:

Water from the Boise River is diverted to Lake Lowell via the New York canal. Each year the lake's water is drawn down for irrigation creating mudflats which attract shorebirds. In the fall, water levels begin rising and reach full pool in the spring. Fluctuating water levels create ideal conditions for growth of water smartweed, which is a food source for waterfowl.

Other Values:
Lake Lowell is visited by over 100,000 people annually due to proximity to population centers. Activities include wildlife observation, fishing, photography, hunting, boating, swimming, water-skiing, and picnicking. Recreation is permitted to the extent that it does not interfere with wildlife objectives. Lake Lowell is recognized as a State Important Bird Area by the National Audubon Society and the American Bird Conservancy.

Conservation Intent:
Established wildlife refuge managed by the United States Fish and Wildlife Service.

Management Needs:
None identified.

Information Needs:
None identified.

Rare Plant Occurrences:

POLYGONUM AMPHIBIUM	G3Q	S4

Rare Animal Occurrences:

AECHMOPHORUS OCCIDENTALIS	G5	S4B,SZN
NYCTICORAX NYCTICORAX	G5	S3B,SZN
HALIAEETUS LEUCOCEPHALUS	G4	S3B,S4N

Author:
M. Jankovsky-Jones

HALVERSON LAKE

Location:
Halverson Lake is located ca 14 miles south of Kuna, Idaho, and is directly north of the Snake River at River Mile 450. Access is by foot either from the canyon rim or from the Snake River if the area is accessed by boat.

Richness:
Halverson Lakes includes two ponds and spring-fed, sloped wetlands east of the ponds. The pond levels are influenced by agricultural run-off that enters the west lake from the Waldvogel Canal. Shoreline vegetation around the west lake is more or less limited to a narrow band of Scirpus acutus, Eleocharis palustris, and the woody species Celtis reticulata, Populus deltoides, Salix amygdaloides, and Salix exigua. The channel joining the ponds mostly supports stems of Eleocharis palustris and Carex lanuginosa. The east pond has an extensive drawdown zone dominated by exotics including Xanthium strumarium, Portulaca

oleracea, and Echinochloa crus-galli. The east side of the pond, where the spring creek enters, supports large stands of Paspalum distichum with some patches of Eleocharis palustris, and Xanthium strumarium. East of the ponds, springs emerge along the lower canyon wall and create a small spring creek that flows into the east pond. The spring creek is filled with stands of Rorippa nasturtium-aquaticum, Berula erecta, and Veronica americana. The springs create sloped wetlands that are a mosaic of Scirpus acutus, S. americanus, and Carex lanuginosa. Historically, the ponds were probably maintained by spring flow and the east pond may have been a patch of emergent vegetation.

Rarity:

The area is of general interest for habitat values associated with springs and ponds.

Condition:

The area was closed to motor vehicle use in 1996. It is within an active grazing allotment. The canal project was completed in the early 1900's. Return flows from irrigation maintain lake levels.

Exotic species are abundant in wetlands and on uplands. The drawdown zone of the east pond is vegetated with a rich mix of exotic forbs. Some of these including Xanthium strumarium and Echinochloa crus-galli are also present in patches of native vegetation at springs. Elaeagnus angustifolia is present at the west pond and along the channel carrying agricultural return flows.

Viability:

Adjacent uplands are in cultivated agriculture. Groundwater pumping and irrigation may impact spring flows.

Key Environmental Factors:

Hydrology of the ponds is currently maintained both by irrigation return flow and spring inputs. Spring flow may also be influenced by off-site groundwater pumping and irrigation.

Other Values:

Information not compiled at this time.

Conservation Intent:

Area should be managed to maintain springs and associated habitat.

Management Needs:

Area has been grazed in the past. The most notable impacts are to the spring creek in the valley bottom where soil compaction has occurred.

Information Needs:

Information not compiled at this time.

Plant Community Occurrences:

CAREX LANUGINOSA	G3 S2
SCIRPUS ACUTUS	G5 S4
SCIRPUS AMERICANUS	G3Q S1

Rare Plant Occurrences:

ASTRAGALUS PURSHII VAR OPHIOGENES	G5T3 S3

Author:
M. Jankovsky-Jones

HAGERMAN WMA

Location:
To reach Hagerman WMA, take Interstate 84 to exit 141; drive S on U. S. Hwy 30 for 12.5 miles. At the Hagerman WMA sign, turn east onto the gravel road leading to the WMA and hatchery. Hagerman WMA is ca 2.3 miles S of the town of Hagerman.

Richness:
At an elevation of 2,950 feet, Hagerman WMA lies on a flat to gently-sloping river terrace between the Snake River and a lava rock canyon rim. Water is abundant; Tucker Spring originates on the WMA providing water to the hatchery, the WMA and downstream landowners. Len Lewis Spring produces irrigation water for WMA croplands while Riley Creek meanders through Hagerman WMA finally emptying into the Snake River. Natural and developed ponds and marshes dot Hagerman WMA. Wetland plants such as cattail and bulrush are plentiful along the Snake River and the WMA's ponds and marshes. Irrigated croplands support grasses, alfalfa and grain crops. The area's low annual precipitation (less than ten inches) creates a semi-arid environment on Hagerman's non-irrigated sites. Native dryland vegetation, including big sagebrush and rabbitbrush, survives among the lava rock boulders common to the WMA.

