RIPARIAN AND WETLAND COMMUNITIES IN SOUTHWESTERN IDAHO:

SECOND-YEAR INVENTORY RESULTS AND PRELIMINARY CATALOG OF COMMUNITY TYPES

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SUMMARY

The low-elevation riparian and wetland communities of southwestern Idaho are the least known of anywhere in the state, in terms of classification of plant associations for management and biodiversity conservation purposes. While many community types described from adjacent, mostly higher-elevation portions of Idaho and surrounding states may be applicable, unique environmental and physical conditions contribute to the formation of undescribed types. Currently, BLM managers in southwestern Idaho have no useful communication tool (*i.e.*, standardized classification) to compare successional states of different watersheds, to characterize reference sites in high ecological quality, to understand site potentials for Proper Functioning Condition assessments, to communicate with managers in surrounding areas, and to set ecological goals for riparian and watershed health.

This modest project began last year with a riparian community inventory of 14 reference areas in southwestern Idaho (Moseley 1998). It expanded this year to include three different studies whose objectives included, at least in part, documentation and characterization of riparian and wetland vegetation: 1) a second year of inventory work in selected reference areas, this year including 16 sites; 2) a study of the stream and riparian conditions on the Rocking M Wildlife Conservation Easement Area in Hells Canyon; and 3) an ecological assessment of the 45 Ranch Allotment funded by The Nature Conservancy.
This report contains a summary of the results for the reference area study (# 1 above). For the Rocking M and 45 Ranch studies, this report only provides the riparian community inventory component, which will supplement reports summarizing the ecological conditions.

The 16 reference area study sites, as well as the Rocking M and 45 Ranch, occur throughout the lower elevations of southwestern Idaho. They extend from Hells Canyon, south to the Nevada border, and from Oregon, east to Salmon Falls Creek, and compliment the 14 sites sampled in 1997 (Moseley 1998). Detailed descriptions of the 16 reference area study sites are included in this report.

We identified 67 community types in southwestern Idaho during the two years of sampling. Of these, 24 community types are considered tentative, where my confidence in their classification certainty is low; more inventory and sampling are needed to determine their repeatability and more fully characterize compositional and structural variation. Each of the 67 community types is described in this report, or reference is made to descriptions in last year's report (Moseley 1998). This amounts to a preliminary guide to riparian and wetland community types in southwestern Idaho.

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INTRODUCTION

The background and justification for the 1998 work is essentially the same as last year and Moseley (1998) should be consulted for details. The difference this year is that inventory and characterization of riparian communities was a primary or secondary goal of three different projects conducted by the Conservation Data Center (CDC) in southwestern Idaho. For efficiency and to reduce redundancy, I have combined the community inventory work into this single document. The three studies and their goals are as follows:

1. 1998 Riparian Reference Areas - The Lower Snake River District, BLM, funded a second year of inventory work in selected reference areas. In 1998, the study included 16 sites occurring in all four Resource Areas. This report represents a complete summary of the reference area study.

2. Rocking M Wildlife Conservation Easement Area - The Cascade Resource Area, BLM, funded a study of the stream and riparian conditions on this large area in Hells Canyon, which is cooperatively managed by the BLM, Idaho Department of Fish and Game, and the private land owner. This report summarizes only the results of the community inventory portion of the project. It is meant to supplement the stream inventory and ecological condition information, which will be prepared as a separate document.

3. 45 Ranch Allotment - The Nature Conservancy funded an ecological assessment of this allotment on the South Fork Owyhee River, which includes a tiny area of private land and a large area of Owyhee Resource Area-administered land. This is a two-year project, with the 1998 work focusing on riparian ecosystems. Similar to the Rocking M, this report summarizes only the results of the community inventory portion of the project. It will supplement the ecological condition and management information, which will be prepared as a separate document.

METHODS

The Field Methods are identical to last year, as were the Site and Community Data Bases used to prepare this report. Please refer to last year's report (Moseley 1998) for an explanation.

STUDY AREAS

The 16 reference area study sites, as well as the Rocking M and 45 Ranch, are scattered throughout the lower elevations of southwestern Idaho (Figure 1). They extend from Hells Canyon, south to the Nevada border, and from Oregon, east to Salmon Falls Creek. In many ways, they ecologically compliment the 14 sites sampled in 1997 (Moseley 1998). A more detailed description of the study sites follows:

Figure 1. Location of 1998 study sites used in the riparian and wetland community type inventory.

(Not available in webpage report, copies of complete reports available by contacting the Idaho Conservation Data Center at (208) 334-3402)

Rocking M Wildlife Conservation Easement Area: The Rocking M lies near the southern end of Hells Canyon and drains into Brownlee Reservoir. The canyon sides are covered mostly by grasslands and sagebrush-steppe, with pockets of Douglas-fir at the upper elevations and an isolated woodland of western juniper near the old townsite of Mineral. The area encompasses five large drainages, which were inventoried in 1998, as well as several smaller ones. All are narrow and steep, with many segments having greater than 10% gradient. The riparian vegetation is dominated by woody species, either tall shrubs, deciduous trees or coniferous trees. The area has been heavily grazed for a long time and in some drainages the woody vegetation has been replaced by weedy herbaceous vegetation.

Thirty-five vegetation plots were sampled as part of the inventory. Of these only 19 plots were used in the analysis presented here. The remaining 16 represented several types of situations which confounded their use:

- 5 plots dominated by exotic herbaceous species
- 2 plots represented grazing-induced, early-seral shrub stands, where the potential natural community could not be identified
- 3 plots from heterogeneous tall shrub stands that defied classification
- 6 plots dominated by aspen, which also could not be classified with the current status of our knowledge

As mentioned, earlier, results of the stream inventory and ecological condition assessment for the Rocking M will be summarized in a separate document.

45 Ranch Allotment: This study area encompasses 240 acres of private land and the nearly 70,000-acre BLM allotment. It occurs along the South Fork Owyhee River in extreme southwestern Owyhee County. Portions of the allotment border both Oregon and Nevada. The area consists of a gently rolling volcanic plateau, abruptly dissected by canyons of the South Fork, East Fork, and Little Owyhee Rivers. Upland vegetation consists entirely of sagebrush-steppe. The riparian vegetation includes shrub and herbaceous communities associated with both intermittent and perennial features. The intermittent features include lake beds, vernal pools, washes, and, in the case of the Little Owyhee River, an intermittent river. Perennial features include the South Fork and East Fork, canyon seeps, and two spring creeks.

The private portion of this study site was inventoried last year (Moseley 1998), when four plots were sampled. An additional 52 plots were sampled from throughout the allotment in 1998. As mentioned in the previous section, the community inventory data presented here is meant to supplement the ecological condition and management information that will appear in a separate document.

1998 Riparian Reference Areas: We inventoried 16 study sites occurring in all four Resource Areas of the Lower Snake River District (Table 1). Twelve of this year's study sites were exclosures, many of them erected 30 to 40 years ago around small springs. We also sampled three high quality drainages on the Jarbidge Resource Area that were recommended by BLM staff, as well as a drainage on the BLM portion of the Boise River Wildlife Management Area. Site summaries (known as Site Basic Records in our data base)

for all but the Dead Dog Creek site are found in Appendix 1 and contain descriptions and background information for each site.

Table 1. 1998 Riparian Reference Area inventory sites in southwestern Idaho. Site Number refers to the record number used in the CDC data base and in Appendix 1.

Site No.	Site Name	Status	County
	BRUNEAU RESOURCE AREA		
52	Black Leg Box Canyon	exclosure	Owyhee
387	Cottonwood Creek Exclosure	exclosure; 40+ years	Elmore
393	Dry Creek Exclosure	exclosure	Elmore
381	Kerr Exclosure	exclosure; 15 years	Owyhee
385	Mud Flat Spring Exclosure	exclosure; 40 years	Owyhee
386	Paradise Creek Exclosure	exclosure; 30+ years	Elmore
37	Ryegrass Spring Exclosure	exclosure; 40+ years	Elmore
9	Syrup Creek Exclosure	exclosure; 10 years	Elmore
394	Teapot Basin Spring Exclosure	exclosure; 30+ years	Elmore
	CASCADE RESOURCE AREA		
N/A	Dead Dog Creek	Boise River WMA	Ada
	JARBIDGE RESOURCE AREA		
392	Jarbidge Buck Creek	high quality drainage	Owyhee
53	Dean Site Exclosure	exclosure; 0-30 years	Twin Falls
50	East Fork Jarbidge River	high quality drainage	Owyhee
384	Flat Creek	high quality drainage	Owyhee
	OWYHEE RESOURCE AREA		
39	Cat Spring Exclosure	exclosure; 40+ years	Owyhee
41	Charity Spring Exclosure	exclosure; 30-50+ years	Owyhee

RIPARIAN AND WETLAND FLORA

Complete riparian and wetland species lists will appear in the 45 Ranch Allotment and Rocking M Easement Area reports. We made complete species lists for the 16 reference area study sites, but were unable to compile them for this report due to lack of funding. We will compile them next year if funding is available to complete a third and final year of the southwestern Idaho riparian inventory study. Of note, however, is that we did not encounter any rare species in the reference areas. See Moseley (1998) for a list riparian species encountered last year and references used for species nomenclature.

RIPARIAN AND WETLAND VEGETATION

Table 2 presents all of the riparian and wetland community types encountered in southwestern Idaho during 1997 and 1998, along with their location and plot documentation. Plot forms are archived in the Plant and Community Monitoring File at the CDC. In a few cases only observation forms were filled out for the community occurrence and no plot was sampled (þobserv. formþ in Table 2). We identified 67 community types during the two years of sampling, occurring in 41 alliances. Of these, 24 community types are considered tentative, where my confidence in their classification certainty is low, based on meager data, personal observation from field work around Idaho, and/or lack of similar communities described elsewhere. More inventory and sampling are needed to determine their repeatability and more fully characterize compositional and structural variation. Each of the community types listed in Table 2 is included in Section 2, where descriptions can be found for the new types encountered in 1998.

One of the objectives of this project was to see how well community patterns fit classifications from surrounding areas (Moseley 1998). We found that these classifications tended to work the least at our lowest elevation study sites, especially on the Snake River Plain and Owyhee uplands. Geographically, however, Crowe and Clausnitzer's (1997) classification from the Blue Mountains of Oregon works well for sites north of the Snake River Plain. These sites are obviously closer to their study area, but also share ecological similarities and occur in the same ecoregional Province (Bailey 1997) and Section (McNab and Avers 1994). Overlapping this geographical pattern is an elevational gradient. We found that many existing classifications worked the best at our higher elevation sites, especially Manning and Padgett (1995) and Evenden (1989), whose study areas were mountainous regions of the Great Basin.

The community types in Table 2 are arranged by vegetation Alliance, as defined by the National Vegetation Classification System (Grossman et al. 1998). The National Vegetation Classification (NVC) is a hierarchical system with the upper levels defined by physiognomic criteria, such as structure (height and spacing) of the vegetation, growth forms of the dominant species, and the character of the leaves of the dominant plants. These physiognomic levels of the classification have been adopted by the Federal Geographic Data Committee as the U.S. national standard (Federal Geographic Data Committee 1997). The two lowest levels, Alliance and Association (or community type), are based on floristic composition. To place the Alliances and community types into the NVC context, refer to Anderson et al. (1998), which has been summarized in Appendix 2.

Table 3 summarizes the riparian and wetland community types found within the 16 Riparian Reference Area study sites, indicating their occurrence number in the CDC data base. Similar tables will appear in reports for the Rocking M Wildlife Conservation Easement and 45 Ranch Allotment study areas.

Table 2. Riparian and wetland community types documented from southwestern Idaho during 1997 and 1998. "(T)" following name in Community Type column = Tentative Type; "*" in Site column = 1997 reference area (see Moseley 1998).

ALLIANCE	COMMUNITY TYPE	SITE	PLOT #
Forested			
Alnus rhombifolia	*Alnus rhombifolia/Cornus sericea* (T)	Hixon HMP Area*	97RM030 97RM031
	Alnus rhombifolia/Philadelphus lewisii	Rocking M	BR95DEN05R ROCK01A ROCK01B
		Summer Creek*	observ. form
Populus tremuloides	*Populus tremuloides/Cornus sericea*	Dead Dog Creek	98RM033
	unclassified tall shrub communities	Rocking M	NDEN01A MDEN01A NFWO02A DENN02A WOLF01B RAFT01A
Populus trichocarpa	*Populus trichocarpa/Acer glabrum*	Rocking M	DENN02B
	Populus trichocarpa/Rosa woodsii	Rocking M	NDEN04A DENN03B WOLF04A
		East Fork Jarbidge River	98RM069
	Populus trichocarpa/Salix lasiandra	Goodrich Creek*	97RM003
		Syrup Creek Exclosure	98RM061 98RM059
	Populus trichocarpa/Salix lutea	East Fork Jarbidge River	98RM068
	P. trichocarpa/Symphoricarpos albus	Goodrich Creek*	97RM002
Woodland			
Juniperus occidentalis	*Juniperus occidentalis/ Danthonia californica* (T)	45 Ranch	98RM077 98RM078
	J. occidentalis/Elymus glaucus (T)	Rocking M	DENN01B
Juniperus scopulorum	*Juniperus scopulorum/Elymus glaucus*	East Fork Jarbidge River	98CM006 98RM067
		Triplet Butte*	observ. form
	J. scopulorum/Equisetum arvense (T)	Buck Creek	98RM070

Table 2. Continued.

	J. scopulorum/Equisetum hyemale (T)	East Fork Jarbidge River	98RM005
Pseudotsuga menziesii	*Pseudotsuga menziesii /Acer glabrum-Physocarpus malvaceus* Flood Plain	Rocking M	WOLF01A
	Pseudotsuga menziesii/Cornus sericea	Dead Dog Creek	98RM029
Tall Shrub			
Alnus incana	*Alnus incana/Cornus sericea*	Hixon HMP Area*	97RM032
Betula occidentalis	*Betula occidentalis/Cornus sericea*	Dead Dog Creek	98RM032
	Betula occidentalis/Mesic forb	Rocking M	MDEN02A
		Goodrich Creek*	97RM001
		Jump Creek*	97RM011
	B. occidentalis/Philadelphus lewisii (T)	Jump Creek*	97RM012
	Betula occidentalis/Poa pratensis	Stewart Gulch*	97RM004
Crataegus douglasii	*Crataegus douglasii/Rosa woodsii* (T)	Hixon HMP Area*	96MM001 96MM013 96MM016
		Rocking M	TRAI01A TRAI04A TRAI05A RAFT01B
Cornus sericea	*Cornus sericea*	Flat Creek	98RM072
		Triplet Butte*	97RM019
		Cottonwood Creek*	97RM009
		Little Jacks Creek*	observ. form
Philadelphus lewisii	*Philadelphus lewisii* (T)	Jump Creek*	97RM013
Prunus virginiana	*Prunus virginiana* (T)	Dry Creek Spring Excl.	98RM004
		Cottonwood Creek*	97RM010
	Prunus virginiana/Elymus glaucus (T)	Flat Creek	98RM071
		Little Jacks Creek*	97RM015 97RM017
Salix exigua	*Salix exigua*/Barren	Snake R. Birds of Prey*	97RM021
		45 Ranch	98CM011 98CM012

Table 2. Continued.			
	Salix exigua/Mesic graminoid	The Tules*	97RM029
		Triplet Butte*	97RM018
		45 Ranch	98RM013 98RM026 98CM002 98RM074 98RM075 98RM076
	Salix exigua/Poa pratensis	Black Leg Box Canyon	98RM064
Salix geyeriana	*Salix geyeriana/Carex utriculata*	Charity Spring Exclosure	98RM040
		Mud Flat Spring Exclosure	98RM038
	Salix geyeriana/Mesic Forb	Charity Spring Exclosure	98RM041
		Dean Site Exclosure	98RM073
Salix lasiandra	*Salix lasiandra*/Bench	Syrup Creek Exclosure	98RM005 98RM067
	Salix lasiandra/Cornus sericea (T)	Pleasant Valley Table*	97RM044
		Dead Dog Creek	98RM030
	Salix lasiandra/Rosa woodsii	Dry Creek Spring Excl.	98RM003
Salix lasiolepis	*Salix lasiolepis*/Barren	Rocking M	ROCK01C
		Dead Dog Creek	98RM031
		Teapot Basin Spring Excl.	98RM001
		Ryegrass Spring Exclosure	98RM002
		Cat Spring Exclosure	98RM043
		Hixon HMP Area*	97RM034
	Salix lasiolepis/Cornus sericea (T)	Jump Creek*	97RM014
		Little Jacks Creek*	97RM016
	Salix lasiolepis/Mesic graminoid (T)	Rocking M	TRAI02A
		Rocking M	TRAI06A
		Syrup Creek Exclosure	98RM060
Salix lutea	*Salix lutea* (T)	Stewart Gulch*	97RM005
	Salix lutea/Poa pratensis (T)	Rocking M	DENN03A WOLF06A
		Black Leg Box Canyon	98RM063

	Salix lutea/Rosa woodsii	Flat Creek	98CM007
Table 2. Continued.			
Low Shrub			
Artemisia cana	*Artemisia cana*/Dry graminoid	Pleasant Valley Table*	97RM043
		45 Ranch	98RM049 98RM080
	Artemisia cana/Festuca idahoensis	Kerr Exclosure	98RM034
	Artemisia cana/ *Muhlenbergia richardsonis*	45 Ranch	98MM001 98RM007 98RM054 98CM010 98RM053 observ. form
		YP Lake Bed*	97RM026
Artemisia papposa	*Artemisia papposa*	Pleasant Valley Table*	97RM041
		45 Ranch	98RM051 98RM079
Artemisia tridentata ssp. *tridentata*	*Artemisia tridentata tridentata/* *Elymus cinereus*	45 Ranch	observ. form 98RM009 98RM015
		Black Leg Box Canyon	98RM066
	Sarcobatus vermiculatus variant	45 Ranch	98RM021 98CM001
Sarcobatus vermiculatus	*Sarcobatus vermiculatus/* *Distichilis stricta*	Snake R. Birds of Prey*	97RM020
	S. vermiculatus/Poa secunda (T)	45 Ranch	98RM022
Graminoid			
Carex nebrascensis	*Carex nebrascensis*	Kerr Exclosure	98RM063
		Dean Site Exclosure	observ. form
		45 Ranch	98RM056 98MM004
Carex sheldonii	*Carex sheldonii* (T)	The Tules*	97RM028
Carex simulata	*Carex simulata*	Kerr Exclosure	98RM037
Carex utriculata	*Carex utriculata*	Dean Site Exclosure	observ. form
		The Tules*	observ. form
Danthonia californica	*Danthonia californica* (T)	Pleasant Valley Table*	97RM042

		45 Ranch	98RM008 98RM050
Table 2. Continued.			
Eleocharis palustris	*Eleocharis palustris* (lotic)	Black Leg Box Canyon	98RM065
		45 Ranch	98RM048
	Eleocharis palustris vernal pool (T)	YP Lake Bed*	97RM025
		45 Ranch	98RM052 98MM002 observ. form
Eleocharis rostellata	*Eleocharis rostellata*	45 Ranch	98RM020 98RM024 98RM082 98MM003 observ. form
Glyceria grandis	*Glyceria grandis*	Charity Spring Exclosure	98RM039
H. brachyantherum	*Hordeum brachyantherum*	Charity Spring Exclosure	98RM042
Juncus balticus	*Juncus balticus*	Kerr Exclosure	98RM035
		45 Ranch	98RM046 98RM044 98RM047
Phragmites australis	*Phragmites australis*	45 Ranch	98RM028 98RM081
Scirpus acutus	*Scirpus acutus*	Snake R. Birds of Prey*	observ. form
		The Tules*	observ. form
Scirpus americanus	*Scirpus americanus*	45 Ranch	98RM023
Scirpus pallidus	*Scirpus pallidus* (T)	Hixon HMP Area*	97RM033
Scirpus pungens	*Scirpus pungens*	45 Ranch	97RM023 98RM012 98RM016
Forb			
Artemisia ludoviciana	*Artemisia ludoviciana* (T)	45 Ranch	97RM022 98RM058 98RM047
Berula erecta	*Berula erecta* (T)	45 Ranch	98RM045 98RM055
Camassia cusickii	*Camassia cusickii*	Summer Creek*	observ. form
Lepidium davisii	*Lepidium davisii* (T)	45 Ranch	97RM024 98RM006
Mimulus guttatus	*Mimulus guttatus* (T)	Dean Site Exclosure	98CM008

Table 3. Riparian and wetland community types occurring in the 1998 Riparian Reference Areas. "Occ. #" refers to the occurrence number of that community in the CDC data base.

SITE NAME	SITE #	COMMUNITY	OCC. #
BRUNEAU RESOURCE AREA			
Black Leg Box Canyon	52	*Artemisia tridentata tri./Elymus cinereus*	007
		Eleocharis palustris	050
		Salix exigua/Poa pratensis	003
		Salix lutea/Poa pratensis	004
Cottonwood Creek Exclosure	387	No community occurrences	
Dry Creek Spring Exclosure	393	*Prunus virginiana*	003
		Salix lasiandra/Rosa woodsii	002
Kerr Exclosure	381	*Artemisia cana/Festuca idahoensis*	005
		Carex nebrascensis	029
		Carex simulata	039
		Juncus balticus	045
Mud Flat Spring Exclosure	385	*Salix geyeriana/Carex utriculata*	012
Paradise Creek Exclosure	386	No community occurrences	
Ryegrass Spring Exclosure	37	*Salix lasiolepis*/Barren	001
Syrup Creek Exclosure	9	*Populus trichocarpa/Salix lasiandra*	002
		Salix lasiolepis/ Mesic graminoid	001
		Salix lasiandra/Bench	002
Teapot Basin Spring Exclosure	394	*Salix lasiolepis*/Barren	002
CASCADE RESOURCE AREA			
Dead Dog Creek-Boise River WMA	N/A	*Betula occidentalis/Cornus sericea*	N/A
		Populus tremuloides/Cornus sericea	N/A
		Pseudotsuga menziesii/Cornus sericea	N/A
		Salix lasiandra/Cornus sericea	N/A
		Salix lasiolepis/Barren	N/A

Table 3. Continued.

JARBIDGE RESOURCE AREA			
Jarbidge Buck Creek	392	*Juniperus scopulorum/Equisetum arvense*	001
Dean Site Exclosure	53	*Carex nebrascensis*	030
		Carex utriculata	104
		Mimulus guttatus	001
		Salix geyeriana/Mesic Forb	002
East Fork Jarbidge River	50	*Juniperus scopulorum/Elymus glaucus*	002
		Juniperus scopulorum/Equisetum hyemale	001
		Populus trichocarpa/Rosa woodsii	003
		Populus trichocarpa/Salix lutea	001
Flat Creek	384	*Cornus sericea*	018
		Prunus virginiana/Elymus glaucus	002
		Salix lutea/Rosa woodsii	001
OWYHEE RESOURCE AREA			
Cat Spring Exclosure	39	*Salix lasiolepis*/Barren	004
Charity Spring Exclosure	41	*Glyceria grandis*	001
		Hordeum brachyantherum	001
		Salix geyeriana/Mesic forb	003
		Salix geyeriana/Carex utriculata	013

CONCLUSIONS

Progress was made during the last two years in our understanding of the distribution and abundance of riparian communities in southwestern Idaho. More of the physical, biological, and geographic gradients present in this part of the state were sampled in 1998. The last two years of funding were rather modest, however, and we are proposing a final year of this project to accomplish the following:

1. Fill in remaining biophysical gaps by sampling a few selected reference sites we were unable to visit in 1997 and 1998.

2. Spend considerable time refining community descriptions and conservation rankings. Also elaborate on the functional aspects of the plant communities, especially as they relate to hydrologic processes. This will make them more useful to the BLM's PFC methodology (Prichard 1998).

3. Compile a complete checklist of the riparian and wetland flora of southwestern Idaho.

4. Prepare publication-ready descriptions of the community types, including text fields and graphics (maps, profiles, photos, etc.). This product can be reproduced in hard copy form, but will be posted on a new module of our web page that we plan to develop over the next couple of years.

Even if this project gets funded, we will still lack knowledge of broader-scale physical processes responsible for maintaining riparian community diversity in the region. An ecological site classification, proposed by Fisher (no date) and modeled after one done in central Nevada (Weixelman et al. 1996), would fill a large gap in our knowledge of riparian and wetland ecosystems in Idaho.

DESCRIPTIONS OF COMMUNITY TYPES

This section contains descriptions of all new community types encountered in 1998, along with a reference to the type descriptions that can be found in last year's report (Moseley 1998). They are arranged in the same order as in Table 2, starting with forested communities, then progressing through tall shrub, low shrub, graminoid, and forb communities. Same as last year, there were some community types I believe have high classification certainty, due to higher sampling effort, personal knowledge of distribution, and/or description from surrounding regions. A Community Characterization Abstract (CCA) has been prepared for each of these 43 communities (see Moseley 1998 for an explanation of CCAs). The 24 types for which there is low classification certainty at this time are tentative community types. Only short descriptions of these types appear here and in Moseley (1998).

FORESTED COMMUNITIES

ALNUS RHOMBIFOLIA/CORNUS SERICEA WHITE ALDER/RED-OSIER DOGWOOD

See description in last year's report (Moseley 1998).

