

14. Blue Willow-Serviceberry Willow-Booth Willow Ecological Series

Table 14-1. Full and short names for the ecological types in the Blue-Serviceberry-Booth Willow Ecological Series.

Ecological Type Code	Name	Plant Association Code	Short Name
R12	Blue willow/reedgrass-beaked sedge—Deep to moderately deep alluvial Cryaquolls—U-shaped or flat floodplains, terraces, and draw bottoms, 8,500-10,200 ft	SADR/CACA4-CAUT	Blue willow—Deep alluvial soils—Bottoms
R13	Serviceberry willow/beaked sedge—Deep to very deep alluvial to colluvial silty to clayey Cryaquolls, sometimes Histic—U-shaped or flat draws, slopes, floodplains, swales, benches, ravines, and slumps, 8,100–11,000 ft	SAMO2/CAUT	Serviceberry willow—Deep alluvial soils—Concave bottoms and swales

The *Salix drummondiana*-*Salix monticola*-*Salix boothii* series is described here for the first time. It is based on the *Salix drummondiana* series of Komárková (1986) and Kittel and others (1994) and on the *Salix drummondiana* Alliance of Kittel and others (1996). It is also based on the *Salix boothii* series of Kittel and others (1994) and on the *Salix monticola* series of Kittel and others (1994), the *Salix geyeriana* series of Hess (1981, in part); and the *Salix geyeriana* Alliance of Kittel and others (1996). It includes the *Alnus incana* ssp. *tenuifolia* Series of Komárková (1986).

Vegetation, Climate, Soils

Stands generally occupy slightly better-drained locations than the Yellow Willow Series, either on slightly higher gradients or coarser soils. Stands are usually long and narrow, surrounding a stream, and easily delineated on aerial photos. Some sites formed through beaver activity and beaver may still inhabit some stands. Successional patterns often coincide with beaver activity (Kittel and Lederer 1993).

Early seral stages lack willows, and are often dominated by Baltic rush, shrubby cinquefoil, silver or big sagebrush, rabbitbrush, Kentucky bluegrass, dandelion, and/or quackgrass. Beaked sedge invades old beaver ponds (Kittel and Lederer 1993). Browsing or grazing by livestock or big game reduces the cover of blue and serviceberry willows and beaked and water sedges, and increases cover by less-palatable willows such as Geyer willow. Some midseral or early midseral stands are dominated by Geyer willow and understory species with drier-site affinities, such as tufted hairgrass or bluejoint reedgrass.

Later seral stages are dominated by various species of willows, occasionally with alder, with beaked sedge in the understory. Later seral stands can be dominated by blue (Drummond) willow (SADR), serviceberry (mountain) willow (SAMO2), or some combination of the two; the most palatable and succulent shrubs in this type. Booth willow (SABO2) dominates a few stands, though this is uncommon in the UGB. Booth willow occurs in stands very similar to those dominated by

serviceberry willow (see Kittel and Lederer 1993) in the UGB.

In the Northern Rockies, tall planeleaf willow (*Salix planifolia* ssp. *planifolia*) commonly occurs mixed with blue, serviceberry, and Booth willows (Girard and others 1985), but tall planeleaf willow does not occur in the UGB. Our plane leaf willow is shorter (*Salix planifolia* ssp. *monica*).

Unwanted willows have been sprayed with herbicides or removed mechanically to increase growth, palatability, and production of plants for livestock forage. However, these methods are not recommended, as they reduce site value and threaten water quality, cause water tables to drop, reduce bank stability, and negatively impact wildlife habitat.

Soil compaction is common where animals have concentrated, and combined with the associated forage and browse use, leads to falling water tables and invasion by exotics and other weedy plants, bank instability, erosion, and declining wildlife values (Kittel and others 1994). More research is required to measure compaction in these riparian sites.

Table 14-2. Climate and Soils

Characteristic	Value	Reference
Precipitation zone	750 mm/year (650 to 850 mm/yr) 29 in/yr (25-33 in/year)	Phillips 1977

Replanting Drummond, serviceberry, or Booth willow from rooted cuttings can restore willow cover to a depleted site, which improves wildlife cover and browse, bank stability, and fisheries habitat (Hansen and others 1988).

Sites with good willow and sedge cover have high bank stability and can withstand floods without damage (Hansen and others 1988). In good condition, such sites provide great natural watershed protection, and keep water in the stream that would not otherwise be there in late season. Good willow and sedge cover contribute significantly to watershed stability. Beaked sedge is the most important bank stabilizer. Sites dominated by shrubby cinquefoil (*Pentaphylloides floribunda*) occur where the water table has

dropped in recent years (to around 1 m below surface in summer), often because of removal of willows and soil compaction by herbivores (Hansen and others 1988).

Fire Management

Willows native to this series sprout vigorously after fire, especially a quick, hot fire (Hansen and others 1988). Prescribed burning can be effective to regenerate decadent willow stands, if burned sites are protected from grazing and browsing long enough for sprouts to become established (Hansen and others 1988). Fire also stimulates beaked sedge and other sedges, though successful burning often requires nonuse the year before to build up fuels (Hansen and others 1989a).

Fires stimulate dramatic increases in bluejoint reedgrass (*Calamagrostis canadensis*) where it is present (Hansen and others 1988). Insects and diseases in this series are not documented.

Range and Wildlife Management

Forage and browse production can be high in these sites (Hansen and others 1988), yet traditional livestock-grazing systems often do not maintain those communities (Kovalchik and Elmore 1992). The number of days these sites are grazed in the late and hot seasons should be limited (Myers 1989). Kovalchik and Elmore (1992) recommend several grazing systems to restore and recover willow riparian areas. Willows will increase where they have received some relief from grazing, and a seed source is available. Season-long grazing is the worst system for maintaining or improving riparian condition (Shaw 1992).

Sedges can tolerate heavy grazing, particularly when upland species are cured or when livestock distribution is poor. Willows will increase when they receive some relief from grazing and a seed source is available. The worst grazing system for maintaining or improving riparian condition is season-long (Shaw 1992). Where these riparian areas are adjacent to upland rangelands, livestock may use the riparian areas for water, which may require protecting the stream and its banks, or livestock-control barriers.

Summer grazing by cattle results in willow shrubs that are less densely spaced and reduces the number of willows in the 1½-2¾ m height classes. It also favors less-palatable willow species such as Geyer willow or Bebb willow, over more palatable species such as Pacific willow or yellow willow (Knopf and Cannon 1981, Cannon and Knopf 1984, Hansen and others 1989ab), and changes the species composition of birds (Knopf and others 1988).

Protracted heavy grazing eliminates the smaller size classes of willows and all blue and serviceberry willows, while increasing dominance by Geyer willow, sometimes with shrubby cinquefoil (PEFL15). Heavy grazing encourages understories with species such as Kentucky bluegrass, Baltic rush, dandelion, and quackgrass (Knopf and others 1988, Girard and others 1995). Eventually all the willows will be extirpated or reduced to one or a few suppressed, mushroom-shaped individuals of Geyer or Bebb willows. Over the last century, many sites have been severely browsed by elk and deer and grazed heavily by livestock. This has resulted in poor condition sites -- sites lacking willows completely or supporting only a few of the least-palatable species -- with understories depleted of younger willows, and sedges replaced by weedy invaders and unpalatable shrubs.

Heavy browsing or grazing by livestock or big game reduces willow and sedge cover, removes smaller size-classes of willows (because they are more available and more palatable), and eventually extirpates willows from the site. Along with those vegetation changes come bank instability, lower water tables, invasion by undesirable species such as Kentucky bluegrass, dandelion, or nettles, a reduction in fisheries, and removal of browse and cover for big game and habitat for birds and small mammals (Kittel and others 1994).

