

E. NON-FORESTED RIPARIAN (RI)

13. Yellow Willow Ecological Series

Table 13-1. Full and short names for the ecological types in the Yellow Willow Ecological Series.

Ecological Type		Plant Association Code	Short Name
Code	Name		
RI1	Yellow willow/beaked sedge—Deep to very deep, alluvial to colluvial clayey Endoaquolls—U-shaped or concave draw bottoms, swales, slumps, and earthflows, 7,800–9,700 ft	SALU2/CAUT	Yellow willow—Deep alluvial soils—Concave bottoms and swales

The *Salix lutea* series is described as new here and is based on the *Salix geyeriana* series, in part, of Kittel and others (1994), and the *Salix eriocephala* var. *ligulifolia* Alliance of Kittel (1996). It is related to the Willow-Mountain Alder Series and the Willow-Dogwood Series of Dick-Peddie (1993).

Later seral stages are dominated by various species of willows and sometimes alder, with beaked sedge in the understory. One stand in the UGB included river birch as well. Yellow willow (SALU2) is usually present in later seral stages, though sometimes Pacific willow (SALUL) is codominant or prominent instead. These two willows are the most palatable and succulent shrubs in this type. Stands are long and narrow when they occur along streams, or larger and more or less isodiametric when on benches. They are easily distinguished on aerial photos.

Vegetation, Climate, Soils

Browsing or grazing by livestock or big game reduces cover by yellow and Pacific willows and increases cover by less-palatable willows such as coyote willow (SAEX) Geyer willow (SAGE2), and Bebb willow (SABE2). Early seral stages are devoid of willows, but are often dominated by Baltic rush, sagebrush, rabbitbrush, Kentucky bluegrass, dandelion, or quackgrass. Geyer and/or Bebb willow dominate some midseral or early midseral stands. Protracted heavy herbivore use eliminates smaller size classes of willows, which are more available and more palatable. Eventually the willows will be extirpated or reduced to one, or a few suppressed, mushroom-shaped individuals of Geyer or Bebb willow shrubs (Hansen and others 1989ab).

Many sites in the UGB are in poor condition due to having been severely browsed by elk and deer and grazed heavily by livestock over the last century. They lack willows altogether or support a few of the least-palatable species, with understories depleted of younger willows and sedges and replaced by weedy invaders and unpalatable plants. Along with changes in vegetation come bank sloughing and instability (Manning and Padgett 1989), drop in water tables,

reduction in fisheries, removal of browse and cover for big game and habitat for birds and small mammals. Regeneration of these stands is a major problem in the UGB, as it is elsewhere (Girard and others 1995) because the willows are usually quickly eaten.

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.

Replanting Geyer, Bebb, Pacific, or yellow willow from rooted cuttings can restore willow cover to a depleted site and improve wildlife cover and browse, bank stability, and fisheries habitat. Yellow willow is an especially rapid colonizer of disturbed sites (Hansen and others 1988-1989). Willow and sedge cover along streambanks provides good to excellent bank stability (Manning and Padgett 1989), contributing significantly to watershed stability and condition. Beaked sedge is the most important bank stabilizer.

Table 13-2. Climate and Soils

Characteristic	Value	Reference
Precipitation zone	400-610 mm/yr 16-24 in/yr	Local data

Sites in good condition, with good willow and sedge cover, have high bank stability and can withstand floods without damage (Hansen and others 1988). Such sites provide great natural watershed protection, and may help keep water in the stream that would not otherwise be there in late season.

Fire Management

Fires may lead to dramatic increases in bluejoint reedgrass (CACA4) if it is present (Hansen and others 1988). The willows normally found in these stands sprout vigorously after fire, especially following a quick, hot fire (Hansen and others 1988). Prescribed fire can be used effectively to regenerate decadent or browsed willow stands if

sites are protected from grazing and browsing for long enough to allow sprouts to become established (Hansen and others 1988). Best results come from quick hot fires, which cannot usually burn in the early wet season (Hansen and others 1989ab). Fire also stimulates beaked sedge and other sedges, though successful regeneration often requires non-use the year before burning to build up fuels (Hansen and others 1989ab).

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 increase where they have received some relief from grazing and where a seed source is available. Season-long grazing is the worst system for maintaining or improving riparian condition (Shaw 1992). 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.

Sedges can tolerate heavy grazing, particularly when upland species are cured or when livestock distribution is poor. 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).

Moose and elk use these sites for summer and winter forage and browse in Montana (Hansen and others 1989ab).

Several large sites at early seral stages (willow cover 2-3%, *Juncus* dominant) are a component of a low-elevation bighorn sheep intermediate range (but not the winter range or summer-lambing

range) in an area west of Saguache near the UGB. Bighorn use the sites sparingly in summer for forage since there is pretty good visibility from them (Shepherd 1975).

Heavy browsing by elk significantly reduces willow height, increases willow mortality, and curtails production of seed since all reachable branches (below 2.5 m) are browsed and produce no seed (Key and Chadde 1992).

Hiding cover and browse production may be high (Hansen and others 1988). Sites in good condition – those with several size classes and high cover of willows – have high values for songbirds, shrub-nesting birds, fish, elk, deer, and furbearers (Youngblood and others 1989, Knopf and others 1988, Manning and Padgett 1989).

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 birds species’ populations are 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. Roads or trails crossing these sites must be stabilized with riprap or gravel or bridged to prevent damage. Off-road vehicles (ORV) can cause extensive damage in the summer, and even worse damage in early spring and late fall when sites are the wettest. ORV use (except in deep winter) should be discouraged.

Construction activities may require a permit under the Clean Water Act.

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.

Table 13-3. Characteristics of Ecological Types within Ecological Series 13 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, %
R11 Yellow willow-Deep alluvial soils- Concave bottoms and swales	69	8,809 (7,800-9,680)	354 (0.09) 6 (0-20)	24 (0-76)	111 (33-203) 89 (11-203)	4 (0-31) 11 (0-40)	0 (0-2) 40 (0-161) 140 (7-295) 84 (9-319)	266.2 (99.0-595.5) 29 (9-56) 12.2 (3.0-39.5)



Alder Creek, a typical example of lower-elevation, below lower tree line, foothills yellow willow riparian area. Alder Creek has recovered significantly over the last 10-15 yr (and is still improving) due to progressive changes in grazing management agreed to by the BLM and the grazing permittee. Notice how easy it is from this photo to accurately delineate the boundaries of the riparian area. The site is now dominated by at least four willow species, all represented by good age-class distributions, alder, and beaked sedge. A beaver population has cooperated, ensuring a rising water table and abundant water available through the season – formerly, the bottom would be dry in late seasons.
July 26, 1990.