ALNUS RHOMBIFOLIA/PHILADELPHUS LEWISII WHITE ALDER/SYRINGA

See Community Characterization Abstract in last year's report (Moseley 1998).

POPULUS TREMULOIDES/CORNUS SERICEA QUAKING ASPEN/RED-OSIER DOGWOOD

CLASSIFICATION COMMENTS: *Populus tremuloides/Cornus sericea* is an accepted community with a large amount of supporting data throughout its range. However, Crowe and Clausnitzer (1997) described *P. tremuloides/Alnus incana-C. sericea*. This community appears to be a variation of the *Alnus incana-C. sericea*/Mesic forb and possibly includes *P. tremuloides/Cornus sericea* stands. Many other studies recognize similar communities which sometimes have *P. tremuloides* as a co-dominant species. These communities are dominated by *Betula occidentalis*, various *Populus* or conifer species, or *Alnus incana* with a shrub layer dominated by *C. sericea* (Kovalchik 1993; Hansen et al. 1995; Manning and Padgett 1995; Crowe and Clausnitzer 1997; Hall and Hansen 1997). These communities are successionally related to *P. tremuloides/C. sericea* and complicate classification.

SIMILAR COMMUNITIES: *Populus tremuloides/Cornus sericea* is similar to many other communities where *C. sericea* is the dominant shrub and *P. tremuloides* is usually present but not dominant. These communities include *Populus* species (e.g. *Populus trichocarpa, P. angustifolia, P. deltoides*)*/C. sericea*, *P. trichocarpa/Alnus incana-C. sericea*, and *Alnus incana/C. sericea*. They are usually on sites less favorable to *P. tremuloides* dominance such as lower elevations or cobble bars. Conifer species (e.g. *Abies lasiocarpa, Picea species, Pinus ponderosa, Pseudotsuga menziesii*)*/C. sericea* communities often have noticeable *P. tremuloides* cover, indicating its possible prior dominance (Kovalchik 1993; Hansen et al. 1995; Manning and Padgett 1995; Crowe and Clausnitzer 1997; Hall and Hansen 1997). Other communities may be successionally related to *P. tremuloides/C. sericea* including *P. tremuloides/Betula occidentalis*, *Betula occidentalis/C. sericea*, and *Alnus incana-C. sericea*/Mesic forb (Manning and Padgett 1995; Crowe and Clausnitzer 1997). Similarly, overgrazing may promote the disclimax *P. tremuloides/Poa pratensis* community type (Hansen et al. 1995; Hall and Hansen 1997).

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

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

ENVIRONMENT: *Populus tremuloides/Cornus sericea* is found from low foothills and flood plains to high mountain valleys throughout its range. Elevations are as low as 730 m (2400 feet) in Montana, 940 m (3100 feet) in northeast Washington and in the Boise River area of Idaho (Kovalchik 1993; Hansen et al. 1995). Mid-elevation sites are along mountain rivers, ranging from 1085 m (3560 feet) on the Salmon River to 1470 m (4800 feet) on the Henry's Fork in Idaho (Collins 1979, Jankovsky-Jones 1996).

Elevations are as high as 2300 m (7500 feet) in Montana, eastern Idaho, and Nevada (Hansen et al. 1995; Manning and Padgett 1995; Hall and Hansen 1997). *Populus tremuloides/Cornus sericea* is typically in narrow to broad U or V-shaped valleys, canyons, and flood plains which are seasonally flooded (Hansen et al. 1995; Hall and Hansen 1997). It is often along stable, low to moderate gradient streams (less than 3% to 8% slope) on alluvial terraces or canyon colluvium, but can also be near seeps and springs (Kovalchik 1993; Manning and Padgett 1995). The community is sometimes found away from streams but usually in moist areas (such as depressions or old channels). These areas typically have a near surface water table in the spring which drops up to 2 m by late summer.

VEGETATION: Due to its broad geographical range, *Populus tremuloides/Cornus sericea* has variable vegetation. The dominant species are *P. tremuloides* with cover 30 to 85% (100% constancy) and *C. sericea* cover 15 to 84% (constancy 67 to 100%) (Collins 1979; Kovalchik 1993; Hansen et al. 1995; Manning and Padgett 1995; Hall and Hansen 1997). In northern areas, sub-dominant trees include *Populus trichocarpa* and *Betula papyrifera* while conifers, such as *Picea engelmannii* or *Abies* species, may be present elsewhere. Other tall shrubs, sometimes mixed with *C. sericea* (all with cover less than 40% and constancy less than 50%), include *Salix* species (usually *Salix bebbiana*), *Betula occidentalis, Alnus incana, Prunus virginiana*, and *Crataegus douglasii*. The low shrub understory is typically dominated by *Rosa woodsii* (or other *Rosa* species) (up to 20% cover and 100% constancy) and *Symphoricarpos albus* (sometimes *S. occidentalis*) (up to 20% cover and 83% constancy) (Collins 1979; Kovalchik 1993; Hall and Hansen 1997; Jankovsky-Jones 1996; 1997a). The herbaceous understory is dominated by forbs which vary from low to moderate cover depending on the density of *C. sericea*. The most common species, all with cover less than 15% but sometimes with high constancy, are *Equisetum* species (*E. arvense* and *E. hyemale*), *Actaea rubra, Smilacina species, Galium* species *(G. triflorum* and *G. aparine*), and *Urtica dioica*. Other forbs which are sometimes encountered include *Viola species, Taraxacum officinale, Osmorhiza chilensis, Geum macrophyllum* , and *Thalictrum* species (Collins 1979; Kovalchik 1993; Manning and Padgett 1995; Hansen et al. 1995; Jankovsky-Jones 1996; 1997a; Hall and Hansen 1997). The graminoid layer has sparse cover, low diversity, and is dominated by exotic species. The common exotic grasses are Bromus species (usually *B. inermis* up to 10% cover), *Agrostis stolonifera*, and *Poa pratensis*. Even less common are native graminoids including *Calamagrostis canadensis*, *Bromus ciliatus*, *Carex* species, and *Elymus glaucus*. The ground cover is predominantly litter (thickest where not flooded) with less than 5% cover of rocks (Kovalchik 1993; Manning and Padgett 1995).

WILDLIFE VALUES: *Populus tremuloides/Cornus sericea* has high wildlife cover and forage value during most of year. *Populus tremuloides* suckers, buds, and bark are often heavily browsed by beaver, rabbits, moose, deer, small mammals, and elk (Hansen et al. 1995; Manning and Padgett 1995; Crowe and Clausnitzer 1997; Hall and Hansen 1997). Moose also utilize *C. sericea* though its density may reduce use by some species. Numerous bird species nest and feed in aspen including grouse, flickers, red-breasted nuthatches, chickadees, sapsuckers, grosbeaks, crossbills, and woodpeckers (Hansen et al. 1995; Crowe and Clausnitzer 1997; Hall and Hansen 1997). The roots and vegetation of this community often overhang streams providing excellent fish cover.

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

ADJACENT COMMUNITIES: Communities with similar moisture adjacent to *Populus tremuloides/Cornus sericea* include other *P. tremuloides, Alnus incana, Salix* species, or *Populus* species dominated communities with *Rosa woodsii, Salix lutea, Cornus sericea, Prunus virginiana* , and *Crataegus douglasii* in the understory (Manning and Padgett 1995; Hall and Hansen 1997). Wetter sites range from saturated *Typha* species, *Scirpus* species, *Eleocharis palustris, Carex utriculata*, and *Phalaris arundinacea*

communities to *P. tremuloides/Carex lanuginosa, Alnus incana, Cornus sericea, Salix exigua*, or *Spiraea douglasii* communities (Kovalchik 1993; Hansen et al. 1995; Hall and Hansen 1997). Adjacent drier riparian sites include *P. tremuloides/Symphoricarpos albus* or *Pseudotsuga menziesii/ Symphoricarpos albus* (Kovalchik 1993). Neighboring upland communities include pinyon-juniper, *Abies concolor, Pseudotsuga menziesii, Picea engelmannii*, and *Pinus contorta*, and *Artemisia tridentata* shrub-steppe communities (Hansen et al. 1995, Manning and Padgett 1995).

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

ANALYSIS COMMENTS: Classification of *Populus tremuloides/Cornus sericea* is based on 15 stands in Idaho (Collins 1979; Hall and Hansen 1997; CDC unpublished data), 75 stands in Montana (Hansen et al. 1995), 6 stands in northeastern Washington (Kovalchik 1993), and 6 stands in Nevada (Manning and Padgett 1995). There are 6 records of the community tracked by Idaho Conservation Data Center (3 with plot data), four of which are protected areas (Cartier Slough Wildlife Management Area on Henry's Fork River, The Nature Conservancy's Silver Creek Preserve, Boise River Wildlife Management Area, and Portneuf Wildlife Management Area).

POPULUS TRICHOCARPA/ACER GLABRUM BLACK COTTONWOOD/ ROCKY MOUNTAIN MAPLE

CLASSIFICATION COMMENTS: This community is well-defined by Crowe and Clausnitzer (1997). Kovalchik (1993) identified this as a potential type, but did not fully describe it.

SIMILAR COMMUNITIES: No information.

RANGE: This type in known from northeastern Oregon and adjacent west-central Idaho, and probably also in northeastern Washington.

SOILS: This type is found on alluvial deposits of silt, sand, gravel, cobbles and stones. The principal substrate was composed of sand and cobbles (Crowe and Clausnitzer 1997).

ENVIRONMENT: The *Populus trichocarpa/Acer glabrum* community occurs in low- to mid-elevation terraces and flood plains ranging from 760 to 1525 m (2500 to 5000 feet). Most stands were in moderate to very high gradient (4% to 10%), V-shaped valleys of narrow to moderate width. Adjacent stream reach types in Oregon and Idaho were A2, A3, B2, C3, and C4. Stream widths ranged from 1 to 15 m (Crowe and Clausnitzer 1997).

VEGETATION: *Populus trichocarpa* dominates the overstory tree layer. Conifer species are regular components of sampled stands in Oregon, where they dominate the lower tree layers. *Acer glabrum* typifies a diverse tall shrub layer of *Amelanchier alnifolia, Cornus sericea, Philadelphus lewisii*, and *Crataegus douglasii*, with *Symphoricarpos albus* occurring beneath. While the herb layers consists of a diverse array of mesic-site species, most have low cover and are poorly represented (Crowe and Clausnitzer 1997).

WILDLIFE VALUES: *Acer glabrum* is an important browse species for wild ungulates and provides food and

cover for birds, squirrels, and chipmunks. Associated shrubs, while not as abundant, provide similar habitat elements for wildlife needs (Crowe and Clausnitzer 1997).

SUCCESSIONAL DYNAMICS: The constancy and abundance of *Abies grandis* regeneration in the stands in Oregon indicates the it may be the site potential here, possibly being seral to the *A. grandis/Acer glabrum* association (Crowe and Clausnitzer 1997).

ADJACENT COMMUNITIES: Adjacent upland sites support *Juniperus occidentalis* woodlands, canyon grasslands, and several *Abies grandis* associations. Adjacent riparian communities include other *P. trichocarpa types*, *Betula occidentalis*, *Populus tremuloides*, and various willow-dominated communities

MANAGEMENT: Black cottonwood is an important community element as habitat for a variety of wildlife. Fire and silviculture may be used in this type to arrest succession to conifer species (Crowe and Clausnitzer 1997).

ANALYSIS COMMENTS: This community has been defined by 6 plots in Oregon, one plot in Idaho, and observations in Washington.

POPULUS TRICHOCARPA/ROSA WOODSII BLACK COTTONWOOD/WOOD'S ROSE

CLASSIFICATION COMMENTS: This community type is quantitatively defined by seven plots in Yellowstone NP (Chadde et al. 1988) and two plots in northern Idaho (Asherin and Orme 1978), supplemented with additional plots and observations from southern Idaho (e.g., Jankovsky-Jones 1997a).

SIMILAR COMMUNITIES: Padgett et al. (1989) described a *Populus angustifolia/Rosa woodsii* community from southern Utah, which appears similar to this. Hall and Hansen (1997) described a *Populus trichocarpa/Symphoricarpos occidentalis* community from eastern Idaho that has a relatively high cover of *Rosa woodsii* and may be related. *Symphoricarpos* spp. are not present or occur in low cover in the *P. trichocarpa/Rosa woodsii* type described here.

RANGE: This type in known from northern Yellowstone NP, Wyoming, the lower Clearwater River canyon in north-central Idaho, and in scattered locations in southern and central Idaho.

SOILS: In Wyoming, the soils have been described as being typically Cryofluvents composed of shallow to deep sand layers overlying river cobbles. Roots and litter of the undergrowth eventually for darkened surface horizons. Limited data there 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 similar sandy alluvial deposits overlying coarse cobbles (Asherin and Orme 1978).

ENVIRONMENT: This type occurs on terraces and flood plains across a wide range of elevations, from below 300 m (1000 feet) in northern Idaho to above 1820 m (6000 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 along small streams, to moderately wide bottoms in deep canyons, to broad flood plains in Intermontane valleys.

VEGETATION: *Populus trichocarpa* dominates the overstory tree layer. In Yellowstone NP, *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, sometimes greater than 80%. 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.

WILDLIFE VALUES: The *Populus trichocarpa/Rosa woodsii* community provides browse and forage for numerous mammals and bird species. Structural diversity is typically high due to multilayered 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.

SUCCESSIONAL DYNAMICS: The *Populus trichocarpa/Rosa woodsii* community has been considered a long-lived seral community, possibly resulting from heavy use by cattle (Asherin and Orme 1978) or native ungulates (Chadde et al. 1988). It is less clear that some 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) *P. trichocarpa/Cicuta douglasii* habitat type. Chadde et al. (1988) suggest that conifers may form stable communities on sites in

Yellowstone.

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

MANAGEMENT: 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*.

ANALYSIS COMMENTS: This community was described from two transects and numerous observations by Asherin and Orme (1978), seven plots by Chadde et al. (1988), and four plots and four observations from southern Idaho (including Jankovsky-Jones 1997a).

POPULUS TRICHOCARPA/SALIX LASIANDRA BLACK COTTONWOOD/WHIPLASH WILLOW

See Community Characterization Abstract in last year's report (Moseley 1998).

POPULUS TRICHOCARPA/SALIX LUTEA BLACK COTTONWOOD/YELLOW WILLOW

CLASSIFICATION COMMENTS: Manning and Padgett (1995) describe a *Populus/Salix* community type 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 by one stand. Their broad type includes the *Populus trichocarpa/Salix lutea* community described here. Four stands have been sampled in Idaho.

SIMILAR COMMUNITIES: Kaufman et al. (1985) describe a gravel bar/*Salix* spp./mixed forb community type from northeastern Oregon that has high cover of *Populus trichocarpa* saplings and *Salix lutea*. His stands may represent an early seral stage of the *P. trichocarpa/Salix lutea* community.

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

SOILS: Soils were young alluvial deposits, often with greater than 35% coarse fragments. The presence of *Salix lutea*, *S. 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 the late summer (Manning and Padgett 1995).

ENVIRONMENT: Stands of this community occupy stream bars and low benches that are generally flooded annually at high water in the spring. It can occur along small streams as well as large rivers. Consequently, valley bottom widths range from narrow to broad (<50 yds to over 300 yds). Stream segments are classified as A1, A2, A3, B3, and C3. Elevations range from 1525 to 2250 m (5000 to 7400 feet).

VEGETATION: *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, S. exigua, S. geyeriana, Cornus sericea, Amelanchier alnifolia,* and *Alnus incana*, among others. Beneath the tall shrubs there is another diverse layer of shorter shrubs, including various *Ribes* spp. and *Rosa woodsii*. The herbaceous layer is sparse, probably because of the dense shade.

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

SUCCESSIONAL DYNAMICS: The successional dynamics in this community are unclear. Kaufman et al.'s (1985) gravel bar/*Salix* spp./mixed forb community type may represent an early seral stage of the *P. trichocarpa/Salix lutea* community.

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: The high shrub density typically limits livestock access. They tend to use narrow corridors through this community.

ANALYSIS COMMENTS: This community has been defined by at least four plots in Nevada and four in Idaho (Jankovsky-Jones 1997a).

POPULUS TRICHOCARPA/ SYMPHORICARPOS ALBUS
BLACK COTTONWOOD/COMMON SNOWBERRY

See Community Characterization Abstract in last year's report (Moseley 1998).

WOODLAND COMMUNITIES

JUNIPERUS OCCIDENTALIS/ DANTHONIA CALIFORNICA
WESTERN JUNIPER/CALIFORNIA OATGRASS

This community type is tentatively described from two plots sampled in intermittent drainages on the 45 Ranch Allotment in southwestern Owyhee County. An open *Juniperus occidentalis* woodland occurs as a stringer along the drainage bottom. The understory vegetation is sparse, with much of the ground cover consisting of rock exposed by the intermittent water flow and by moss (30-50% cover in the two plots). Fourteen graminoid species, comprised of a mixture of mesic and wet site species, were sampled in the two plots. *Festuca idahoensis*, *Poa nevadensis*, *Danthonia californica*, and *Carex douglasii* had the highest cover. Trace amounts of *Artemisia cana* and/or *A. arbuscula*, as well as a diversity of forbs, also occur in the drainage bottom. *Artemisia tridentata* ssp. *wyomingensis* shrub - steppe and *Juniperus occidentalis* woodlands surround this community. This type is related to the *Danthonia californica* community described in my report last year (Moseley 1998), which occurs in nearby drainage bottoms on the 45 Ranch Allotment. I expect that this community occurs along other intermittent drainages in western Owyhee County.

JUNIPERUS OCCIDENTALIS/ELYMUS GLAUCUS
WESTERN JUNIPER/BLUE WILDRYE

A relatively isolated *Juniperus occidentalis* woodland occurs in the Rocking M Conservation Easement Area of Hells Canyon, Washington County. Along one segment of Dennett Creek, a perennial stream, the woodland extends to the riparian zone. At the one plot sampled, the valley bottom is 15 to 40 m wide and is steep (ca. 14%). The elevation is 1200 m (4000 feet). *Juniperus occidentalis* has about 50% canopy cover and several widely scattered shrubs occurred in the understory, with *Philadelphus lewisii* being the most prominent. The perennial grass cover is nearly 60% with *Elymus glaucus* alone reaching 40%. There were 13 forb species present, all in trace amounts. A single large *Pseudotsuga menziesii* occurred in the stand. Surrounding vegetation included juniper woodlands, canyon grasslands, and Douglas-fir forest types.

JUNIPERUS SCOPULORUM/ELYMUS GLAUCUS
ROCKY MOUNTAIN JUNIPER/BLUE WILDRYE

CLASSIFICATION COMMENTS: *Juniperus scopulorum/Elymus glaucus* is currently undescribed in any reviewed literature. It is based on field observations and two plots (Moseley 1998). An early seral stand of this type was tentatively described by Moseley (1998) as the *J. scopulorum*/Mesic graminoid community type.

SIMILAR COMMUNITIES: Few *Juniperus scopulorum* riparian communities have been described. However, Hansen et al. (1995) and Hall and Hansen (1997) described *J. scopulorum/Cornus sericea* which shares some herbaceous species with *J. scopulorum/Elymus glaucus*, though it has a well developed shrub understory. Other observed *J. scopulorum* communities, also tentatively described, have similar structural characteristics but different herbaceous layer composition. These include *J. scopulorum/Equisetum arvense* and *J. scopulorum/Equisetum hyemale*.

RANGE: *Juniperus scopulorum/Elymus glaucus* is possibly a rare community. It has only been reported in the canyons of the East Fork Jarbidge River and Bruneau River of Idaho near the Nevada border (Moseley 1998 as *J. scopulorum*/Mesic forb). It is probably located elsewhere in tributary canyons confluent with the Bruneau and Jarbidge rivers in both Idaho and Nevada.

SOILS: Little soils information is available. This community type occurs on alluvial terraces that have sandy and gravelly textures with occasional colluvial stones or boulders (less than 10% cover). Soils have low water holding capacity. Parent materials are mixed alluvium, derived predominantly from volcanics.

ENVIRONMENT: The *Juniperus scopulorum/ Elymus glaucus* community type is known from 1400 to 1600 m (4700 to 5300 feet) in elevation. It is found in deep canyons trending north to northwest out of the foothills of the Jarbidge Mountains and onto the Owyhee volcanic plateau. The community is located along 6 to 10 m wide, low gradient rivers full of coarse cobbles, stones, and boulders. The rivers are entrenched, with no real flood plain below old alluvial terraces. The community is located on 5 to 10 m wide dry terraces adjacent to the river, 1.5 to 2 m above the base flow. The terraces are flat to gently sloping (to 5 degrees). River bankfull stage is about 0.5 to 1 m below the terraces which only flood in rare, extreme events.

VEGETATION: *Juniperus scopulorum* nearly forms a closed canopy with 90% cover in uneven-aged stands, 5 to 10 m tall. The most common tree sizes are pole and mature trees with diameters at breast height from 15 to 50 cm. However, larger diameter trees and young saplings are also present. *Populus tremuloides* and *P. trichocarpa* may also be present with low cover. There is less than 10% low shrub cover, composed of *Berberis repens, Rosa woodsii*, and *Ribes inerme* in order of importance. The herbaceous layer is predominantly graminoid dominated (with 20 to 30% cover). The most common species, with 3 to 10% cover, is *Elymus glaucus* followed by *Poa nevadensis* with 3% cover. A mix of other species, usually averaging less than 3% cover, include *Festuca idahoensis, Poa pratensis, Bromus tectorum*, and *Carex* species (*C. lanuginosa* or C. *rossii*). Forb cover is about 10%, dominated by *Smilacina stellata* (10% cover). No other forbs are common (averaging 1% or less cover). However, *Equisetum hyemale, Silene menziesii*, and *Clematis ligusticifolia* may be noticeable. The ground cover is 10 to 50% litter (mainly juniper needles), 10% downed wood, and 40 to 80% cryptogam cover (mainly moss).

WILDLIFE VALUES: Evidence of mule deer and historic beaver use is present in the *Juniperus scopulorum/Elymus glaucus* community. Mule deer will feed on *J. scopulorum* foliage and *E. glaucus*. Birds and small mammals will feed on *J. scopulorum* berries in winter. *Juniperus scopulorum* also provides excellent thermal and hiding cover for ungulates and other species (Hansen et al. 1995).

SUCCESSIONAL DYNAMICS: The *Juniperus scopulorum/Elymus glaucus* community possibly originated as a *Populus trichocarpa* type before river downcutting further dried the site, preventing *P. trichocarpa* regeneration. This is evidenced by old beaver cut stumps present in some stands and lack of *P. trichocarpa* regeneration. A similar situation was observed in early to mid-seral *J. scopulorum/Cornus sericea* stands which may be dominated by *Populus* species or shrubs such as *Salix* species or *Betula occidentalis* (Hansen et al. 1995; Hall and Hansen 1997). With further downcutting of the river, the community might move toward a drier community with slow invasion by drought tolerant upland species (Hansen et al. 1995) such as *Artemisia tridentata, Cercocarpus ledifolius, Purshia tridentata, Chrysothamnus species, Festuca idahoensis, Agropyron spicatum, Elymus cinereus*, and *Poa secunda*. The stand that Moseley (1998) called the *J. scopulorum*/Mesic forb community type, but is now considered an early seral stage of this type, was used as a loafing area by cattle and had reduced graminoid cover and higher cover of exotic or unpalatable native forbs.

ADJACENT COMMUNITIES: Other alluvial terrace communities adjacent to *Juniperus scopulorum/ Elymus glaucus* include *J. scopulorum/ Equisetum hyemale* and possibly *J. scopulorum/Equisetum arvense*. Drier terraces show invasion by canyon slope upland species such as *Artemisia tridentata, Cercocarpus ledifolius, Purshia tridentata, Chrysothamnus species, Festuca idahoensis, Agropyron spicatum, Elymus cinereus, Poa secunda*, and *Eriogonum* spp. Wetter terrace communities include *Populus trichocarpa* communities with high cover of *Cornus sericea, Rosa woodsii, Salix* species, and *Ribes inerme* in the understory. Wetter streambank communities include *Salix exigua* and other *Salix* species, *Cornus sericea*, and mesic graminoid types. Adjacent upland communities are *Artemisia tridentata* var. *wyomingensis/Agropyron spicatum* or */Festuca idahoensis* with scattered *J. scopulorum*, low sagebrush, and other upland shrub species.

MANAGEMENT: Production of livestock forage is low in the *Juniperus scopulorum/Elymus glaucus* community due to tree shading and droughty soils. Moreover, *J. scopulorum* has low palatability for livestock, though, seedlings can be killed by grazing (Hansen et al. 1995; Hall and Hansen 1997). *Elymus glaucus* is good early season forage but does not tolerate heavy grazing. The community may provide some logs for pencils and posts but mechanical soil damage is likely. Soils are droughty and structurally weak, with low organic matter, thus, logging and grazing easily scarify the ground promoting invasive species such as *Bromus tectorum*. Younger *J. scopulorum* trees are easily killed by fire, though older trees can survive (Hall and Hansen 1997). Fire potential, however, is low in the canyon bottom sites. *Juniperus scopulorum* is slow to invade disturbed sites since regeneration is by bird deposited seeds. *Elymus glaucus* produces abundant seed and germinates readily. Both *J. scopulorum* and *E. glaucus*

provide moderate to good erosion control and potential as long-term revegetation species (Hansen et al. 1995). The alluvial benches which support this community are usually too small for recreation or other developments. This community type occurs on flat terraces and has abundant shade, making stands ideal for loafing livestock in the summer. Considerable damage can be done to the duff layer by this activity making the sites ripe for weed invasion.