In pastures where serviceberry willow and Pacific willow have been replaced by Geyer willow, bird-population densities of habitat generalists ("mesotopic") such as American robins, red-winged blackbirds, and brown-headed cowbirds are reduced, and riparian-specific ("stenotopic") birds such as willow flycatchers, Lincoln's sparrows, and white-crowned sparrows are absent or accidental (Knopf and others 1988). Populations of upland birds such as yellow warblers, savannah sparrows, and song sparrows are unaffected by relatively subtle changes in livestock grazing season (Knopf and others 1988). The responses of these bird's populations is indicative of changes in the horizontal patterning of the vegetation (Knopf and others 1988).

Recreation, Roads & Trails, Scenery

Sites are not suitable for roads and trails or for any construction. Where roads or trails cross these sites, they must be stabilized with riprap or gravel, or bridged to prevent damage.

Construction activities may require a permit under the Clean Water Act. Off-road vehicles (ORV) can cause extensive damage in the summer and worse damage in early spring and late fall when sites are wettest (Kittel and others 1994). ORV use (except in deep winter) should be discouraged.

Since these sites often have fine-textured soils, moderate to heavy recreation use can lead to compaction and riparian deterioration. Campers, hikers, pack stock, or fishers can also cause severe ruts (Hansen and others 1989ab). Sites are unsuitable for camping or developed recreation, as

soils contain clay and are often muddy or frequently flooded, resulting in dense mosquito and fly populations. However, scenic values can be high when sites have good willow cover, contributing to high wildlife viewing and hunting values.

Key to Ecological Types in the Blue and Serviceberry Willow Series

- 1. Blue willow absent or < 1% cover. Deeper soil with less coarse fragment content RI3
- 1. Blue willow present; serviceberry willow absent or if present clearly less cover than blue willow. Moderately-deep soil with more coarse fragment content RI2

Table 14-3. Characteristics of Ecological Types within Ecological Series 14 in the Upper Gunnison Basin.
Numbers are shown in form Average (Minimum-Maximum)

Code Short Name	No. Samples	Elevation, ft	Avg. Aspect, °M (r) Slope, %	Soil Coarse, %	Depth, cm Mollic, cm	Surface: Coarse, % Bare, %	Cover, %: Trees Shrubs Graminoids Forbs	Total Live Cover, % No. Species TLC/NS, %
RI2 Blue willow-Deep alluvial soils-Bottoms	17	9,291 (8,560-10,160)	204 (0.36) 3 (0-12)	35 (8-60)	70 (50-92) 48 (16-71)	6 (1-15) 10 (0-40)	6 (0-57) 83 (14-155) 85 (6-185) 57 (8-193)	238.9 (127.8-422.9) 27 (11-41) 10.1 (4.3-26.0)
RI3 Serviceberry willow- Deep alluvial soils- Concave bottoms and swales	34	9,468 (8,160-10,970)	188 (0.41) 6 (0-25)	19 (0-47)	102 (71-168) 75 (41-168)	3 (0-15) 20 (0-75)	1 (0-15) 55 (0-147) 127 (50-226) 84 (13-191)	268.5 (125.6-425.0) 29 (10-59) 12.3 (3.3-36.0)



Lower Pauline Creek, a tributary of Cochetopa Creek. A good example of late seral stage in serviceberry willow/beaked sedge type. Notice the active beaver population, which helps keep the water in this system even in late season. August 12, 1992.

BLUE WILLOW-DEEP ALLUVIAL SOILS-BOTTOMS

Blue willow/reedgrass-beaked sedge-Deep to moderately deep alluvial Cryaquolls-
U-shaped or flat floodplains, terraces, and draw bottoms, 8,500-10,200 ft

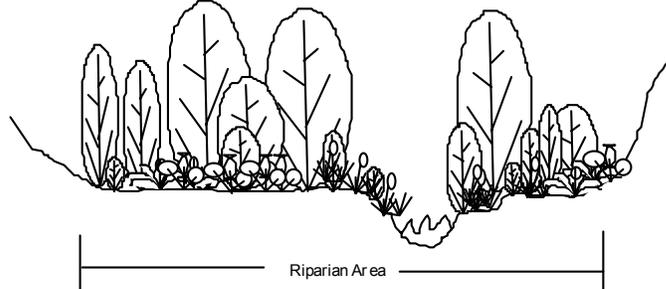


Figure 14-1. Cross-section of vegetation structure of *Blue willow-Deep alluvial soils-Bottoms*. Aspects are various, and slope angles average 2.8%.

Blue willow-Deep alluvial soils-Bottoms is a moderately common type in draw bottoms or canyon bottoms on alluvial soils outside the deep rainshadows. In the Gunnison Basin, it is found on streamside terraces in the lower Subalpine zone. It also occurs scattered through the mountains of Colorado. In good condition, *Blue willow-Deep alluvial soils-Bottoms* is characterized by blue (Drummond) willow (SADR), and sometimes serviceberry (mountain) willow (SAMO2) or Geyer willow (SAGE2), with bluejoint reedgrass (CACA4), beaked sedge (CAUT), and cow-parsnip (HESP6). Earlier seral stages may have Kentucky bluegrass (POPR) or dandelion (TAOF); see Table 14-7 for common species names and codes. Other distinguishing features include location on moderately-drained alluvial streamside terraces and Aquic mineral soils or Histosols.

Blue willow-Deep alluvial soils-Bottoms is related to *Yellow willow-Deep alluvial soils-Concave bottoms and swales*, which occurs at somewhat lower elevations on deeper, warmer (Frigid) clayey soils. *Blue willow-Deep alluvial soils-Bottoms* is also related to *Serviceberry willow-Deep alluvial soils-Concave bottoms and swales*, which occurs at somewhat higher elevations on deeper, loamier soils.

The plant association *Salix drummondiana/Calamagrostis canadensis-Carex utriculata* is described as new here, based in part on *Salix drummondiana/Calamagrostis canadensis* (Johnston 1987, Komarkova 1986). *Salix drummondiana/Calamagrostis canadensis-Carex utriculata* phase *Salix monticola* is described as new here.

Secondary succession is easy to see in the field, but primary succession may be more difficult to assess. In these riparian areas, the distinction between primary and secondary succession seems blurred, probably because the soils change readily under different management. Succession is complex, involving vegetation, land, water, and soil acting together. In very early seral to early seral stage, no shrubs are present, or dryland shrubs such as sagebrush (big or silver) dominate, with an understory of exotic bottomland species such as Kentucky bluegrass, quackgrass (ELRE3), and dandelion, and assorted weeds. The water table is usually low all summer and fall.

In early midseral to midseral stages, shrub cover is patchy (<40% across the site), consisting of a mix of willows and cinquefoil. There is little or no reproduction of later-successional, more succulent willows such as blue willow, serviceberry willow, or Booth willow (SABO2). Small patches of beaked sedge and/or reedgrass, rushes, and moist-site forbs occur in the low bottom microsites, but sagebrush, cinquefoil, bluegrass, quackgrass, dandelion, and dryland forbs occur on higher microsites. The water table is high in spring, and stays high enough through summer and fall to keep the small, lowest microsites wet all year.

In late midseral to potential natural community stages, willow cover is >60% across the site, and is continuous except in the wettest patches, which are uniformly dominated by beaked sedge, reedgrass, and other wet-site plants. Sagebrush, cinquefoil, Kentucky bluegrass, quackgrass, and dandelion are absent to minor. The water table is high throughout the year, and there is standing water in the lowest microsites through the growing season.

Blue spruce-cottonwood communities occur on adjacent higher-gradient sites upstream or downstream. Bitterbrush-sagebrush communities border this type on adjacent better-drained sites. Spruce-fir or Douglas-fir forests occur on adjacent dryer, more protected sites.

Horizontal obstruction varies from moderately low to very high. These sites are mostly summer range for deer and elk, which use them for browse, forage, and cover. Deer use of communities A and C is low in winter but moderately high to high in spring through fall; elk use is very low in winter but moderately high in summer. Deer and elk use of

community type B is very low in winter but moderate spring through fall for deer and moderately low for elk. Deer and elk use of community type D is very low in winter; in spring through fall, deer use is moderately low and elk use is low.