A view inside the yellow willow riparian area in Alder Creek, Community Type A). See photo at left. Geyer willow 38% cover, swamp bluegrass 34%, bluejoint reedgrass 33%, Pacific willow 27%, beaked sedge 18%, alder 15%, Bebb willow 12%. Coarse Fragments Cover = 2%, Total Live Cover = 238%, Coarse Fragments in Soil = 0. Soil sampled as an Histic Endoaquoll, Euic, Frigid. Parlin Quadrangle, elevation 8,300 ft, 2.3% S-facing slope.
July 26, 1990.

YELLOW WILLOW–DEEP ALLUVIAL SOILS–CONCAVE BOTTOMS AND SWALES

Yellow willow/beaked sedge–Deep to very deep, alluvial to colluvial clayey Endoaquolls–U-shaped or concave draw bottoms, swales, slumps, and earthflows, 7,800–9,700 ft

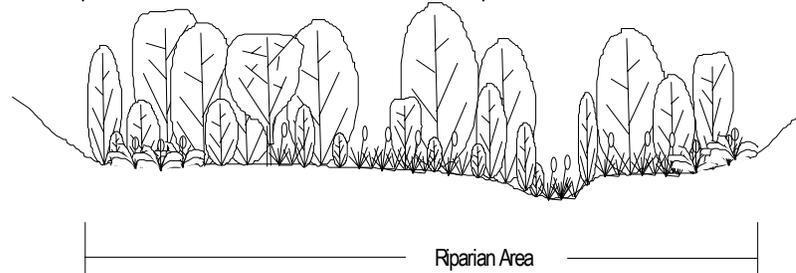


Figure 13-1. Cross-section of vegetation structure of a stand in good condition, of Yellow willow–Deep alluvial soils–Concave bottoms and swales. Aspects are various, and slope angles average 6%.

Yellow willow–Deep alluvial soils–Concave bottoms and swales is a very common type in draw bottoms and on swales, slumps, and earthflows, in relatively-flat areas with clayey soils, where water ponds for at least part of the year. In the Gunnison Basin, it is found on streambanks, in basins, and on benches (“hanging riparian”). This type is also known from throughout the Rocky Mountains, including western Wyoming and Idaho, throughout the mountains of eastern Utah, Colorado, and in northern New Mexico and northern Arizona.

In good condition, *Yellow willow–Deep alluvial soils–Concave bottoms and swales* is characterized by yellow willow (SALU2), Geyer willow (SAGE2), and beaked sedge (CAUT). Thinleaf alder (ALINT) or serviceberry willow (SAMO2) are found on some sites. Early seral sites have abundant exotics or increasers, such as Kentucky bluegrass (POPR), Baltic rush (JUARA4), dandelion (TAOF), or quackgrass (ELRE3). See Table 13-7 for common species names and codes. Other distinguishing features include location in poorly-drained alluvial bottoms and Aquic mineral soils.

Yellow willow–Deep alluvial soils–Concave bottoms and swales varies widely in community structure and species composition, though trees are usually absent or uncommonly as much as 2% cover. Sites in good condition support dense stands of mixed willow species, with understories of wet sedges and other wet-site graminoids, such as bluejoint reedgrass (CACA4) or swamp bluegrass (POPA2). Loose patches of dense willows alternate with loose wet patches of sedges and grasses which sometimes correspond to beaver ponds and dams of various ages. Many of these communities, especially those in later seral stages, have high species diversity, often 35 or more species per plot.

Midserral stages include some tall willow cover, but lack more palatable species and shorter, younger willow stems. The patchy structure is pronounced, with smaller willow patches alternating with dry-site shrubs such as shrubby

cinquefoil or sagebrush, and with dry-site grasses and forbs. Earlier seral stages are dominated entirely by sagebrush, or lack shrubs altogether. Understories are dominated by dryland grasses and exotic graminoids and forbs.

Soil classification is complicated because class-defining factors of soils in these communities change with the management that has been common in these sites since settlement. Early seral sites may have a soil that seems to be a good, rich Mollisol (in the case of this type, probably an Argiboroll); yet 120 years ago or less, the same soil would have been classified as a Histosol or an Endoaquoll. The change in soil classification has been due to changes following the level of the water table dropping. Soil classification needs reform for site succession to be consistently interpreted in sites such as these.

The plant association *Salix lutea/Carex utriculata* is described as new here, based in part on *Salix geyeriana-Salix spp./Carex utriculata* (Johnston 1987, Youngblood 1985). *Salix lutea/Carex utriculata* phase *Salix geyeriana* is described as new here. *Salix lutea/Carex utriculata* phase *Alnus incana ssp. tenuifolia-Calamagrostis canadensis*, described as new here, is based on *Salix geyeriana-Salix spp./Calamagrostis canadensis* (Johnston 1987, Hess 1981, Youngblood 1986). *Salix lutea/Carex utriculata* phase *Betula fontinalis* is also described as new here.

Although secondary succession is easy to see in the field, primary succession is more difficult to assess. In these riparian areas, the distinction between primary and secondary succession seems blurred, probably because the soils change so readily with changes in management. Succession in these communities is complex, involving changes in vegetation, land, water, and soil. Very early seral to early seral stages lack shrubs or support dryland shrubs such as sagebrush or rabbitbrush, with an understory of exotic bottomland species such as

Kentucky bluegrass, quackgrass, dandelion, and assorted weeds. The water table is usually low in summer and fall. In early midseral to midseral stages, patchy willow cover is <40% across the site, composed of a mix of early-successional willows such as Geyer and Bebb, with little to no reproduction of the later-successional, more succulent willows such as yellow or Pacific. Small patches of beaked sedge or moist-site sedges, rushes, and moist-site forbs occur in low bottom microsities, but sagebrush, bluegrass, quackgrass, dandelion, and dryland forbs dominate the higher microsities. The water table is high in spring and remains high enough in summer and fall to keep the lowest small microsities wet all year.

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

Cottonwood/willow communities adjoin this ecological type on gravelly, warmer sites along the

streams. Bitterbrush-sagebrush communities occur on adjacent better-drained sites. Conifer forests, grasslands, and black sagebrush communities do not adjoin this ecological type.

Moderately-heavy to heavy grazing by cattle, sheep, deer, elk, or antelope decreases all sedges and other graminoids, willow reproduction, and tall willows. Heavy grazing, especially if continued every year, and especially if allowed late in the growing season, removes all but a few willows and sharply reduces the level of the water table, drying out of the surface and allowing increase or invasion by dry-site plants. This is a common phenomenon in many parts of the Gunnison Basin.