ANALYSIS COMMENTS: Classification of *J. scopulorum/E. glaucus* is tentative and based on field observations and two plots from the Jarbidge and Bruneau rivers, Idaho (Moseley 1998; CDC unpublished data).

JUNIPERUS SCOPULORUM/EQUISETUM ARVENSE ROCKY MOUNTAIN JUNIPER/ COMMON HORSETAIL

This type was sampled on a terrace along Buck Creek, a tributary of the Jarbidge River in southern Owyhee County. It is a relatively steep gradient stream in a narrow canyon bottom. The substrate was bouldery with finer alluvial material deposited on top. At present, the site does not appear to flood regularly. The riparian zone consisted of a stand of large, uneven-aged *Juniperus scopulorum* with a few seedlings in the understory. *Equisetum arvense* dominates a herbaceous understory both beneath the canopy and in gaps. There is a high diversity of understory associates (35 species), despite the 50% cover of *Equisetum*. Most occur in trace cover, with only *Senecio serra* and *Smilacina stellata* having greater than 5% cover. Most of the shrub species were on the edge of the stand adjacent to the creek. Juniper woodlands occurred on adjacent canyon slopes. This type will probably not be encountered in many other places in southwestern Idaho, but may be more common across the border in Nevada.

JUNIPERUS SCOPULORUM/EQUISETUM HYEMALE ROCKY MOUNTAIN JUNIPER/ COMMON SCOURING RUSH

This tentative community type was sampled once on a terrace along the East Fork Jarbidge River at 1600 m (5300 feet). *Juniperus scopulorum* occurred in a dense, even-aged stand, with *Equisetum hyemale* (70% cover) and *Poa pratensis* (30% cover) being the only species in the understory having more than trace or low cover. Old *Artemisia tridentata* stems and one live plant (outside of the plot) indicate that this type may have invaded an *Artemisia tridentata* spp. *wyomingensis/Festuca idahoensis* site. The valley bottom was 30 m wide and *Artemisia tridentata* spp. *wyomingensis* vegetation occupied adjacent canyon slopes. This type may be more common in the Jarbidge and Bruneau river canyons.

PSEUDOTSUGA MENZIESII/ ACER GLABRUM-PHYSOCARPUS MALVACEUS-FLOOD PLAIN DOUGLAS-FIR/ROCKY MOUNTAIN MAPLE-MALLOW NINEBARK-FLOOD PLAIN

CLASSIFICATION COMMENTS: The *Pseudotsuga menziesii/Acre glabrum-Physocarpus malvaceus* association was described by Johnson and Simon (1987) as a steep-slope, upland association. Crowe and Clausnitzer (1997) added "flood plain" to the name to distinguish their riparian type from the upland one.

SIMILAR COMMUNITIES: No information available.

RANGE: This association is known from northeastern Oregon and adjacent Idaho.

SOILS: Soils are composed of 0.5 to 1 m of silt and sandy loam over gravel, cobbles, and stones. The water table generally resides in the coarse alluvium at depths of 0.5 to 1 m (Crowe and Clausnitzer 1997).

ENVIRONMENT: This Douglas-fir association is found on streambanks, flood plains, and terraces at elevations from 850 to 1340 m (2800 to 4400 feet). Valleys are generally moderate, high, and very high gradient (5 to 12%) V-shaped valleys. Valley widths vary from 3 to 200 m with very steep side slopes. Rosgen stream types identified in Idaho and Oregon were A2, A3, A5, C3, and C4 streams. Stream widths are narrow, ranging from 1 to 3 m (Crowe and Clausnitzer 1997).

VEGETATION: Stands are characterized by a *Pseudotsuga menziesii* overstory with a diverse tall shrub understory. *Acer glabrum, Philadelphus lewisii, Holodiscus discolor, Physocarpus malvaceus*, and *Amelanchier alnifolia* dominate this layer. A short shrub layer is composed of *Symphoricarpos albus, Spiraea betulifolia*, and *Rosa gymnocarpa*. A diverse herbaceous layer occurs under the

dense shade of the tree and shrub canopy, but it has generally low-cover. *Betula occidentalis* has been observed in a few stands, but this early seral species will eventually be eliminated by the Douglas-fir overstory (Crowe and Clausnitzer 1997).

WILDLIFE VALUES: These streamside sites provide important habitat for a variety of wildlife species. Shrubs and fruits are eaten by deer, elk, bear, songbirds, and grouse. Trees provide habitat for squirrels, woodpeckers, and hawks. The densely vegetated, cool bottoms are used for bedding areas, hiding cover, and thermal cover by wild ungulates (Crowe and Clausnitzer 1997).

SUCCESSIONAL DYNAMICS: Members of this community are fire-resistant and will resprout following fire. Bark beetles and insect defoliators may impact overstory trees stressed by recurrent drought.

ADJACENT COMMUNITIES: Upland communities on adjacent slopes include canyon grasslands and Douglas-fir and grand fir forest associations. Adjacent riparian communities include aspen types.

MANAGEMENT: Although often in rugged country, this community can be easily accessible to livestock, especially for loafing and shade. Because this association is often at the headwaters of steep-gradient drainages, every effort should be made to reduce grazing impacts to the riparian vegetation and streambanks.

ANALYSIS COMMENTS: Description of this community is derived from a review of Crowe and Clausnitzer's (1997) work in Oregon and one plot in adjacent Idaho.

PSEUDOTSUGA MENZIESII/CORNUS SERICEA DOUGLAS-FIR/RED-OSIER DOGWOOD

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

SIMILAR COMMUNITIES: No information available.

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

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

ENVIRONMENT: This type occurs in mountains and the edges of high valleys. Elevations range from 1200 to 2250 m (3600 to 7400 feet). It occurs on alluvial benches and terraces of major streams and rivers and along small streams and creeks, usually in narrow, V-shaped valleys.

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

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

SUCCESSIONAL DYNAMICS: Stands of *Populus tremuloides* and a variety of shrub-dominated communities, typically *Salix* spp. and *Alnus incana*, represent seral stages of this type. *Pseudotsuga menziesii* will probably be present and successfully reproducing in these stands, although usually in the understory. Heavy, persistent livestock grazing may result in a loss of shrubs or change in shrub composition.

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

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

ANALYSIS COMMENTS: Many plots have been sampled by Hansen et al. (1995) in Montana, Hall and Hansen (1997) in eastern Idaho, by Moseley (unpublished data) in southwestern Idaho, and an undetermined number by Padgett et al. (1989) in Utah.

TALL SHRUB COMMUNITIES

ALNUS INCANA/CORNUS SERICEA MOUNTAIN ALDER/RED-OSIER DOGWOOD

See Community Characterization Abstract in last year's report (Moseley 1998).

BETULA OCCIDENTALIS/CORNUS SERICEA WATER BIRCH/RED-OSIER DOGWOOD

CLASSIFICATION COMMENTS: This community is a well-documented type.

SIMILAR COMMUNITIES: From stand tables, it appears as if some *Betula occidentalis/Cornus sericea* stands are included in Hansen et al's. (1995) *Betula occidentalis* dominance type.

RANGE: The community is known from Montana and eastern Washington, south to Idaho, Utah and Nevada.

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

ENVIRONMENT: Elevation ranges from 640 to 2280 m (2100 to 7500 feet). Type occurs on gentle slopes of streambanks and terraces of moderate to high gradient mountain and foothill streams. Surface topography is often undulating (Padgett et al. 1989; Manning and Padgett. 1995).

VEGETATION: *Betula occidentalis* clearly dominates the tall shrub overstory with over 30% cover. The undergrowth is characterized by nearly impenetrable shrub undergrowth dominated by *Cornus sericea* (40% or greater cover). *Rosa woodsii* and tall *Salix* spp. are frequently present with up to 15% cover. The herbaceous layer varies inversely with the shrub layer. Herbaceous species which are consistently present include *Smilacina stellata*, *Equisetum* spp., *Galium triflorum*, and *Poa pratensis*.

WILDLIFE VALUES: Information not available.

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

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

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

GANALYSIS.DATA.MANAGE.COM Classification is based on 9 stands in Nevada, 14 stands in Utah and

southeastern Idaho, and an unknown number of stands in Montana and Washington.

***BETULA OCCIDENTALIS*/MESIC FORB**
WATER BIRCH/MESIC FORB

See Community Characterization Abstract in last year's report (Moseley 1998).

BETULA OCCIDENTALIS/PHILADELPHUS LEWISII
WATER BIRCH/SYRINGA

See description in last year's report (Moseley 1998).

BETULA OCCIDENTALIS/POA PRATENSIS
WATER BIRCH/KENTUCKY BLUEGRASS

See Community Characterization Abstract in last year's report (Moseley 1998).

CRATAEGUS DOUGLASII/ROSA WOODSII
BLACK HAWTHORN/WOOD'S ROSE

See description in last year's report (Moseley 1998).

CORNUS SERICEA
RED-OSIER DOGWOOD

See Community Characterization Abstract in last year's report (Moseley 1998).

PHILADELPHUS LEWISII
SYRINGA

See description in last year's report (Moseley 1998).

PRUNUS VIRGINIANA
CHOKECHERRY

See description in last year's report (Moseley 1998).

PRUNUS VIRGINIANA/ELYMUS GLAUCUS
CHOKECHERRY/BLUE WILDRYE

See description in last year's report (Moseley 1998).

***SALIX EXIGUA*/BARREN**
SANDBAR WILLOW/BARREN

See Community Characterization Abstract in last year's report (Moseley 1998).

***SALIX EXIGUA*/MESIC GRAMINOID**
SANDBAR WILLOW/MESIC GRAMINOID

See Community Characterization Abstract in last year's report (Moseley 1998).

SALIX EXIGUA/POA PRATENSIS
SANDBAR WILLOW/KENTUCKY BLUEGRASS

A small, variable stand of *Salix exigua* was sampled in the Black Leg Box Canyon exclosure in southern Owyhee County. This may represent the *S. exigua/Poa pratensis* community type described and documented from central Oregon, eastern Idaho, western Wyoming, and throughout Utah (Norton et al. 1981; Youngblood et al. 1985; Padgett et al. 1989; Jankovsky-Jones 1996; 1997b). A dense stand of *S. exigua* occurred on small bars along a small, incised stream. *Poa pratensis*, *P. palustris*, and *Eleocharis palustris* had equal cover (ca. 10%) in an otherwise sparse understory. This may be a grazing induced version of the *S. exigua*/Mesic forb or *S. exigua*/Mesic graminoid community types or resulting from an increase in graminoid cover in the *S. exigua*/Barren type (Youngblood et al. 1985; Padgett et al. 1989). The latter scenario appears to fit the Black Leg stand. More samples are needed in southwestern

Idaho to determine the identity of this stand with confidence.

SALIX GEYERIANA/CAREX UTRICULATA GEYER'S WILLOW/BLADDER SEDGE

CLASSIFICATION COMMENTS: This community has been quantitatively defined and described by at least 12 studies throughout the Intermountain region and Rocky Mountains. All these classifications have used the old name, *Carex rostrata*, which is now known to be strictly boreal. This name is now superseded by *C. utriculata* (Reznicek 1987). Because of the wide geographic distribution, different studies have taken different approaches to its classification, with some taking rather narrow approach and others taking a much broader view of this type. Most of the variability revolves around the treatment of *Salix boothii, Salix drummondiana*, and *Carex aquatilis*. *Salix geyeriana* and *S. boothii* have been treated differently in different classifications. For example, Hansen et al. (1995) in Montana include in their *Salix geyeriana* types those stands with all combinations of *S. geyeriana* and *S. boothii*, citing similarities between the two species in the environments they occupy and in management issues. On the other hand, Padgett et al. (1989) place stands with at least 25% cover of *S. boothii* into their *S. boothii* community types, even if the stands have greater cover of the taller *S. geyeriana*, arguing that much *S. boothii* cover significantly alters the structure of the vegetation. Some studies have taken an even broader approach by lumping stands dominated by *Salix geyeriana* and *S. drummondiana*, as well as *S. boothii, S. lemmonii, S. bebbiana, S. wolfii* and/or *Betula glandulosa*, into a generic *Salix/Carex utriculata* type (e.g., Tuhy and Jensen 1982; Kovalchik 1987; Crowe and Clausnitzer 1997).

Studies have also taken varying approaches to the amount of *Carex aquatilis* in this community type. Some studies (e.g., Youngblood et al. 1985; Mutz and Queiroz 1983; Hall and Hansen 1997) take the broad view by defining a *S. geyeriana/Carex utriculata* type with either *C. utriculata* or *C. aquatilis* as the herbaceous dominant. A narrower approach has been taken by others (e.g., Padgett et al. 1989, Kittel and Lederer 1993; Walford et al. 1997), where *C. utriculata* is the sole herbaceous dominant and *C. aquatilis*-dominated sites would be a different community type.

SIMILAR COMMUNITIES: See discussion in Classification Comments section on the treatment of *Salix boothii* and *Carex aquatilis* within the *S. geyeriana/C. utriculata* community type. The community described here is a narrow one, that is *S. boothii*-dominated sites are treated as different associations (sensu Padgett et al. 1989, Walford et al. 1997, and others) and *Carex aquatilis*-dominated understory similarly defines a separate type (sensu Padgett et al. 1989 and others).

RANGE: This is a common and widespread type in the Intermountain and Rocky Mountain areas. It is distributed from the eastern Sierra Nevada (Manning and Padgett 1995) and central Oregon (Kovalchick 1987) on the west, across northeastern Oregon (Crowe and Clausnitzer 1997), Idaho (Tuhy 1981; Tuhy and Jensen 1982; Mutz and Queiroz 1983; Youngblood et al. 1985; Jankovsky-Jones 1996; Hall and Hansen 1997), Nevada (Manning and Padgett 1995), and northern Utah (Padgett et al. 1989) to Colorado (Kittel and Lederer 1993; Kettler and McMullen 1996), Wyoming (Norton et al. 1981; Chadde et al. 1988; Walford et al. 1997) and Montana (Hansen et al. 1995).

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

ENVIRONMENT: Throughout its distribution, this community occurs in mountains and high valleys at elevations ranging from 1310 to 2740 m (4300 to 9000 feet). This type is most common on broad, level flood plains, but does occur in narrow bands along smaller streams in open, U-shaped valleys. Valley bottom gradients are usually low. Surface microtopography is often hummocky as a result of the irregular buildup of organic material. Hydrology of these sites is usually maintained through subirrigation and soil moisture is maintained at or near the surface in most cases. These sites may or may not be annually flooded during high water in the spring and early summer.

VEGETATION: *Salix geyeriana* dominates the open overstory and characteristically appears in large, often widely-spaced clumps. *Salix geyeriana* can be as much a 3 m tall. A diversity of other shrubs may be present, but usually in low amounts. Some of these subordinate shrubs include *Betula glandulosa, Salix boothii, S.*

drummondiana, Ribes inerme, Lonicera involucrata, *Potentilla fruticosa*, and *Alnus incana*. The lower shrubs of this group often occur at the base of *S. geyeriana*. *Carex utriculata* clearly dominates the understory. Other sedges and grasses, such as *Carex aquatilis, Carex interior*, and *Calamagrostis canadensis*, may be present, but they have low cover. Forb species are sparse, but *Geum macrophyllum* appears to be the most constant species across the range of this type.

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

SUCCESSIONAL DYNAMICS: The *Salix geyeriana/Carex utriculata* association is the wettest of all *S. geyeriana* types. Prolonged, intense utilization by livestock and wild ungulates may shift the site potential to a drier grazing disclimax, characterized by more open stands with exotic grasses, such as *Poa pratensis* and *Agrostis stolonifera*, dominating the understory. Beavers may exert a significant influence on sites as well. Active dams maintain high water tables needed to support this type. However, sustained removal of willows by beavers may reduce the site to a *Carex utriculata* community type. When beaver abandon a site, the dams eventually deteriorate and the water table may drop, shifting the site potential to the *S. geyeriana/Calamagrostis canadensis* type (Hall and Hansen 1997).

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

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

ANALYSIS COMMENTS: This type has been defined and described by numerous quantitative studies.

SALIX GEYERIANA/MESIC FORB
GEYER'S WILLOW/MESIC FORB

CLASSIFICATION COMMENTS: The *Salix geyeriana*/Mesic Forb community is sometimes lumped within broader community types when dominance by *S. geyeriana* is not obvious. For example, Weixelman et al. (1996) described a Cold Willow/Mesic Forb community in central Nevada while Crowe and Clausnitzer (1997) described a Willow/Mesic Forb type for northeastern Oregon, both of which may have high cover of *S. geyeriana, S. boothii*, or hybrids. Similarly, a general *S. geyeriana* community type described in eastern Idaho may include stands with mesic forb understories (Hall and Hansen 1997). In contrast, older studies apparently split *S. geyeriana*/Mesic Forb into communities such as *S. geyeriana/Geum macrophyllum* (Tuhy 1981) and *S. geyeriana/Fragaria virginiana* (Mattson 1984). These probably represent grazing-induced variants that should be included within the *S. geyeriana*/ Mesic forb type. Several other communities, such as Mesic Forb meadow, *S. boothii/Smilacina stellata*, and *S. boothii*/Mesic Forb, may floristically resemble *S. geyeriana*/Mesic Forb. However, when undisturbed, *S. geyeriana*/Mesic Forb is defined by obvious dominance by *S. geyeriana* (Youngblood et al. 1985; Padgett et al. 1989)

SIMILAR COMMUNITIES: *Salix geyeriana*/Mesic Forb has physiognomic, floristic, and ecologic similarities with many different communities (some of which are successionally related). For example, the understory species composition is similar to Cold Willow/Mesic Forb, Willow/Mesic Forb, Mesic Forb Meadow, *S. boothii/Smilacina stellata, S. boothii*/Mesic Forb, *S. lutea*/Mesic Forb, *S. lasiandra*/Mesic Forb, *S. geyeriana/Geum macrophyllum*, and *S. geyeriana/Fragaria virginiana* (Tuhy 1981; Mattson 1984; Youngblood et. al. 1985; Padgett et al. 1989; Weixelman et al. 1996; Crowe and Clausnitzer 1997). *S. geyeriana*/Mesic Forb is structurally, and often floristically, similar to broader *Salix boothii, Salix drummondiana*, and *Salix geyeriana* community types (Weixelman et al. 1996; Hall and Hansen 1997). Under different hydrologic conditions or grazing disturbance, the understory of the *S. geyeriana* Mesic Forb community often moves toward dominance by graminoids. These communities, such as *S.*

geyeriana/Deschampsia cespitosa, *S. geyeriana/Calamagrostis canadensis*, and *S. geyeriana/Poa pratensis* may have similar soils and physiognomy as *S. geyeriana*/Mesic Forb (Youngblood et. al. 1985; Padgett et al. 1989; Walford et al. 1997).

RANGE: The *Salix geyeriana*/Mesic Forb community is a widely scattered, minor type known from southern and eastern Idaho, western Wyoming, Utah (Uinta, Wasatch, and southern mountains), and Colorado (Youngblood et. al. 1985; Padgett et al. 1989; Walford et al. 1997). In Idaho it is found in the Owyhee Mountains, Salmon Falls Highlands, the Centennial Mountains, and around the Teton Range (Youngblood et al. 1985; Jankovsky-Jones 1996). Very similar Willow/Mesic Forb communities are known from central Nevada and northeast Oregon (Weixelman et al. 1996; Crowe and Clausnitzer 1997). Other similar communities, including *S. geyeriana/Geum macrophyllum* (Tuhy 1981) and *S. geyeriana/Fragaria virginiana* (Mattson 1984) are found in the Sawtooth Valley, Idaho and Yellowstone National Park, respectively.

SOILS: These sites are characterized by rocky alluvium (often volcanic in origin) evidenced by the large amount of coarse fragments in the fine textured soils (up to 50%). Soil textures are loamy skeletal, fine-loamy, clayey-skeletal, and sandy with moderate available water capacity (Youngblood et al. 1985; Padgett et al. 1989; Walford et al. 1997). Soils are often Cryoborolls (Aquic, Pachic, or Cumulic) but also include Cryofluvents or Cumulic Cryaquolls. The water table is seasonally within 50 cm of the surface (as evidenced by mottling) but drops to over 1 m deep by late summer (Youngblood et al. 1985; Padgett et al. 1989; Walford et al. 1997).

ENVIRONMENT: The *Salix geyeriana*/Mesic Forb community is found in narrow to wide valleys of rolling highlands and mountains. In Idaho, elevations range from 1720 m to 2035 m (5640 to 6670 feet) in the southwest to over 2600 m (8520 feet) in the east (Padgett et al. 1989; Jankovsky-Jones 1996; Hall and Hansen 1997). In western Wyoming it is found up to 2465 m (8085 feet) (Youngblood et al. 1985; Walford et al. 1997) while in Utah as high as 3050 m (10,000 feet) (Padgett et al. 1989). The community is found both on terraces adjacent to small creeks or braided rivers and near the drier margins of wetland flood plains. Sites include headwaters of small, rocky, and shallow spring-fed creeks (only 1 m wide) and larger mountain rivers. Valley gradients range from less than 2% to 5%. The community is located on undulating or concave ground both at creek bankfull level or much higher above it, though often within the seasonal flooding zone (Youngblood et al. 1985; Padgett et al. 1989; Jankovsky-Jones 1996; Hall and Hansen 1997; Walford et al. 1997). Salix geyeriana/Mesic Forb is on drier or better drained sites than other *S. geyeriana* communities.

VEGETATION: *Salix geyeriana*/Mesic Forb is clearly dominated by *S. geyeriana* (60 to 90% cover, 100% constancy) with *S. boothii* sometimes also present (with less than 30% cover and only 40 to 50% constancy) (Youngblood et al. 1985; Padgett et al. 1989; Hall and Hansen 1997). *Salix geyeriana* tends to grow in clumps separated by corridors. Other tall willows, such as *S. drummondiana* and *S. lutea*, occasionally occur with moderate cover, but are not dominant. A few trees may be present with low cover, including *Pinus contorta, Populus tremuloides*, and *Picea pungens*. There is a low shrub layer often dominated by *Ribes inerme* (less than 10% cover, 40 to 50% constancy) and *Potentilla fruticosa* (less than 15% cover and 25% constancy). In addition, several other shrubs are occasionally present with low cover including *Lonicera involucrata, Ribes aureum*, and *R. lacustre* (Youngblood et al. 1985; Padgett et al. 1989; Jankovsky-Jones 1996; Hall and Hansen 1997; Walford et al. 1997). There is a diverse, but variable, mixture of mesic forbs forming multiple height layers in the understory. The most common and widespread forbs are *Aconitum columbianum* (less than 20% cover), *Fragaria virginiana* (less than 12% cover), and *Geum macrophyllum* (less than 10% cover) (Youngblood et al. 1985; Padgett et al. 1989; Hall and Hansen 1997). Other common forbs, usually with less than 15% cover, are *Smilacina stellata, Aster foliaceus, Geranium* spp. (*G. richardsonii* and G. *viscosissimum*), and *Equisetum arvense*. Other forb species, sometimes with moderate to high cover but lower constancy throughout the community's range are *Mertensia* spp., *Polemonium occidentale, Urtica dioica, Thalictrum* spp., *Heracleum lanatum, Potentilla gracilis, Epilobium ciliatum, Mimulus guttatus*, and *Angelica arguta* (Youngblood et al. 1985; Padgett et al. 1989; Jankovsky-Jones 1996; Hall and Hansen 1997; Walford et al. 1997). The graminoid layer is poorly developed, tending to be dominated by weedy exotic species such as *Agrostis stolonifera* (less than 15% cover), *Poa pratensis*, and *Phleum pratense*. The most common native graminoids are *Carex* spp., mainly *C. microptera*. Moss and lichen cover is variable, ranging from zero to 40% of ground cover.

WILDLIFE VALUES: The *Salix geyeriana*/Mesic Forb community provides good cover, bedding ground, and forage for wildlife such as beaver, deer, moose, small mammals, and elk (especially in the winter) (Hansen et al. 1988; Hall and Hansen 1997). *Salix geyeriana* is

apparently more palatable than *S. boothii* to ungulates. Songbirds also use this community for nesting and foraging. The dense root network of *S. geyeriana* both shades and stabilizes streambanks, thus, creating excellent fish habitat (Hansen et al. 1988; Hall and Hansen 1997).

SUCCESSIONAL DYNAMICS: Little information exists on the successional dynamics of the *S. geyeriana*/Mesic Forb community. However, it is hypothesized that under heavy livestock grazing the community will move toward S. *geyeriana/Poa pratensis* with which it shares a similar forb understory composition (Youngblood et al. 1985; Padgett et al. 1989; Hall and Hansen 1997; Walford et al. 1997). *Salix geyeriana* may be less tolerant of browsing pressure than *S. boothii*, thus, moderate grazing may move the community toward *S. boothii* dominated communities. Continued overgrazing may directly or indirectly eliminate *S. geyeriana*, such as by decreasing its vigor or altering hydrologic conditions (Hall and Hansen 1997). The resulting communities may be drier types such as Mesic Forb Meadow, conifer or *Populus tremuloides* communities, or one with a graminoid dominated understory (Youngblood et al. 1985). Similarly, understory shrub and forb composition may be the result of disturbances (e.g. some species, such as *Rosa woodsii*, increase under livestock grazing while others decrease) (Weixelman et al. 1996; Hall and Hansen 1997). The origins of *S. geyeriana*/Mesic Forb are unclear, though, it appears to be a stable type on younger and drier alluvial surfaces (Walford et al. 1997). Thus, it is less likely to form on organic soil sites (formerly wet and occupied by *S. geyeriana/Carex utriculata* or *C. aquatilis*) and more related to *S. geyeriana/Deschampsia cespitosa* sites (Padgett et al. 1989).