Summary of Ecological Type Characteristics

1. Explanation of symbols in Appendix A. Percentages in [brackets] indicate the percentage of plots sampled that have that characteristic.

NUMBER OF SAMPLES	17, soil descriptions from 6; 1 not assigned to a CT (total 18)
ELEVATION	9,291 ft (8,560-10,160 ft); 2,832 m (2,609-3,097 m)
AVERAGE ASPECT	204°M ($r = 0.36$)
LITHOLOGY	Mostly from igneous: granite [41%], breccia [23%], tuff [27%]; only one plot was on sedimentaries
FORMATIONS ¹	Xg [33%], Taf-Tpl [53%]
LANDFORMS	Predominantly floodplains [47%], terraces [24%], and draws [24%]
SLOPE POSITIONS	In bottoms
SLOPE SHAPES	U-shaped [65%] to flat [35%]
SLOPE ANGLE	2.8% (0-12%)
SOIL PARENT MATERIAL	Alluvium [94%]
COARSE FRAGMENTS	4.1% (0-15%) cover on surface, 34.7% (8-60%) by volume in soil
SOIL DEPTH	70 cm (50-92 cm); 27.7 in (20-36 in)
MOLLIC THICKNESS	48 cm (16-71 cm); 19.0 in (6-28 in)
TEXTURE	Silty loam [67%], a few others on the surface; subsurface is a wide variety of silty, clayey, and loamy textures
SOIL CLASSIFICATION	Mostly Cryaquolls [92%], one Cryaquent, Deep [83%] to moderately deep [17%]
TOTAL LIVE COVER	238.9% (127.8-422.9%)
NUMBER OF SPECIES	27.2 (11-41)
TOTAL LIVE COVER/NO. SPECIES	10.1% (4.3-26.0%)
CLIMATE	Cool to cold, wet to moderately wet lower Subalpine climate when the site is in good condition; in earlier seral stages, the microclimate becomes moderately warm, moderately dry, as the water table drops and the soil surface is less shaded.
WATER	At climax, sites are ponded seasonally or throughout the growing season. At earlier seral stages, the water table is lower. The level of the water table changes with management, through manipulating the water-holding and sediment-holding capacities of the vegetation on site and along the water course.

Key to Community Types

- 1. Blue (Drummond) willow conspicuous, >10% cover, dominant or codominant with serviceberry (mountain) willow, usually >10% cover (2)
- 1. Blue (Drummond) willow conspicuous, >10% cover, dominant alone, no other tall willow species >2% cover, Serviceberry (mountain) willow absent to <1% cover (3)
- 2. Bluejoint reedgrass prominent, >15% cover **A**
- 2. Bluejoint reedgrass usually absent or <15% cover **B**
- 3. Graminoids sparse; total graminoid cover <50% **C**
- 3. Graminoids more prominent; total graminoid cover >80% **D**

Description of Community Types

- A** *Blue willow-reedgrass-beaked sedge* is dominated by blue willow, often mixed with serviceberry willow. Total willow cover is >30%, often >50%. Bluejoint reedgrass is conspicuous in the understory at >20% cover. Wet-site sedges (CAUT, CAAQ) are often prominent; total sedge cover ranges from 3 to 140%, often >20%.
- B** *Blue-serviceberry-Geyer willows-Kentucky bluegrass-moist forbs* is dominated by a mix of blue willow and serviceberry willow. Total willow cover is >40%. Bluejoint reedgrass is absent to <15% cover. Wet-site sedges are sometimes prominent; total sedge cover ranges from 0 to 25%.
- C** *Blue willow-reedgrass-cow-parsnip* is dominated by blue willow; serviceberry willow is usually absent or very minor. Total willow cover ranges from 10 to 110%. Wet-site sedges are absent to <5% cover. Total sedge cover ranges from 0 to 20%.
- D** *Blue willow-dandelion-sparse* is dominated by blue willow; serviceberry willow is absent or very minor. Total willow cover ranges from 10 to 70%. Wet-site sedges are often prominent; total sedge cover ranges from 25 to 110%.

Communities Not Assigned to a Community Type

- One community was dominated by shrubby cinquefoil (PEFL15), with a little bluejoint reedgrass in the understory and prominent quackgrass (ELRE3) and Kentucky bluegrass (POPR).

Table 14-4. Community types within *Blue willow-Deep alluvial soils-Bottoms*.

Community Type	No. samples	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Seral Stage	Layer Height, m			Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %	Prod.!, lb/ac/yr Shrubs Gramin. Forbs	Obstruct'n %: 1.5-2.0 m 1.0-1.5 m 0.5-1.0 m 0.0-0.5 m Total<2m
					Lr	Avg Layer Cvr %	M				
A. Blue willow-reedgrass-beaked sedge	6	9,237 (8,560-10,130) 3.9 (1-12)	35 (25-54) 71 (50-92) 38 (16-71)	2 (1-4) 4 (1-10) LS	S1 2.9 (0.5-6.0) S2 0.9 (0.0-2.0) GF 0.3 (0.0-1.9) M 0.0	87.0 6.0 96.7 5.0	0 (0-0) 95 (27-155) 113 (71-168) 42 (14-70)	30 (19-41) 262 (176-332) 9.7 (4.3-17.5)	757-1765 1213- 2766 91-1316	50 100 100 100 88	
B. Blue-serviceberry-Geyer willows-Kentucky bluegrass-moist forbs	3	9,175 (9,100-9,250) 0.0 (0-0)	* * *	7 (1-7) 36 (36-36) MS	* * *	* * *	0 (0-1) 72 (49-92) 76 (40-120) 80 (55-94)	21 (11-30) 231 (173-286) 14.3 (5.8-26.0)	1303- 1741 316-2426 1012- 1560	* * * * *	
C. Blue willow-reedgrass-cow-parsnip	5	9,284 (9,000-9,600) 3.2 (1-5)	* * *	8 (3-15) 12 (0-40) LM	S1 2.1 (0.3-7.0) S2 0.6 (0.3-1.0) GF 0.5 (0.0-1.3) M 0.0	79.6 16.5 86.7 2.8	20 (0-57) 95 (73-109) 23 (6-35) 44 (11-98)	28 (11-40) 191 (128-258) 7.8 (5.5-13.5)	1630- 1767 23-208 74-1581	100 100 100 100 100	
D. Blue willow-dandelion-sparse	3	9,490 (8,710-10,160) 1.8 (0-4)	34 (8-60) 70 (70-70) 64 (58-70)	* 7 (2-11) EM	S1 Missing S2 0.6 (0.0-0.9) GF 0.4 (0.0-1.1) M Missing	M 49 93 M	0 (0-0) 50 (14-90) 142 (116-185) 86 (8-193)	27 (27-27) 280 (148-423) 10.4 (5.5-15.7)	396-1734 2365- 2748 51-1577	* * * *	

*. Unknown: measurements were not taken in this CT.

CT	Mule Deer	Elk
	Season-Preference	Season-Preference
A, C	Winter, Any- Low Spring/Fall- Mod. High to High (Browse, Cover)	Winter, Any- Very Low Spring/Fall- Mod. High (Browse, Cover, Forage)
B	Winter, Any- Very Low Spring/Fall- Moderate (Browse, Cover)	Winter, Any- Very Low Spring/Fall- Mod. Low (Browse, Cover, Forage)
D	Winter, Any- Very Low Spring/Fall- Mod. Low (Browse, Cover)	Winter, Any- Very Low Spring/Fall- Low

Table 14-6. Resource Values for *Blue willow-Deep alluvial soils-Bottoms*. Resource values were calculated from the numbers in Table 14-4, relative to the whole UGB.