Horizontal obstruction varies widely, from very high in later seral stages to very low in earlier seral stages; see Table 13-3. The sites accumulate much snow in severe winters, but are commonly used by deer and elk during mild winters and as spring-fall range. Deer use these sites in the summer as well. Deer and elk make more use late-seral sites, which provide abundant browse and cover than earlier seral stages. Early-seral sites dominated by sagebrush (community type H) are good sage grouse nesting habitat. Sage grouse use other community types as summer range.

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	64, soil descriptions from 25; 2 do not fit into a CT (total 66)
ELEVATION	8,801 ft (7,800-9,680 ft); 2,682 m (2,377-2,950 m)
AVERAGE ASPECT	29°M (r = 0.09)
LITHOLOGY	A wide variety, led by shale [33%], breccia-schist-tuff-granite-gneiss-basalt [59%], and others
FORMATIONS ¹	A wide variety
LANDFORMS	Predominantly draws and ravines[57%], swales [12%], and floodplains [7%]. several others
SLOPE POSITIONS	Mostly U-shaped (concave) [85%]
SLOPE SHAPES	Usually in a bottom, at least locally
SLOPE ANGLE	6.0% (0-20%)
SOIL PARENT MATERIAL	Mostly alluvial [62%], some colluvial [38%]
COARSE FRAGMENTS	2.9% (0-31%) cover on surface, 24.0% (0-76%) by volume in soil
SOIL DEPTH	111 cm (33-203 cm); 43.9 in (13-80 in)
MOLLIC THICKNESS	89 cm (11-203 cm); 35.1 in (4-80 in)
TEXTURE	Surface a wide variety, led by silty clay [20%], sandy loam [17%], clay loam [13%] and organic [13%]. Subsurface mostly clayey (clay-clay loam-silty clay-sandy clay [70%])
SOIL CLASSIFICATION	Mostly Endoaquolls [72%], some Endoaquents or Argiborolls
TOTAL LIVE COVER	268.5% (99.0-595.5%)
NUMBER OF SPECIES	28.8 (9-56)
TOTAL LIVE COVER/NO. SPECIES	12.5% (3.0-39.5%)
CLIMATE	Moderately warm, moist Montane climate when sites are in good condition; in earlier seral stages, microclimate varies to 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, roughly proportional to seral stage: lowest seral stages have lower water tables, upper seral stages have highest water tables. Water table level can be manipulated by management of water-holding and sediment-holding capacities of the vegetation at sites and up and down stream.

Key to Community Types

Note. In the key and descriptions that follow, cover of willow species includes *dead* cover as well as live cover.

1. Yellow willow (SALU2) or Pacific willow (SALUL) prominent, >10% cover, often >20%. Total willow cover usually >45%.....(2)
 1. Yellow willow and Pacific willow absent to <10% cover.....(4)
 2. Wet sedges (beaked [CAUT] and water [CAAQ]), prominent and >10% cover. Total sedge cover >15%, often >25%.....**A**
 2. Wet sedges usually absent or uncommonly <10%. Total sedge cover 0-40%.....(3)
 3. Kentucky bluegrass prominent, >80%. Total graminoid cover >125%.....**E**
 3. Kentucky bluegrass absent to <30%. Total graminoid cover <125%.....**C**
 4. Total willow cover >15%. Geyer willow (SAGE2) prominent, >10% cover, usually >15%.....(5)
 4. Willows absent or total willow cover <15%. Geyer willow usually absent.....(6)
 5. Beaked sedge prominent, >10% cover. Total sedge cover >10%, usually >20%.....**B**
 5. Beaked sedge absent or <10% cover. Total sedge cover usually <15%, rarely up to 30%..... **D**
 6. Willows (at least one species) present and >1% cover, and total willow cover 1-15% **F**
 6. Willows usually absent or total willow cover <0.5%.....(7)
 7. Shrubby cinquefoil (PEFL15) dominant, >10% cover..... **G**
 7. Shrubby cinquefoil absent or <10% cover (8)
 8. Big sagebrush dominant (ARTR2), >10% cover **H**
 8. Big sagebrush usually absent, sometimes up to 1% cover.....(9)
 9. Kentucky bluegrass prominent, >10% cover, often >25%.....(10)
 9. Kentucky bluegrass absent or <25% cover. Baltic rush always present, 5-40% cover. Dandelion always present, 0.5-30% cover **L**
 10. Baltic rush (JUARA4) prominent, >10% cover. Dandelion (TAOF) often >15% cover..... **J**
 10. Baltic rush absent or inconspicuous..... **K**
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Description of Community Types