Rarity:
Numerous nesting and/or migratory waterfowl, game birds, raptors, songbirds, wading and shorebirds are found at Hagerman WMA along with mule deer, red foxes, coyotes, badgers, cottontail rabbits, yellow-bellied marmots, river otter, beavers, muskrat, mink and other furbearers. A variety of reptiles and amphibians inhabit this area. Shoshone sculpin are found at Tucker Springs and in the Riley Creek. Species of special consern found at Hagerman WMA include bald eagles, buffleheads, common goldeneyes, and black-crowned night-herons.

Condition:
An estimated 50,000 hours of fishing effort is spent on the WMA annually.

Several exotic species are estabilished at Hagerman WMA including Lythrum salicaria (purple loosestrife), Conium maculatum (poison hemlock), Dipsacus sylvestris (teasel) and Elaeagnus angustifolia (Russian olive). It is unknown if a weed management plan is in place for these or other species.

Viability:
Information not compiled at this time.

Key Environmental Factors:
Due to a combination of topography and geography, Hagerman Valley enjoys significantly warmer winter temperatures than the surrounding region. This mild weather, in combination with spring water flowing at a constant 58 degrees F, allows much of Hagerman WMA's water to remain ice-free during winter months.

Other Values:
Hagerman WMA has six miles of soft-surface walking trails. There are areas for wildlife viewing and photography. It is a popular site for sport fishing. The Hagerman WMA is recognized as a State Important Bird Area by the National Audubon Society and the American Bird Conservancy.

Conservation Intent:
Estabilished WMA.

Management Needs:
Management needs are outlined in the 1981 Policy Plan for Hagerman WMA (IDFG 1986).

Information Needs:
The WMA manager recently (1999) completed a management plan for the WMA. It would be beneficial to extract relevant information from this.

Plant Community Occurrences:

SCIRPUS ACUTUS	G5	S4
TYPHA LATIFOLIA	G5	S4

Author:
IDFG

BARBER TO BOISE

Location:
Barber to Boise extends along both sides of the Boise River and is located between South Eckert Road to just downstream of Warm Springs Golf Course in Boise.

Richness:
From Barber Park to Boise the Boise River flows through residential and industrial areas. The river is confined by a low levee system, but there is a remnant and active floodplain with the levee. Woody riparian vegetation persists along the river throughout the greater Boise area as long narrow bands at and above the high water line. Active floodplain and/or areas supporting large patches of riparian habitat are uncommon. The reach from Barber Park to Boise includes ten out of sixteen important habitat areas used regularly by bald eagles wintering on the Boise River (Kaltenecker et al. 1994). The vegetation includes stands of Populus trichocarpa (black cottonwood) with the native species Salix exigua (coyote willow), S. lutea (yellow willow), S. lasiandra (whiplash willow), Alnus incana (mountain alder), Cornus sericea (red-osier dogwood), and Ribes aureum (golden current) in the understory. In addition, numerous exotic woody and herbaceous species are present. Recent alluvial deposits are vegetated with stands of Salix exigua with lesser amounts of other shrub species and occasional cottonwood seedlings. Occasional sloughs and swales are present that support patches of Typha latifolia (common cattail), Carex lanuginosa (woolly sedge), and Scirpus acutus (hardstem bulrush).

Rarity:

This area of the Boise River includes ten of sixteen important wintering bald eagle habitat areas by the Ada Planning Association, Bald Eagle Task Force (Kaltenecker et al. 1994).

Condition:

Most of the floodplain of the Boise River has been lost to commercial, residential, and recreational development. Development within the historic floodplain continues.

The riparian vegetation along the Boise River has a significant exotic component. Exotic woody species include the deciduous trees Acer saccharinum (silver maple), A. negundo (boxelder), Catalpa speciosa (catalpa), Salix alba (European willow), Ulmus americana (American elm), and Robinia psuedoacacia (black locust), and the shrub Amorpha fruticosa (false indigo). While the exotic woody species are common throughout the city they are much more abundant and dominant downstream of Boise starting at Eagle Island. Numerous exotic herbaceous species including Lythrum salicaria (purple loosestrife) are also present and species lists are available in Tiedemann and Ehrenfeld (no date) and from the Idaho Department of Fish and Game, Conservation Data Center.

Viability:

Information not compiled at this time.

Key Environmental Factors:

The riparian corridor of the Boise River was historically maintained by frequent flooding events. The current hydrograph is impacted by the operation of upstream dams. Much of the floodplain has been lost through the city due to channel straightening, dikes, and development. It is questionable whether the cottonwood community will persist without active management.

Other Values:

The Boise River has high habitat and recreational values. The National Audubon Society and American Bird Conservancy recognize the site as a State Important Bird Area. Numerous bird species including mallard ducks, blue winged teals, Canada geese, wood ducks, great blue heron, osprey, fly fisher, and various mammal species including beaver and deer can be observed within the city limits. The river is a popular fishery. A heavily used Greenbelt path is present. Barber Park is at the upstream end of the site and is a popular put-in point for rafters and tubers.

Conservation Intent:

Information not compiled at this time.

Management Needs:

Information not compiled at this time.

Information Needs:

It is unknown if fluvial models have been developed to address flow needs for cottonwood regeneration.

Plant Community Occurrences:

SALIX EXIGUA/BARREN	G5	S4

POPULUS TRICHOCARPA/RECENT ALLUVIAL BAR	G?	SP
POPULUS TRICHOCARPA/SALIX LUTEA	G?	S2
SALIX LUTEA/BENCH	G?	SP
CAREX LANUGINOSA	G3	S2
TYPHA LATIFOLIA	G5	S4

Rare Animal Occurrences:

HALIAEETUS LEUCOCEPHALUS	G4	S3B,S4N

Author:
C. Murphy

BOISE RIVER AT GARDEN CITY

Location:
Boise River at Garden City is located on both sides of the Boise River and extends from River Mile 46 to River Mile 51.