The numbers in this table can be translated: 0 = Very Low, 1 = Low, 2 = Moderately Low, 3 = Moderate, 4 = Moderately High, 5 = High, and 6 = Very High.									
Resource Value	Community Type				Resource Value	Community Type			
	A	B	C	D		A	B	C	D
Potential Cattle Forage Production	4-5	3-5	0-1	5	Deer & Elk Forage & Browse	5-6	3-4	4-5	3-4
Grazing Suitability	ns ¹	1-2	ns ¹	1-2	Need for Watershed Protection	5	5	4	4
Wetland	Yes	Often	Yes	Often	Soil Stability	1	1	1	1-2
Riparian Area	Yes	Yes	Yes	Yes	Risk of Soil Loss-Natural	5	5	5	4-5
Developed Recreation	ns ¹	0	ns ¹	1	Risk of Soil Loss-Management	4-5	4-5	4-5	4
Dispersed Recreation	ns ¹	1	ns ¹	1	Risk of Permanent Depletion-Range	4	4	4	4
Scenic	4-5	4-5	4-5	4-5	Risk of Permanent Depletion-Wildlife	4-5	4-5	3-4	3-4
Road & Trail Stability	1	1	1	1-2	Resource Cost of Management	5	5	5	5
Construction Suitability	0	0	0	1	Cost of Rehabilitation	3	3	3	3
Deer & Elk Hiding Cover	6	4-5	6	2-3					



A late seral stage in blue (Drummond) willow. Notice the well-vegetated, stable bank in the foreground. Blue willow 66% cover, bluejoint reedgrass 52%, cow-parsnip 21%, horsetail 5%. Coarse Fragments Cover = 0%, Total Live Cover = 268%, Coarse Fragments in Soil = 30. Soil sampled as a Borohemist. Cement Mountain Quadrangle, elevation 8,710 ft, 2.3% SSW-facing slope. September 11, 1990.

Table 14-7. Common Species in *Blue willow–Deep alluvial soils–Bottoms*, where Characteristic cover > 10% or Constancy > 20%. "-" means that the species is not found. Dead cover is not listed. Ccv = Characteristic Cover, Con = Constancy. If Avc = Average Cover, then these are related using the formula $Avc = Ccv \cdot 100\% / Con$.

Community Type		A	B	C	D	
Code	Species	Ccv(Con) N = 6	Ccv(Con) 3	Ccv(Con) 5	Ccv(Con) 3	Common Name
TREES						
PIEN	<i>Picea engelmannii</i>	T (17)	1 (67)	9 (20)	T (33)	Engelmann spruce
POTR5	<i>Populus tremuloides</i>	- -	- -	46 (40)	- -	quaking aspen
SHRUBS						
ALINT	<i>Alnus incana</i> ssp. <i>tenuifolia</i>	21 (50)	10 (33)	47 (40)	- -	thinleaf alder
B EGL	<i>Betula glandulosa</i>	- -	- -	13 (20)	- -	bog birch
DIIN5	<i>Distegia involucrata</i>	9 (33)	- -	29 (80)	- -	bush honeysuckle
PEFL15	<i>Pentaphylloides floribunda</i>	8 (50)	20 (33)	1 (20)	6 (33)	shrubby cinquefoil
RIIN2	<i>Ribes inerme</i>	6 (67)	- -	3 (40)	24 (33)	whitestem currant
RUID	<i>Rubus idaeus</i>	1 (17)	T (33)	2 (40)	- -	American red raspberry
SADR	<i>Salix drummondiana</i>	43(100)	23(100)	43(100)	37(100)	blue willow
SAGE2	<i>Salix geeyeriana</i>	- -	14(100)	- -	- -	Geyer willow
SAMO2	<i>Salix monticola</i>	30 (83)	19(100)	- -	- -	serviceberry willow
SAPL2	<i>Salix planifolia</i>	2 (17)	10 (33)	T (20)	8 (33)	planeleaf willow
SASC	<i>Salix scouleriana</i>	10 (17)	- -	- -	- -	Scouler willow
GRAMINOIDS						
CACA4	<i>Calamagrostis canadensis</i>	43(100)	10 (33)	13(100)	32 (67)	bluejoint reedgrass
CAREX	<i>Carex</i>	20 (33)	- -	- -	25 (33)	sedge
CAAQ	<i>Carex aquatilis</i>	23 (50)	- -	4 (60)	28 (33)	water sedge
CADI6	<i>Carex disperma</i>	- -	- -	14 (20)	- -	soft leaved sedge
CAEG	<i>Carex egglestonii</i>	2 (17)	- -	- -	49 (33)	Eggleston sedge
CAFE2	<i>Carex festivella</i>	12 (17)	- -	- -	- -	ovalhead sedge
CAUT	<i>Carex utriculata</i>	25 (83)	14 (67)	- -	34 (67)	beaked sedge
DECE	<i>Deschampsia cespitosa</i>	3 (67)	- -	- -	10 (67)	tufted hairgrass
ELRE3	<i>Elytrigia repens</i>	- -	- -	- -	13 (67)	creeping quackgrass
FEID	<i>Festuca idahoensis</i>	- -	- -	- -	16 (33)	Idaho fescue
FETH	<i>Festuca thurberi</i>	- -	50 (33)	- -	38 (33)	Thurber fescue
PHPR3	<i>Phleum pratense</i>	2 (67)	- -	- -	25 (33)	common timothy
POPA2	<i>Poa palustris</i>	5 (50)	- -	14 (20)	- -	swamp bluegrass
POPR	<i>Poa pratensis</i>	22 (83)	44(100)	2 (20)	3 (33)	Kentucky bluegrass
FORBS						
ACLA5	<i>Achillea lanulosa</i>	2 (67)	12 (67)	3 (40)	53 (33)	western yarrow
ANAM	<i>Angelica ampla</i>	- -	- -	22 (40)	1 (33)	giant angelica
CACO6	<i>Cardamine cordifolia</i>	T (17)	- -	1 (60)	- -	heartleaf bittercress
CHDA2	<i>Chamerion danielsii</i>	1 (17)	- -	T (60)	1 (33)	fireweed
EPHA	<i>Epilobium halleianum</i>	- -	- -	11 (20)	- -	glandular willow-herb
FRVI	<i>Fragaria virginiana</i>	T (17)	16 (67)	7 (80)	1 (67)	Virginia strawberry
GATR2	<i>Galium trifidum</i>	1 (33)	- -	- -	2 (67)	small bedstraw
GERI	<i>Geranium richardsonii</i>	2 (17)	70 (33)	1 (40)	- -	Richardson geranium
GEMA4	<i>Geum macrophyllum</i>	2 (83)	- -	2 (20)	T(100)	large-leaved avens
HESP6	<i>Heracleum sphondylium</i>	14 (67)	T (33)	8(100)	21 (33)	cow-parsnip
OXFE	<i>Oxypolis fendleri</i>	11 (33)	- -	- -	- -	Fendler cowbane
RAMA	<i>Ranunculus macauleyi</i>	- -	- -	10 (20)	- -	Macauley buttercup
RUAM9	<i>Rudbeckia ampla</i>	25 (17)	- -	- -	- -	golden glow
SETR	<i>Senecio triangularis</i>	10 (17)	- -	- -	- -	arrowleaf groundsel
SOSI3	<i>Solidago simplex</i>	- -	- -	13 (20)	- -	Mt. Albert goldenrod
TAOF	<i>Taraxacum officinale</i>	3 (17)	27 (67)	4 (20)	16(100)	common dandelion
THFE	<i>Thalictrum fendleri</i>	20 (17)	- -	5 (20)	- -	Fendler meadow-rue
THMO6	<i>Thermopsis montana</i>	- -	20 (33)	- -	- -	golden banner
TRHY	<i>Trifolium hybridum</i>	- -	- -	- -	36 (33)	alfalfa clover
TRRE3	<i>Trifolium repens</i>	1 (17)	5 (67)	1 (20)	- -	white Dutch clover
URGR3	<i>Urtica gracilis</i>	7 (67)	- -	12 (20)	6 (67)	stinging nettle
VIAM	<i>Vicia americana</i>	4 (17)	- -	1 (40)	1 (33)	American vetch
VIOLA	<i>Viola</i>	1 (33)	- -	1 (20)	2 (33)	violet
FORB	forb unknown	T (17)	2 (33)	1 (40)	- -	unknown forb
FERNS & FERN-ALLIES						
EQAR	<i>Equisetum arvense</i>	17 (67)	8 (33)	50 (20)	5 (33)	field horsetail
GROUND COVER						
.BARESO	bare soil	4 (83)	36 (33)	12(100)	7 (67)	
.LITTER	litter and duff	87 (83)	70 (67)	72(100)	86(100)	
.GRAVEL	gravel 0.2-10 cm	-	7	6	-	
.COBBLE	cobble 10-25 cm	1 (33)	- -	4 (20)	- -	
.STONES	stone > 25 cm	2 (33)	- -	5 (20)	- -	
.MOSSON	moss on soil	15 (17)	1 (33)	3 (40)	7 (33)	
LICHENS	lichens on soil	9	-	22	15	