- A** *Yellow willow-Geyer willow-other willows-beaked sedge* is dominated by yellow willow (or Pacific willow) and Geyer willows; always more than two willow species are present and reproducing. Total willow cover is >15%, often >45%. Wet-site sedges (CAUT, CAAQ) are prominent, >10% cover. Total sedge cover is >35%. Sites are usually patchy, with loose patches of dense willows alternating with loose wet, often ponded patches of sedges and grasses. Sometimes patches correspond to beaver ponds and dams of various ages.
- B** *Geyer willow-beaked sedge* is dominated by Geyer willow, >20% cover; sometimes other willow species are present, but clearly subordinate. Yellow and Pacific willows are absent to <10% cover; total willow cover ranges 20-55%. Wet sedges are prominent, >10% cover, often >20%. Total sedge cover is >10%. Sites include well-defined patches of willows alternating with well-defined wet patches dominated by sedges (ponded only in early season); patches of dry graminoids and forbs or shrubby cinquefoil are possible.
- C** *Yellow willow-other willows-moist to dry grasses and forbs* is dominated by yellow willow or Pacific willow at >20% cover. Other willow species may be present or even codominant; total willow cover ranges from 20 to 90%. Wet-site sedges are absent or rare at <10% cover. Total sedge cover ranges from 0 to 45%. Sites include well-defined patches of willows alternating with well-defined dry spots dominated by dry-site graminoids and forbs.
- D** *Geyer willow-Kentucky bluegrass-dandelion* is dominated by Geyer willow at >10% cover. Other willow species are absent or few and sparse, usually <2% cover. Wet-site sedges are absent to <10% cover. Total sedge cover ranges from 0 to 30%. The sites are patchy, but well-defined patches of willows are small and browsed, alternating with larger patches of exotic and increaser grasses and forbs such as Kentucky bluegrass, Baltic rush, and dandelion.
- E** *Geyer-serviceberry-yellow willows-alder-Kentucky bluegrass* is dominated by a mix of yellow, Pacific, and Geyer willows and alder (ALINT). Total willow cover is >70%. Wet-site sedges are usually absent, or rarely <10% cover. Total sedge cover ranges from 0 to 5%. Sites are patchy, with the large well-defined patches of mixed willows alternating with smaller well-defined patches of exotic, dry-site grasses and forbs such as Kentucky bluegrass.
- F** *Baltic rush-dandelion-yarrow-sparse willows* has sparse willow cover, <15%. Wet-site sedges are usually present in small to medium-sized patches. Total sedge cover ranges 0-97%. Large dry patches are dominated by exotic or increaser graminoids such as Kentucky bluegrass, Baltic rush, little barley (CRBR12), foxtail barley (CRJU2), or common timothy (PHPR3).
- G** *Shrubby cinquefoil-Baltic rush-Kentucky bluegrass-tufted hairgrass* lacks willows, or they are very minor at <0.5% cover. Shrubby cinquefoil is dominant, >10% cover. The understory is dominated by exotic or increaser graminoids such as Kentucky bluegrass, Baltic rush, quackgrass (ELRE3), redtop (AGGI2), tufted hairgrass (DECE), or common timothy (PHPR3). Sites often do not appear patchy from a distance.
- H** *Big sagebrush-Kentucky bluegrass-yarrow-dandelion* Willows are absent or very minor, <0.5%. Big sagebrush is dominant, >10% cover. The understory is dominated by exotics and increasers such as Kentucky bluegrass, dandelion, and Baltic rush, with dry-site grasses and forbs such as yarrow (ACLA5) and muttongrass (POFE).
- J** *Kentucky bluegrass-Baltic rush-dry grasses* Willows are absent or very minor, <0.5%. The community is dominated by exotics and increasers such as Kentucky bluegrass, dandelion, Baltic rush, quackgrass, timothy, smooth brome (BRIN7), and crested wheatgrass (AGCR), with dry-site grasses and forbs such as western wheatgrass (PASM), yarrow, Arizona fescue (FEAR2), or muttongrass. Kentucky bluegrass is prominent at >25%.
- K** *Kentucky bluegrass-western wheatgrass-bluegrass* Willows are absent or very minor, <0.5%. The community is dominated by exotics and increasers such as Kentucky bluegrass (POPR), with dry-site grasses and forbs such as western wheatgrass, yarrow, or muttongrass.
- L** *Baltic rush-quackgrass-dandelion-yarrow-Kentucky bluegrass-iris* Willows are absent or very minor, <0.5%. The community is dominated by exotics and increasers such as iris (IRMI), dandelion, Baltic rush, quackgrass, timothy, smooth brome, and crested wheatgrass, with dry-site grasses and forbs such as western wheatgrass, yarrow, or muttongrass. Kentucky bluegrass is absent or inconspicuous, with <25% cover.

Communities Not Assigned to a Community Type

- One community was dominated by river birch (BEFO2) with mixed willows (yellow, Bebb [SABE2]). The understory has sparse beaked sedge, Kentucky bluegrass, and Baltic rush. This community is rare in the UGB, but common elsewhere.
 - One community was dominated by a mix of blue willow (SADR), Geyer willow, and shrubby cinquefoil, with sedge-Baltic rush understory. This rare community is transitional between yellow willow and blue willow types.
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Table 13-4. Community types within *Yellow willow-Deep alluvial soils-Concave bottoms and swales.*