ADJACENT COMMUNITIES: Wetter types adjacent to *S. geyeriana*/Mesic Forb include *Carex utriculata, C. nebrascensis Eleocharis* spp., *Phalaris arundinacea*, *Puccinellia pauciflora, Hordeum brachyantherum* , and *S. geyeriana/Carex utriculata* or /*C. aquatilis* communities (Youngblood et al. 1985; Padgett et al. 1989; Hall and Hansen 1997). *Salix geyeriana* is more tolerant of drier soil than *S. boothii* or *S. drummondiana*, thus, communities dominated by the latter two willows may be adjacent on wetter ground. Adjacent on sites with a similar, or slightly drier, moisture regime, are *S. geyeriana/Poa pratensis, S. geyeriana/ Calamagrostis canadensis, S. geyeriana / Deschampsia cespitosa*, and other *Salix*-dominated communities (Youngblood et al. 1985; Padgett et al. 1989; Hall and Hansen 1997). Other adjacent communities include those with high cover of *Prunus virginiana, Cornus stolonifera, Betula occidentalis*, or *Populus tremuloides*. Adjacent drier valley bottom sites are meadow communities dominated by *Deschampsia cespitosa, Poa pratensis* , and *Potentilla fruticosa* (Youngblood et al. 1985; Padgett et al. 1989). Adjacent uplands are usually forests dominated by *Pinus contorta, Pseudotsuga menziesii, Juniperus occidentalis, Abies lasiocarpa, Picea* spp., or *Populus tremuloides*. *Artemisia tridentata* var. *vaseyana* steppe may also be adjacent (Youngblood et al. 1985; Padgett et al. 1989; Hall and Hansen 1997).

MANAGEMENT: *Salix geyeriana*/Mesic Forb is a moderately productive community for livestock and *S. geyeriana* is more palatable to livestock than associated *S. boothii* (Crowe and Clausnitzer 1997). This community has many corridors between willow clumps which allow livestock access, thus, impacts from grazing must be closely monitored (Hall and Hansen 1997). For example, overgrazing of *S. geyeriana* causes lost vigor, decreased stand density, and eventual elimination. After overgrazing, *S. geyeriana* stands regain vigor if rested for at least 3 to 6 years (Crowe and Clausnitzer 1997). The mesic forb understory, however, will become dominated by *Poa pratensis* or other weedy species that tend to increase with grazing (Youngblood et al. 1985; Padgett et al. 1989; Hall and Hansen 1997; Walford et al. 1997). Livestock grazing, as well as human developments (e.g. roads, recreation sites, etc.), compact the Mollisols of *S. geyeriana*/Mesic Forb and are not usually compatible (especially under wet conditions). Moreover, when the community converts to *Poa pratensis* dominance, streambank stability decreases and cattle trampling causes bank sloughing, creek overwidening, and water table alterations (Padgett et al. 1989; Hall and Hansen 1997). Though the mesic forb understory does not have significant soil stabilizing ability, *Poa pratensis* roots are even poorer soil binders. *Salix geyeriana* will sprout vigorously after fire, especially in wetter stands after quick, hot fires. Thus, prescribed burning is effective in rejuvenating old clumps (Hansen et al. 1988; Hall and Hansen 1997). *Salix geyeriana*, though more difficult to root than *S. boothii* or *S. drummondiana*, is valuable for revegetation of streambanks. It has high value for stabilizing streambanks, trapping debris, and creating pools, thus, reducing erosional energy (Hansen et al. 1988; Hall and Hansen 1997).

ANALYSIS COMMENTS: Classification of *Salix geyeriana*/Mesic Forb is based on at least 7 stands in Idaho, 3 stands in Utah, 2 stands in western Wyoming, and unknown numbers of plots in Colorado (Youngblood et al. 1985; Padgett et al. 1989; Walford et al. 1997). One stand, without plot data, was observed on Trail Creek, Idaho (in the Teton Range) (Jankovsky-Jones 1996).

SALIX LASIANDRA/BENCH
WHIPLASH WILLOW/BENCH

CLASSIFICATION COMMENTS: The community is quantitatively defined from Nevada by Manning and Padgett (1995), and supplemented with three plots from southern Idaho.

SIMILAR COMMUNITIES: The *Salix lasiandra*/Mesic forb community type (Manning and Padgett 1995) also has a dense cover of *S. lasiandra*, but differs from the *S. lasiandra*/Bench by having a conspicuous herbaceous ground cover. Hall and Hansen (1997) described a broad *Salix lasiandra* community type from eastern Idaho, modeled after a similar Montana type (Hansen et al. 1995). At least some of their stands probably fall within the definition of the *S. lasiandra*/Bench community type described by Manning and Padgett (1995).

RANGE: This community is known to occur in mountains of northeastern Nevada and along the northern edge of the Snake River Plain in southern Idaho.

SOILS: Soils are mostly young and fluvial in origin and were classified as Xerofluvents and Udifluvents. The water table is usually deep (Manning and Padgett 1995).

ENVIRONMENT: This community type occupies coarse-textured stream bars or benches along very low to moderate stream gradients. Valley bottoms are narrow to wide, although typically moderate (Manning and Padgett 1995). Throughout its distribution, elevations range from 1280 to 2280 m (4200 to 7500 feet). Most of these sites are flooded annually at high water, and some channels may run through the stands throughout the summer.

VEGETATION: *Salix lasiandra* dominates a dense, tall canopy up to 8 m in height. All other shrubs and the herbaceous component are in low cover. Litter, bare soil and rock, and water comprise most of the ground cover.

WILDLIFE VALUES: The *Salix lasiandra*/Bench community type provides browse and cover for moose, deer, birds, and small mammals. Beaver tend to heavily utilize most species of willow (Hall and Hansen 1997).

SUCCESSIONAL DYNAMICS: *Salix lasiandra* colonizes coarse sand and gravel bars at low elevations. As these bars become elevated through flood plain development, this species maintains dominance on these drier sites. Droughty surface soils and dense shade limit the undergrowth to a sparse herbaceous layer (Manning and Padgett 1995).

ADJACENT COMMUNITIES: Adjacent upland communities include those dominated by sagebrush-steppe, pinyon-juniper, and *Cercocarpus ledifolius*. Adjacent riparian communities include those dominated by Populus *trichocarpa, Salix lasiolepis, S. exigua, S. lutea*, and *Cornus sericea*.

MANAGEMENT: This community is typically susceptible to heavy grazing. Because of dry surface soils, establishment of herbaceous species is limited. The coarse-textured soils lack sufficient vegetative cover and root density and are susceptible to disturbance by livestock and other mechanical means (Manning and Padgett 1995). *Salix* spp. communities in general, such as the *Salix lasiandra*/Bench community type, function in a variety of capacities to promote stream health and enhance water quality. In this community, *S. lasiandra* forms dense root networks that stabilize streambanks against lateral cutting and erosion, provides cover in the form of overhanging branches, which effectively moderates extreme temperature fluctuations. The large stature of the willows in this community contribute large woody debris to the stream (Hall and Hansen 1997).

ANALYSIS COMMENTS: This community was quantitatively described from five plots in northern Nevada (Manning and Padgett 1995), supplemented by three plots from southern Idaho (e.g., Jankovsky-Jones 1996).

SALIX LASIANDRA/*CORNUS SERICEA*
WHIPLASH WILLOW/RED-OSIER DOGWOOD

See description in last year's report (Moseley 1998).

SALIX LASIANDRA/ROSA WOODSII
WHIPLASH WILLOW/WOOD'S ROSE

CLASSIFICATION COMMENTS: The community is quantitatively defined from the Trout Creek Mountains, Oregon (Evenden 1989). Manning and Padgett's (1995) *Salix/Rosa woodsii* community type from Nevada is a broadly defined type that includes *S. lasiandra*/, *S. geyeriana*/, and *S. bebbiana/Rosa woodsii*.

SIMILAR COMMUNITIES: The high cover of *Rosa woodsii* and/or *Ribes aureum* distinguish this community type from other *Salix lasiandra*-dominated communities (Manning and Padgett 1995).

RANGE: The *Salix lasiandra/Rosa woodsii* has been documented from the Trout Creek Mountains of southeastern Oregon (Evenden 1989), the northern tier of mountain ranges in nearby northeastern Nevada (Manning and Padgett 1995), and from two widely separated foothill locations on the northern and southern edges of the Snake River Plain, Idaho.

SOILS: Most soils were Cumulic or Typic Haploxerolls. Surface soils textures are clayey, silty, and sandy. The water table is usually deep, although in some stands it can be near the surface throughout the season (Evenden 1989; Manning and Padgett 1995).

ENVIRONMENT: This community type is found in moderate V-shaped valleys at elevations ranging from 1220 to at least 1615 m (4000 to 5300 feet), and possibly higher. Valley floor widths are narrow to moderately wide. Stream channels can be up to 3 m wide and have low to moderate gradients. Typically, it occurs on terraces and banks from a level equal to the stream to up to 3.1 m above the channel. This type can also occur around headwater springs with small channels.

VEGETATION: A dense cover of *Salix lasiandra* and *Rosa woodsii* form two distinct overstory layers in this community type. The mature *S. lasiandra* can reach up to 8 m tall. Thickets of *Rosa woodsii* 2-3 m tall form in openings under the *Salix* canopy. The generally dense understory prevents light from reaching the soil surface resulting in a sparsely vegetated herbaceous layer. Often over half the stand is bare, except for a light layer of leaf litter. A diversity of herbaceous species may be associated with this community type. The most commonly encountered species are *Poa pratensis, Poa palustris, Galium triflorum*, and *Urtica dioica* (Evenden 1989).

WILDLIFE VALUES: The dense shrub layers and the structural diversity of this community produce good cover for wildlife.

SUCCESSIONAL DYNAMICS: *Rosa woodsii* can indicate past heavy grazing, but the successional relationships are not well-known. Evenden (1989) indicates that this type may be a deteriorated state of the *Salix lasiandra/Poa pratensis* type, however, one occurrence in Idaho has been protected in an exclosure for nearly 40 years.

ADJACENT COMMUNITIES: Adjacent upland communities include those dominated by sagebrush-steppe.

MANAGEMENT: The sparse herbaceous understory provides little forage for livestock. Thickets of *Rosa woodsii* tend to preclude livestock access to the interior of these communities, although they may create access lanes through the stands. The erosion control potential for this community type is high.

ANALYSIS COMMENTS: This community was quantitatively described from nine plots in Oregon (Evenden 1989) and some from northern Nevada (Manning and Padgett 1995), supplemented by one plot and one observation from southern Idaho.

SALIX LASIOLEPIS/BARREN
ARROYO WILLOW/BARREN

CLASSIFICATION COMMENTS: Quantitatively defined from Utah by Padgett et al. (1989) and Nevada by Manning and Padgett (1995), who called it Salix lasiolepis/Bench. The composition and structure of the vegetation is similar, as well as physical and environmental features. This is supplemented with six plots from southwestern Idaho (Moseley 1998 and unpublished data).

SIMILAR COMMUNITIES: Similar to the *Salix lasiolepis/Rosa woodsii* community, but it lacks the dense shrub understory (Manning and Padgett 1995).

RANGE: This community is known to occur in southeastern Utah (Padgett et al. 1989), scattered throughout Nevada (Manning and Padgett 1995), and in southwestern Idaho (Moseley 1998).

SOILS: Soils are mostly developed in alluvium and have xeric moisture regimes. They were classified as Xerofluvents, Xerochrepts, Udifluvents, Halumbrepts, and Haploxerolls, indicating the range in soil development. Soil texture classes include sandy-skeletal and fine-loamy. Water tables are deep, usually below the level of the soil pit, and no mottles were evident because of the coarse soil textures (Padgett et al. 1989; Manning and Padgett 1995). Some stands in Idaho were on well-drained residuum or colluvial material near springs.

ENVIRONMENT: Elevations ranged from 760 m (2500

feet) in the north to over 2130 m (7000 feet) in the south. Most stands occur on stream benches and low terraces in valley bottoms with narrow to moderate widths and low to high (typically moderate) gradients. The substrates are coarse textured and surface soils are usually dry. Most streams were A2 channels, but include also A3, B2, B3, C3, and D2 types (Padgett et al. 1989; Manning and Padgett 1995).

VEGETATION: *Salix lasiolepis* dominates a very dense overstory. This shrub is highly branched from the base, with long sweeping stems that totally dominate the stand structure. *Ribes aureum, Rosa woodsii*, and possibly other low shrubs occur in the stand, but always in low cover. The low, herbaceous understory is depauperate with a diversity of often weedy species occurring with low constancy and cover (Padgett et al. 1989; Manning and Padgett 1995).

WILDLIFE VALUES: *Salix lasiolepis* is considered a good browse species for deer in California. This community often occurs where riparian zones are scarce and is very important for terrestrial and avian wildlife species (Padgett et al. 1989; Manning and Padgett 1995).

SUCCESSIONAL DYNAMICS: Little is known about the successional status of this type. It appears to occur where soils are coarse-textured and water is available at least early in the growing season. The depauperate undergrowth is likely indicative of dense shade coupled with xeric surface soils. *Pinus ponderosa* was a major component of one stand in the Spring Mountains of far southern Nevada and may represent a trend toward a conifer-dominated overstory there (Padgett et al. 1989; Manning and Padgett 1995).

ADJACENT COMMUNITIES: Adjacent upland communities include those dominated by sagebrush-steppe, pinyon-juniper, *Quercus gambelii*, and *Cercocarpus ledifolius*. Adjacent riparian communities include those dominated by *Populus trichocarpa, Salix lasiolepis, S. exigua, S. lutea, Salix lemmonii, Alnus rhombifolia*, and *Cornus sericea*.

MANAGEMENT: Little is known about the response to management. This type should be maintained for the streambank stability it provides to the coarse-textured soils (Manning and Padgett 1995).

ANALYSIS COMMENTS: This community was quantitatively described from nine plots in Nevada (Manning and Padgett 1995) and six plots in Utah (Padgett et al. 1989), supplemented by six plots from southwestern Idaho (Moseley 1998).

SALIX LASIOLEPIS/CORNUS SERICEA ARROYO WILLOW/RED-OSIER DOGWOOD

I erected a broad *Salix lasiolepis* cover type for the three, highly variable stands sampled in 1997 (Moseley 1998). This year eight more stands were sampled and, when combined with last year's data, some of the community patterns became apparent. Most of the plots appear to be the *S. lasiolepis*/Barren community type described above. Two *Salix lasiolepis*-dominated stands sampled last year at Jump Creek Canyon and Little Jacks Creek, have high cover of *Cornus sericea* (30-60%) in the shrub canopy. A mixture of other shrubs also occur, although with less cover than *S. lasiolepis* and *Cornus*. They include *Salix lasiandra, S. lutea, Ribes aureum*, and *Rosa woodsii*. The shrub canopy ranges from 60 to 100%, while the herbaceous understory is depauperate, with less than 10% cover. Both of these stands occur along perennial drainages, with channel widths ranging from 1 to 3 m. The understory herbaceous cover appeared to be kept low due to annual scouring. The valley bottom gradient ranged from low (Little Jacks Creek) to moderate (Jump Creek Canyon) and elevations ranged from 1000 to 1220 m (3300 to 4000 feet). This type has not been described elsewhere and in southwestern Idaho, at least, appears to be restricted to canyons in Owyhee County.

SALIX LASIOLEPIS/MESIC GRAMINOID ARROYO WILLOW/MESIC GRAMINOID

Three *Salix lasiolepis* dominated plots sampled this year have a relatively high cover of graminoid species. As in most community types of the *S. lasiolepis* alliance, *S. lasiolepis* completely dominates the stands (80-90% cover). *Philadelphus lewisii* may be prominent in the stands. Perennial grass cover ranges from 30 to 70%, with *Elymus glaucus* and *Poa pratensis* being the most prominent. Forb cover averages 30% and consists of a diversity of native perennial and weedy annual species. Valley bottom widths ranged from 3 to 80 m and gradients ranged from 2% to 6%. Elevations ranged from 800 to 1280 m (2600 to 4200 feet). Stands of this community type were sampled in the Danskin Mountains north of Mountain Home and in the Rocking M Conservation Easement area in Hells Canyon. It has not been described elsewhere.

SALIX LUTEA
YELLOW WILLOW

See description in last year's report (Moseley 1998).

SALIX LUTEA/POA PRATENSIS
YELLOW WILLOW/KENTUCKY BLUEGRASS

This is a grazing-induced community type first described from Nevada (Manning and Padgett 1995) and later documented from southeastern Idaho (Jankovsky-Jones 1997b). Three plots were sampled this year that appear to fit this type, two on the Rocking M in Hells Canyon and one along the Nevada border at Flat Creek. Stands sampled this year tended to be rather heterogeneous, with *Salix lutea* being prominent and sometimes dominant, but always with a mixture of other tall shrubs having high cover, such as *Salix exigua, S. lasiandra, S. lasiolepis, S. boothii* , and *Betula occidentalis*. Perennial grass cover ranged from 30% to 60% and *Poa pratensis* was always prominent. Forb cover was also high, ranging from 20% to 60%, often containing weedy species. Some of the native forbs that high high cover included *Solidago canadensis* and *Equisetum arvense*. This is probably a widespread type.

SALIX LUTEA/ROSA WOODSII
YELLOW WILLOW/WOOD'S ROSE

CLASSIFICATION COMMENTS: Quantitatively defined from Oregon (Evenden 1989) and Nevada (Manning and Padgett 1995) and qualitatively described from Oregon by Dean (1960). Manning and Padgett (1995) included *Salix boothii* in their "*Salix lutea* group" because of identification difficulties, and its dominance in some stands they used to describe this type.

SIMILAR COMMUNITIES: The high cover of *Rosa woodsii* and/or *Ribes aureum* distinguish this community type from other *Salix lutea*-dominated communities (Manning and Padgett 1995).

RANGE: *Salix lutea/Rosa woodsii* has been documented from the Trout Creek Mountains (Evenden 1989) and Owyhee River canyon (Dean 1960) of southeastern Oregon, throughout the mountains of Nevada (Manning and Padgett 1995), and from an adjacent area of southwestern Idaho.

SOILS: Most soils are Cumulic Haploxerolls. Surface soils textures are variable, with sand and silt being the most commonly mentioned. The water table is usually deep during late summer, although it is certainly near the surface at high water in the spring. In some cases, such as the Owyhee canyons where annual water fluctuations are dramatic, this community can be flooded annually (Dean 1960; Evenden 1989; Manning and Padgett 1995).

ENVIRONMENT: This community type is found in moderate V-shaped valleys at elevations ranging from 1525 to 2440 m (5000 to 8000 feet). Valley floor widths vary from very narrow to very wide. Stream channels are generally narrow, with most being classified as B2, B3, or B4. Gradients are very low to moderate (up to 5%). Typically, it occurs on terraces and bars that are 0.6-1.0 m above the adjacent stream channel (Dean 1960; Evenden 1989; Manning and Padgett 1995).

VEGETATION: Mature *Salix lutea*, up to 3 m tall, dominates this community, typically with a dry and open understory. *Rosa woodsii* is prominent in the understory of the willows, with it and/or *Ribes aureum* usually having greater than 20% cover. *Ribes inerme* is also common. The ground cover is fairly open with greater than half of the surface unvegetated and covered with a light layer of leaf litter (Dean 1960; Evenden 1989; Manning and Padgett 1995).

WILDLIFE VALUES: Tall *Rosa woodsii* cover provides habitat and forage for small wildlife and avian species. Forage value ratings for *Rosa* are high for mule deer (Manning and Padgett 19995).
SUCCESSIONAL DYNAMICS: Manning and Padgett (1995) consider this type to be disturbance induced in Nevada. *Salix lutea* establishes on periodically flooded stream bars that have shallow water tables. As the flood plain continues its development and the stream becomes incised, the understory shifts to xeric species, that they indicate eventually are replaced by *Rosa woodsii* and *Ribes aureum* as a response to heavy livestock grazing. The high cover of *Rosa* may not indicate past heavy grazing in all cases. The one known occurrence in Idaho is in a rugged canyon that has limited livestock use.

ADJACENT COMMUNITIES: Adjacent upland communities include those dominated by sagebrush-steppe and pinyon-juniper woodlands. Adjacent riparian communities include *Cornus sericea* and other tall

willow-dominated types.

MANAGEMENT: The sparse herbaceous understory provides little forage for livestock. Thickets of *Rosa woodsii* tend to preclude livestock access to the interior of these communities, although they may create access lanes through the stands. The erosion control potential for this community type is high.

ANALYSIS COMMENTS: This community was quantitatively described from 6 plots in Oregon (Evenden 1989) and 18 from Nevada, although some of these are dominated or codominated by *Salix boothii* (Manning and Padgett 1995). These analyses have been supplemented by observations from southeastern Oregon (Dean 1960) and one plot from southern Idaho.

LOW SHRUB COMMUNITIES

ARTEMISIA CANA/DRY GRAMINOID
SILVER SAGEBRUSH/DRY GRAMINOID

CLASSIFICATION COMMENTS: Quantitatively defined from Nevada by Manning and Padgett (1995). Stands were also sampled in southwestern Idaho (Moseley 1998). Manning and Padgett's stands from extreme northern Nevada, in the Jarbidge Mountains area, appear to be more similar to the *Artemisia cana/Festuca idahoensis* community type (see Similar Communities section). The remaining Nevada and southwestern Idaho stands appear the same.

SIMILAR COMMUNITIES: This plant community type is similar to the *Artemisia cana/Festuca idahoensis* type described from mountainous regions farther north and east. *Festuca idahoensis* is the characteristic herbaceous dominant in this type, whereas most of Manning and Padgett's (1995) stands had a mixture of other grasses and graminoids as dominants. Their stands from extreme northern Nevada (Jarbidge Mountains area) appear to be more similar to the *A. cana/F. idahoensis* type.

RANGE: Known from the Owyhee uplands of extreme southwestern Idaho (Moseley 1998), south to central Nevada (Manning and Padgett 1995).

SOILS: Most soils have thick mollic epipedons or other indicators of advanced soil development and included Haploxerolls, Cryoborolls, and Argixerolls. Soil particle sizes were variable and included clayey, clayey-skeletal, coarse-loamy, and loamy-skeletal (Manning and Padgett 1995).

ENVIRONMENT: This community type occupies seasonally moist sites in broad meadows with perennial streams or low terraces along intermittent drainageways. Valley bottom gradients are generally low and stands can occur in narrow to very broad valleys.

VEGETATION: *Artemisia cana* is the only shrub with any significant cover, ranging from 20-65%. *Rosa woodsii* is the only other shrub likely to occur in stands. The understory consists of a variety of drier-site grasses and grass-like species, typically none of which clearly dominate this herbaceous layer. *Carex douglasii, Juncus balticus*, and *Agropyron trachycaulum* have high constancy. Some of the other graminoids that occur in these stands include several native *Poa (P. fendleriana, P. nevadensis, P. cusickii), Juncus (J. tenuis, confusus)* and *Stipa* species, *Elymus triticoides, Muhlenbergia richardsonis, Hordeum brachyantherum, Sitanion hystrix*, and *Festuca idahoensis*. One stand on a well-drained bar along an intermittent drainage in Idaho has high cover of *Agropyron spicatum*, although several of the species mentioned above were also present. Although there was a high diversity of forbs in the Idaho stands, none had high constancy or more than trace cover. *Achillea millefolium, Taraxacum officinale*, and *Potentilla gracilis* had high constancy in Nevada. Similar to Idaho, forbs generally had low cover (Manning and Padgett 1995; Moseley 1998)

WILDLIFE VALUES: No information available.

SUCCESSIONAL DYNAMICS: Although this community is on stable sites, livestock overgrazing shifts undergrowth composition to early seral species. The common occurrence of *Achillea millefolium, Helenium hoopesii, Iris missouriensis, Potentilla gracilis*, and *Taraxacum officinale* indicates past heavy grazing. These highly productive sites attract livestock, reducing vigor and cover of palatable species such as *Poa nevadensis, P. cusickii, P. fendleriana, Agropyron trachycaulum, Festuca idahoensis*, and *Elymus triticoides*. Competitive low seral forbs typically colonize these communities (Manning and Padgett 1995).

ADJACENT COMMUNITIES: Adjacent upland communities include those dominated by *Pinus contorta*, pinyon-juniper, *Artemisia tridentata* ssp. *vaseyana* and ssp. *wyomingensis*, and *Artemisia arbuscula*. Adjacent riparian

communities include those dominated by *Artemisia ludoviciana, Artemisia tridentata* spp. *tridentata*, mesic graminoids, and tall willows.