SERVICEBERRY WILLOW–DEEP ALLUVIAL SOILS–CONCAVE BOTTOMS AND SWALES

Serviceberry willow/beaked sedge–

Deep to very deep alluvial to colluvial silty to clayey Cryaquolls, sometimes Histic–U-shaped or flat draws, slopes, floodplains, swales, benches, ravines, and slumps, 8,100–11,000 ft

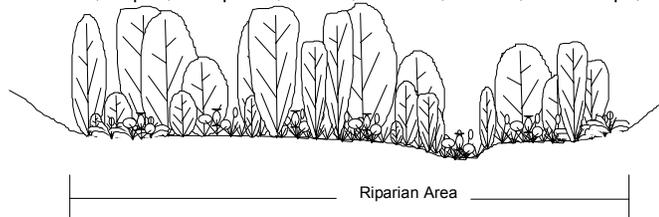


Figure 14-2. Cross-section of vegetation structure of *Serviceberry willow–Deep alluvial soils–Concave bottoms and swales*. The tallest shrub layer typically averages 1.6 ft tall. Aspects are non-northerly, and slope angles average 12%.

Serviceberry willow–Deep alluvial soils–Concave bottoms and swales is a common type in draws, swales, or benches, with cold (Cryic) soils outside the deep rainshadows. In the Gunnison Basin, it occurs on streamsides, basins, and benches (“hanging riparian”). It probably occurs throughout the Rocky Mountains in good condition. *Serviceberry willow–Deep alluvial soils–Concave bottoms and swales* is characterized by serviceberry (mountain) willow (SAMO2) and beaked sedge (CAUT). Blue (Drummond) willow (SADR) is usually absent or minor compared with serviceberry willow. Earlier seral stands have shrubby cinquefoil (PEFL15), Kentucky bluegrass (POPR), Baltic rush (JUARA4), or dandelion (TAOF) as well; see Table 14-11 for common species names and codes. Other distinguishing features include location on poorly-drained alluvial bottoms and Cryaquolls.

At lower elevations, stands in this Series still consistently have cold (Cryic) soils; these sites remain Cryic because of cold-air drainage, a common ecological phenomenon here throughout the year.

Serviceberry willow–Deep alluvial soils–Concave bottoms and swales is related to *Blue willow–Deep alluvial soils–Bottoms*, which occurs at lower elevations on less steep gradients and on shallower soils. *Serviceberry willow–Deep alluvial soils–Concave bottoms and swales* is also related to *Yellow willow–Deep alluvial soils–Concave bottoms and swales*, which occurs at lower elevations in similar sites, on more clayey soils, and supports yellow willow (SALU2) instead of serviceberry willow.

The plant association *Salix monticola/Carex utriculata* is described as new here. *Salix monticola/Carex utriculata* phase *Salix boothii*, also described as new here, is based on *Salix boothii/Carex rostrata* (Youngblood 1985).

Secondary succession is easy to see in the field, but primary succession may be more difficult to assess. In these riparian areas, the distinction between primary and secondary succession seems blurred, probably because the soils change readily with management. Succession is complex, involving vegetation, land, water, and soil. In very early seral to early seral stages, there are no shrubs, or dryland shrubs such as sagebrush (big or silver) dominate, with an understory of exotic bottomland species such as Kentucky bluegrass, quackgrass (ELRE3), dandelion, and assorted weeds. The water table is usually low in summer and fall.

In early midseral to midseral stages, patchy willow cover (<40% across the site) is dominant, composed of a mix of willows and cinquefoil. There is little to no reproduction of the later-successional, more succulent willows such as serviceberry willow or Booth willow. Small patches of beaked sedge and/or reedgrass, rushes, and moist-site forbs occur in low bottom microsites, but higher microsites support sagebrush, cinquefoil, bluegrass, quackgrass, dandelion, and dryland forbs. The water table is high in spring and stays high enough through summer and fall to keep the small, lowest microsites wet all year.

In late midseral to potential natural communities, willow cover is >60% across the site, and is continuous except in the wettest patches, which are uniformly dominated by beaked sedge, reedgrass, and other wet-site plants. Sagebrush, cinquefoil, Kentucky bluegrass, quackgrass, and dandelion are usually absent. The water table is high throughout the year, with standing water in the lowest microsites through the growing season.

Spruce riparian forests border this type on higher-gradient sites upstream and downstream. Cold, moist spruce-fir forests adjoin this type on steep slopes with much better-drained soils. Cliffs and rockslides often occur adjacent to this type where they define the riparian boundary.

Horizontal obstruction varies from very low to very high, generally proportional to the tall willow cover. In good condition, these sites are used extensively by elk and deer in their winter ranges for cover, browse, and forage, though most sites are inaccessible during all but the mildest winters due to snow accumulation. Elk use of all community types is moderately low in mild winters and very low in severe winters. Deer use of community types A, B, C, and D is low in mild winters, very low in severe winters. Deer use of community types E and D is very low in all winters. Deer use of community types A, C, and D is moderate in spring through

fall; deer use of other community types is low in spring through fall. Elk use of community types A, C, and D is moderate in spring through fall; their use of community type B is moderately low, and use of E and F is low.

These sites are useful to sage grouse mainly as summer range. Sage grouse use of community types A, B, C, and D is low in spring for nesting and leks, and moderately high in summer. Community types E and F receive low use for leks, but moderate use for nesting and moderately high use in summer.

Summary of Ecological Type Characteristics

1. Explanation of symbols in Appendix A. Percentages in [brackets] indicate the percentage of plots sampled that have that characteristic.

NUMBER OF SAMPLES	34, soil descriptions from 11; 1 not assigned to a CT (total 35)
ELEVATION	9,468 ft (8,160-10,970 ft); 2,886 m (2,487-3,343 m)
AVERAGE ASPECT	188°M (r = 0.41)
LITHOLOGY	Shale-sandstone-siltstone [49%], basalt-tuff-gneiss-granite [46%]
FORMATIONS ¹	Km-KJdm-Kdb [41%], Tbb-Taf [32%], Xfh-Xg [21%]
LANDFORMS	Draws, floodplains, swales, ravines [66%], some benches or soil creep slopes also
SLOPE POSITIONS	Mostly in bottoms
SLOPE SHAPES	U-shaped [66%] to flat [17%]
SLOPE ANGLE	6.2% (0-25%)
SOIL PARENT MATERIAL	Mostly alluvial [57%], some colluvial [39%]
COARSE FRAGMENTS	2.1% (0-10%) cover on surface, 19.2% (0-47%) by volume in soil
SOIL DEPTH	105 cm (73-168 cm); 41.2 in (29-66 in)
MOLLIC THICKNESS	75 cm (41-168 cm); 29.7 in (16-66 in)
TEXTURE	Surface Organic [33%] or silty (silty clay loam-silty clay [42%]); Subsurface a wide variety of textures
SOIL CLASSIFICATION	Mostly Cryaquolls [69%], some Borohemists [23%]
TOTAL LIVE COVER	268.5% (125.6-425.0%)
NUMBER OF SPECIES	28.6 (10-59)
TOTAL LIVE COVER/NO. SPECIES	12.3% (3.3-36.0%)
CLIMATE	Climate. Cool to cold, wet to moderately wet lower Subalpine climate when the site is in good condition; in earlier seral stages, microclimate may be moderately warm, moderately dry, as the water table drops and the soil surface is less shaded.
WATER	At climax, sites are ponded seasonally or throughout the growing season. At earlier seral stages, the water table is lower. The level of the water table can be manipulated by management of the water-holding and sediment-holding capacities of the vegetation and the water course.