Richness:
In Garden City the Boise River flows through residential and light industrial areas. Woody riparian vegetation persists along the river throughout the greater Boise area as long narrow bands at the high water line. An active floodplain supporting large patches of riparian habitat is uncommon. The reach from the Main Street Bridge to Eagle Island includes four properties that are the largest tracts of undeveloped riparian bottomland left within the city limits. The remnant habitat on this reach may be the reason the river continues to support a wintering population of bald eagles (Kaltenecker et al. 1994). The vegetation includes stands of Populus trichocarpa (black cottonwood) with the native species Salix exigua (coyote willow), S. lutea (yellow willow), S. lasiandra (whiplash willow), Cornus sericea (red-osier dogwood), and Ribes aureum (golden current) in the understory. In addition numerous exotic woody and herbaceous species are present. Recent alluvial deposits are vegetated with stands of Salix exigua with lesser amounts of other willow species and occasional cottonwood seedlings. Occasional sloughs and swales are present that support patches of Typha latifolia (common cattail), Carex lanuginosa (woolly sedge), Equisetum hyemale (scouring rush), and Scirpus acutus (hardstem bulrush).

Rarity:
This area of the Boise River was identified by the Ada Planning Association, Bald Eagle Task Force as the largest remaining block of riparian habitat within the greater Boise area (Kaltenecker et al. 1994). Habitat for the plant species of special concern Cyperus rivularis is also present on the river.

Condition:
Most of the floodplain of the Boise River has been lost to commercial, residential and recreational development. Development within the historic floodplain continues.

The riparian vegetation along the Boise River has a significant exotic component. Exotic woody species include the deciduous trees Acer saccharinum (silver maple), A. negundo (boxelder), Catalpa speciosa (catalpa), Salix alba

(European willow), Ulmus americana (American elm), and Robinia psuedoacacia (black locust), and the shrub Amorpha fruticosa (false indigo). While the exotic woody species are common throughout the city they are much more abundant and dominant downstream starting at Eagle Island. Numerous exotic herbaceous species are also present and species lists are available in Tiedemann and Ehrenfeld (no date) and from the Idaho Department of Fish and Game, Conservation Data Center.

Viability:
Information not compiled at this time.

Key Environmental Factors:
The riparian corridor of the Boise River was historically maintained by frequent flooding events. The current hydrograph is impacted by the operation of upstream dams. Much of the floodplain has been lost through the city due to channel straightening, dikes, and development. It is questionable whether the cottonwood community will persist without active management.

Other Values:
The Boise River has high habitat and recreational values. The National Audubon Society and American Bird Conservancy recognize the site as a State Important Bird Area. Numerous bird species including mallard ducks, blue winged teals, Canada geese, wood ducks, great blue heron, osprey, king fisher, and various mammal species including beaver and deer can be observed within the city limits. The river is a popular fishery. A heavily used Greenbelt path is present. In the summer months the river is a popular spot for tubers and picnickers.

Conservation Intent:
Management of both private and publicly owned lands should strive to maintain existing native vegetation and floodplain.

Management Needs:
Information not compiled at this time.

Information Needs:
A comparison of avian habitat use of riparian vegetation with a significant cottonwood component to that dominated by exotic hardwoods could provide support for management which focuses on maintaining native vegetation. It is unknown if fluvial models have been developed to address flow needs for cottonwood regeneration on the Boise River

Plant Community Occurrences:

SALIX EXIGUA/BARREN	G5	S4
POPULUS TRICHOCARPA/SALIX LUTEA	G?	S2

Author:
M. Jankovsky-Jones

TRUEBLOOD

Location:
Trueblood WMA is 1 mile north of Grandview on the north side of the Snake River.

Richness:
Trueblood WMA includes a series of artificial ponds on the south side of the Snake River. The area is managed for waterfowl production. Habitat includes open water with Scirpus acutus (hardstem bulrush) and lesser amounts of Typha latifolia (common cattail). Small patches of Juncus balticus (Baltic rush) are also present. Stands of Sarcobatus vermiculatus (greasewood) are also partially within the WMA.

Rarity:
The area is of general interest for habitat values.

Condition:
A number of nonnative species are present including Lepidium latifolium (perennial pepperweed), Elaeagnus angustifolia (Russian olive), Cirsium arvense (Canada thistle), Tamarix sp. (salt cedar), and Lythrum salicaria (purple loosestrife).

Viability:
Information not compiled at this time.

Key Environmental Factors:
The hydrology of the area is maintained by water control structures.

Other Values:
Information not compiled at this time.

Conservation Intent:
The area is managed a Wildlife Management Area.

Management Needs:
Information not compiled at this time.

Information Needs:
Information not compiled at this time.

Rare Animal Occurrences:

ATHENE CUNICULARIA HYPUGAEA	G4TU S3S4

Author:
S. Rust

SURVEY NOTES ON OTHER SITES

Boise River – Eagle Island to Star

Plant associations

Salix exigua/bar
Salix lutea/bar
Populus trichocarpa/bar

Populus trichocarpa/Salix lutea
Populus trichocarpa/Rosa woodsii
Artemisia leudoviciana

Description

Several patches of gallery forest were surveyed from Eagle Island to Star. A narrow floodplain is present in some areas with sandbars, terraces, swales and backwater sloughs. Native tree and shrub species including Populus trichocarpa, Rosa woodsii, Salix lutea, and Salix exigua are present. Most of the stands, however, have a significant exotic understory and overstory component. Exotic woody species include Acer saccharinum, Populus deltoides, Salix alba, Acer negundo, and Amorpha fruticosa. Cobble and sand bars frequently have high cover of herbaceous species including the forbs Achillea millefolium, Artemisia leudoviciana, Conyza canadensis, Bidens frondosa, B. cernua, and Lythrum salicaria. Common graminoids include Cyperus spp., Echinochloe crus-gallii, Eragrostis pectinatus, Panicum capillare, Juncus bufonius, and Juncus effusus.