Community Type	No. samples	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Layer			Cover, %: Trees Shrubs Gramin. 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	Height, m	Avg Layr Cvr %				
A. Yellow willow-Geyer willow-other willows-beaked sedge	6	8,976 (8,300-9,680) 2.8 (1-4)	37 (0-61) 107 (67-203) 87 (11-203)	8 (2-21) 13 (2-30) PN-LS	S1 3.6 (2.0-5.0) S2 1.9 (0.8-4.0) S3 0.6 (0.0-1.8) GF 0.2 (0.0-1.1) M 0.0 L Missing	17.0 40.0 25.8 83.5 18.5 M	0 (0-1) 86 (19-130) 136 (102-170) 47 (15-105)	34 (14-50) 269 (186-405) 10.2 (5.3-28.9)	532-1767 2076-2765 186-1598	37 (0-85) 45 (10-100) 70 (45-100) 93 (85-100) 61 (35-96)	
B. Geyer willow-beaked sedge	8	8,758 (7,820-9,480) 5.0 (0-16)	28 (4-58) 134 (80-155) 94 (45-149)	0 (0-21) 9 (1-30) LM	S1 6.0 (4.0-8.0) S2 2.6 (1.0-4.0) S3 1.2 (0.2-1.7) GF 0.5 (0.0-1.1) M 0.0 L 0.0	42.9 25.3 91.4 7.8 0.3	0 (0-1) 56 (31-132) 151 (76-230) 67 (9-147)	34 (20-47) 275 (118-429) 9.2 (3.0-21.4)	875-1758 1378-2762 106-1540	75 (25-100) 75 (25-100) 78 (35-100) 100(100-100) 82 (46-100)	
C. Yellow willow-other willows-moist to dry grasses and forbs	5	8,749 (8,475-9,000) 3.8 (0-8)	76 106 106	1 (0-2) 7 (2-10) LM-MS	S1 5.3 (3.0-9.0) S2 2.8 (1.2-6.1) S3 0.8 (0.0-3.0) GF 0.53 (0.0-0.9) M 0.0 L Missing	24.6 44.9 39.0 72.6 2.3 M	0 (0-0) 99 (63-143) 62 (7-96) 86 (54-125)	34 (19-45) 255 (203-316) 8.2 (5.5-10.8)	1521-1765 24-1938 987-1589	91 (75-100) 93 (75-100) 94 (75-100) 96 (85-100) 93 (78-100)	
D. Geyer willow-Kentucky bluegrass-dandelion	8	8,638 (8,050-9,020) 5.9 (1-20)	6 163 163	6 (0-10) 11 (3-23) MS-EM	S1 Missing S2 2.6 (1.7-3.5) S3 0.8 (0.3-1.5) GF 0.2 (0.0-0.7) M Missing L 0.0	10 10 88 M 1	1 (0-2) 61 (18-151) 112 (47-190) 89 (9-319)	34 (23-46) 263 (106-595) 8.4 (3.5-22.9)	506-1756 496-2757 104-2453	35 40 35 45 39	
E. Geyer-serviceberry-yellow willows-aider-Kentucky bluegrass	3	*	*	*	*	*	0 (0-0) 141 (108-161) 160 (140-176) 156 (98-211)	20 (18-22) 464 (406-542) 23.9 (20.2-30.1)	1758-1766 2664-2765 1525-1643	*	
F. Baltic rush-dandelion-yarrow-sparse willows	7	8,515 (7,800-9,000) 5.0 (3-9)	5 (0-11) 119 (33-158) 93 (33-149)	9 (0-31) 15 (2-30) ES-EM	S1 6.0 (4.0-8.0) S2 3.0 (1.9-6.0) S3 0.9 (0.0-2.2) GF 0.3 (0.0-0.7) M * L *	T 10 6 95 * *	0 (0-1) 13 (2-34) 145 (79-190) 99 (13-319)	37 (20-56) 259 (178-544) 8.3 (3.2-21.8)	58-958 1444-2761 156-2453	1 (0-5) 6 (0-25) 19 (5-45) 60 (35-70) 22 (13-36)	
G. Shrubby cinquefoil-Baltic rush-Kentucky bluegrass-tufted hairgrass	6	8,740 (8,680-8,800) 14.5 (9-20)	10 130 130	4 (4-4) 4 (3-5) ES	S1 Missing S2 0.9 S3 0.3 GF 0.4 M * L *	M 47 19 63 * *	0 (0-0) 28 (11-66) 162 (57-270) 125 (32-223)	23 (13-44) 315 (155-491) 18.0 (4.8-37.8)	297-1561 781-2922 417-1681	0 (0-0) 0 (0-0) 10 (5-15) 73 (70-75) 21 (19-23)	
H. Big sagebrush-Kentucky bluegrass-yarrow-dandelion	3	9,191 (9,154-9,260) 13.0 (8-16)	*	4 (1-9) 9 (8-11) ES	S1 Missing S2 0.5 (0.3-0.6) S3 0.3 (0.0-0.4) GF 0.3 (0.0-0.6) M 0.0 L 0.0	M 1 19 94 T 1	0 (0-0) 36 (17-70) 88 (78-97) 67 (22-91)	39 (34-47) 190 (185-197) 4.9 (3.9-5.8)	467-1605 1411-1951 267-1543	0 (0-0) 0 (0-0) 3 (0-5) 53 (35-70) 14 (9-19)	
J. Kentucky bluegrass-Baltic rush-dandelion-dry grasses	13	8,786 (8,270-9,310) 5.4 (2-9)	10 (9-10) 61 (51-71) 33 (30-36)	1 (0-4) 7 (0-15) ES	S1 Missing S2 Missing S3 0.4 (0.0-0.6) GF 0.4 (0.0-0.9) M 0.0 L Missing	M M 1.5 95.3 1.0 M	0 (0-1) 1 (0-7) 207 (132-295) 95 (11-161)	18 (9-32) 305 (153-477) 21.6 (6.4-39.5)	0-192 2590-2935 134-1596	0 (0-0) 0 (0-0) 3 (0-15) 60 (25-95) 16 (6-28)	
K. Kentucky bluegrass-western wheatgrass-bluegrass	6	9,136 (8,880-9,450) 9.2 (3-18)	42 46 46	2 (0-5) 19 (14-30) ES	S1 Missing S2 Missing S3 0.6 (0.0-0.9) GF 0.3 (0.0-0.7) M * L *	M M 11 97 * *	0 (0-0) 6 (0-15) 90 (64-125) 52 (12-95)	23 (14-36) 148 (99-229) 6.8 (5.2-13.1)	0-433 984-2499 147-1565	0 (0-0) 0 (0-0) 0 (0-0) 13 (5-20) 3 (1-5)	
L. Baltic rush-quackgrass-dandelion-yarrow-Kentucky bluegrass-iris	4	8,941 (8,400-9,425) 5.7 (3-9)	*	6 (1-14) 17 (4-40) ES	*	*	0 (0-0) 2 (0-7) 111 (77-137) 47 (22-77)	32 (25-36) 161 (122-221) 5.2 (3.5-7.6)	0-209 1402-2634 264-1414	0 0 0 55 14	

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

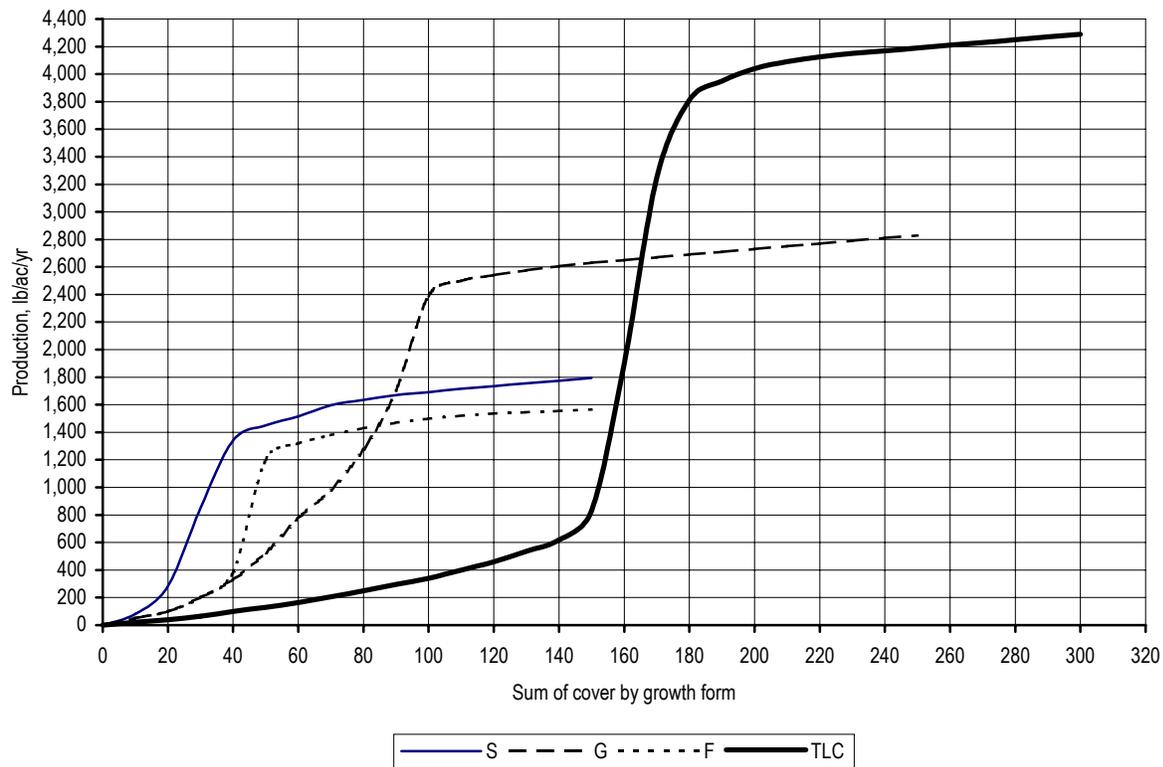


Figure 13-2. Relationship of cover by growth form and production. This is the SALUSAMO (SALU2-SAMO2) model. S = shrubs, G = graminoids, F = forbs, and TLC = Total live cover.