A typical serviceberry willow/beaked sedge stand in late seral stage (Community Type A). Serviceberry willow 43% cover, Geyer willow 33% (the bluish foliage to the right center), beaked sedge 70%, bluejoint reedgrass 39%, water sedge 17%. Soil sampled as a Terric (or Fluvaquentic) Borosaprist, Euic; very dark and gleyed with many bright-colored mottles down to 48 cm (19 in), with alluvium below that. Elk Park Quadrangle, elevation 10,060 ft, 1.1% NW-facing streambank. August 13, 1992.



Key to Community Types

1. Serviceberry (mountain) willow dominant or codominant, >20% cover.....(2)
 1. Serviceberry willow usually absent, uncommonly <20% cover(3)

 2. Beaked sedge prominent, >15% cover, often >20%. Shrubby cinquefoil minor, <6% cover**A**
 2. Beaked sedge usually absent, sometimes <10%. Shrubby cinquefoil 5-25% cover**B**

 3. Dominated by Bebb willow (SABE2) or Geyer willow (SAGE2); total willow cover >10%, usually >40%. Silver sagebrush (ARCA13) usually absent, rarely <1% cover. Shrubby cinquefoil always <15% cover, usually <10%...**C**
 3. Dominated by shrubby cinquefoil, silver sagebrush, or herbaceous plants. Total willow cover ranges 0-20%, usually <15%(4)

 4. Dominated by silver sagebrush (ARCA13), shrubby cinquefoil (PEFL15), or big sagebrush (ARTR2, ARTRV); one of these always >10%, and the total of these >15% cover.....(5)
 4. Dominated by exotic, native, and increaser graminoids and forbs such as Kentucky bluegrass (POPR), silvertop sedge (CAFO3), quackgrass (ELRE3), muttongrass (POFE), and Baltic rush (JUARA4). Total shrub cover 0-5%.....**F**

 5. Geyer willow always present and >0.5% cover. Total willow cover ranges 1-20%, usually >3%. Dominated by shrubby cinquefoil or silver sagebrush..... **D**
 5. Geyer willow usually absent. Total willow cover usually zero, sometimes an occasional plant, <0.1% cover. Dominated by shrubby cinquefoil, silver sagebrush, or big sagebrush.....**E**
-

Description of Community Types

- A** *Serviceberry willow-beaked sedge* is dominated by serviceberry willow at >35% cover. At least one other willow species is usually present; total willow cover ranges from 65 to 130%. Shrubby cinquefoil is absent or minor, <10%. Wet-site sedges (CAUT, CAAQ) and bluejoint reedgrass (CACA4) dominate the understory; at least one of these has >40% cover, and their total cover is >60%.
- B** *Serviceberry willow-shrubby cinquefoil-yarrow-dandelion* has serviceberry willow dominant or codominant, >20% cover. Usually just one other willow species is present; total willow cover ranges 20-95%. Shrubby cinquefoil is usually codominant, 5-25% cover. Dryland or exotic grasses dominate the understory, such as Kentucky bluegrass (POPR) or alpine foxtail (ALAL2). Wet sedges and bluejoint reedgrass are absent to <25% cover each, and their total is always <25%.
- C** *Bebb-Geyer willows-shrubby cinquefoil-Baltic rush-dandelion-yarrow* is dominated by Bebb willow or Geyer willow, one of which has >10% cover. Total willow cover ranges from 12 to 90%. Shrubby cinquefoil is always present at 2-15% cover, but is subordinate to willows. Exotic or dryland graminoids, such as Baltic rush, Kentucky bluegrass, tufted hairgrass (DECE), little barley (CRBR12), or Thurber fescue (FETH) dominate the understory. Wet sedges are sometimes prominent, with as much as 30% cover.
- D** *Shrubby cinquefoil-sparse Geyer willow-Kentucky bluegrass* is dominated by shrubby cinquefoil and/or silver sagebrush, one of which always has >15% cover. Geyer willow is always present but usually at <10% cover. The understory is dominated by Kentucky bluegrass (>50% cover), Baltic rush, tufted hairgrass and other moist-to-dry-site graminoids. Wet-site sedges are usually absent, but sometimes at <5% cover.
- E** *Kentucky bluegrass-sagebrush-cinquefoil* is dominated by shrubby cinquefoil, silver sagebrush, or big sagebrush, one of which always has at least 10% cover, and their total cover is >30%. Willows are usually absent. The understory is dominated by Kentucky bluegrass (>30% cover), quackgrass, Baltic rush, and other moist-to-dry-site graminoids. Wet-site sedges are usually absent.
- F** *Dandelion-Kentucky bluegrass-Baltic rush-moist sedges* includes few shrubs of any kind; total shrub cover is <5%, and willows are usually absent. The understory is dominated by exotic and dryland graminoids such as Kentucky bluegrass, Baltic rush, silvertop sedge, Bebb's sedge, quackgrass, and muttongrass.

Communities Not Assigned to a Community Type

- One community was dominated by Booth willow (SABO2), with an understory of beaked sedge, other sedges, and swamp bluegrass (POPA2). This community is very similar in vegetation, soils, and landform to CT A, but Booth willow replaces serviceberry willow. It represents the "Booth willow/beaked sedge" type, which is rare in the Gunnison Basin.
-