Caldwell Pond Access

Plant associations

Typha latifolia

Description

Caldwell pond is 1 mile north of the City of Caldwell. The gravel pond is lined with Typha latifolia with patches of Scirpus spp. and Elaeagnus angustifolia. Stands of Distichlis spicata and Sarcobatus vermiculatus are present in the general area. The access area is adjacent to a private rod and gun club.

Clarks Island

Description

Clarks Island is 3 miles southeast of Homedale on the south bank of the Snake River. The channel banks and island support Elaeagnus angustifolia and Tamarix sp. Moist swales support Elymus cinereus and Typha latifolia.

Dixie Access

Description

Dixie Access is located 2 miles southwest of Parma. The riparian forest is dominated by Populus deltoides, Salix alba, and Acer saccharinum. The channel banks are lined with Salix exigua and Amorpha fruticosa.

Duff Lane Pond Access

Description

Duff Lane Pond is one mile southeast of the town of Middleton. The pond is a gravel pit that is ringed by exotic hardwoods including Acer saccharinum, Populus deltoides, and Salix alba. Little emergent vegetation is present.

Lansing Lane Access

Description

The access area is 2 miles southeast of Middleton on the north Bank of the Boise River. Populus trichocarpa and Acer saccharinum are present on the banks of the river with Amorpha fruticosa in the understory,

Hubbard Reservoir

Plant associations

Eleocharis palustris
Scirpus acutus
Typha latifolia

Hubbard Reservoir is located 6 miles south of Meridian. The reservoir is fed by flows from the New York Canal. Aquatic plant species diversity is high in open water areas. Emergent habitat includes stands of Typha latifolia, Eleocharis palustris, Scirpus acutus, and Phalaris arundinacea.

Hyatt Wetland

Plant associations

Typha latifolia

Description

Hyatt Wetland is located in an abandoned gravel pit in Garden City 1 mile west of the Chinden/Glenwood Intersection. The wetland is dominated by emergent vegetation with lesser amounts of open water, forested, and scrub-shrub habitat. The emergent wetland is mostly cattail marsh with small patches of reed canary grass, and softstem bulrush. Patches and scattered individuals of cottonwood and willow provide vertical structure in the wetland. The area provides important wildlife habitat within an urban setting. The area is currently managed by the City of Boise Parks and Recreation.

Lava Point Access

Plant associations

Sarcobatus vermiculatus/Distichlis spicata
Distichlis spicata

Description

The Lava Point Access is 2 miles west of Walters Ferry on the north bank of the Snake River. The terrace above the Snake River is dominated by Sarcobatus vermiculatus. The understory is mostly dominated by Bromus tectorum with the exception of low lying swales where Distichlis spicata is present. The channel banks are steep with a mix of shrubs and herbs near the high water line that include Salix exigua, Scirpus americanus, Scirpus acutus, and Lythrum salicaria. Salix exigua is present on shorelines of channel and islands. Higher ground on islands is dominated by stands of Sarcobatus vermiculatus.

Map Rock Access

Plant associations

Sarcobatus vermiculatus/Distichlis spicata
Rhus trilobata

Description

The Map Rock Access is 6 miles west of Walters Ferry on the north bank of the Snake River. The terrace above the Snake River is dominated by Sarcobatus vermiculatus and Artemisia tridentata with an understory mostly dominated by Distichlis spicata. Channel banks are dominated b Phalaris arundinacea, Asparagus officinale, Ribes aureum, and Elaeagnus angustifolia.

Noble Island

Plant associations

Sarcobatus vermiculatus/Distichlis spicata
Scirpus acutus

Description

Noble Island is 1 mile east of Walters Ferry on the north bank of the Snake River. Most of the island is cultivated agricultural land. Side channels are filled with Scirpus acutus, Toxicodendron rydbergii, and Echinochloe crus-gallii with occasional areas of open water. The south end of the island is a dense thicket of Salix exigua, Elaeagnus angustifolia, and Acer negundo.

Regan Bend

Plant associations

Salix alba x fragilis/Mesic graminoid
Salix exigua/barren
Salix lasiandra/Mesic Forb
Populus trichocarpa/Phalaris arundinacea

Description

The Payette River meanders through a moderately wide valley bottom just upstream of Black Canyon Reservoir. The stretch of river supports numerous islands, some of which are the result of sediment deposition in the slackwater of Black Canyon Reservoir. The islands and channels support sand and cobble bars with poorly developed riparian vegetation, emergent wetlands, scrub-shrub wetlands, and forested wetlands. Sand and cobble bars are often sparsely vegetated due to movement of sediments and support scattered annual species or seedlings of Populus trichocarpa, Salix lutea, Salix lasiandra, and Salix exigua. Emergent wetlands are present in overflow channels and back water sloughs. Well developed stands of Typha latifolia are occasionally present in the intermittent channels. Other species in the sloughs include Eleocharis acicularis, Eleocharis palustris, Elodea canadensis, and Potamogeton natans, Slightly higher sand and cobble bars support shrublands dominated by Salix exigua. Stands of Salix lasiandra with a mesic forb understory are frequently present on channel banks. Stands of the tree Populus trichocarpa are also present. A shrub understory is absent in cottonwood stands. The stand surveyed at Regan Bend supported a monoculture of Phalaris arundinacea in the understory. A notable cottonwood stand was also surveyed just south of Regan Butte that had conspicuous reproduction of Acer saccharinum.