Table 13-5. Wildlife values (relative to the whole UGB) for the principal wildlife species using Yellow willow–Deep alluvial soils–Concave bottoms and swales. “ ” means the same as above.			
CT	Sage Grouse	Mule Deer	Elk
	Season–Preference	Season–Preference	Season–Preference
A, B, E	Spring– Mod. Low (Lek) Nesting– Very Low Summer– Mod. High (margins only)	Winter, Mild– Mod. High (Cover, Browse, Overnight) Winter, Severe– Very Low Spring/Fall– High (Cover, Browse, Overnight)	Winter, Mild– Mod. High (Cover, Browse, Overnight) Winter, Severe– Very Low Spring/Fall– Mod. High (Cover, Browse, Overnight)
C		Winter, Mild– Moderate (Cover, Browse, Overnight) Winter, Severe– Very Low Spring/Fall– Moderate (Cover, Browse, Overnight)	
D	Spring– Mod. Low (Lek) Nesting– Mod. Low Summer– Mod. High (margins only)	Winter, Mild– Mod. Low (Cover, Browse, Overnight) Winter, Severe– Mod. Low Spring/Fall– Moderate (Cover, Browse, Overnight)	Winter, Mild– Mod. Low (Cover, Browse, Overnight) Winter, Severe– Mod. Low Spring/Fall– Mod. Low (Cover, Browse, Overnight)
F, G	Spring– Moderate (Lek) Nesting– Very Low Summer– High	Winter, Mild– Mod. Low (Cover, Browse, Overnight) Winter, Severe– Mod. Low Spring/Fall– Low (Cover, Browse, Overnight)	Winter, Mild– Mod. Low (Cover, Browse, Overnight) Winter, Severe– Mod. Low Spring/Fall– Low (Cover, Browse, Overnight)
H	Spring– Moderate (Lek) Nesting– High Summer– High		
J, K, L	Spring– Moderate (Lek) Nesting– Very Low Summer– Mod. High		

Table 13-6. Resource Values for <i>Yellow willow–Deep alluvial soils–Concave bottoms and swales</i> . Resource values were calculated from the numbers in Table 13-4, 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.											
Community Type											
Resource Value	A	B	C	D	E	F	G	H	J	K	L
Potential Cattle Forage Production	5	4-5	1-3	3-5	5	4-5	3-5	4	4-5	4-5	4-5
Grazing Suitability	ns ¹	ns ¹	2	3	3	4	4	4	4	4	4
Wetland	Yes	Yes	Often	No	Often	No	No	No	No	No	No
Riparian Area	Yes	Yes	Yes	Yes	Yes	Yes	Often	No	No	No	No
Developed Recreation	ns ¹	0-1	0-1	0-1	0-1	0-1	0-1				
Dispersed Recreation	0	0	0	0	1	1	1	1	1	1	1
Scenic	4-5	4-5	4-5	3-4	4-5	2-3	1-2	1-2	1-2	1-2	1-2
Road & Trail Stability	0	0	0	0-1	0-1	1	1	1	1	1	1
Construction Suitability	0	0	0	0	0	0	0	0	0	0	0
Deer & Elk Hiding Cover	4-6	4-6	6	3	4-5	1-2	1-2	0-1	0-1	0-1	0-1
Deer & Elk Forage & Browse	5	5	4-5	3	3	2	2	2	1	1	1
Need for Watershed Protection	4	4	4	5	5	5	5	6	6	6	6
Soil Stability	0	0	0	0	0	0	0-1	0-1	0-1	0-1	0-1
Risk of Soil Loss-Natural	3	3	3	4-5	4-5	4-5	5-6	5-6	5-6	5-6	5-6
Risk of Soil Loss-Management	5	5	5	5	5	5	5	5	5	5	5
Risk of Permanent Depletion-Range	4-5	4-5	4-5	3-4	3-4	3-4	3-4	2-3	2-3	2-3	2-3
Risk of Permanent Depletion-Wildlife	4-5	4-5	4-5	2-3	2-3	2-3	2	1-2	1-2	1-2	1-2
Resource Cost of Management	5	5	5	5	5	5	5	5	5	5	5
Cost of Rehabilitation	2	2	2	2	2	3-4	4-5	4-5	4-5	4-5	4-5

1. Not suitable.



A midseral stage in the yellow willow riparian type (Community Type F). Willows have been heavily browsed by livestock, but probably more so by elk and deer in their winter range, because the herbaceous component of wet sedges is still intact. Beaked sedge 97% cover, silverweed 68%, meadow barley 24%, Baltic rush 24%, tufted hairgrass 12%, Geyer willow 9%, Kentucky bluegrass 3%, redtop 2%. Coarse Fragments Cover = 0%, Total Live Cover = 251%, Coarse Fragments in Soil = 12. Soil sampled as a Terric (or Fluvaquentic) Borosaprist, Euic. Big Mesa Quadrangle, elevation 8,395 ft, 3.6% 280° (W) slope. August 4, 1994.



An early-seral yellow willow stand, with no willows or other tall shrubs, and few sedges (Community Type K). Big sagebrush 7% cover (mostly on the edges of the stand), Kentucky bluegrass 69%, western wheatgrass 41%, dandelion 51%, western aster 40%. Razor Creek Dome Quadrangle, elevation 9,030 ft, 3% 121° (SE) slope. July 31, 1998.



From ridge above (east of) Almont, looking south across Fisher Basin, the upper valley of Fisher Gulch. From the heavily browsed serviceberry in the foreground, and the depleted yellow willow riparian areas in the valley, you can see that there is a long history of cattle grazing, and that *many* elk and deer pass through here in the winter and linger here in milder winters. July 22, 1993.