Community Type	No. samples	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Seral Stage	Layer Height,			Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %	Prod. ¹ , lb/ac/yr Shrubs Gramin. Forbs	Obstruct'n %: 1.5-2.0 m 1.0-1.5 m 0.5-1.0 m 0.0-0.5 m Total<2m
					Lr	m	Cvr %				
A. Serviceberry willow-beaked sedge	6	9,522 (8,800-10,060) 6.6 (1-25)	12 (0-19) 101 (73-168) 97 (73-168)	* 4 (2-9) PN-LS	S1 3.7 (1.0-6.0) S2 2.2 (1.5-4.0) S3 1.3 (0.0-2.3) GF 0.5 (0.0-1.2) M 0.0	11.8 63.8 44.7 83.3 13.6	0 (0-0) 114 (69-147) 131 (99-192) 51 (13-71)	31 (21-47) 298 (219-355) 10.4 (6.9-16.9)	1596-1763 2006-2733 88-1321	50 (0-100) 73 (45-100) 98 (95-100) 100(100-100) 80 (60-100)	
B. Serviceberry willow-shrubby cinquefoil-yarrow-dandelion	4	9,553 (9,460-9,600) 8.2 (6-9)	36 (24-47) 87 (71-95) 51 (41-71)	4 (1-6) 11 (8-14) LM-MS	S1 5.0 (3.0-8.0) S2 4.0 (2.0-6.0) S3 1.1 (0.0-1.8) GF 0.6 (0.0-1.3) M 0.0	5.3 22.8 22.7 89.0 9.1	1 (0-2) 70 (36-141) 99 (77-122) 138 (100-185)	40 (19-48) 308 (266-343) 9.1 (5.8-17.4)	1020-1755 1397-2461 1524-1602	15 50 55 85 51	
C. Bebb-Geyer willows-shrubby cinquefoil-Baltic rush-dandelion-yarrow	4	9,065 (8,160-9,850) 1.3 (0-4)	0 144 56	5 (0-7) 10 (0-25) MS	S1 4.5 (1.0-6.1) S2 4.0 (2.0-6.0) S3 0.6 (0.0-1.6) GF 0.4 (0.0-1.0) M 0.0	1.4 34.1 40.2 87.8 6.6	2 (0-10) 50 (20-102) 125 (107-150) 50 (39-67)	43 (33-59) 227 (181-286) 5.8 (3.3-8.7)	560-1761 2187-2726 614-1263	80 (65-95) 75 (50-100) 70 (45-95) 78 (55-100) 76 (54-98)	
D. Shrubby cinquefoil-sparse Geyer willow-Kentucky bluegrass	7	9,260 (9,240-9,280) 5.7 (2-12)	* * *	0 (0-0) 2 (1-4) EM	*		2 (0-15) 45 (26-60) 164 (107-226) 109 (58-191)	26 (15-53) 320 (208-416) 16.5 (3.9-24.5)	736-1482 2176-2765 1087-1600	63 63 68 98 73	
E. Kentucky bluegrass-sagebrush-cinquefoil	8	9,068 (8,920-9,180) 9.6 (5-20)	* * *	2 (0-2) 14 (1-15) ES	*		0 (0-0) 49 (35-80) 129 (68-210) 75 (37-175)	20 (10-40) 252 (155-425) 17.5 (4.1-36.0)	986-1684 1108-2746 553-1566	0 (0-0) 0 (0-0) 3 (0-5) 75 (65-85) 19 (16-23)	
F. Dandelion-Kentucky bluegrass-Baltic rush-moist sedges	5	10,080 (9,700-10,970) 5.3 (4-7)	31 (29-33) 103 65	3 (0-10) 46 (7-75) ES	S1 Missing S2 Missing S3 0.4 (0.0-0.6) GF 0.2 (0.0-0.8) M Missing	M M 3.3 94.5 M	0 (0-0) 2 (0-4) 94 (50-132) 91 (32-135)	24 (16-34) 186 (126-255) 7.9 (4.5-10.2)	0-113 579-2589 409-1591	0 (0-0) 0 (0-0) 3 (0-5) 43 (30-55) 11 (8-15)	

*. Unknown: measurements were not taken in this CT.

CT	Sage Grouse	Mule Deer	Elk
	Season–Preference	Season–Preference	Season–Preference
A, C, D	Spring– Low (Lek) Nesting– Low Summer– Mod. High	Winter, Mild– Low (Browse, Cover) Winter, Severe– Very Low Spring/Fall– Moderate (Cover, Browse, Overnight)	Winter, Mild– Mod. Low (Browse, Forage, Cover) Winter, Severe– Very Low Spring/Fall– Moderate (Cover, Browse, Forage)
B	I	Winter, Mild– Low (Browse, Cover) Winter, Severe– Very Low Spring/Fall– Mod. Low (Cover, Browse, Overnight)	Winter, Mild– Mod. Low (Browse, Forage, Cover) Winter, Severe– Very Low Spring/Fall– Mod. Low (Cover, Browse, Forage)
E, F	Spring– Low (Lek) Nesting– Moderate Summer– Mod. High	Winter, Mild– Very Low (Browse, Cover) Winter, Severe– Very Low Spring/Fall– Low (Cover, Browse, Overnight)	Winter, Mild– Low (Browse, Cover) Winter, Severe– Very Low Spring/Fall– Low (Cover, Browse, Forage)

Table 14-10. Resource Values for *Serviceberry willow–Deep alluvial soils–Concave bottoms and swales*. Resource values were calculated from the numbers in Table 14-8, relative to the whole UGB.

The numbers in this table can be translated: 0 = Very Low, 1 = Low, 2 = Moderately Low, 3 = Moderate, 4 = Moderately High, 5 = High, and 6 = Very High.

Resource Value	Community Type					
	A	B	C	D	E	F
Potential Cattle Forage Production	4-5	4-5	5	5	4-5	3-5
Grazing Suitability	ns ¹	ns ¹	3	3	2	2
Wetland	Yes	Often	No	No	No	No
Riparian Area	Yes	Yes	Yes	Sometimes	Sometimes	Sometimes
Developed Recreation	ns ¹	ns ¹	ns ¹	0	0	0
Dispersed Recreation	ns ¹	ns ¹	ns ¹	1	1	1
Scenic	4-5	4-5	3-4	2-3	2	1-2
Road & Trail Stability	0-1	0-1	0-1	1	1	1
Construction Suitability	ns ¹	ns ¹	ns ¹	0	0	0
Deer & Elk Hiding Cover	5-6	3-4	4-6	6	1	0-1
Deer & Elk Forage & Browse	5-6	4	4-5	4-5	0-1	0-1
Need for Watershed Protection	5-6	5-6	4-5	4-5	3-4	3-4
Soil Stability	0-1	0-1	0-1	1	1	1
Risk of Soil Loss-Natural	2	2	2	4-5	4-5	4-5
Risk of Soil Loss-Management	4	4	4	4	4	4
Risk of Permanent Depletion-Range	ns ¹	ns ¹	3-4	3-4	3-4	3
Risk of Permanent Depletion-Wildlife	4-5	4-5	3-4	3-4	2-3	2-3
Resource Cost of Management	4-5	4-5	4	4	4	4
Cost of Rehabilitation	2	2	3-4	4-5	4-5	4-5



A midseral in serviceberry willow (Community Type B) with sagebrush and shrubby cinquefoil invading. Serviceberry willow 21% cover, whitestem currant 22%, Kentucky bluegrass 51%, dandelion 38%, yarrow 32%. Soil sampled as a Terric (or Fluvaquent) Borohemist, Euic. Flat Top Quadrangle, elevation 9,600 ft, 9% 207° (SSW) bottom. July 14, 1993.



An early seral stage in serviceberry willow (Community Type F) with no shrubs and exotic and dryland herbs dominant. Dandelion 70% cover, Baltic rush 52%, silvertop sedge 48%, Kentucky bluegrass 19%, quackgrass 10%. Soil sampled as an Endoaquoll. Mineral Mountain Quadrangle, elevation 9,700 ft, 4% 174° (S) bench-bottom. August 7, 1995.



Pauline Creek, a fenceline contrast between two seral stages in serviceberry willow/beaked sedge. Thurber fescue grassland in the foreground. Left of the fence, grazing pressure is greater – notice the mushroom-shaped, highlined willow plants, considerably reduced young willow stems, and depleted herbaceous layer. Transect 92-2019 is in the Thurber fescue grassland in the foreground, left of the fence; which is in *better* condition than right of the fence – which shows how seasonal differences between grazing practices affect riparian areas and upland grasslands very differently. Therefore, grazing practices designed to help uplands may well work to the detriment of associated riparian areas. A transect is right of the fence in the bottom. Elk Park Quadrangle, elevation 10,060 ft, 1.1% NW-facing slope. August 11, 1992.



The same view, two years later. The fence has been removed in the interim. Condition of the upland seems somewhat poorer than in 1992, but the riparian vegetation has changed little. September 14, 1994.

Table 14-11. Common Species in *Serviceberry willow–Deep alluvial soils–Concave bottoms and swales*, where Characteristic cover > 10% or Constasy > 20%. "-" means that the species is not found. Dead cover is not listed. Ccv = Characteristic Cover, Con = Constasy. If Avc = Average Cover, then these are related using the formula $Avc = Ccv \cdot 100\% / Con$.