Trappers Flat

Plant associations

Sarcobatus vermiculatus/Distichlis spicata-Elymus cinereus
Scirpus acutus

Description

Trappers Flat is 10 miles west of Walters Ferry on the west bank of the Snake River. Patches of Echinochloe crus-gallii, Arctium minus, Scirpus acutus and Elaeagnus angustifolia are present along the shoreline. The

slough includes stands of Phalaris arundinacea, Scirpus acutus, and Elaeagnus angustifolia as well as open water. Islands in the area have a fringe of Scirpus acutus and Salix exigua with Eleagnus angustifolia and Rhus trilobata on the islands.

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Appendix F

Acres of wetland and deepwater habitat for digitized maps by Hydrologic Unit

Wetland and deepwater habitat for digitized maps within Hydrologic Unit 17040212 (Middle Snake).

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	6	39.69	0.34
L1UBHh	208	3229.04	27.40
L1UBHx	6	14.91	0.13
L2ABFh	3	3.70	0.03
L2ABHh	6	21.63	0.18
L2EMFh	51	129.24	1.10
L2EMHh	1	21.75	0.18
L2RSAh	1	0.26	0.00
L2UBHh	3	3.45	0.03
L2USAh	37	74.55	0.63
L2USCh	3	3.81	0.03
PABC	6	2.12	0.02
PABCh	10	4.63	0.04
PABCx	7	2.75	0.02
PABF	54	56.27	0.48
PABFb	1	0.27	0.00
PABFh	42	68.04	0.58
PABFx	44	19.81	0.17
PABH	26	30.24	0.26
PABHh	17	48.92	0.42
PABHx	7	8.32	0.07
PABKx	7	7.99	0.07
PEM/ABFx	1	0.38	0.00
PEM/SSC	2	13.46	0.11
PEMA	137	133.26	1.13
PEMAd	1	2.22	0.02
PEMAh	34	41.65	0.35
PEMAx	8	5.59	0.05
PEMB	101	84.41	0.72
PEMBh	1	0.10	0.00
PEMC	973	1331.37	11.30
PEMCh	280	245.36	2.08
PEMCx	61	46.44	0.39
PEMF	82	80.23	0.68
PEMFh	89	261.64	2.22
PEMFx	23	25.55	0.22
PEMJ	1	1.27	0.01
PEMKh	1	2.45	0.02
PEMKrx	1	9.99	0.08
PEMKx	9	8.34	0.07
PFOA	148	281.62	2.39

PFOAh	51	57.42	0.49
PFOB	12	18.78	0.16
PFOC	84	124.43	1.06
PFOCh	14	11.56	0.10
PFOCx	1	1.13	0.01
PSS/EMC	2	2.54	0.02
PSSA	72	68.40	0.58
PSSAh	14	10.71	0.09
PSSAx	3	0.59	0.01
PSSB	131	229.62	1.95
PSSC	464	611.44	5.19
PSSCh	119	111.86	0.95
PSSCx	13	26.93	0.23
PSSFh	2	2.12	0.02
PSSJ	3	3.21	0.03
PUBF	45	34.65	0.29
PUBFb	2	1.42	0.01
PUBFh	77	73.08	0.62
PUBFx	78	62.59	0.53
PUBH	72	92.86	0.79
PUBHh	83	108.13	0.92
PUBHx	70	78.04	0.66
PUBKh	2	2.90	0.02
PUBKrx	48	56.04	0.48
PUBKx	65	67.72	0.57
PUSA	11	5.91	0.05
PUSAh	8	2.24	0.02
PUSAx	8	3.63	0.03
PUSC	68	46.02	0.39
PUSCh	122	58.10	0.49
PUSCx	173	76.43	0.65
PUSJ	1	0.18	0.00
PUSK	5	1.42	0.01
PUSKx	17	11.05	0.09
R2ABH	12	11.95	0.10
R2UBH	4	1.82	0.02
R3RSA	27	21.25	0.18
R3RSC	42	42.22	0.36
R3UBF	2	1.40	0.01
R3UBH	200	2372.35	20.13
R3USA	40	59.84	0.51
R3USC	20	10.84	0.09
R4SBC	1	0.43	0.00
R4SBF	2	9.77	0.08

R4SBFrx	61	714.80	6.06
R4SBFx	12	109.70	0.93
TOTAL	**4862**	**11786.24**	**100.00**

Wetland and deepwater habitat for digitized maps within Hydrologic Unit 17050101 (C.J. Strike Reservoir).