Table 13-7. Common Species in Yellow willow–Deep alluvial soils–Concave bottoms and swales, 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	E	F	G	H	J	K	L		
Code	Ccv(Con) N = 6	Ccv(Con) 8	Ccv(Con) 5	Ccv(Con) 8	Ccv(Con) 3	Ccv(Con) 7	Ccv(Con) 6	Ccv(Con) 3	Ccv(Con) 13	Ccv(Con) 6	Ccv(Con) 4	Common Name	
SHRUBS													
ALINT	Alnus incana ssp. tenuifolia	15 (17)	10 (13)	43 (60)	20 (38)	20(100)	4 (29)	-	-	-	-	thinleaf alder	
ARTR2	Artemisia tridentata	-	10 (25)	T (20)	10 (38)	-	3 (43)	6 (33)	12(100)	1 (15)	2 (50)	T (50)	big sagebrush
PEFL15	Pentaphylloides floribunda	6 (83)	3 (88)	4 (20)	4 (63)	10 (33)	4 (43)	21(100)	-	2 (31)	4 (50)	4 (50)	shrubby cinquefoil
RIN2	Ribes inerme	12 (33)	11 (25)	29 (60)	9 (63)	3 (67)	1 (29)	3 (50)	-	-	-	-	whitestem currant
RILA	Ribes lacustre	3 (33)	8 (50)	8 (40)	3 (25)	5 (33)	2 (29)	-	T (33)	-	-	-	swamp black gooseberry
RILE	Ribes leptanthum	19 (17)	10 (13)	-	11 (25)	-	-	-	-	-	-	T (25)	trumpet gooseberry
ROWO	Rosa woodsii	8 (50)	10 (38)	19 (40)	6 (50)	20 (67)	2 (43)	1 (33)	1 (67)	T (23)	4 (33)	T (50)	Woods rose
SABE2	Salix bebbiana	17 (67)	10 (38)	1 (60)	1 (13)	5 (33)	T (43)	-	T (33)	-	-	-	Bebb willow
SAGE2	Salix geeyeriana	20(100)	29(100)	26 (40)	28(100)	40(100)	6 (43)	-	-	-	-	-	Geyer willow
SALU2	Salix lutea	29 (83)	2 (75)	27(100)	-	15(100)	9 (14)	-	-	T (8)	-	-	yellow willow
SAM02	Salix monticola	-	4 (13)	-	T (13)	27(100)	T (14)	-	-	-	-	-	serviceberry willow
SASC	Salix scouleriana	-	-	-	12 (13)	-	-	-	-	-	-	-	Scouler willow
SYRO	Symphoricarpos rotundifolius	-	3 (25)	1 (40)	3 (38)	-	T (43)	6 (33)	18 (67)	T (8)	T (33)	2 (25)	mountain snowberry
GRAMINOIDS													
AGCR	Agropyron cristatum	-	-	-	-	-	-	-	-	30 (8)	-	6 (50)	crested wheatgrass
AGGI2	Agrostis gigantea	-	11 (38)	43 (20)	7 (25)	-	19 (43)	30 (33)	-	46 (8)	-	-	redtop
AGSC5	Agrostis scabra	-	-	-	29 (13)	-	-	-	-	-	-	-	rough bentgrass
BRIN7	Bromopsis inermis	20 (17)	-	1 (20)	-	5 (33)	3 (14)	-	-	27 (38)	T (17)	-	smooth brome
CACA4	Calamagrostis canadensis	22 (83)	3 (38)	8 (60)	24 (25)	30 (33)	T (14)	1 (33)	-	-	-	8 (25)	bluejoint reedgrass
CAREX	Carex	10 (17)	14 (25)	-	-	-	3 (14)	-	-	14 (15)	7 (33)	-	sedge
CAAQ	Carex aquatilis	16 (50)	30 (25)	-	4 (25)	-	12 (29)	-	-	-	-	-	water sedge
CABE2	Carex bebbii	28 (33)	-	11 (40)	5 (13)	-	-	-	-	26 (8)	-	16 (25)	Bebb's sedge
CAEB	Carex ebenea	-	-	38 (20)	-	-	-	-	-	-	-	-	ebony sedge
CAEG	Carex egglestonii	-	19 (13)	-	11 (25)	-	T (14)	-	-	-	-	-	Eggleston sedge
CAFO3	Carex foenea	-	12 (13)	-	-	-	-	-	-	12 (15)	-	11 (25)	silvertop sedge
CAHO5	Carex hoodii	-	-	-	-	-	-	-	-	54 (8)	-	-	Hood sedge
CANE2	Carex nebrascensis	27 (17)	-	-	-	-	-	-	-	-	-	-	Nebraska sedge
CAPH2	Carex phaeocephala	-	-	-	-	-	-	-	-	46 (8)	-	25 (25)	dunhead sedge
CAUT	Carex utriculata	27(100)	30(100)	8 (20)	5 (38)	3 (67)	38 (71)	5 (33)	-	2 (15)	-	3 (50)	beaked sedge
CRBR12	Critesion brachyantherum	8 (33)	14 (38)	4 (40)	14 (38)	10 (33)	10 (43)	-	-	9 (31)	1 (17)	T (25)	little barley
CRJU2	Critesion jubatum	-	1 (38)	-	2 (25)	-	2 (29)	1 (17)	-	2 (23)	-	1 (75)	foxtail barley
DECE	Deschampsia cespitosa	24 (67)	23 (63)	-	2 (25)	-	12 (14)	50 (33)	-	2 (8)	-	25 (50)	tufted hairgrass
ELQU2	Eleocharis quinqueflora	-	31 (13)	-	-	-	-	-	-	-	-	-	few-flowered spike-rush
ELRE3	Elytrigia repens	4 (33)	4 (38)	5 (40)	-	-	4 (57)	9 (67)	-	12 (31)	8 (50)	16(100)	creeping quackgrass
GLST	Glyceria striata	4 (67)	31 (13)	21 (40)	3 (13)	30 (33)	1 (43)	5 (33)	-	15 (8)	-	4 (25)	fowl mannagrass
JUARA4	Juncus arcticus ssp. ater	29 (83)	25 (38)	-	30 (88)	40 (67)	39(100)	55 (83)	-	62(100)	2 (50)	22(100)	Baltic rush
JUCO2	Juncus confusus	-	15 (13)	-	-	-	-	-	-	-	-	-	Colorado rush
JUME3	Juncus mertensianus	-	32 (13)	-	-	-	-	-	-	-	-	-	blackheaded rush
JUTR	Juncus tracyi	-	-	-	-	-	14 (14)	-	-	-	-	-	Tracy rush
LUPA4	Luzula parviflora	18 (17)	-	3 (20)	-	-	-	-	-	-	-	-	millet woodrush
MUAN	Muhlenbergia andina	-	-	20 (20)	-	-	-	-	-	-	-	-	foxtail muhly
MUF12	Muhlenbergia filiformis	-	-	-	-	-	-	-	-	39 (8)	-	-	pullup muhly
PASM	Pascopyrum smithii	-	-	T (20)	1 (13)	-	-	6 (17)	3 (67)	31 (38)	25 (33)	8 (50)	western wheatgrass
PHPR3	Phleum pratense	2 (50)	27 (38)	3 (80)	5 (50)	20 (33)	12 (43)	51 (33)	-	23 (31)	-	2 (75)	common timothy