MANAGEMENT: Erosion control potential for this community ranges from moderate to high for most associated species. Trampling sites with fine-textured soils leads to compaction and/or surface erosion. Graminoid associates are desirable forage and management should favor these species. Fire will increase *Artemisia cana* cover, which not only sprouts from the base, but also reproduces vegetatively from underground stems (Manning and Padgett 1995).

ANALYSIS COMMENTS: This community was quantitatively described from nine plots in Nevada (Manning and Padgett 1995), supplemented by three plots from southwestern Idaho (Moseley 1998).

ARTEMISIA CANA/FESTUCA IDAHOENSIS SILVER SAGEBRUSH/IDAHO FESCUE

CLASSIFICATION COMMENTS: This is a well-defined community. The *Artemisia cana/ Festuca idahoensis* community mentioned for Montana by Mueggler and Stewart (1980) is probably this subspecies, ssp. *viscidula* (Hansen et al. 1995). *Artemisia cana* ssp. *cana*, found mostly on the Great Plains, appears to have other understory unions. However, Cronquist (1994) offers an alternative taxonomic view of *Artemisia cana* by merging all infraspecific taxa, stating that there is no basis for splitting them.

SIMILAR COMMUNITIES: Manning and Padgett (1995) describe a broad type that they called *Artemisia cana*/Dry graminoid that, in part, included a few stands from the Jarbidge Mountains area that fall into this type, the *Artemisia cana/Festuca idahoensis*. An *Artemisia cana/Festuca ovina* community described from Utah is similar in structure to this community but is restricted to elevations above 2800 m (9200 feet) (Padgett et al. 1989).

RANGE: This type occurs in central and southwestern Montana (Mueggler and Stewart 1989; Hansen et al. 1995), western Wyoming (Bramble-Brodahl 1978; Mutz and Graham 1982; Youngblood et al. 1985), and central and eastern Idaho (Schlatterer 1972; Tuhy 1981; Tuhy and Jensen 1982; Hironaka et al. 1983; Mutz and Queiroz 1983; Youngblood et al. 1985; Jankovsky-Jones 1996; 1997a) and one site recently sampled in Owyhee County. This type may also extend into Colorado (Youngblood et al. 1985).

SOILS: Soils are silty to sandy loams, often with coarse fragments. Redox concentrations (mottles) are common and indicate a fluctuating water table. Soil reaction ranges from slightly acid to moderately alkaline (pH 6.0 to 8.0).

ENVIRONMENT: This community type is tolerant of imperfect drainage, high water tables, and periodic flooding. Available water is moderate (Youngblood et al. 1985, Hansen et al. 1995).

VEGETATION: Throughout its distribution, this community type represents the driest extreme of the riparian zones, and not all *Artemisia cana* sites are considered wetlands. *Artemisia cana* is usually the only species in a conspicuous low shrub stratum. On the moist extreme, *Potentilla fruticosa* may grade into this type, while at the drier extreme, *Artemisia tridentata* ssp. *vaseyana* may occasionally occur. *Festuca idahoensis* is common in the undergrowth, which may also include *Helenium hoopesii, Fragaria virginiana, Potentilla gracilis, Geum triflorum, Achillea millefolium* and *Taraxacum officinale* (Youngblood et al. 1985).

WILDLIFE VALUES: Because of its productivity and proximity to wetter communities, this type is an important source of forage and cover for mammals, songbirds, and game birds. Deer, elk, and antelope browse this habitat type, especially in winter when snow covers low growing vegetation. Sage grouse use this type for food and nesting cover (Hansen et al. 1995).

SUCCESSIONAL DYNAMICS: This community type represents stable conditions. With disturbance, *Festuca idahoensis* may be replaced by the graminoids *Poa pratensis, P. bulbosa*, or *Bromus tectorum*, and forbs such as *Taraxacum officinale* and *Fragaria virginiana* may increase (Youngblood et al. 1985, Hansen et al. 1995).

ADJACENT COMMUNITIES: Adjacent wetter sites support communities dominated by *Salix wolfii, S. boothii* and *Potentilla fruticosa* with a *Deschampsia cespitosa* or *Carex* sp. understory. *Artemisia tridentata* generally occupies drier, upland sites (Hansen et al. 1995).

MANAGEMENT: The accessibility of stands of this type may result in excessive use by livestock. *Festuca idahoensis* is moderately tolerant of grazing but can be injured by too intense early spring grazing. Mature plants

are strongly competitive while seedlings are weakly competitive. *Artemisia cana* is a vigorous root sprouter following a burn; fire is not an effective method of decreasing shrub densities. Youngblood et al. (1985) states that herbicides have been effective in killing *A. cana* if applied when the plant is phenologically active. Use of mechanical equipment or trampling by livestock when soils are moist can cause soil compaction and increased bare ground (Hansen et al. 1995). *Artemisia cana* is used in seed mixtures for big game range restoration, highway stabilization and beautification, and in mine reclamation work.

ANALYSIS COMMENTS: This type has been quantitatively defined and described by several studies, supplemented with generalized descriptions and plots from several other studies.

ARTEMISIA CANA/ MUHLENBERGIA RICHARDSONIS SILVER SAGEBRUSH/MAT MUHLY

CLASSIFICATION COMMENTS: This type was originally defined by two brief, general descriptions (Dealy 1971; Hironaka et al. 1983). There was no quantitative analysis or composition and structure data. Moseley (1998 and unpublished data) sampled six stands of *Artemisia cana* in dry lake beds and internally drained basins (see Environmental Description section), which appear to be this community.

SIMILAR COMMUNITIES: This community occurs in vernal pools and lake beds or other types of internally drained-basins. In this respect, as well as in floristic composition, it is unlike any other *Artemisia cana* communities in the Intermountain region, which generally occur along drainageways (e.g., *Artemisia cana/Festuca idahoensis* and *A. cana*/Dry graminoid).

RANGE: This type has been documented from two disjunct areas of Idaho and Oregon and may also occur in California (Bourgeron and Engelking 1994; Anderson et al. 1998). In Idaho it occurs on the central Snake River Plains northeast of Bliss (Hironaka et al. 1983) and in the Owyhee uplands in the far southwestern corner of the state (Moseley 1998). In Oregon it is known from the south-central portion of the state, near the east base of the Cascades (Dealy 1971; Franklin and Dyrness 1988).

SOILS: This type occurs in internally drained basins that accumulate fine-textured alluvium, generally either clay-loam or silt-loam. They can be relatively deep, greater than 0.6 m deep in the stands sampled in Idaho (Moseley 1998).

ENVIRONMENT: The *Artemisia cana/Muhlenbergia richardsonis* plant community type occurs in flat, internally-drained basins, which sometimes contain a vernal pool or lake in the center. All the known occurrences are on rolling volcanic plains. In Idaho it lies within the sagebrush-steppe zone and in Oregon it's within the lower montane forest zone. The stands are flooded in the spring of most years, but the surface soils, at least, are thoroughly dry by mid-summer. Elevations range from 1070 m (3500 feet) on the Snake River Plain near Bliss, to 1310 m (4300 feet) in Oregon, and 1550 m (5100 feet) in the Owyhee uplands of Idaho.

VEGETATION: *Artemisia cana* is the only shrub that occurs commonly in this type. Most Idaho stands have between 40 and 60% cover of *A. cana*. In Oregon, several trees and shrubs occur at the edge of the type or as inclusions, including *Salix* sp., *Populus tremuloides, Pinus contorta, Artemisia arbuscula*, and *A. tridentata* (Dealy 1971). In Idaho, *Chrysothamnus nauseosus* occurred in trace amounts in one stand. The herbaceous cover is variable and generally sparse. *Muhlenbergia richardsonis* appears to be the most constant species. *Muhlenbergia* cover in Owyhee Upland stands ranged from absent to 30% cover. Hironaka et al. (1983) describe *Juncus balticus* as a sparse associate of *Muhlenbergia* in the stands near Bliss and Dealy (1971) states that "*M. richardsonis, Juncus* sp., and *Eleocharis* sp. form a fairly heavy stand" under the *A. cana*. *Poa nevadensis* is mentioned as a community dominant in this community "in some areas in Oregon" (Hironaka et al. 1983). Graminoids associated with *Muhlenbergia* in Owyhee County stands include *Poa nevadensis, Eleocharis palustris, Sitanion hystrix*, and *Alopecurus geniculatus*. *Eleocharis palustris* can have cover as high as 80% in Owyhee stands, with *Muhlenbergia* being absent or having low cover. Forbs are sparse and, in Idaho, consist largely of small annual species, such as *Epilobium pygmaeum, Plagiobothyrs leptocladus, Naverritia intertexta*, and *Psilocarphus brevissimus*. A few short-lived perennial species also occur in these stands, such as *Cammisonia tanacetifolia*. The ground cover is generally greater than 80% bare soil.

WILDLIFE VALUES: No information available.

SUCCESSIONAL DYNAMICS: Nothing is known about

the primary or secondary successional dynamics of this community. Dealy (1971) suggests that, when there is a pool or lake at the center of the basin, this community can expand or recede as the water line moves back and forth due to long-term climatic changes.

ADJACENT COMMUNITIES: Adjacent upland communities include those dominated by *Artemisia tridentata* ssp. *wyomingensis* in Idaho and *Pinus contorta, P. ponderosa*, and *Populus tremuloides* communities in Oregon. The *Eleocharis palustris* vernal pool (Moseley 1998) community type was the only other wetland type observed to be adjacent to the *A. cana/M. richardsonii* type in southwestern Idaho.

MANAGEMENT: Little information is available. Dealy (1971) states that there is extreme competition between livestock and deer for the few forbs that do occur in the stands.

ANALYSIS COMMENTS: Six stands of this community were sampled in the Owyhee Uplands of Idaho, as well as one additional observation (Moseley 1998 and unpublished data). Dealy (1971) and Hironaka et al. (1983) provide only general descriptions and present no composition and structure data.

ARTEMISIA PAPPOSA
OWYHEE SAGEBRUSH

CLASSIFICATION COMMENTS: This community has been mentioned in several studies during the last two decades (Eidemiller 1977a; 1977b; Moseley 1987; Tirmenstein 1987), but the composition and structure was only recently sampled (Moseley 1998 and unpublished data).

SIMILAR COMMUNITIES: This community is unlike any other shrubland.

RANGE: This type has been documented from two disjunct locations in Idaho, although it has only been sampled in one of these. One area is in the Bennett Hills - upper Little Wood River region at the northern edge of the Snake River Plain in Blaine, Camas, Gooding, Lincoln, and Elmore counties. The other area where this community is documented is on the Owyhee Uplands of southern Owyhee County, south of the Snake River Plain. The species also occurs in adjacent portions of Elko County, Nevada, and Malheur County, Oregon (Cronquist 1994), but the community type has yet to be documented from these states.

SOILS: Soils are clay and stony-clay derived from volcanic parent material, generally basalt (Eidemiller 1977a). Some authors claim that *A. papposa* is tolerant of alkaline conditions (Eidemiller 1977a; Cronquist 1994).

ENVIRONMENT: The *Artemisia papposa* community type occurs on gently rolling volcanic plains and low hills. It most often occurs in low-gradient, intermittent drainageways, that carry water in the spring, or possibly during intense thunderstorms, but are otherwise dry during the summer. It also can occur in patterned ground or "biscuit and swale" topography that creates poorly drained areas with thin soil over bedrock (swales) between deep-soil mounds (biscuits). The *A. papposa* community occurs in the swales where there is little soil and water perches on the bedrock during the spring (Eidemiller 1977a; 1977b; Moseley 1987). Communities are best developed on low terraces adjacent to the main intermittent channels. The flood plain of these drainage systems are from 5 to over 30 yards wide. Elevations range from about 1460 to 1700 m (4800 to 5600 feet).

VEGETATION: The following community description is from the three plots sampled in Owyhee County (Moseley 1998 and unpublished data). This community type is characterized by a moderately dense cover of *Artemisia papposa* with an understory dominated by grasses. *Artemisia papposa* cover ranged from 10% to 40%. *Artemisia cana* and *A. arbuscula* were the only other shrubs present and they were in trace amounts. *Poa secunda* is the predominant grass in sampled stands, although *Poa nevadensis, Sitanion hystrix, Danthonia californica*, and *Festuca idahoensis* are present in low cover. Several perennial and annuals forbs were present, usually in only trace amounts, but in one stand having a combined cover of 20%. *Allium accuminatum, Lomatium cous, Balsamorhiza hookeri*, and *Epilobium brachycarpum* were the most constant forbs. This community occurs in small but well-developed patches scattered along drainageways and in patterned ground. Considerable soil is exposed in the community, mostly from natural frost churning and stream erosion, processes that sometimes leave the bunchgrasses, such as *Poa secunda*, on pedestals. The rare regional endemic plant, *Haplopappus uniflorus* var. *howellii* occurs in two of the stands sampled in Owyhee County, Idaho.

WILDLIFE VALUES: *Artemisia papposa* presumably provides very limited cover for larger mammals due to it

short stature (ca. one foot tall). It may, however, provide escape cover for smaller birds and mammals. Because it is deciduous, *A. papposa* provides little thermal cover during the winter (Tirmenstein 1987).

SUCCESSIONAL DYNAMICS: Nothing is known about the primary or secondary successional dynamics of this community.

ADJACENT COMMUNITIES: Adjacent upland communities include those dominated by *Artemisia tridentata* ssp. *wyomingensis*, *A. longiloba*, and *A. arbuscula*. Adjacent riparian communities in these intermittent drainage systems include *Danthonia californica* and *Artemisia cana* types.

MANAGEMENT: Little is known about its response to management. Feral horses browse *Artemisia papposa* in the spring and both deer and sheep readily consume the flower stalks in summer (Tirmenstein 1987).

ANALYSIS COMMENTS: Three stands of this community were sampled in the Owyhee Uplands of Idaho (Moseley 1998 and unpublished data). Others provide only general descriptions and present no composition and structure data (Eidemiller 1977a; 1977b; Moseley 1987; Tirmenstein 1987).

ARTEMISIA TRIDENTATA SSP. *TRIDENTATA/ ELYMUS CINEREUS*
BASIN BIG SAGEBRUSH/BASIN WILDRYE

See Community Characterization Abstract in last year's report (Moseley 1998).

SARCOBATUS VERMICULATUS/ DISTICHILIS STRICTA
GREASEWOOD/SALTGRASS

See Community Characterization Abstract in last year's report (Moseley 1998).

SARCOBATUS VERMICULATUS/POA SECUNDA
GREASEWOOD/SANDBERG BLUEGRASS

This is probably not a riparian community but it does occur on river terraces in valley bottoms. It was observed in two areas along the South Fork Owyhee River on the 45 Ranch Allotment. It was sampled at Bull Camp and observed at Coyote Hole. Both of these are wide areas in the canyon, with relatively large terraces that have had human habitation in the past. The stand sampled at Bull Camp had 40% cover of *Sarcobatus vermiculatus*, 20% *Poa secunda*, and 10% of the exotic weed *Lepidium perfoliatum*. *Artemisia tridentata* ssp. *tridentata* was present in trace amounts. Surprisingly, *Bromus tectorum* occurred in only trace amounts. The stand at Coyote Hole was similar, except the *Poa* was absent and the *Lepidium* had higher cover. *Bromus tectorum* again had very low cover.

Superficially, these terraces appear to be similar to the many other river terraces along the South Fork and Little Owyhee rivers, where the *Artemisia tridentata* spp. *tridentata/Elymus cinereus* community type dominates. My first impression was that the *S. vermiculatus/P. secunda* type may be a grazing-induced type, due to its occurrence near two old homesteads. This may be purely coincidence, however, because all other stands of *A. tridentata* spp. *tridentata/E. cinereus* that were obviously degraded by livestock still had the *Artemisia*, but the native grasses had been replaced by *Bromus tectorum*. In fact, adjacent to the large *S. vermiculatus/P. secunda* stand at Bull Camp, on a somewhat lower terrace, was a small stand of *A. tridentata* spp. *tridentata/E. cinereus* in reasonably good condition. I speculate that the site supporting this community may represent a different soil type, or possibly higher terraces farther from the water table, than the *A. tridentata* type.

GRAMINOID COMMUNITIES

CAREX NEBRASCENSIS
NEBRASKA SEDGE

CLASSIFICATION COMMENTS: A well-documented community type.

SIMILAR COMMUNITIES: Other communities for which *Carex nebrascensis* is a community dominant or codominant include the *C. nebrascensis-C. micropter a* community possibly occurring in California, Nevada, Oregon, and Washington, the *C. nebrascensis-Catabrosa aquatica* community from Colorado, and the *Deschampsia*

cespitosa-C. nebrascensis community from Colorado and Wyoming (Bourgeron and Engelking 1994; Anderson et al. 1998).

RANGE: The *Carex nebrascensis* community type has been documented in every western State, with the possible exception of New Mexico and Washington (Manning and Padgett 1995; Anderson et al. 1998).

SOILS: The *Carex nebrascensis* community type 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).

ENVIRONMENT: This community typically occurs at low to mid-elevations in the mountains, ca. 1000 to 2800 m (3300 to 9200 feet) depending on latitude. It most often occurs in meadows and on broad alluvial terraces with fine-textured soils, but also around seeps. Although stands can occur near streams and rivers, the high water tables found in this type appear to result from lateral subirrigation rather than fluvial flooding. Valley bottom widths can range from very narrow to very broad (typically moderate to broad) and gradients can range from very low to very high (typically low). It also occurs along a wide variety of Rosgen stream
classes (Youngblood et al. 1985; Padgett et al. 1989; Hansen et al. 1995; Manning and Padgett 1995; Crowe and Clausnitzer 1997).

VEGETATION: Stands of the *Carex nebrascensis* community type are generally small and widely scattered on the landscape. *Carex nebrascensis* clearly dominates the vegetation, with generally minor amounts of other graminoids, including *Glyceria striata, Deschampsia cespitosa, Juncus balticus, Calamagrostis neglecta,* and *Poa pratensis*, among many others. Forbs species present in the community 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).

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

SUCCESSIONAL DYNAMICS: Some studies consider all stands of the *Carex nebrascensis* community type 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).

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

MANAGEMENT: *Carex nebrascensis*, although an increaser in some communities, is very palatable to livestock and an excellent soil binder in wet meadows. Several studies suggest that management of this community 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).

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

CAREX SHELDONII
SHELDON'S SEDGE

See description from last year's report (Moseley 1998).

CAREX SIMULATA
SHORT BEAKED SEDGE

CLASSIFICATION COMMENTS: A well-documented community type.

SIMILAR COMMUNITIES: No information.

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

SOILS: Soils of the *Carex simulata* community type commonly have organic matter accumulation 30-120 cm thick; Padgett et al. (1989) noted that although the degree of organic matter decomposition is variable, communities within his study area were most often associated with organic soils rather than highly decomposed mineral soils. Kovalchik (1987) describes soils of this community type as organic loam and sedge peats. This type may also be found on poorly drained, fine textured, mineral soils (Hansen et al. 1995) or fine loams and clays with organic surface horizons of thick (cumulic) mollic epipedons (Youngblood et al. 1985). Water tables remain at or near the soil surface throughout the growing season. Available water capacity is moderate to high. Soil reaction is slightly acid to neutral (Hansen et al. 1995).

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

VEGETATION: *Carex simulata* dominates the intermediate to rich fen with 60-85% cover. Moss cover is typically high. Low species diversity, with *Carex aquatilis, Deschampsia cespitosa* and *C. utriculata* being the only associates with high constancy, is characteristic. The shrubs *Potentilla fruticosa, Salix wolfii* and *S. brachycarpa* are sometimes present. The most common forbs include *Pedicularis groenlandica* and *Swertia perennis*.

WILDLIFE VALUES: Waterfowl may use wetter extremes of this type for foraging (Hansen et al. 1995). This type may provide early spring forage for deer when adjacent uplands are still covered by snow. Streams are generally too small or intermittent to support salmonids (Kovalchik 1987).

SUCCESSIONAL DYNAMICS: The strongly rhizomatous *Carex simulata* appears to form a dense, stable community (Padgett et al. 1989). Continually high water tables limit the successful establishment of most other species. Due to the season long high water table, the sites are often inaccessible and minimally disturbed (Hansen et al. 1995).

ADJACENT COMMUNITIES: Wetter sites are the *Scirpus acutus* (Hansen et al. 1995), *Carex aquatilis* (Padgett et al. 1989), or the *C. utriculata* community type, or open water. The *Potentilla fruticosa/Deschampsia cespitosa* community types are common on drier sites (Hansen et al. 1995), while uplands may be dominated by *Pinus contorta, Picea engelmannii*, and/or *Populus tremuloides* (Padgett et al. 1989).

MANAGEMENT: *Carex simulata* appears able to withstand moderate grazing pressures, though impacts on soils may include hummocking and pitting (Padgett et al. 1989). For a grazing program to be successful, it must meet the basic biological requirement of the plants; long rest periods may be required to maintain or improve a plant community (Hansen et al. 1995). Prescribed fire is not a useful tool on this type. If the soil surface becomes dry, the organic soil may be quite flammable and fire will penetrate the soil and destroy sedge rhizomes (Kovalchik 1987).

ANALYSIS COMMENTS: Quantitatively defined and described by several studies in western North America.

CAREX UTRICULATA
BLADDER SEDGE

See Community Characterization Abstract in last year's report (Moseley 1998).

DANTHONIA CALIFORNICA
CALIFORNIA OATGRASS

See description in last year's report (Moseley 1998).

***ELEOCHARIS PALUSTRIS* (LOTIC)**
COMMON SPIKE-RUSH (RIVERS AND STREAMS)

CLASSIFICATION COMMENTS: A well-defined community.

SIMILAR COMMUNITIES: In some cases, the *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 true identity. A misidentification will result in the wrong community type and the sites on which they occur are very different ecologically.

RANGE: *Eleocharis palustris* is a common type in California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming, and Saskatchewan. Essentially it has been documented from every western state except Arizona and New Mexico (Bourgeron and Engelking 1994; Anderson et al. 1998).

SOILS: Soils of this community type 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 rich 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).

ENVIRONMENT: The *Eleocharis palustris* community type is found at low to moderate elevations, generally in wide, low gradient valleys of all shapes. Sites are wet basins, flood plains, 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 670 to at least 2650 m (2200 to 8700 feet), depending on latitude (Hansen et al. 1995; Manning and Padgett 1995; Crowe and Clausnitzer 1997; Hall and Hansen 1997).

VEGETATION: *Eleocharis palustris* is an aggressive, rhizomatous species that nearly excludes all other species from establishing any significant cover. Common associates in high quality sites include *Alopecurus aequalis, Mentha arvense, Rumex crispus, Eleocharis acicularis*, *Cares utriculata, Glyceria* spp., and *Phalaris arundinacea*. On some sites aquatic species, such as *Hippuris vulgaris, Utricularia vulgaris*, and *Potamogeton natans*, have high cover.

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

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

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: Seasonally wet conditions and low palatability of *Eleocharis palustris* limit the grazing value of this type for livestock, even during drought years when upland forage dries early and dies back (Kovalchik 1987). Sites occupied by this type are typically inundated or at least saturated for much of the year so 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).

ANALYSIS COMMENTS: This type has been quantitatively defined and described by numerous studies throughout the western United States and Canada (Bourgeron and Engelking 1994; Anderson et al. 1998).

ELEOCHARIS PALUSTRIS VERNAL POOL
COMMON SPIKE-RUSH VERNAL POOL

See description in last year's report (Moseley 1998).

ELEOCHARIS ROSTELLATA
WANDERING SPIKE-RUSH

CLASSIFICATION COMMENTS: In Montana, Hansen et al. (1995) lumped all combinations of *Eleocharis 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.

SIMILAR COMMUNITIES: 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 community type and the sites on which they occur are very different ecologically.

RANGE: *Eleocharis rostellata* is a minor type in Idaho, Montana, and Yellowstone National Park, Wyoming, and may occur in Washington, British Columbia, and other parts of Wyoming.

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

ENVIRONMENT: This community occurs in intermontane valleys (Lesica 1990), in wet basins and adjacent to streams, rivers, and ponds (Hansen et al. 1995). It is often restricted to thermal areas or areas with alkaline or calcareous soils, especially at the northern edge of it's distribution. It is also found around cold springs in desert canyons. It occurs in spring fed wetlands which are saturated throughout the year, often with water running over the ground surface through the stands (Moseley 1995).

VEGETATION: *Eleocharis rostellata* forms near monocultures, and may occur as a quaking mat, or may be more open with considerable areas of bare soil, gravel, rock, and open water (Moseley 1995). Hansen et al. (1995) state that *E. rostellata* dominates a low (less than 30 cm) herbaceous layer. Moseley (1995) notes that there are two distinct phases of this community: 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 areas of bare soil, gravel, rock, and open water on the surface. The open phase appears restricted to mineral substrates and occurs on gentle as well as very steep slopes. Low species diversity is characteristic of the *E. rostellata* community type. Common associated species with low cover include *Deschampsia cespitosa, Juncus balticus, Muhlenbergia asperifolia, Potentilla fruticosa, Aster ascendens, Mimulus guttatus, Helianthus nuttallii, Castilleja exilis, Scirpus americanus, Carex simulata, C. nebrascensis*, and *C. scirpoidea*.

WILDLIFE VALUES: This community is a source of green forage early in the spring and attracts wildlife (especially elk and deer). Waterfowl also use this type (Hansen et al. 1995).

SUCCESSIONAL DYNAMICS: Little is known about the successional dynamics of this community type.