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	7	101.36	0.97
L1UBHh	104	5502.32	52.75
L1UBKx	1	42.28	0.41
L2UBF	2	0.32	0.00
L2UBFh	8	84.44	0.81
L2UBGh	4	22.74	0.22
L2USA	6	8.42	0.08
L2USC	1	25.13	0.24
L2USCh	13	27.62	0.26
PABCh	1	0.22	0.00
PABF	2	0.42	0.00
PABH	4	12.03	0.12
PABHh	1	0.36	0.00
PEM/ABF	1	0.86	0.01
PEMA	105	173.87	1.67
PEMAh	34	64.13	0.61
PEMB	60	25.06	0.24
PEMC	231	291.60	2.80
PEMCh	65	144.30	1.38
PEMCx	12	7.40	0.07
PEMF	31	80.96	0.78
PEMFb	1	0.95	0.01
PEMFh	78	277.45	2.66
PFOA	20	17.79	0.17
PFOB	2	1.26	0.01
PFOC	28	34.39	0.33
PFOCh	4	2.07	0.02
PSS/EMA	1	13.92	0.13
PSS/EMC	2	10.46	0.10
PSSA	105	212.09	2.03
PSSAh	2	31.06	0.30
PSSAx	2	0.72	0.01
PSSB	41	14.02	0.13
PSSC	232	339.11	3.25
PSSCh	49	24.13	0.23
PSSJ	1	5.77	0.06
PUBF	9	3.68	0.04

PUBFb	2	0.30	0.00
PUBFh	19	17.44	0.17
PUBFx	19	7.54	0.07
PUBH	22	34.58	0.33
PUBHh	27	62.47	0.60
PUBHx	12	14.07	0.13
PUBKx	6	36.45	0.35
PUSA	52	40.53	0.39
PUSAh	3	0.64	0.01
PUSC	24	48.29	0.46
PUSCh	19	9.41	0.09
PUSCx	22	10.26	0.10
PUSJ	30	5.02	0.05
R2UBH	1	3.55	0.03
R3RSA	3	0.60	0.01
R3UBH	123	2477.88	23.76
R3USA	7	5.88	0.06
R4SBA	28	48.00	0.46
R4SBC	1	2.91	0.03
TOTAL	**1690**	**10430.52**	**100.00**

Wetland and deepwater habitat for digitized maps within Hydrologic Unit 17050103 (Middle Snake).

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBHh	19	428.36	4.73
L2ABFh	3	26.02	0.29
PAB4/UBHrx	1	1.71	0.02
PAB4Hh	1	0.20	0.00
PAB4Hx	1	0.69	0.01
PABF	9	6.83	0.08
PABFh	59	116.21	1.28
PABFx	39	47.73	0.53
PABGh	7	23.03	0.25
PABGx	3	8.90	0.10
PABH	3	1.79	0.02
PABHh	1	1.10	0.01
PEM/FOC	2	4.18	0.05
PEM/SSC	4	7.57	0.08
PEM1/USC	1	2.45	0.03
PEM1A	4	7.40	0.08
PEM1Ad	3	10.17	0.11
PEM1B	3	3.03	0.03
PEM1C	75	155.94	1.72
PEM1Cd	3	2.89	0.03
PEM1Ch	2	2.11	0.02

PEM1F	23	41.42	0.46
PEM1J	1	18.98	0.21
PEM2F	1	2.36	0.03
PEMA	55	105.67	1.17
PEMAh	8	14.82	0.16
PEMAx	1	0.80	0.01
PEMB	24	33.48	0.37
PEMBh	2	3.55	0.04
PEMC	196	547.81	6.05
PEMCh	65	93.52	1.03
PEMCx	4	1.74	0.02
PEMF	32	82.68	0.91
PEMFh	14	23.40	0.26
PEMFx	7	10.86	0.12
PFO1A	23	38.65	0.43
PFO1C	5	6.77	0.07
PFOA	18	31.25	0.35
PFOC	19	24.37	0.27
PFOCh	2	8.80	0.10
PSS/EMC	1	1.86	0.02
PSS1A	22	34.09	0.38
PSS1C	10	6.99	0.08
PSS1Cx	1	0.99	0.01
PSSA	96	137.14	1.52
PSSB	11	8.54	0.09
PSSC	149	216.38	2.39
PSSCh	37	86.89	0.96
PSSF	3	2.27	0.03
PUB/EM1Fx	1	4.03	0.04
PUBF	8	1.69	0.02
PUBFh	12	8.41	0.09
PUBFx	31	25.59	0.28
PUBG	8	64.72	0.72
PUBH	4	12.94	0.14
PUBHh	24	19.18	0.21
PUBHrx	2	13.70	0.15
PUBHx	26	14.39	0.16
PUBKx	2	0.73	0.01
PUSA	38	69.75	0.77
PUSAh	4	2.71	0.03
PUSAx	2	0.98	0.01
PUSC	8	13.24	0.15
PUSCh	17	24.04	0.27
PUSCx	13	9.48	0.10

PUSJ	6	1.42	0.02
R2UBH	1	4.99	0.06
R3UBH	290	6171.06	68.19
R3USA	23	35.75	0.39
R3USC	109	105.40	1.16
R4SBC	2	1.58	0.02
TOTAL	**1704**	**9050.18**	**100.00**

Wetland and deepwater habitat for digitized maps within Hydrologic Unit 17050114 (Lower Boise).