Community Type	A	B	C	D	E	F		
Code	Species	Ccv(Con) N = 6	Ccv(Con) 4	Ccv(Con) 4	Ccv(Con) 7	Ccv(Con) 8	Ccv(Con) 5	Common Name
SHRUBS								
ALINT	<i>Alnus incana</i> ssp. <i>tenuifolia</i>	1 (17)	30 (25)	-	T (14)	-	-	thinleaf alder
ARCA13	<i>Artemisia cana</i>	10 (17)	8 (25)	T (25)	16 (86)	17 (50)	4 (20)	silver sagebrush
ARTR2	<i>Artemisia tridentata</i>	-	-	-	-	23 (75)	-	big sagebrush
ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	-	-	-	5 (14)	37 (13)	-	mountain big sagebrush
PEFL15	<i>Pentaphylloides floribunda</i>	3(100)	12(100)	6(100)	18(100)	20 (50)	3 (20)	shrubby cinquefoil
RIIN2	<i>Ribes inerme</i>	8 (67)	12 (50)	7 (50)	7 (43)	-	-	whitestem currant
SABE2	<i>Salix bebbiana</i>	24 (67)	5 (50)	27 (50)	-	-	-	Bebb willow
SAGE2	<i>Salix geyeriana</i>	10 (67)	40 (25)	16 (75)	7(100)	-	-	Geyer willow
SALU2	<i>Salix lutea</i>	31 (17)	-	-	-	-	-	yellow willow
SAMO2	<i>Salix monticola</i>	63(100)	29(100)	7 (75)	1 (71)	-	-	serviceberry willow
SAWO	<i>Salix wolfii</i>	2 (17)	-	33 (25)	-	-	-	Wolf's willow
GRAMINOIDS								
ALAL2	<i>Alopecurus alpinus</i>	-	50 (25)	-	10 (14)	30 (13)	-	alpine foxtail
CACA4	<i>Calamagrostis canadensis</i>	43 (67)	7 (50)	6 (50)	2 (43)	20 (13)	-	bluejoint reedgrass
CAREX	<i>Carex</i>	-	1 (25)	-	19 (29)	11 (13)	-	sedge
CAAQ	<i>Carex aquatilis</i>	24 (50)	20 (50)	20 (50)	3 (29)	-	-	water sedge
CAAU3	<i>Carex aurea</i>	11 (17)	-	-	-	-	-	golden sedge
CABE2	<i>Carex bebbii</i>	13 (17)	4 (25)	7 (25)	12 (14)	-	35 (20)	Bebb's sedge
CAF03	<i>Carex foenea</i>	T (17)	6 (25)	21 (25)	-	-	33 (40)	silvertop sedge
CAUT	<i>Carex utriculata</i>	47(100)	5 (50)	13 (50)	4 (43)	-	-	beaked sedge
CRBR12	<i>Critesion brachyantherum</i>	5 (17)	-	17 (50)	6 (14)	-	-	little barley
DECE	<i>Deschampsia cespitosa</i>	3 (50)	T (25)	35 (50)	16 (71)	30 (13)	1 (40)	tufted hairgrass
ELRE3	<i>Elytrigia repens</i>	1 (33)	1 (25)	T (25)	30 (14)	-	9 (60)	creeping quackgrass
JUARA4	<i>Juncus arcticus</i> ssp. <i>ater</i>	25 (50)	7 (25)	6(100)	55 (57)	60 (13)	44 (40)	Baltic rush
JUCO2	<i>Juncus confusus</i>	-	-	-	55 (29)	5 (13)	-	Colorado rush
JUSA	<i>Juncus saximontanus</i>	18 (17)	15 (25)	9 (25)	-	-	4 (20)	Rocky Mountain rush
PASM	<i>Pascopyrum smithii</i>	-	-	-	-	13 (25)	-	western wheatgrass
PHPR3	<i>Phleum pratense</i>	3 (50)	3 (50)	T (50)	15 (57)	80 (13)	-	common timothy
POA	<i>Poa</i>	-	4 (25)	19 (25)	7 (14)	25 (13)	-	bluegrass
POFE	<i>Poa fendleriana</i>	-	-	-	-	11 (38)	60 (20)	muttongrass
PONE2	<i>Poa nervosa</i>	-	-	-	-	30 (13)	-	Wheeler bluegrass
POPR	<i>Poa pratensis</i>	27 (50)	61 (75)	59 (75)	72(100)	69(100)	33 (80)	Kentucky bluegrass
FORBS								
ACLA5	<i>Achillea lanulosa</i>	3 (33)	26(100)	4(100)	22 (71)	14 (75)	27 (80)	western yarrow
AGGL	<i>Agoseris glauca</i>	-	T (50)	-	T (14)	1 (38)	2 (40)	false-dandelion
ASSP16	<i>Aster spathulatus</i>	-	23 (50)	4 (50)	-	-	9 (60)	western aster
CHBE4	<i>Chenopodium berlandieri</i>	-	-	-	-	-	35 (20)	pitseed goosefoot
COSC2	<i>Conioselinum scopulorum</i>	14 (67)	5 (25)	2 (50)	-	-	-	Rocky Mountain hemlock-parsley
DOPU	<i>Dodecatheon pulchellum</i>	-	19 (25)	-	-	-	-	darkthroat shooting star
ERCO24	<i>Eremogone congesta</i>	-	-	-	-	27 (50)	-	desert sandwort
ERIGE2	<i>Erigeron</i>	6 (17)	2 (25)	-	50 (14)	23 (13)	T (20)	feabane
ERSP4	<i>Erigeron speciosus</i>	17 (17)	10 (50)	1 (25)	11 (57)	5 (50)	-	Oregon feabane
ERSU11	<i>Eriogonum subalpinum</i>	-	-	-	-	20 (13)	-	sulfurflower
FRVI	<i>Fragaria virginiana</i>	-	27 (50)	4 (50)	13 (43)	-	2 (20)	Virginia strawberry
GASE6	<i>Galium septentrionale</i>	4 (50)	7 (50)	T (50)	11 (43)	10 (25)	-	northern bedstraw
GERI	<i>Geranium richardsonii</i>	4 (50)	2 (50)	-	1 (14)	-	T (20)	Richardson geranium
GEMA4	<i>Geum macrophyllum</i>	3 (83)	1 (75)	14 (25)	1 (14)	-	-	large-leaved avens
IRMI	<i>Iris missouriensis</i>	-	5 (75)	6 (50)	4 (57)	-	-	wild iris
LUAR3	<i>Lupinus argenteus</i>	-	3 (25)	-	-	-	24 (20)	silvery lupine
ORLU2	<i>Orthocarpus luteus</i>	-	-	T (25)	5 (29)	4 (25)	T (40)	yellow owl-clover
POPU9	<i>Potentilla pulcherrima</i>	-	6 (75)	4 (50)	17 (71)	20 (38)	8 (40)	beauty cinquefoil
TAOF	<i>Taraxacum officinale</i>	6 (67)	38(100)	13(100)	35 (86)	20 (63)	35(100)	common dandelion
TRIFO	<i>Trifolium</i>	-	-	21 (25)	-	-	-	clover
TRRE3	<i>Trifolium repens</i>	6 (17)	15 (25)	5 (25)	3 (43)	T (13)	-	white Dutch clover
VAED	<i>Valeriana edulis</i>	-	-	-	-	10 (13)	-	edible valerian
VETE4	<i>Veratrum tenuipetalum</i>	-	6 (25)	T (25)	13 (57)	35 (13)	-	Colorado false-hellebore
VIAM	<i>Vicia americana</i>	5 (33)	6 (50)	T (50)	-	1 (13)	3 (20)	American vetch
VIOLA	<i>Viola</i>	4 (33)	1 (25)	T (50)	T (14)	-	T (20)	violet
GROUND COVER								
.BARESO	bare soil	4 (33)	11 (75)	10 (75)	2 (29)	14 (25)	46(100)	
.LITTER	litter and duff	89 (83)	83 (75)	86(100)	91 (29)	81 (25)	51(100)	
GRAVEL	gravel 0.2-10 cm	-	1	T	T	2	T	
.COBBLE	cobble 10-25 cm	-	4 (25)	1 (50)	-	-	-	
.STONES	stone > 25 cm	-	3 (25)	6 (50)	-	1 (13)	-	
.MOSSON	moss on soil	17 (67)	18 (25)	7 (75)	-	-	-	
LICHENS	lichens on soil	-	-	22	11	7	2	