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

MANAGEMENT: This community type 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 the wet, organic soils of this association occurs readily with any livestock utilization. Livestock may graze forage plants in this association, but overgrazing can cause compositional changes to species of lower palatability (Hansen et al. 1995).

ANALYSIS COMMENTS: Type description based on literature review and summary of community observations and plots in Idaho.

GLYCERIA GRANDIS
AMERICAN MANNAGRASS

CLASSIFICATION COMMENTS: This community has been quantitatively defined by Evenden (1989) from southeastern Oregon, supplemented with one plot from southwestern Idaho.

SIMILAR COMMUNITIES: A *Glyceria borealis* community type has been described from Idaho, Montana, Oregon, and possibly Wyoming (Anderson et al. 1998). Crowe and Clausnitzer (1997) described a *Glyceria elata* community type from northeastern Oregon. These two types are similar to the *Glyceria grandis* type in the genus of the dominant grass and somewhat in landscape position, hydrology, and associated species.

RANGE: Known from the Trout Creek Mountains in southeastern Oregon and the Owyhee Mountains of southwestern Idaho.

SOILS: Little soils information is available. Soils are saturated alluvium, usually immediately adjacent to a stream, and are often inundated early in the season. Textures are predominantly silty (Evenden 1989). Soils at the Idaho site were saturated season-long by a nearby spring.

ENVIRONMENT: This community occurs in the mountains at elevations ranging from1700 to 2225 m (5600 to 7300 feet). It occurs in narrow to broad V-shaped valleys with 5-6% gradients. It occupies low-lying bars and streamside terraces with saturated soils no more than 1 foot above the channel. Adjacent stream channel widths varied from 0.3 to almost 2 m. The Idaho occurrence is near a spring-fed channel, but the Oregon stands apparently are adjacent to more dynamic fluvial systems.

VEGETATION: The *Glyceria grandis* community type is generally small in area, but is a distinctive feature of the riparian zone. *Glyceria grandis* is the dominant species. In Oregon it had an average cover of 27%, while it had almost complete cover in the Idaho plot. Other graminoids with high constancy and variable cover include *Carex athrostachya, Juncus balticus, Eleocharis palustris*, and *E. pauciflora*. A variety of forbs that indicate saturated moisture conditions also occur, generally with low cover. They include *Mimulus guttatus, M. primuloides, Montia chamissoi, Rumex crispus, Epilobium ciliatum*, and *Alopecurus aequalis* (Evenden 1989).

WILDLIFE VALUES: No information on this type. Other *Glyceria* species are considered good forage for wild ungulates and waterfowl (Hansen et al. 1995; Crowe and Clausnitzer 1997).

SUCCESSIONAL DYNAMICS: Nothing is known about successional dynamics in this community type. The Idaho occurrence is in an exclosure that has been in place for between 30 and 50 years. It is not known if this community type has persisted that long or whether it replaced something else during the protected period. This community type was not seen outside of the exclosure.

ADJACENT COMMUNITIES: In Idaho, this type is within a *Juniperus occidentalis* woodland. Adjacent riparian communities are dominated by *Salix geyeriana*.

ANALYSIS COMMENTS: This type has been quantitatively defined and described from six plots by Evenden (1989), supplemented with one plot from Idaho.

HORDEUM BRACHYANTHERUM
MEADOW BARLEY

CLASSIFICATION COMMENTS: This community has been quantitatively defined by Manning and Padgett (1995) from eastern and northern Nevada, supplemented with one plot from southwestern Idaho.

SIMILAR COMMUNITIES: A *Hordeum jubatum* community has been described by several studies, mostly from the Great Plains (Anderson et al.1998), but also Montana and Idaho (Hansen et al. 1995; Hall and Hansen 1997). The *Poa nevadensis* community type is closely related to this type. According to Manning and Padgett (1995), if a stand in which both species occur is clearly dominated by *Poa nevadensis* it is placed in the *Poa nevadensis* community type. If they have more or less equivalent cover, the stand is placed in the *Hordeum brachyantherum* community type. Their observations suggest that the site conditions must be fairly moist for the *Hordeum brachyantherum* type, while they are usually much drier for the *Poa nevadensis* type.

RANGE: Manning and Padgett (1995) described this community from widely scattered locations in western, central, and northern Nevada. It has been sampled once in the Owyhee Mountains of southwestern Idaho.

SOILS: All soils sampled in Nevada had thick mollic

epipedons and, therefore, were all Mollisols. Soil particle size classes were clayey, silty, or fine-loamy. The depth to the water table in Nevada was greater than 1 m (Manning and Padgett 1995). Soils at the Idaho site were saturated season-long by a nearby spring.

ENVIRONMENT: This community is known from the mountains, where it occurs at elevations ranging from 1700 to 2680 m (5600 to 8800 feet). It occurs along streams or in meadows (mostly), in valley bottoms that range from very narrow to very wide and have low to moderate gradients. Two sites in Nevada were along C3 and B3 stream channels (Manning and Padgett 1995). The Idaho site is near a headwater spring.

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

WILDLIFE VALUES: *Hordeum brachyantherum* has high forage value rating for mule deer (Manning and Padgett 1995).

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

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

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

ANALYSIS COMMENTS: This type has been quantitatively defined and described from 9 plots by Manning and Padgett (1995), supplemented with one plot from Idaho.

JUNCUS BALTICUS
BALTIC RUSH

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

SIMILAR COMMUNITIES: This appears to be a distinctive type. *Eleocharis palustris - Juncus balticus* and J. *balticus - Carex rossii* community types have been described from central and southern Utah (Bourgeron and Engelking 1994), that may related to the *J. balticus* community type described here. Similarly, Mattson's (1984) *Deschampsia cespitosa - Juncus balticus* from the Yellowstone Plateau is rich in J. balticus.

RANGE: The *Juncus balticus* community type has been documented from every state in the western United States, with the exception of Arizona (Bourgeron and Engelking 1994; Manning and Padgett 1995; Anderson et al. 1998).

SOILS: This community type typically occurs on fine-textured surface soils. Textures range from silt to sandy-loam. The water table ranged 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 ranged from low to high. 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).

ENVIRONMENT: The elevational range occupied by the Juncus balticus type is as wide as the geographic range, ranging from 914 m (3000 feet) in Montana to over 3048 m (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).

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

WILDLIFE VALUES: This type provides early season forage for wildlife (Hansen et al. 1995).

SUCCESSIONAL DYNAMICS: Some studies state unequivocally that the *Juncus balticus* community type is a livestock grazing-induced type (e.g., Evenden 1989; Hansen et al. 1995; Manning and Padgett 1989; Hall and Hansen 1997; Crowe and Clausnitzer 1997), while others hedge somewhat stating that many or most occurrences are grazing induced (e.g., Padgett et al. 1989; Walford et al. 1997). There is evidence for the latter view. Two stands in central Idaho occur at sites that were never grazed by livestock, being protected by insurmountable cliff bands. They contain extensive near-monocultures of *Juncus balticus* and have significant hummocking (Jankovsky-Jones, IDCDC, unpublished data). Observations in Montana and elsewhere indicate that *J. balticus* acts as an increaser and/or invader, occurring over a wide range of environmental conditions. It can increase after intensive grazing on sites occupied by the *Carex nebrascensis, Deschampsia cespitosa*, *Calamagrostis canadensis*, and possibly others. It is an increaser because it has a high tolerance for 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).

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

MANAGEMENT: 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 that 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).

ANALYSIS COMMENTS: This type has been quantitatively defined and described by numerous studies throughout the western United States (refer to Bourgeron and Engelking 1994 and Manning and Padgett 1995 for references).

PHRAGMITES AUSTRALIS
COMMON REED

CLASSIFICATION COMMENTS: This appears to be a clearly defined community type in the literature.

SIMILAR COMMUNITIES: A *Phragmites australis* Riverbank community type has been described from Texas and adjacent Mexico. There are probably floristic differences between the two types, but it also differs in being placed in a different Formation in the U.S. National Vegetation Classification System: the Texas and Mexican type is in the Temporarily Flooded Temperate or Subpolar Grassland Formation, while the one described here is in the Seasonally Flooded Temperate or Subpolar Grassland Formation (Anderson et al. 1998).

RANGE: The *Phragmites australis* community type has been documented in many states and provinces in western North America, including California, Colorado, Idaho, Montana, Oklahoma, Oregon, and Saskatchewan. Other states where it is considered to probably occur are North

Dakota, Nevada, Texas, and Utah (Bourgeron and Engelking 1994; Anderson et al. 1998).

SOILS: Soils are generally Entisols and Mollisols. Soil texture ranges from clay to sandy loam. Sites frequently experience prolonged flooding, although water tables 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).

ENVIRONMENT: This is a low-elevation type found in swales, marshes, pond and lake margins, oxbow lakes, backwater areas, seepy canyon slopes, and on the banks of rivers and streams. 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 640 to 1170 m (2100 to 3850 feet), while in Idaho it occurs between 975 and 1609 m (3200 and 5280 feet) (Hansen et al. 1995; Hall and Hansen 1997).

VEGETATION: *Phragmites* is a strongly rhizomatous perennial that generally forms tall (2-4 m), dense, monotypic stands. Some stands may be quite extensive in size. Most stands have few associated species and they generally occur only in trace amounts. Some exceptions include *Agrostis stolonifera* and *Scirpus acutus*, which had high cover in a stand in eastern Idaho and around springs in southwestern Idaho, where *Aster hesperius* and *Angelica kingii* had relatively high cover (10% and 30%, respectively) in undisturbed stands (Hansen et al. 1995; Hall and Hansen 1997).

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

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

ADJACENT COMMUNITIES: Adjacent uplands in eastern Idaho include *Juniperus scopulorum* (Hall and Hansen 1997), while in the Owyhee canyonlands of southwestern Idaho it was *Artemisia tridentata* spp. *wyomingensis* communities. This community 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, *Betula occidentalis*, and various other herbaceous types (Hansen et al. 1995; Hall and Hansen 1997).

MANAGEMENT: Herbage production in the *Phragmites australis* community 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 community type 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).

ANALYSIS COMMENTS: This type has been quantitatively defined and described by 5 plots in Montana (Hansen et al. 1995) and one plot in eastern Idaho (Hall and Hansen 1997). Two plots were also sampled in southwestern Idaho.

SCIRPUS ACUTUS
HARDSTEM BULRUSH

See Community Characterization Abstract in last year's report (Moseley 1998).

SCIRPUS AMERICANUS
THREESQUARE BULRUSH

CLASSIFICATION COMMENTS: In Montana, Hansen et al. (1995) lumped all combinations of *Scirpus americanus* (N=14) and *S. pungens* (N=3) into a *S. pungens* habitat type due to similarities in environmental conditions and management concerns.

SIMILAR COMMUNITIES: No information available.
RANGE: Minor type in Idaho, Montana, and Oregon.

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

ENVIRONMENT: *Scirpus americanus* occurs in marshes and wet meadows and is tolerant of alkaline conditions.

VEGETATION: The *Scirpus americanus* community type may occur in alkaline habitats or in association with hot springs. *Scirpus americanus* clearly dominates with 50-90% cover. 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*. The forbs *Helianthus nutallii* and *Epilobium ciliatum* were also noted as present in association with the type at hot springs.

WILDLIFE VALUES: *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).

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.

ADJACENT COMMUNITIES: Adjacent communities may be dominated by *Carex* spp., *Eleocharis* sp. (*E. palustris* or *E. rostellata*), *Potentilla fruticosa, Deschampsia cespitosa*, or *Distichlis stricta*. This type often occurs in the sagebrush-steppe zone.

MANAGEMENT: Trampling damage of the wet, organic soils of this association occurs readily with any livestock utilization. Livestock may graze forage plants in this association, and overgrazing can cause compositional changes to species of lower palatability. *Scirpus americanus* may have potential for restoration of wetlands as it is a prolific seed producer, 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).

ANALYSIS COMMENTS: Type description based on literature review and summary of community observations.

SCIRPUS PALLIDUS
PALE BULRUSH

See description in last year's report (Moseley 1998).

SCIRPUS PUNGENS
COMMON THREESQUARE

See Community Characterization Abstract in last year's report (Moseley 1998).

FORB COMMUNITIES

ARTEMISIA LUDOVICIANA
WESTERN MUGWORT

See description in last year's report (Moseley 1998).

BERULA ERECTA
CUT-LEAVED WATER-PARSNIP

The *Berula erecta* community type was sampled at sites on the 45 Ranch Allotment, where it dominated the headwater channels of small spring creeks. The channels were narrow (ca. 1 m) and steep (8-10% gradient), with a rocky substrate. *Berula erecta* is rooted on the channel bottom and dominates the vegetation, providing nearly complete cover for the stream channel. Other species commonly present, usually at low cover, include *Aster eatonii, Juncus balticus, Carex nebrascensis*, and *Agrostis stolonifera*. The rare species, *Angelica kingii*, is also prominent in one stand. On the 45 Allotment, the *Carex nebrascensis* community type usually occurs on adjacent stream banks. In areas not excluded from livestock grazing, cattle can heavily graze the *B. erecta*, reducing its cover. I've found no mention of this community in the literature and it may be quite rare. The *Mimulus guttatus* community, discussed below, is often seen in similar ecological settings in the sagebrush-steppe.

CAMASSIA CUSICKII
CUSICK'S CAMAS

See Community Characterization Abstract in last year's report (Moseley 1998).

LEPIDIUM DAVISII
DAVIS' PEPPERGRASS

See description in last year's report (Moseley 1998).

MIMULUS GUTTATUS
YELLOW MONKEYFLOWER

Mimulus guttatus is often found dominating small spring and seep channels on hillsides in the northern Rocky Mountains and Intermountain area. It is only mentioned as a community type briefly in two sources (Norton et al. 1981; Collins 1992). We sampled a stand in the Salmon Falls Creek highlands south of Three Creek, at one of the springs in the Dean Site Exclosure, elevation 2030 m (6680 feet). *Epilobium ciliatum* actually had higher cover than *M. guttatus* in this stand, but the two completely dominated a broad spring outflow channel. Water was running through the stand, ca. 2 to 10 cm deep. The substrate was gravel and rock. Five graminoids, *Carex athrostachya*, *Puccinellia pauciflora*, *Deschampsia elongata*, *Poa pratensis*, and *P. palustris*, all had trace cover. Surrounding upland communities included *Artemisia tridentata* ssp. *vaseyana* and *Populus tremuloides* types. This is a common type that occurs in small stands.

REFERENCES

Anderson, M., P. Bourgeron, M.T. Bryer, and 13 others. 1998. International classification of ecological communities: terrestrial vegetation of the United States. Volume II. The National Classification System: list of types. The Nature Conservancy, Arlington, VA. 502 p. [Available at www.tnc.org, click on Conservation Science]

Asherin, D. A., and M.L. Orme. 1978. Inventory of riparian habitats and associated wildlife along Dworshak Reservoir and lower Clearwater River. Idaho Cooperative Wildlife Research Unit, College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, ID. 477 p.

Bailey, R.G. 1997. Description of the ecoregions of the United States. Miscellaneous Publication 1391 (revised). USDA, Forest Service, Washington, D.C.

Bourgeron P. S., and L. D. Engelking, eds. 1994. A preliminary vegetation classification of the Western United States. The Nature Conservancy, Western Heritage Task Force, Boulder.

Bramble-Brodahl, M.K. 1978. Classification of *Artemisia* vegetation in the Gros Ventre area, Wyoming. Unpublished M.S. Thesis, University of Idaho, Moscow, ID.

Chadde, S. W., P.L. Hansen, and R.D. Pfister. 1988. Wetland plant communities of the northern range, Yellowstone National Park. University of Montana, School of Forestry, Missoula, MT. 77 p.

Collins, T.C. 1979. Vegetation typing of riparian communities, Newland Ranch management area. Unpublished report on file at the Salmon National Forest, Salmon, ID.

Collins, T.M, workgroup leader. 1992. Integrated riparian evaluation guide, Intermountain Region. USDA, Forest Service, Intermountain Region, Ogden, UT. 60 p., plus appendices.

Cronquist, A. 1994. Asterales. Intermountain Flora, Volume 5. The New York Botanical Garden, Bronx, NY. 496 p.

Crowe, E.A., and R.R. Clausnitzer. 1997. Mid-montane wetland plant associations of the Malheur, Umatilla and Wallowa-Whitman National Forests. Technical Paper R6-NR-ECOL-TP-22-97. USDA Forest Service, Pacific Northwest Region, Portland, OR. 299 p

Daubenmire, R. F. 1970. Steppe vegetation of Washington. Washington State University Agricultural Experiment Station Technical Bulletin No. 62. 131 pp.

Dealy, J.E. 1971. Habitat characteristics of the Silver Lake mule deer range. Research Paper PNW-125. USDA, Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, OR. 99 p.

Dean, M.L. A taxonomic and ecologic study of the vascular plants of a section of the Owyhee River Canyon in Oregon. Unpublished M.S. Thesis, Oregon State University, Corvallis, OR. 147 p.

Eidemiller, B.J. 1977a. Endangered and threatened plant inventory, Sun Valley ES area. Unpublished report on file at the Shoshone District Office, Bureau of Land Management, Shoshone, ID. 33 p.

Eidemiller, B.J. 1977b. Bennett Hills environmental impact study area threatened and endangered plant inventory. Unpublished report on file at the Shoshone District Office, Bureau of Land Management, Shoshone, ID.

Evenden, A.G. 1989. Ecology and distribution of riparian vegetation in the Trout Creek Mountains of southeastern Oregon. Unpublished Ph.D. Dissertation, Oregon State University, Corvallis. 128 p.

Federal Geographic Data Committee. 1997. Vegetation classification standard, FGDC-STD-005. Web address: http://www.fdgc.gov/Standards/Documents/Standards/Vegetation.

Fisher, H.M. No date. Project proposal: Riparian site classification for the Owyhee High Plateau. Unpublished proposal on file at the Idaho State Office, Bureau of Land Management, Boise, ID.

Franklin, J.F., and C.T. Dyrness. 1988. Natural vegetation of Oregon and Washington. Oregon State University Press, Corvallis, OR. 452 p.

Grossman, D.H., D. Faber-Langendon, A.S. Weakley, and 10 others. 1998. International classification of ecological communities: terrestrial vegetation of the United States. Volume I. The National Classification System: development, status and applications. The Nature Conservancy, Arlington, VA. 126 p. [Available at www.tnc.org, click on Conservation Science]

Hall, J.B., and P.L. Hansen. 1997. A preliminary riparian habitat type classification system for the Bureau of Land Management districts in southern and eastern Idaho. Technical Bulletin No. 97-11. Idaho State Office, Bureau of Land Management, Boise, ID. 381 p.

Hansen, P.L., R.D. Pfister, K. Boggs, B.J. Cook, J. Joy, and D.K. Hinkley. 1995. Classification and management of Montana's riparian and wetland sites. Misc. Publication No. 54. Montana Forest and Conservation Experiment Station, University of Montana, Missoula, MT. 646 p.

Hironaka, M., M.A. Fosberg, and A.H. Winward. 1983. Sagebrush-grass habitat types of southern Idaho. Bulletin Number 35. Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow, ID. 44 p.

Jankovsky-Jones, M. 1996. Conservation strategy for Henrys Fork basin wetlands. Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 30 p., plus appendices.

Jankovsky-Jones, M. 1997a. Conservation strategy for Big Wood River basin wetlands. Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 32 p., plus appendices.

Jankovsky-Jones, M. 1997b. Conservation strategy for southeastern Idaho wetlands. Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 39 p., plus appendices.

Johnson, C. G. and S. A. Simon. 1987. Plant associations of the Wallowa-Snake province. R6-ECOL-TP-255A-86. USDA, Forest Service, Wallowa-Whitman National Forest, Baker City, OR. 400 p., plus appendices.

Kauffman, J. B., W.C. Krueger, and M. Vavra. 1985. Ecology and plant communities of the riparian area associated with Catherine Creek in northeastern Oregon. Agricultural Experiment Station Technical Bulletin 147. Oregon State University, Corvallis, OR. 35 p.

Kettler, S., and A. McMullen. 1996. Routt National Forest riparian vegetation classification. Unpublished report on file at the Colorado Natural Heritage Program, Colorado State University, Fort Collins, CO.

Kittel, G.M., and N. Lederer. 1993. A preliminary classification of the riparian vegetation of the Yampa and San Miguel/Dolores river basins. Unpublished report on file at the Colorado Natural Heritage Program, Colorado State University, Fort Collins, CO.

Kovalchik, B. L. 1987. Riparian Zone Associations: Deschutes, Ochoco, Fremont, and Winema National Forests. USDA Forest Service, Region 6 Ecology Technical Paper 279-87. Pacific Northwest Region, Portland, OR. 171 p.

Kovalchik, B. L. 1993. Riparian plant associations on the national forests of eastern Washington. Draft version 1. USDA, Forest Service, Colville National Forest, Colville, WA. 203 p.

Lesica, P. 1990. Vegetation and sensitive plant species of wetlands associated with geothermal areas in the Greater Yellowstone Ecosystem in Montana. Unpublished report on file at the Montana Field Office, The Nature Conservancy, Helena, MT. 9 p.

Manning, M.E., and W.G. Padgett. 1995. Riparian community type classification for the Humboldt and Toiyabe National Forests, Nevada and eastern California. R4-Ecol-95-01. USDA Forest Service, Intermountain Region, Ogden, UT. 306 p.

Mattson, J. D. 1984. Classification and environmental relationships of wetland vegetation in central Yellowstone National Park. Unpublished M.S. Thesis, University of Idaho, Moscow, ID. 409 p.

McNab, W.H., and P.E. Avers, compilers. 1994. Ecoregional subregions of the United States: Section description. WO-WSA-5. USDA, Forest Service, Washington, D.C.

Moseley, R. K. 1987. Research Natural Area/Area of Critical Environmental Concern recommendation for Pleasant Valley Table. Unpublished report on file at the Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 5 p.

Moseley, R. K. 1995. The ecology of geothermal springs in south-central Idaho. Unpublished report on file at the Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 47 p.

Moseley, R.K. 1998. Riparian and wetland community inventory of 14 reference areas in southwestern Idaho. Technical Bulletin No. 98-5. Idaho State Office, Bureau of Land Management, Boise, ID. 52 p., plus appendices.

Mueggler, W. F., and W.L. Stewart. 1980. Grassland and shrubland habitat types of Western Montana. General Technical Report INT-66. USDA, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT. 154 p.

Mutz, K. M., and R. Graham. 1982. Riparian community type classification: Big Piney Ranger District, Wyoming. Meiiji Resource Consultants, Layton, UT. 87 p.

Mutz, K.M., and J. Queiroz. 1983. Riparian community classification for the Centennial Mountains and South Fork Salmon River, Idaho. Meiiji Consultants, Layton, UT. 170 p.

Norton, B.E., J. Tuhy, and S. Jensen. 1981. Riparian community classification for the Greys River, Wyoming. Unpublished report on file at USDA, Forest Service, Intermountain Region, Ogden, UT. 190 p.

Ogle, D.G., compiler. 1997. Plant guide handbook. USDA, Natural Resources Conservation Service, Boise, ID.

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

Prichard, D. 1998. Riparian area management: Process for assessing Proper Functioning Condition. TR 1737-9. USDI Bureau of Land Management, Denver, CO. 51 p.

Reznicek, A. A. 1987. Key to *Carex rostrata* complex in North America. Unpublished key on file at the Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 3 p.

Schlaterer, E.F. 1972. A preliminary description of plant communities found on the Sawtooth, White Cloud, Boulder, and Pioneer Mountains. Unpublished report on file at the USDA, Forest Service, Intermountain Region, Ogden, UT. 111 p.

Tirmenstein, D.A. 1987. *Artemisia papposa*. In: W.C. Fischer, compiler, Fire effects information system data base. USDA, Forest Service, Intermountain Research Station, Missoula, MT.

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

Tuhy, J.S., and S. Jensen. 1982. Riparian classification for the Upper Salmon/Middle Fork Salmon River drainages, Idaho. White Horse Associates, Smithfield, UT. 183 p.

Walford, G., G. Jones, W. Fertig, and K. Houston. 1997. Riparian and wetland plant community types of the Shoshone National Forest. Unpublished report on file at the Wyoming Natural Heritage Program, University of Wyoming, Laramie, WY. 120 p.

Weixelman, D.A., D.C. Zamudio, and K.A. Zamudio. 1996. Central Nevada riparian field guide. USDA, Forest Service, Toiyabe National Forest, Sparks, NV.

Youngblood, A.P., W.G. Padgett, and A.H. Winward. 1985. Riparian community type classification of eastern Idaho - western Wyoming. R4-Ecol-8501. USDA Forest Service, Intermountain Region, Ogden, UT. 78 p.

Appendix 1

Site Basic Records from the CDC data base for the 1998 reference areas.

BLACK LEG BOX CANYON
52

Location

Ecoregion Section: OWYHEE UPLANDS SECTION (342C)
Watershed: 17050102052
County: Owyhee
USGS Quad: BLACK LEG CREEK 4211517
LAT: 420418N S: 420357N E: 1154923W
LONG: 1154944W N: 420441N W: 1155004W
Legal Description (township/range, section, meridian, note)

015S005E	35	BO	E2SE4
015S005E	36	BO	W2NW4SW4
016S005E	02	BO	NE4

Directions:

Black Leg Box Canyon occurs along lower Black Leg Creek near its confluence with Pole Creek, about 5 miles north of the Nevada border, and 21 miles south of Grasmere. Access is via the all-weather gravel road that goes between Grasmere (on Highway 51) and Wild Horse Reservoir in Nevada. Turn west off of the gravel road about 1.5 miles south of Tokembamy Ranch on Pole Creek, and follow a two-track road north and west for 2 miles to the upper end of the canyon.