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBHh	24	6661.79	45.63
L1UBHrx	1	30.74	0.21
L1UBHx	14	104.31	0.71
L2EM2F	3	3.81	0.03
L2EM2Fh	24	769.30	5.27
L2UBFh	7	47.80	0.33
L2USCh	25	115.79	0.79
PAB4/UBF	1	0.21	0.00
PAB4/UBFx	1	0.55	0.00
PAB4/UBHh	2	0.82	0.01
PAB4F	1	0.70	0.00
PAB4Fh	3	1.09	0.01
PAB4Fx	2	0.35	0.00
PAB4H	2	0.59	0.00
PAB4Hb	1	0.90	0.01
PAB4Hh	2	1.98	0.01
PAB4Hrx	2	0.73	0.01
PAB4Hx	6	4.19	0.03
PABFh	4	6.60	0.05
PABFx	5	6.16	0.04
PABH	1	6.84	0.05
PEM/SSC	5	16.44	0.11
PEM1/FO1A	1	0.53	0.00
PEM1/SS1Ch	1	11.67	0.08
PEM1/UBF	5	26.03	0.18
PEM1/UBFh	3	4.08	0.03
PEM1/UBFx	1	1.46	0.01
PEM1A	18	102.36	0.70
PEM1Ah	7	38.82	0.27
PEM1B	15	10.87	0.07
PEM1C	227	511.20	3.50
PEM1Cd	5	40.46	0.28
PEM1Ch	26	84.06	0.58
PEM1Crx	2	5.56	0.04

PEM1Cx	2	7.98	0.05
PEM1F	130	369.13	2.53
PEM1Fd	2	3.47	0.02
PEM1Fh	18	15.11	0.10
PEM1Frx	4	9.80	0.07
PEM1Fx	2	1.86	0.01
PEM1KCx	1	0.65	0.00
PEM1KFx	8	7.85	0.05
PEM2/UBFh	6	3.55	0.02
PEM2F	1	3.75	0.03
PEM2Fh	3	4.38	0.03
PEMA	20	131.10	0.90
PEMC	20	56.43	0.39
PEMCh	3	2.91	0.02
PEMF	3	28.05	0.19
PEMFh	1	0.42	0.00
PEMFx	1	0.84	0.01
PFO/USC	4	13.23	0.09
PFO1/EM1C	4	43.82	0.30
PFO1/SS1A	2	3.64	0.02
PFO1/SS1C	1	3.63	0.02
PFO1/USA	11	86.63	0.59
PFO1/USC	6	34.58	0.24
PFO1A	181	588.46	4.03
PFO1Ah	14	53.54	0.37
PFO1C	22	30.00	0.21
PFO1Ch	55	572.74	3.92
PFO1Fh	1	8.35	0.06
PFO1J	9	30.23	0.21
PFOA	3	5.91	0.04
PFOC	30	71.78	0.49
PSS/EMC	2	5.06	0.03
PSS1/EM1Ch	12	61.90	0.42
PSS1/EM1F	1	1.59	0.01
PSS1/FO1Ch	1	97.13	0.67
PSS1/USA	8	36.51	0.25
PSS1/USC	2	4.71	0.03
PSS1A	25	40.67	0.28
PSS1B	2	0.56	0.00
PSS1C	15	45.03	0.31
PSS1Ch	41	546.58	3.74
PSS1Fh	3	19.60	0.13
PSSA	1	4.31	0.03
PSSC	13	66.68	0.46

PUB/AB4Hh	2	1.90	0.01
PUB/AB4Hrx	1	4.87	0.03
PUB/AB4Hx	2	3.04	0.02
PUB/EM1C	1	1.86	0.01
PUB/EM1F	2	4.96	0.03
PUB/EM1Fh	2	1.66	0.01
PUB/EM1Fx	3	2.18	0.01
PUB/EM2Fh	2	1.74	0.01
PUBF	57	36.90	0.25
PUBFh	28	33.30	0.23
PUBFrx	4	2.36	0.02
PUBFx	65	100.44	0.69
PUBH	27	29.19	0.20
PUBHh	125	91.25	0.63
PUBHrx	14	17.71	0.12
PUBHx	262	411.04	2.82
PUS/FO1A	1	6.77	0.05
PUS/SS1A	10	79.06	0.54
PUS/SS1C	3	18.04	0.12
PUSC	1	0.50	0.00
PUSCh	10	7.90	0.05
PUSCrx	3	29.43	0.20
PUSCx	5	2.53	0.02
R2UBH	2	9.58	0.07
R2UBHx	3	20.32	0.14
R3SBC	2	1.95	0.01
R3UBH	83	1446.13	9.91
R3USA	20	48.58	0.33
R3USC	126	173.86	1.19
R4SBA	1	0.85	0.01
R4SBKFrx	5	265.75	1.82
R4SBKFx	1	0.90	0.01
TOTAL	**2014**	**14599.52**	**100.00**

Wetland and deepwater habitat for digitized maps within Hydrologic Unit 17050115 (Middle Snake-Payette).

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
PAB4H	1	0.25	0.01
PAB4Hh	1	0.47	0.02
PABF	2	3.82	0.13
PABFh	3	2.05	0.07
PABH	1	1.72	0.06
PABHh	10	10.30	0.35
PABHx	4	1.82	0.06
PABKHrx	2	0.92	0.03

PEM/SSC	13	70.41	2.41
PEM1A	10	36.48	1.25
PEM1B	11	38.78	1.33
PEM1C	42	221.61	7.58
PEM1Ch	3	2.47	0.08
PEM1F	14	87.67	3.00
PEM1Fd	1	2.97	0.10
PEM1Fh	2	2.91	0.10
PEM1Fx	1	0.31	0.01
PEM1KFx	1	1.17	0.04
PEMA	31	62.52	2.14
PEMAh	3	1.79	0.06
PEMB	3	1.48	0.05
PEMC	55	117.28	4.01
PEMCh	3	5.06	0.17
PEMCx	1	0.20	0.01
PEMF	7	20.59	0.70
PEMFh	1	1.60	0.05
PEMFx	2	2.34	0.08
PFO1A	18	24.18	0.83
PFO1C	1	1.45	0.05
PFO1J	1	7.02	0.24
PFOA	63	134.71	4.61
PFOB	1	0.11	0.00
PFOC	55	82.19	2.81
PFOCx	1	2.97	0.10
PSS1A	5	2.53	0.09
PSS1C	3	3.24	0.11
PSSA	14	32.37	1.11
PSSB	1	0.17	0.01
PSSC	45	85.39	2.92
PUBF	4	8.14	0.28
PUBFh	6	5.21	0.18
PUBFx	6	8.24	0.28
PUBH	18	73.38	2.51
PUBHh	33	31.74	1.09
PUBHx	28	16.88	0.58
PUBKHrx	2	8.03	0.27
PUSAh	1	0.24	0.01
PUSC	4	6.79	0.23
PUSCh	1	0.17	0.01
R2UBH	1	0.67	0.02
R2USC	3	4.06	0.14
R3UBH	186	1647.47	56.37