Table 13-7. (Continued)

Community Type		A	B	C	D	E	F	G	H	J	K	L	Common Name
Code	Species	Ccv(Con) N = 6	Ccv(Con) 8	Ccv(Con) 5	Ccv(Con) 8	Ccv(Con) 3	Ccv(Con) 7	Ccv(Con) 6	Ccv(Con) 3	Ccv(Con) 13	Ccv(Con) 6	Ccv(Con) 4	
GRAMINOIDS (continued)													
POFE	<i>Poa fendleriana</i>	-	-	50 (20)	-	-	-	23 (17)	26 (67)	63 (8)	1 (17)	21 (50)	muttongrass
POJU	<i>Poa juncifolia</i>	-	-	-	-	-	-	-	-	-	27 (17)	5 (25)	alkali bluegrass
PONE2	<i>Poa nervosa</i>	-	-	-	5 (13)	-	-	-	-	60 (8)	-	-	Wheeler bluegrass
POPA2	<i>Poa palustris</i>	34 (17)	20 (38)	-	23 (38)	-	12 (14)	-	-	8 (8)	-	-	swamp bluegrass
POPR	<i>Poa pratensis</i>	3 (83)	45 (75)	7 (60)	47(100)	100(100)	35(100)	67 (83)	58 (67)	71(100)	62(100)	10 (75)	Kentucky bluegrass
FORBS													
ACLA5	<i>Achillea lanulosa</i>	19 (67)	10 (88)	5 (60)	16 (88)	50 (67)	12(100)	6 (50)	31 (67)	28 (85)	8 (83)	6(100)	western yarrow
ARAN7	<i>Argentina anserina</i>	1 (17)	7 (38)	-	7 (38)	-	68 (14)	80 (17)	-	26 (15)	T (17)	T (25)	silverweed
ASSP16	<i>Aster spathulatus</i>	8 (67)	6 (25)	28 (20)	-	-	14 (29)	8 (33)	-	20 (23)	24 (33)	14 (75)	western aster
CICE	<i>Cirsium centaureae</i>	-	-	-	-	13 (67)	-	-	-	-	-	-	thistle
CIEA	<i>Cirsium eatonii</i>	-	-	15 (20)	-	-	-	-	-	-	-	-	Eaton's thistle
DENU2	<i>Delphinium nuttallianum</i>	-	-	-	-	-	T (14)	-	-	12 (38)	-	-	pine larkspur
ERIGE2	<i>Erigeron</i>	-	4 (13)	-	1 (13)	70 (33)	3 (14)	-	12 (33)	11 (8)	3 (33)	-	fleabane
GASE6	<i>Galium septentrionale</i>	T (17)	T (25)	7 (40)	T (25)	-	1 (14)	1 (33)	2 (67)	3 (8)	2 (33)	1 (25)	northern bedstraw
GERI	<i>Geranium richardsonii</i>	1 (17)	T (25)	2(100)	3 (50)	1 (67)	T (14)	15 (17)	-	1 (8)	-	-	Richardson geranium
IRMI	<i>Iris missouriensis</i>	4 (50)	1 (13)	1 (40)	6 (63)	-	5 (57)	6 (33)	-	11 (62)	15 (50)	5(100)	wild iris
POPU9	<i>Potentilla pulcherrima</i>	1 (17)	5 (25)	1 (40)	-	80 (33)	40 (14)	19 (33)	1(100)	8 (31)	T (50)	5 (25)	beauty cinquefoil
PSLE	<i>Psychrophila leptosepala</i>	-	-	-	-	-	-	10 (33)	-	-	-	-	elkslip marsh-marigold
SICA3	<i>Sidalcea candida</i>	T (17)	25 (25)	-	9 (50)	-	30 (14)	5 (17)	-	35 (15)	-	-	white checker mallow
TAOF	<i>Taraxacum officinale</i>	2 (67)	15 (75)	6 (80)	21(100)	60 (67)	32 (57)	60 (50)	15(100)	33(100)	23 (83)	12(100)	common dandelion
TRGY	<i>Trifolium gymnocarpum</i>	-	70 (13)	T (40)	1 (13)	-	3 (14)	-	3 (33)	T (8)	7 (17)	-	holly-leaf clover
TRRE3	<i>Trifolium repens</i>	3 (17)	14 (13)	3 (40)	25 (50)	-	31 (71)	12 (83)	-	4 (31)	-	-	white Dutch clover
URGR3	<i>Urtica gracilis</i>	T (33)	1 (63)	15 (60)	19 (63)	-	40 (14)	-	-	-	-	-	stinging nettle
VETE4	<i>Veratrum tenuipetalum</i>	-	-	-	-	-	-	32 (67)	-	-	-	-	Colorado false-hellebore
VIAM	<i>Vicia americana</i>	11 (50)	6 (13)	9 (60)	3 (13)	6 (67)	T (29)	10 (50)	9 (67)	6 (15)	T (67)	T (25)	American vetch
GROUND COVER													
.BARESO	bare soil	13 (67)	9 (63)	7 (80)	11 (75)	-	15 (86)	4 (50)	9(100)	7 (46)	19 (83)	17(100)	
.LITTER	litter and duff	83 (83)	90 (75)	87(100)	80 (75)	-	65 (86)	92 (33)	85(100)	91 (54)	81(100)	73(100)	
GRAVEL	gravel 0.2-10 cm	1	T	T	T	-	7	T	2	1	1	1	
.COBBLE	cobble 10-25 cm	3 (33)	-	1 (20)	8 (25)	-	2 (29)	1 (17)	-	1 (15)	1 (67)	14 (25)	
.STONES	stone > 25 cm	8 (33)	-	1 (40)	6 (13)	-	2 (29)	2 (17)	-	2 (8)	-	-	
.MOSSON	moss on soil	19 (83)	5 (38)	5 (80)	8 (50)	-	T (29)	-	5 (67)	21 (23)	5 (50)	28 (50)	
LICHENS	lichens on soil	-	3	-	2	-	1	-	1	-	T	1	