Site Design

Designer: Moseley, R. K.
Date: 98-08-14
Design Justification:

Drift fences occur at both ends of the box canyon that form the upper and lower (north and south) boundaries. Rimrock on the canyon rim form the east and west boundaries.

Biological and Physical Characteristics

Size. Primary and Secondary Acres:
Primary Acres:
Elevation (ft). Minimum: 5400
Maximum: 5600
Site Description:

The Black Leg Box Canyon site is a narrow canyon that is fenced at both ends, excluding cattle from about 1 mile of the canyon bottom. The valley bottom is generally less than 100 feet wide, and by late summer, the small 2%-gradient stream wanders back and forth across the bottom. Artemisia tridentata tridentata/Elymus cinereus community occurs on the small terraces, and the mostly entrenched floodplain has Eleocharis palustris along most of its length, sometimes beneath Salix exigua, or a mixture of Salix lutea, Salix boothii, and Salix lasiandra. The canyon is rimmed by cliff bands, and the lower canyon slopes are dominated by Artemisia tridentata wyomingensis communities.

Key Environmental Factors:

The stream hydrology appears to be intact although there is a small livestock reservoir 1 mile upstream. There is annual flooding during spring runoff from the Bull Run Mountains, and evidence of larger, episodic events with large gravel depositions.

Element Occurrences (element/size):
ARTEMISIA TRIDENTATA TRIDENTATA/ELYMUS CINEREUS 5 AC
ELEOCHARIS PALUSTRIS
SALIX LUTEA/POA PRATENSIS
SALIX EXIGUA/POA PRATENSIS
Biodiversity Significance: B3
The site is a good riparian reference area.
Other Values: V3
The site was originally fenced for wildlife values.

Protection and Stewardship
Designation: REFERENCE AREA
Protection Urgency: P5
The site is currently protected by a well-maintained fence.
Management Needs:
Continue to maintain the fences and eradicate the small spots of Cirsium arvense.
Management Urgency: M5
Continue to maintain the fences.
Current Landuse:
Onsite: There was probably some past grazing, although there is no evidence of such.
Offsite: The site hydrology is dependent on upstream activities.
Exotic Species Comments:
The site has some small spots of Cirsium arvense.
MA Comments:
The exclosure was originally constructed as a Habitat Improvement Project. The BLM, Department of Fish and Game, and Pheasants Forever are all involved with the project, at some capacity.

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COTTONWOOD CREEK EXCLOSURE
387

Location
Ecoregion Section: IDAHO BATHOLITH SECTION (M332A)
Watershed: 17050101057
County: Elmore
USGS Quad: SYRUP CREEK 4311536

LAT: 432048N S: 432047N E: 1153800W
LONG: 1153803W N: 432050N W: 1153805W
Legal Description (township/range, section, meridian, note)
001S007E 09 BO SE4NW4SW4
Directions:
Located about 14 miles north of Mountain Home at the headwaters of Cottonwood Creek in the upper Canyon Creek drainage. Access is via a four-wheel drive vehicle along a complicated series of rough, dirt roads either from the west (from the Willow Creek Road), or from the east (from Smith Prairie Road).

Site Design

Designer: Moseley, R. K.
Date: 98-08-13
Design Justification:
The boundary of the site follows the perimeter of the exclosure.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 1.00
Primary Acres: 1.00
Elevation (ft). Minimum: 4650
Site Description:
The site is a small exclosure encompassing a short section of a small spring creek; several small springs surface within the exclosure and all form a single channel at the lower end. It is within the Artemisia tridentata vaseyana zone. The riparian area is a heterogenous mixture of herbaceous and willow dominance types. Several willow species, Salix lasiandra, S. lasiolepis, S. geyeriana, and S. lutea, occur in local patches alone or mixed. Aster hesperius dominates around the spring heads. The site is interrupted in places by mixed wet-site graminoids such as Glyceria elata, Juncus ensifolius, and Carex lanuginosa. No single dominance type occurs in a large enough area to be called an occurrence.
Key Environmental Factors:
The hydrology and maintenance of the communities are tied to the spring creek, and the springs emanating withing the exclosure. The headwater springs for the spring creek are about 0.5 mile upstream of the exclosure.
Biodiversity Significance: B4
The site is useful as a reference area because it is a small exclosure with several springs and a portion of a spring creek.

Other Values: V2
The site was originally fenced for wildlife values.

Protection and Stewardship

Designation: REFERENCE AREA
Information Needs:
The site may need to be revisited to sample the spring communities.
Protection Urgency: P5
The site is protected by a well-maintained exclosure fence.
Management Needs:
Continue to maintain the exclosure fence.
Management Urgency: M5
Continue to maintain the fence through the Habitat Improvement Program.
Current Landuse:
Onsite: The site was probably grazed prior to fencing 40 years ago.
Offsite: Very heavy grazing occurs around the springs about 0.5 mile above the exclosure.
Exotic Species Comments:
There are very few prominent exotics in the site.

MA Comments:

The exclosure was originally constructed as a Habitat Improvement Project. The BLM, Department of Fish and Game, and Pheasants Forever are all involved with the project, at some capacity.

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DRY CREEK SPRING EXCLOSURE
393

Location

Ecoregion Section: OWYHEE UPLANDS SECTION (342C)
Watershed: 17050101057
County: Elmore
USGS Quad: SYRUP CREEK 4311536
LAT: 432131N S: 432130N E: 1154402W
LONG: 1154405W N: 432132N W: 1154407W
Legal Description (township/range, section, meridian, note)
001S006E 03 BO N2SW4SW4
Directions:

Dry Creek Spring is located about 7 miles southeast of Mayfield, Idaho in the Danskin Mountains. Take the Mayfield/Orchard exit off of Interstate 84, and travel northeast 6 miles to the ghost town of Mayfield. Continue southeast on the county road through Mayfield about 13 miles to the Danskin Road. Travel north on the Danskin Road about 2 miles to a four-wheel drive road near the top of the first pass. Take the four-wheel drive road to near its end. The springhead and exclosure can be seen from the end of the road and accessed by walking about a quarter of a mile southwest.

Site Design

Designer: Moseley, R. K., and M. Jankovsky-Jones
Date: 98-06-21
Design Justification:

The boundary of the site follows the perimeter of the exclosure.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 1.00
Primary Acres: 1.00
Elevation (ft). Minimum: 4560
Maximum: 4600
Site Description:

Dry Creek Exclosure is located at the head of a small spring which feeds the south fork of Dry Creek. The area burned in 1992 and shrubs are resprouting vigorously. Patches of willow (Salix lasiandra, and S. geyeriana) are present in the valley bottom and a stand of Prunus virginiana is present on the north-facing valley wall. The spring seeps have a mix of mesic herbaceous species with Carex stipata, Mimulus guttatus, and Solidago occidentalis forming small patches of near monocultures. Other associated species include Eleocharis palustris, Glyceria elata, Juncus ensifolius, Geum macrophyllum, Urtica dioica, Typha latifolia, and Galium aparine.

Landuse History:
The general area has a long history of livestock use and some spring flow was diverted at one time into a watering trough. The exclosure fence has been in place for 30 to 40 years.

Cultural Features:
An old watering trough is within the exclosure, and an old grown-over road also runs through the exclosure.
Element Occurrences (element/size):
PRUNUS VIRGINIANA
SALIX LASIANDRA/ROSA WOODSII
Biodiversity Significance: B3
The site is a good riparian reference area with two community occurrences.
Other Values:
Numerous songbirds were present during the survey. Deer bedding areas were noted in the Prunus virginiana stands.

Protection and Stewardship
Designation: REFERENCE AREA
Protection Urgency: P5
The site is protected by a well maintained exclosure.
Management Needs:
Continue to maintain the exclosure fence.
Management Urgency: M5
Continue to maintain the fence.
Current Landuse:
Onsite: The site was probably grazed prior to fencing.
Offsite:
Exotic Species Comments:
The area was aerial seeded after the 1992 fire and many of those species are established in the valley bottom. However, native species are dominant and reproducing.
MA Comments:
The exclosure was originally constructed as a Habitat Improvement Project. The BLM, Department of Fish and Game, and Pheasants Forever are all involved with the project, at some capacity.

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KERR EXCLOSURE
381

Location
Ecoregion Section: OWYHEE UPLANDS SECTION (342C)
Watershed: 17050108047
County: Owyhee
USGS Quad: HURRY UP CREEK 4211665
LAT: 424220N S: 424207N E: 1163018W
LONG: 1163025W N: 424230N W: 1163031W

Legal Description (township/range, section, meridian, note)

008S001W	19	BO	SE4SW4SW4
008S001W	30	BO	W2NW4

Directions:

Approximately 9 miles SE of Triangle at the north end of Antelope Ridge, headwaters of Rock Creek. Access via Antelope Ridge Road or Rattlesnake Station Road traveling north from Mud Flat Road. Both roads are signed on Mud Flat Road. The exclosure lies about 4 miles north of the Mud Flat Road along the Antelope Ridge Road.

Site Design

Designer: Moseley, Bob

Date: 98-07-30

Design Justification:

Site boundaries coincide with the perimeter of the exclosure.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 20.00

Primary Acres: 20.00

Elevation (ft). Minimum: 5840

Maximum: 5880

Site Description:

Gentle, wide headwaters basin with numerous seeps and very slow drainage through the exclosure. All channels are thoroughly vegetated with graminoid communities of varying degrees of moisture tolerance; there are no unvegetated channels. The drier valley bottom terraces have Artemisia cana dominated communities. Vegetation patterning is a small-scale mosaic with evidence of past disturbance from cattle grazing. The exclosure lies in a rolling volcanic upland dominated by Artemisia tridentata vaseyana, Juniperus occidentalis, and Cercocarpus ledifolius.

Key Environmental Factors:

Fine-scale mosaic of meadow communities lie along a long hydrologic gradient from standing water to Artemisia cana communities. The ecotones tend to be very wide.

Landuse History:

The site shows evidence of grazing in the past.

Element Occurrences (element/size):

ARTEMISIA CANA/FESTUCA IDAHOENSIS	8
CAREX NEBRASCENSIS	2
CAREX SIMULATA	2
JUNCUS BALTICUS	10

Biodiversity Significance: B3

Kerr exclosure is an excellent reference site.

Other Values: V3

The exclosure was erected for wildlife habitat enhancement (particularly sage grouse). Numerous snipe, probably nesting, were seen in the exclosure as well.

Protection and Stewardship

Designation: REFERENCE AREA

Protection Urgency: P4

The fence should be maintained, otherwise the site is well protected.

Management Urgency: M4

The fence needs periodic maintenance; cattle have breached the fence on the east side.

Current Landuse:

Onsite: The exclosure was erected in 1983 for wildlife habitat protection. A portion of Station Spring (within the exclosure) has been capped and piped to a cattle water trough, where it then flows back through the exclosure. There is an internal fence within the exclosure; the purpose of the fence is unclear.

Offsite:

Exotic Species Comments:

No noxious weeds were observed, although several exotic plants indicate past grazing (especially Poa pratensis).

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MUD FLAT SPRING EXCLOSURE
385

Location

Ecoregion Section: OWYHEE UPLANDS SECTION (342C)

Watershed: 17050104098

County: Owyhee

USGS Quad: WAGON BOX BASIN 4211655

LAT: 423614N S: 423612N E: 1163255W

LONG: 1163257W N: 423617N W: 1163259W

Legal Description (township/range, section, meridian, note)

009S002W 26 BO SW4SW4SW4

Directions:

The site is adjacent to the Mud Flat Guard Station along the Mud Flat Road. It occurs about 40 road miles SW of Grandview in the headwaters of Pole Creek on the Owyhee Plateau.

Site Design

Designer: Moseley, R. K.

Date: 98-07-30

Design Justification:

The boundary of the site follows the perimeter of the exclosure.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 1.50

Primary Acres: 1.50

Elevation (ft). Minimum: 5720

Site Description:

This small exclosure occurs in a saturated/subirrigated valley bottom associated with a headwater spring, and is bounded by low volcanic

ridges. Most of the exclosure is dominated by Salix geyeriana/Carex utriculata community, with small Artemisia cana stands on the mesic fringe and Juniperus occidentalis on the bedrock.

Key Environmental Factors:

Site hydrology is tied to spring flow which appears to be contained within the exclosure.

Landuse History:

The exclosure was erected 40+ years ago.

Cultural Features:

A water trough occurs below the lower fence and is fed by the spring.

Element Occurrences (element/size):

SALIX GEYERIANA/CAREX UTRICULATA 1.0

Biodiversity Significance: B3

The site provides an excellent reference area that has been protected for 40+ years.

Other Values: V3

The site was originally fenced for wildlife values.

Protection and Stewardship

Designation: REFERENCE AREA

Protection Urgency: P5

The site is protected by a well-maintained exclosure.

Management Needs:

Continue to keep a well-maintained exclosure fence, and eradicate the small Cirsium arvense stand.

Management Urgency: M5

Continue to maintain the fence.

Current Landuse:

Onsite:

Offsite: Mud Flat Road runs immediately outside of the exclosure fence to the west.

Exotic Species Comments:

There are no significant stands of exotic species except a very small stand of Cirsium arvense located at the upper end of the willows.

MA Comments:

The exclosure was originally constructed as a Habitat Improvement Project (HIP). The BLM, Department of Fish and Game, and Pheasants Forever are all involved with the project, at some capacity.

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PARADISE CREEK EXCLOSURE
386

Location

Ecoregion Section: IDAHO BATHOLITH SECTION (M332A)

Watershed: 17050101057

County: Elmore

USGS Quad: SYRUP CREEK 4311536

LAT: 432043N S: 432041N E: 1154023W

LONG: 1154026W N: 432044N W: 1154028W

Legal Description (township/range, section, meridian, note)
001S007E 07 BO NE4SW4SW4
Directions:
Located about 14 miles north of Mountain Home at the headwaters of Paradise Creek; a small, spring-fed tributary of Syrup Creek in the upper Canyon Creek drainage. Access is via a four-wheel drive vehicle along a complicated series of rough, dirt roads either from the west (from the Willow Creek Road), or from the east (from Smith Prairie Road).

Site Design
Designer: Moseley, R. K.
Date: 98-08-13

Design Justification:
The boundary of the site follows the perimeter of the exclosure.

Biological and Physical Characteristics
Size. Primary and Secondary Acres: .50
Primary Acres: .50
Elevation (ft). Minimum: 4320
Site Description:
The site is a very small exclosure at the headwater springs of Paradise Creek. It is within the Artemisia tridentata wyomingensis zone. Three small springs surface in the exclosure, and are dominated by herbaceous species in a very heterogeneous nature. They include Urtica dioica, Rorippa nasturtium-aquaticum, Glyceria elata, Aster hesperius, Carex stipata, and Geum macrophyllum. There is a narrow strip of Philadelphus lewisii along the hillside above the spring channel, and a couple of Salix lasiolepis shrubs occur at the lower end of the exclosure. Most of the rest of the exclosure is weedy with Bromus tectorum, or Hypericum perforatum.
Key Environmental Factors:
The hydrology of the site is tied to springs which all emanate within the exclosure.
Biodiversity Significance: B4
The site is useful as a reference area because it is a small exclosure with several springs.
Other Values: V3
The site was originally fenced for upland game values.

Protection and Stewardship
Designation: REFERENCE AREA
Information Needs:
The site may need to be revisited to sample the spring communities.
Protection Urgency: P5
The site is protected by an exclosure.
Management Needs:
Continue to maintain the exclosure fence.
Management Urgency: M5
Continue to maintain the fence.

Current Landuse:
Onsite: The site was probably grazed prior to fencing.
Offsite:
Exotic Species Comments:
Bromus tectorum is common in the upland. Hypericum perforatum is also present.
MA Comments:
The exclosure was originally constructed as a Habitat Improvement Project. The BLM, Department of Fish and Game, and Pheasants Forever are all involved with the project, at some capacity.

RYEGRASS SPRING EXCLOSURE
37

Location
Ecoregion Section: OWYHEE UPLANDS SECTION (342C)
Watershed: 17050101063
County: Elmore
USGS Quad: BENNETT MOUNTAIN 4311524
LAT: 430841N S: 430838N E: 1152415W
LONG: 1152417W N: 430843N W: 1152420W
Legal Description (township/range, section, meridian, note)
003S009E 20 BO SW4NE4SE4, NW4SE4SE4
Directions:
The spring is on the south slope of the Bennett Hills near the north edge of the Snake River Plains in the Ryegrass Creek drainage. It is about 14 miles east of Mountain Home. Access is via a series of high clearance roads eventually leading up to Ryegrass Creek where a jeep road leads to the exclosure.

Site Design
Designer: Moseley, R. K
Date: 98-06-10
Design Justification:
The boundary of the site follows the perimeter of the exclosure.

Biological and Physical Characteristics
Size. Primary and Secondary Acres:
Elevation (ft). Minimum: 4200
Site Description:
The site is a small, narrow exclosure about 0.75 acres in size that surrounds a creek and spring that emanates from the base of a rhyolite rock outcrop. A dense stand of Salix lasiolepis dominates the spring creek throughout its length in the exclosure except for a small area at the spring which is dominated by Rorippa nasturtium-aquaticum and Urtica dioica. Sagebrush-steppe dominates the surrounding hillsides. There is a striking lack of riparian shrubs beginning immediately below the exclosure.
Landuse History:
The exclosure was erected 40+ years ago.
Element Occurrences (element/size):
SALIX LASIOLEPIS/BARREN

Biodiversity Significance: B3
This site has an extensive stand of Salix lasiolepis, a community that is little protected.

Protection and Stewardship
Designation: REFERENCE AREA

Protection Urgency: P5
The site is protected by a long-term, well-maintained exclosure.
Management Needs:
Continue to maintain the exclosure fence.
Management Urgency: M5
MA Comments:
The exclosure was originally constructed as a Habitat Improvement Project. The BLM, Department of Fish and Game, and Pheasants Forever are all involved with the project, at some capacity.

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SYRUP CREEK EXCLOSURE
9

Location
Ecoregion Section: IDAHO BATHOLITH SECTION (M332A)
Watershed: 17050101057
County: Elmore
USGS Quad: SYRUP CREEK 4311536
LAT: 432049N S: 432021N E: 1153926W
LONG: 1153947W N: 432107N W: 1154017W
Legal Description (township/range, section, meridian, note)

001S007E	07	BO	SE4NE4, SE4, SE4SE4SW4
001S007E	08	BO	SW4SW4NW4
001S007E	18	BO	NE4NW4

Directions:
The Syrup Creek Exclosure site consists of two exclosures, upstream and downstream from the "Oregon Trail" road. The site lies along about 1.5 miles of Syrup Creek between Cottonwood Creek and Cove Creek, about 14 miles north of Mountain Home. Access is via a complicated series of rough dirt roads that require four-wheel drive, either from the west (from the Willow Creek Road), or from the east (from the Smith Prairie Road).

Site Design
Designer: Moseley, R. K, and M. Jankovsky-Jones
Date: 98-08-13
Design Justification:
The boundaries follow the fence lines around the two exclosures.

Biological and Physical Characteristics
Size. Primary and Secondary Acres:
Elevation (ft). Minimum: 4110
Maximum: 4280

Site Description:

There are two portions of this exclosure, up and downstream from the road, separated by about 200 meters, that collectively cover about 1.5 miles of the floodplain. The valley bottom is relatively wide (about 20-80 meters) and bordered by steep canyonsides covered with Artemisia tridentata vaseyana communities. A Populus trichocarpa/Salix lasiandra community dominates the riparian zone in most of the upper exclosure with small areas of the Salix lasiolepis and S. lasiandra community types. The Salix lasiandra community dominates the lower exclosure. There is a well dispersed age class structure of the stands. Upland habitats within the narrow exclosures indicate heavy grazing in the past.

Key Environmental Factors:

Hydrologic processes appear to be intact with a regular frequency of episodic floods which deposit rocks and gravel in the floodplain and shift the channel every now and then. This creates a diversity of age classes of the willow and cottonwood communities.

Cultural Features:

The site is bisected by the Hudspeth Cutoff of the Oregon Trail (now a jeep road).

Element Occurrences (element/size):
SALIX LASIANDRA/BENCH
POPULUS TRICHOCARPA/SALIX LASIANDRA
SALIX LASIOLEPIS/MESIC GRAMINOID

Biodiversity Significance: B3

The site is an excellent reference area because it is a relatively large exclosure with fine examples of three community types.

Other Values: V3

Aquatic values are partially protected within this segment of the creek.

Protection and Stewardship

Designation: REFERENCE AREA

Information Needs:

A small area of upland vegetation is within the exclosure on the adjacent canyon slopes and has not been surveyed.

Protection Urgency: P5

The site is protected.

Management Needs:

Continue to maintain the fence.

Management Urgency: M5

The fence surrounding the exclosure appears to be well- maintained.

Current Landuse:

Onsite: The site was grazed by livestock prior to the erection of the exclosure in 1989.

Offsite:

Exotic Species Comments:

Cheatgrass dominates the herbaceous layer of the upland habitats and some of the riparian habitats.

TEAPOT BASIN SPRING EXCLOSURE
394

Location
Ecoregion Section: OWYHEE UPLANDS SECTION (342C)
Watershed: 17050101042
County: Elmore
USGS Quad: BENNETT MOUNTAIN 4311524
LAT: 431109N S: 431108N E: 1152951W
LONG: 1152952W N: 431110N W: 1152954W
Legal Description (township/range, section, meridian, note)
003S008E 03 BO NW4SW4SW4
Directions:
The spring is located 10 miles northeast of Mountain Home, and emanates from the base of rocks on the lower slope on the east side of Teapot Basin. Access is via a dirt, county road into Teapot Basin from the south.

Site Design
Designer: Moseley, R. K.
Date: 98-06-10
Design Justification:
The boundary of the site follows the perimeter of the exclosure on the north, west, and south sides, and the east side boundary is a small, broken cliff band.

Biological and Physical Characteristics
Size. Primary and Secondary Acres: .20
Primary Acres: .20
Elevation (ft). Minimum: 4200
Site Description:
The site is a small exclosure around a spring on the lower slope of Teapot Basin on volcanic substrate. A dense stand of Salix lasiolepis dominates the spring head and a mixed stand of Juncus balticus, Rosa woodsii, and Solidago missouriensis dominate along the broad zone on the lower end. Juncus balticus continues along the channel below the exclosure. No riparian shrubs were seen anywhere in Teapot Basin except within the exclosure. The site has been excluded from livestock grazing for 30-40 years. Sagebrush-steppe is the predominant native vegetation in the basin although this has been converted to medusae-head.
Key Environmental Factors:
There is evidence of recent fire in the adjacent uplands which may have burned the willow stand, but it has resprouted and is vigorous.
Landuse History:
The exclosure was erected 30-40 years ago.

Element Occurrences (element/size):
SALIX LASIOLEPIS/BARREN
Biodiversity Significance: B3
A high quality reference site containing a very small occurrence of a Salix lasiolepis community type.

Protection and Stewardship

Designation: REFERENCE AREA

Protection Urgency:

The site is protected by a well maintained BLM exclosure.

Management Needs:

Continue to maintain the exclosure fence.

Management Urgency:

Continue to maintain the fence; management urgency is low because the fence is in fine shape.

MA Comments:

The exclosure was originally constructed as a Habitat Improvement Project. The BLM, Department of Fish and Game, and Pheasants Forever are all involved with the project, at some capacity.

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JARBIDGE BUCK CREEK
392

Location

Ecoregion Section: NORTHWESTERN BASIN AND RANGE SECTION (342B)
Watershed: 17050102085
County: Owyhee
USGS Quad: DISHPAN 4211514
LAT: 420006N S: 415948N E: 1152448W
LONG: 1152513W N: 420031N W: 1152528W
Legal Description (township/range, section, meridian, note)

016S009E	28	BO	W2
016S009E	29	BO	SE4SE4SE4
016S009E	32	BO	NE4NE4
016S009E	33	BO	W2NW4NW4

Directions:

The site lies along the lower 1 mile of Buck Creek between its confluence with the Jarbidge River and the Nevada border. The site lies along the Jarbidge-Mountain City Road about 9 miles west of Jarbidge, Nevada, and 3 miles southwest of Murphy Hot Springs. Access is via the road between Murphy Hot Springs, and Jarbidge. An improved gravel road parallels the Buck Creek site.

Site Design

Designer: Moseley, R. K
Date: 98-08-19
Design Justification:

The site is essentially the valley bottom containing riparian vegetation from the Nevada border, downstream to where the road crosses Buck Creek near its confluence. The road forms the western boundary and is very close to the creek. The eastern boundary follows a prominent ridge and the canyon rim to include the Juniper woodlands on the west-facing canyon slope.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 94.00
Primary Acres: 94.00
Elevation (ft). Minimum: 5280
Maximum: 5650
Site Description:
The site is a steep, narrow drainage bottom cut through a volcanic canyon. The stream bed consists of large boulders. Diverse age classes of Juniperus scopulorum form a dense stand in the narrow valley bottom. The Juniperus scopulorum/Equisetum arvense is the predominant community along the 1 mile of stream that makes up this site. Equisetum hymenale is dominant in the understory in a few places. Cornus sericea, and to a lesser extent, Rosa woodsii attain prominence in canopy openings along the stream, but they are small. The west-facing canyon slope was added to the site because of the potential to include undisturbed upland Juniperus scopulorum woodlands.
Key Environmental Factors:
The stream hydrology appears intact. The uplands were previously burned.
Element Occurrences (element/size):
JUNIPERUS SCOPULORUM/EQUISETUM ARVENSE
Biodiversity Significance: B2
The site contains a rare Juniperus scopulorum association, and an interesting upland juniper woodland.