R3USA	15	29.75	1.02
R3USC	17	6.64	0.23
TOTAL	**761**	**2922.72**	**100.00**

Wetland and deepwater habitat for digitized maps within Hydrologic Unit 17050122 (Payette).

COWARDIN TYPE	FREQUENCY	ACRES	PERCENT
L1UBH	1	5.43	0.07
L1UBHh	76	1388.15	17.32
L1UBHrx	8	113.94	1.42
L1UBHx	1	12.32	0.15
L2USCh	17	7.01	0.09
L2USKrx	4	50.08	0.62
PAB4F	2	0.64	0.01
PAB4H	2	1.28	0.02
PAB4Hh	5	6.00	0.07
PABF	6	2.07	0.03
PABFh	35	14.34	0.18
PABH	4	5.42	0.07
PABHb	12	4.02	0.05
PABHh	19	32.55	0.41
PABHx	3	2.66	0.03
PEM/FOC	1	5.70	0.07
PEM1/FO1A	2	2.60	0.03
PEM1/FO1C	1	2.91	0.04
PEM1/SS1A	1	12.70	0.16
PEM1/SS1C	1	5.92	0.07
PEM1/UBF	1	3.85	0.05
PEM1/UBFh	1	4.98	0.06
PEM1/UBFx	2	1.23	0.02
PEM1/USC	1	0.31	0.00
PEM1A	27	148.33	1.85
PEM1B	8	2.45	0.03
PEM1C	140	366.08	4.57
PEM1Ch	9	5.13	0.06
PEM1F	77	187.80	2.34
PEM1Fh	30	34.07	0.43
PEM2/UBF	1	0.67	0.01
PEM2/UBFh	1	0.31	0.00
PEM2/UBHh	1	0.81	0.01
PEM2F	1	0.17	0.00
PEM2Fh	7	2.95	0.04
PEMA	59	213.78	2.67
PEMAh	2	1.44	0.02
PEMB	48	92.66	1.16

PEMC	164	637.97	7.96
PEMCh	39	78.81	0.98
PEMF	46	121.50	1.52
PEMFb	1	0.51	0.01
PEMFh	34	66.60	0.83
PEMH	3	19.76	0.25
PFOCh	1	1.02	0.01
PFO/EM1A	1	3.76	0.05
PFO1/EM1A	5	8.70	0.11
PFO1/EM1C	4	13.87	0.17
PFO1/SS1A	2	8.78	0.11
PFO1/SS1C	1	3.47	0.04
PFO1/USA	9	37.12	0.46
PFO1A	94	212.39	2.65
PFO1B	8	2.89	0.04
PFO1C	44	75.18	0.94
PFO1J	7	23.60	0.29
PFOA	97	203.08	2.53
PFOB	11	37.01	0.46
PFOC	34	69.33	0.87
PSS/USC	1	1.88	0.02
PSS1/EM1A	2	4.96	0.06
PSS1/EM1C	5	8.80	0.11
PSS1/EM1J	1	2.36	0.03
PSS1/USA	28	98.30	1.23
PSS1/USC	6	7.33	0.09
PSS1A	36	42.60	0.53
PSS1B	5	0.92	0.01
PSS1C	26	83.84	1.05
PSS1Ch	5	7.98	0.10
PSS1J	30	65.46	0.82
PSSA	2	8.04	0.10
PSSB	35	34.16	0.43
PSSC	45	74.55	0.93
PSSF	1	1.93	0.02
PUB/AB4Hh	1	0.88	0.01
PUB/EM1F	1	6.97	0.09
PUB/EM1Fh	1	0.60	0.01
PUB/EM2Hh	2	0.74	0.01
PUBF	32	29.46	0.37
PUBFh	89	29.32	0.37
PUBFx	10	4.30	0.05
PUBH	73	101.08	1.26
PUBHb	4	1.53	0.02

PUBHh	179	186.34	2.33
PUBHrx	9	13.53	0.17
PUBHx	67	82.31	1.03
PUBKHrx	4	3.14	0.04
PUS/FO1A	2	4.94	0.06
PUS/SS1A	18	37.12	0.46
PUSCh	5	1.49	0.02
PUSCrx	2	15.03	0.19
R2UBH	3	5.33	0.07
R3ABH	1	4.59	0.06
R3RBH	36	232.75	2.90
R3RSA	1	0.67	0.01
R3RSC	2	0.76	0.01
R3UBH	200	2066.95	25.79
R3USA	75	126.52	1.58
R3USC	93	84.86	1.06
R4SBKFrx	48	161.65	2.02
TOTAL	**2408**	**8014.06**	**100.00**

Appendix G.

Guidelines for assigning element (species and plant association) 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 survey area 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__________________/_______ _____
F11__________________/_______ _____
F12__________________/_______ _____
F13__________________/_______ _____
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