Protection and Stewardship

Designation: REFERENCE AREA
Information Needs:
Juniper stands on the canyon slopes to the east need to be inventoried to determine if the uplands should be included as part of the site.
Protection Urgency: P3
The site will probably be undisturbed for a while.
Management Needs:
Road maintenance is a management concern.
Management Urgency: M1
Road maintenance activity should be limited to current road prism and not impinge any further on the valley bottom.

Current Landuse:
Onsite: A county road forms the west boundary of the site. A few juniper have been cut selectively from the riparian forest.
Offsite: The road is very close to the valley bottom and has the potential to impact the riparian vegetation and the stream.

DEAN SITE EXCLOSURE
53

Location

Ecoregion Section: OWYHEE UPLANDS SECTION (342C)

Watershed: 17040213017
County: Twin Falls
USGS Quad: TAYLOR CANYON 4211418
LAT: 420550N S: 420544N E: 1145337W
LONG: 1145347W N: 420603N W: 1145359W
Legal Description (township/range, section, meridian, note)
015S013E 23 BO SW4SE4
015S013E 26 BO N2NE4, SE4NE4NW4
Directions:

The Dean Site Exclosure is located at the headwater springs of Cedar Creek in the highlands southeast of Three Creek, west of Salmon Falls Creek. Access is via the Rogerson-Jarbidge Road about 10 miles west of Rogerson. Turn south off of the paved road and onto a well-maintained, all weather dirt road that climbs into the hills. Take this for about 12 miles, then turn north onto a good dirt road that deadends in the exclosure after about a mile.

Site Design

Designer: Moseley, Bob
Date: 98-08-20
Design Justification:

The site boundary coincides with the perimeter of the exclosure fence.

Site Comments:

Mostly BLM - a few acres are private (BLM attempting to acquire).

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 40.00
Primary Acres: 40.00
Elevation (ft). Minimum: 6600
Maximum: 6700

Site Description:

The site lies in rolling, dissected, volcanic uplands with Artemisia tridentata vaseyana and Populus tremuloides dominating the landscape. It contains four major headwater springs, each with substantial flow, plus numerous other small seeps. The spring heads are dominated by aquatic forb communities with Mimulus guttatus and Epilobium ciliatum being the most prominent species. Most of the channels are dominated by tall willows, mostly Salix geyeriana, and Aspen is locally common along the creek as well. Carex rostrata and C. nebrascensis stands occur on the subirrigated benches. The portion of the creek that runs through the upper part of the exclosure is gentler than the lower portion. The fenceline contrast at the lower end of the exclosure is huge.

Key Environmental Factors:

All of the water surfaces from within the exclosure. The uppermost spring has a portion of its flow (apparently minor) diverted and pumped out of the drainage.

Landuse History:

The exclosure was probably heavily grazed prior to fencing.

Cultural Features:
A pump house is within the exclosure diverting a small amount of water from the uppermost spring.
Element Occurrences (element/size):
SALIX GEYERIANA/MESIC FORB
CAREX UTRICULATA 1 AC
CAREX NEBRASCENSIS 1 AC
MIMULUS GUTTATUS
Biodiversity Significance: B3
This site is a useful reference area because it is a relatively large exclosure with high quality riparian vegetation, and several large springs.

Protection and Stewardship
Designation: REFERENCE AREA
Information Needs:
The uplands need to be inventoried.
Protection Urgency: P5
The site is protected by an exclosure fence.
Management Needs:
Continue to maintain the exclosure fence.
Management Urgency: M5
Continue to maintain the fence.
Current Landuse:
Onsite: A pump house is within the exclosure that pumps water up over the ridge somewhere. The water is taken from the uppermost spring, but appears to be a small amount.

MA Comments:
This area was first fenced in 1969 as a primitive recreation site. A pit toilet was installed in 1970. Vandalism at the site, including having the outhouse pulled over, resulted in the recreation site being abandoned in 1981 by the BLM. During this time the fenced area protected about 7 acres at a rocky bluff where several springs are located. Because of the dramatic improvement of vegetation within the fenced area, the wildlife program enlarged the exclosure to about 28 acres in 1987. The fence has been maintained by the wildlife program since that time. In the summer of 1998, the exclosure was enlarged again to protect additional springs and some adjacent uplands. Approximately 40 acres are now fenced.

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EAST FORK JARBIDGE RIVER
50

Location
Ecoregion Section: OWYHEE UPLANDS SECTION (342C)
Watershed: 17050102093
County: Owyhee
USGS Quad: MURPHY HOT SPRINGS 4211513

LAT: 420026N S: 415947N E: 1152042W
LONG: 1152053W N: 420108N W: 1152126W
Legal Description (township/range, section, meridian, note)

016S009E	24	BO	center S2
016S009E	25	BO	E2
016S009E	36	BO	N2NE4, E2NE4NW4

Directions:

The site is located in the East Fork Jarbidge River canyon above Murphy Hot Springs. The site begins 0.2 mile upstream from the private land/BLM boundary and extends for about 1.8 river miles upstream to the Nevada border. The site is accessed via the Three Creek Road (paved) from the Twin Falls-Jackpot Highway (U.S. 93) near Rogerson, or from Bruneau via the Clover Creek-Three Creek Road (gravel). Turn off the pavement at the Hot Springs store and take the gravel road upstream on the East side of the river through a residential area to the end, which is in a small camping area on BLM land.

Site Design

Designer: Moseley, Bob
Date: 98-08-18
Design Justification:

The western boundary coincides with rimrock on the canyon rim. The eastern boundary is also rimrock, beginning low within the canyon near Murphy Hot Springs below the road, and eventually rising to the canyon rim along the upper portion to the south. The southern boundary is the Nevada border. The northern boundary coincides with the southern limit of roads and campsites occurring on the eastern river bank.

Biological and Physical Characteristics

Size. Primary and Secondary Acres:
Elevation (ft). Minimum: 5200
Maximum: 5900
Site Description:

The site encompasses a segment of the East Fork Jarbidge River canyon which is about 600 feet deep. The canyon walls have many vertical cliff bands with the intervening steep slopes dominated by Artemisia tridentata wyomingensis/Festuca idahoensis communities, or Artemisia tridentata/Agropyron spicatum communities. The valley bottom has two different aspects. The upper mile is relatively narrow, about 20-30 meters wide, and the river is relatively straight. The river terraces are small and dominated by Juniperus scopulorum. The lower 0.8 mile is broader, 50-60 meters wide, with greater sinuosity, and has created a broader floodplain with greater erosion/deposition than the upper segment. This segment is dominated by cottonwood communities.

Key Environmental Factors:

Fluvial processes appear intact. The East Fork above the site runs through the Humboldt National Forest, and originates in the Jarbidge Wilderness. A Murphy Hot Springs resident complained that the rancher has diverted water out of some headwater springs.

Landuse History:

Cattle grazing in the past is noted.

Element Occurrences (element/size):

POPULUS TRICHOCARPA/ROSA WOODSII 6 AC
POPULUS TRICHOCARPA/SALIX LUTEA 10 AC
JUNIPERUS SCOPULORUM/ELYMUS GLAUCUS
JUNIPERUS SCOPULORUM/EQUISETUM HYEMALE
Biodiversity Significance: B2
The site contains the best-known, undisturbed examples of two Rocky Mountain juniper communities. Two cottonwood communities also occur in the site.
Other Values: V3
The site has moderate recreational and wildlife values.

Protection and Stewardship
Designation: REFERENCE AREA
Protection Comments:
The site occurs within an established ACEC.
Information Needs:
The willow communities and their relationship with the cottonwood community in the lower portion of the site needs to be determined. The August 1998 visit focused on Juniperus and Populus trichocarpa stands. An inventory of the upland communities is needed as well.
Protection Urgency: P2
The canyon segment is relatively well-protected naturally, but the BLM should recognize the reference area and biodiversity conservation significance through a special designation.
Management Needs:
Impacts to biodiversity values from the current (1998) cow grazing were minor, but could become deleterious if allowed to continue in future years, especially if more cows wander upstream.
Management Urgency: M3
Cattle can wander into the canyon and get stranded. This apparently does not happen often, but the cattle should be restrained.
Current Landuse:
Onsite: There is evidence of light cattle grazing and hiking; both have minor impacts within the site. A small, little-used hiking trail goes up the west side of the river, probably starting at Murphy Hot Springs. A few tree branches have been cut for the trail, some very old, and some more recent. A small camp was also found along the trail. There was no evidence of past grazing in the site, except on the broad floodplain immediately upstream from Murphy Hot Springs at the southern boundary. There was some current grazing in 1998 that looked like one lost cow got stuck in the upper portion of the site.
Exotic Species Comments:
1998: No major exotic flora or fauna problems were observed.
MA Comments:
East Fork Jarbidge River site is confined within the Bruneau/Jarbidge River ACEC.

FLAT CREEK
384

Location

Ecoregion Section: NORTHWESTERN BASIN AND RANGE SECTION (342B)
Watershed: 17050102108
17050102109
County: Owyhee
USGS Quad: THREE CREEK 4211512
LAT: 420020N S: 415947N E: 1151302W
LONG: 1151307W N: 420100N W: 1151315W

Legal Description (township/range, section, meridian, note)

016S011E	19	BO	SE4SW4
016S011E	30	BO	E2W2
016S011E	31	BO	NE4NW4

Directions:

Flat Creek is located in southeastern Owyhee County, about 5 miles southwest of the Three Creek School. The site encompasses the Flat Creek Canyon, for about 0.5 mile below the Pole Creek/Flat Creek confluence extending south to the Idaho/Nevada state border. The site is accessed via the paved road from Rogerson (about 33.5 miles W of Highway 93) to the intersection of the Pole Creek Road, which is about 0.5 mile west of the Three Creek School. Drive the Pole Creek Road (improved gravel) for about 4 miles, then walk west into the lower end (about 0.5 mile below the Pole Creek confluence) of the site.

Site Design

Designer: Moseley, B. and C. Murphy
Date: 98-08-19
Design Justification:

The south boundary is the Nevada border; east and west boundaries are the canyon rims; north boundary is the narrow, rocky portion of the canyon that limits upstream movement of cattle. The north boundary is also adjacent to private land.

Site Comments:

Site extends about 1.6 linear miles along Flat Creek, and includes the steep canyon walls up to the canyon rim. Total acreage of site is somewhat difficult to determine.

Biological and Physical Characteristics

Size. Primary and Secondary Acres:
Elevation (ft). Minimum: 5600
Maximum: 6000
Site Description:

A narrow, moderately deep canyon lined with impressive rimrock. Artemisia tridentata wyomingensis/Festuca idahoensis association covers the lower canyon slopes below the rim. The 2% gradient stream is dominated by Cornus sericea along the upper 1.6 miles in a wide dense stand, totally overhanging the stream. The lower 0.5 mile is more open and heterogeneous, but Salix lutea/Rosa woodsii appears to be the most prominent community. Two small terraces near the upper

boundary have the Prunus virginiana/Elymus glaucus association.
Key Environmental Factors:
Stream hydrology appears to be intact. Cattle grazing may be altering the composition and structure of the small terraces.
Element Occurrences (element/size):

CORNUS STOLONIFERA	0 NO DET.
SALIX LUTEA/ROSA WOODSII	0 NO DET.
PRUNUS VIRGINIANA/ELYMUS GLAUCUS	0.1

Biodiversity Significance: B3
High quality riparian communities; site is useful as a reference area.
Other Values: V2
Redband trout are present in the creek indicating high water quality and intact aquatic communities.

Protection and Stewardship
Designation: REFERENCE AREA
Information Needs:
Upland vegetation communities need to be assessed.
Protection Urgency: P3
The site is largely protected through physical attributes of the canyon.
Management Needs:
Management of surrounding cattle allotment needs to be considered.
Management will need to exclude cattle grazing.
Management Urgency: M2
Cattle grazing/exclusion is the most pressing management issue.
Current Landuse:
Onsite:
Offsite: Surrounding land use is cattle grazing. Some cattle get into the canyon occasionally; about 10 head were observed in 1998.
Exotic Species Comments:
Cirsium arvense is locally common in a couple of small areas.

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CAT SPRING EXCLOSURE
39

Location
Ecoregion Section: OWYHEE UPLANDS SECTION (342C)
Watershed: 17050103061
County: Owyhee
USGS Quad: TOY PASS 4211685
LAT: 425544N S: 425543N E: 1163123W
LONG: 1163125W N: 425546N W: 1163127W
Legal Description (township/range, section, meridian, note)
006S002W 01 BO NE4NE4SW4
Directions:
The exclosure in the Cat Creek drainage is on the north slope of the Owyhee Mountains, on the west side of the Triangle-Oreana Road. The site is about 2 miles northeast of Toy Pass, and about 15 miles southwest of Oreana.

Site Design

Designer: Moseley, R. K
Date: 98-07-30
Design Justification:
The boundary of the site follows the perimeter of the exclosure.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 1.00
Primary Acres: 1.00
Elevation (ft). Minimum: 4480
Maximum: 4520
Site Description:
The site is a small exclosure around a small spring and seepy ground on the lower slopes immediately above Cat Creek. The seepy ground, spring, and channels are mostly dominated by Salix lasiolepis, although some small seep areas are dominated by Juncus and Geum macrophyllum. The stream is relatively steep as it runs into Cat Creek. The surrounding mountain sides are dominated by Artemisia species and Purshia tridentata.
Key Environmental Factors:
The spring and seeps emanate from within the exclosure, so hydrology is intact.
Landuse History:
The exclosure was erected about 40 years ago.
Element Occurrences (element/size):
SALIX LASIOLEPIS/BARREN
Biodiversity Significance: B3
The site is a useful reference area because, although it is small, it contains a protected stand of Salix lasiolepis.
Other Values: V3
The exclosure was originally erected for wildlife habitat.

Protection and Stewardship

Designation: REFERENCE AREA
Protection Urgency: P5
The site is protected by a well-maintained exclosure fence.
Management Needs:
Continue to maintain the exclosure fence.
Management Urgency: M5
Continue to maintain the exclosure fence.
Current Landuse:
Onsite: The exclosure was erected about 40 years ago.
Offsite:

Exotic Species Comments:
Bromus tectorum dominates most of the upland portions of the exclosure.
MA Comments:
The exclosure was originally constructed as a Habitat Improvement Project. The BLM, Department of Fish and Game, and Pheasants Forever are all involved with the project, at some capacity.

CHARITY SPRING EXCLOSURE
41

Location
Ecoregion Section: OWYHEE UPLANDS SECTION (342C)
Watershed: 17050103067
County: Owyhee
USGS Quad: TOY PASS 4211685
LAT: 425352N S: 425343N E: 1163256W
LONG: 1163300W N: 425354N W: 1163316W
Legal Description (township/range, section, meridian, note)
006S002W 14 BO NW4SW4SW4
006S002W 15 BO SE4SE4
Directions:
The site is located about 9 miles northeast of Triangle along the Triangle-Oreana Road, 0.5 mile southwest of Toy Pass in the headwaters of the North Fork Castle Creek.

Site Design
Designer: Moseley, R. K.
Date: 98-07-30
Design Justification:
The boundary of the site follows the perimeter of the exclosure.

Biological and Physical Characteristics
Size. Primary and Secondary Acres: 3.00
Primary Acres: 3.00
Elevation (ft). Minimum: 5560
Maximum: 5650
Site Description:
The site consists of two contiguous exclosures constructed 30 to 50 years ago. The narrow exclosure encompasses the valley bottom from Charity Spring, downstream for about 0.3 mile. Much of the valley bottom is subirrigated and several seeps surface within the exclosure. Glyceria grandis and Salix geyeriana communities dominate the seeps, spring-fed channel, and subirrigated sites. A Hordeum brachyantherum community occupies the mesic fringe, which is relatively extensive in several areas of the exclosure. Juniperus occidentalis woodlands occupy the adjacent mountain slopes.
Key Environmental Factors:
Hydrology is tied to Charity Spring at the upper end of the exclosure. In addition, other areas within the exclosure are subirrigated, and several seeps occur there as well.
Landuse History:
The exclosure was erected 30+ years ago.
Element Occurrences (element/size):
SALIX GEYERIANA/CAREX UTRICULATA 0.5 AC
SALIX GEYERIANA/MESIC FORB
GLYCERIA GRANDIS
HORDEUM BARCHYANTHERUM
Biodiversity Significance: B3
The site has been protected for a long time and has the diversity of a

high quality spring and subirrigated communities.
Other Values: V3
The site was originally fenced for wildlife values.

Protection and Stewardship
Designation: REFERENCE AREA
Protection Urgency: P5
The site is protected by a well-maintained exclosure.
Management Needs:
Continue to keep a well-maintained exclosure fence, and eradicate the small Cirsium arvense stands.
Management Urgency: M5
Continue to maintain the fence.
Current Landuse:
Onsite:
Offsite: The west side of the exclosure is at the edge of a road.
Exotic Species Comments:
Cirsium arvense is present in a few patches.
MA Comments:
The exclosure was originally constructed as a Habitat Improvement Project (HIP). The BLM, Department of Fish and Game, and Pheasants Forever are all involved with the project, at some capacity.

Appendix 2

Community Types and Alliances arranged by the Formation level of the National Vegetation Classification System hierarchy.

Note: Formation names and National Vegetation Classification codes are from Anderson et al. (1998).

I.B.2.N.d. TEMPORARILY FLOODED COLD-DECIDUOUS FOREST

***Alnus rhombifolia* Temporarily Flooded Forest Alliance**

Alnus rhombifolia/Cornus sericea

Alnus rhombifolia/Philadelphus lewisii

***Populus trichocarpa* Temporarily Flooded Forest Alliance**

Populus trichocarpa/Acer glabrum

Populus trichocarpa/Rosa woodsii

Populus trichocarpa/Salix lasiandra

Populus trichocarpa/Salix lutea

Populus trichocarpa/Symphoricarpos albus

***Populus tremuloides* Temporarily Flooded Forest Alliance**

Populus tremuloides/Cornus sericea

II.A.4.N.d. TEMPORARILY FLOODED TEMPERATE OR SUBPOLAR NEEDLE-LEAVED EVERGREEN WOODLAND

***Juniperus occidentalis* Temporarily Flooded Woodland Alliance**

Juniperus occidentalis/Danthonia californica

Juniperus occidentalis/Elymus glaucus

***Juniperus scopulorum* Temporarily Flooded Woodland Alliance**

Juniperus scopulorum/Elymus glaucus (*J. scopulorum*/Mesic forb in Moseley 1998)

Juniperus scopulorum/Equisetum arvense

Juniperus scopulorum/Equisetum hyemale

***Pseudotsuga menziesii* Temporarily Flooded Woodland Alliance**

Pseudotsuga menziesii /Acer glabrum-Physocarpus malvaceus Flood Plain

Pseudotsuga menziesii/Cornus sericea

III.A.4.N.a. MICROPHYLLOUS EVERGREEN SHRUBLAND

***Artemisia cana* Shrubland Alliance**

Artemisia cana/Dry graminoid

Artemisia cana/Festuca idahoensis

***Artemisia tridentata* ssp. *tridentata* Shrubland Alliance**

Artemisia tridentata tridentata/Elymus cinereus

III.A.4.N.c. TEMPORARILY FLOODED MICROPHYLLOUS SHRUBLAND

***Artemisia cana* Temporarily Flooded Shrubland Alliance**

Artemisia cana/Eleocharis palustris

Artemisia cana/Muhlenbergia richardsonis

***Artemisia papposa* Temporarily Flooded Shrubland Alliance**

Artemisia papposa

III.B.2.N.d. TEMPORARILY FLOODED COLD-DECIDUOUS SHRUBLAND

***Alnus incana* Temporarily Flooded Shrubland Alliance**

Alnus incana/Cornus sericea

***Betula occidentalis* Temporarily Flooded Shrubland Alliance**

Betula occidentalis/Cornus sericea

Betula occidentalis/Mesic forb

Betula occidentalis/Philadelphus lewisii

Betula occidentalis/Poa pratensis

***Crataegus douglasii* Temporarily Flooded Shrubland Alliance**

Crataegus douglasii/Rosa woodsii

***Cornus sericea* Temporarily Flooded Shrubland Alliance**

Cornus sericea

***Prunus virginiana* Temporarily Flooded Shrubland Alliance**
Prunus virginiana
Prunus virginiana/Elymus glaucus
***Salix exigua* Temporarily Flooded Shrubland Alliance**
*Salix exigua/*Barren
Salix exigua/Mesic graminoid
Salix exigua/Poa pratensis
***Salix geyeriana* Temporarily Flooded Shrubland Alliance**
Salix geyeriana/Carex utriculata
Salix geyeriana/Mesic Forb
***Salix lasiandra* Temporarily Flooded Shrubland Alliance**
*Salix lasiandra/*Bench
Salix lasiandra/Cornus sericea
Salix lasiandra/Rosa woodsii
***Salix lasiolepis* Temporarily Flooded Shrubland Alliance**
*Salix lasiolepis/*Barren
Salix lasiolepis/Cornus sericea
*Salix lasiolepis/*Mesic graminoid
***Salix lutea* Temporarily Flooded Shrubland Alliance**
Salix lutea
Salix lutea/Poa pratensis
Salix lutea/Rosa woodsii

III.B.2.N.d. INTERMITTENTLY FLOODED COLD-DECIDUOUS SHRUBLAND
***Philadelphus lewisii* Intermittently Flooded Shrubland Alliance**
Philadelphus lewisii

III.B.3.N.d. INTERMITTENTLY FLOODED EXTREMELY XEROMORPHIC DECIDUOUS SUBDESERT SHRUBLAND
***Sarcobatus vermiculatus* Intermittently Flooded Shrubland Alliance**
Sarcobatus vermiculatus/Distichilis stricta
Sarcobatus vermiculatus/Poa secunda

V.A.5.N.i. INTERMITTENTLY FLOODED TEMPERATE OR SUBPOLAR GRASSLAND
***Danthonia californica* Intermittently Flooded Herbaceous Alliance**
Danthonia californica

V.A.5.N.j. TEMPORARILY FLOODED TEMPERATE OR SUBPOLAR GRASSLAND
***Eleocharis palustris* Temporarily Flooded Herbaceous Alliance**
Eleocharis palustris (vernal pool)
***Hordeum brachyantherum* Temporarily Flooded Herbaceous Alliance**
Hordeum brachyantherum

V.A.5.N.k. SEASONALLY FLOODED TEMPERATE OR SUBPOLAR GRASSLAND
***Carex nebrascensis* Seasonally Flooded Herbaceous Alliance**
Carex nebrascensis
***Carex sheldonii* Seasonally Flooded Herbaceous Alliance**
Carex sheldonii
***Carex utriculata (rostrata)* Seasonally Flooded Herbaceous Alliance**
Carex utriculata
***Eleocharis palustris* Seasonally Flooded Herbaceous Alliance**
Eleocharis palustris

***Juncus balticus* Seasonally Flooded Herbaceous Alliance**
Juncus balticus

V.A.5.N.l. SEMIPERMANENTLY FLOODED TEMPERATE OR SUBPOLAR GRASSLAND
***Glyceria grandis* Semipermanently Flooded Herbaceous Alliance**
Glyceria grandis
***Phragmites australis* Semipermanently Flooded Herbaceous Alliance**
Phragmites australis
***Scirpus acutus* Semipermanently Flooded Herbaceous Alliance**
Scirpus acutus
***Scirpus americanus* Semipermanently Flooded Herbaceous Alliance**
Scirpus americanus
***Scirpus pallidus* Semipermanently Flooded Herbaceous Alliance**
Scirpus pallidus
***Scirpus pungens* Semipermanently Flooded Herbaceous Alliance**
Scirpus pungens

V.A.5.N.m. SATURATED TEMPERATE OR SUBPOLAR GRASSLAND
***Carex simulata* Saturated Herbaceous Alliance**
Carex simulata
***Eleocharis rostellata* Saturated Herbaceous Alliance**
Eleocharis rostellata

V.B.2.N.c. INTERMITTENTLY FLOODED TEMPERATE PERENNIAL FORB VEGETATION
***Lepidium davisii* Intermittently Flooded Herbaceous Alliance**
Lepidium davisii

V.B.2.N.f. SATURATED TEMPERATE PERENNIAL FORB VEGETATION
***Berula erecta* Saturated Herbaceous Alliance**
Berula erecta
***Mimulus guttatus* Saturated Herbaceous Alliance**
Mimulus guttatus

V.B.2.N.h. SEASONALLY FLOODED TEMPERATE PERENNIAL FORB VEGETATION
***Artemisia ludoviciana* Seasonally Flooded Herbaceous Alliance**
Artemisia ludoviciana
***Camassia cusickii* Seasonally Flooded Herbaceous Alliance**
Camassia cusickii