USDA Natural Resources
Conservation Service

Ecological site R009XY033ID
Stony Bottomland SYAL/PSSP6

Last updated: 9/23/2020
Accessed: 05/11/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Classification relationships

No data.

Associated sites

R009XY001ID	**Shallow Stony Loam 16-22 PZ**
R009XY002ID	**North Slope Loamy 16-22 PZ**
R009XY003ID	**Loamy 16-22 PZ**
R009XY008ID	**Schist 16-22 PZ PSSPS-FEID**
R009XY010ID	**South Slope Schist 16-22 PZ PSSPS-POSE**
R009XY017ID	**Very Shallow 12-22 PZ PSSPS-POSE**

Similar sites

R009XY032ID	**Riparian DECA5-CAREX**
R009XY031ID	**Stony Riparian POBAT-ALNUS/ELYMU**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on gently sloping low stream terraces and flood plains. Slopes are generally 1-3 percent. Elevations are 750 to 2300 feet (225-700 meters).

Table 2. Representative physiographic features

Landforms	(1) Stream terrace
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Elevation	750–2,300 ft
Slope	1–3%

Aspect	Aspect is not a significant factor

Climatic features

The elevation of MLRA 9 ranges from 2000 to 4000 feet with an average elevation of 3000 feet. Elevation along major streams averages only 650 feet above sea level. Average annual precipitation ranges from 20 to 25 inches with an average of 23 based on 9 long term climate stations located throughout the MLRA. Summers are relatively dry while precipitation is evenly distributed between fall, winter, and spring.
The maximum average annual temperature is 58 degrees Fahrenheit while the average minimum temperature is 35 degrees F. The average annual temperature is 46.8 degrees F. The frost free period ranges from 107 to 134 days and the freeze free period ranges from 143 to 173 days.

Table 3. Representative climatic features

Frost-free period (average)	134 days
Freeze-free period (average)	173 days
Precipitation total (average)	26 in

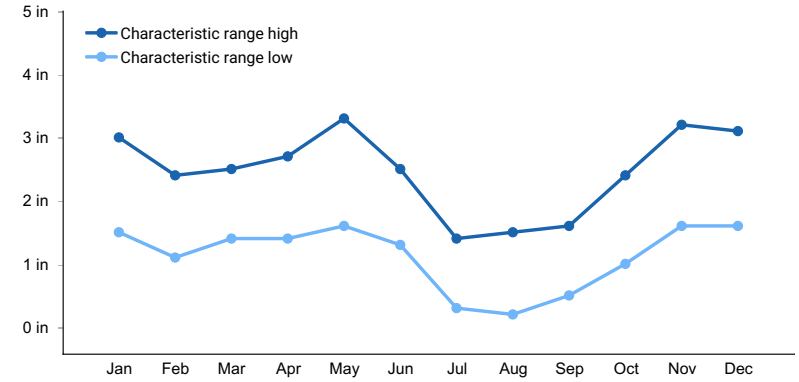


Figure 1. Monthly precipitation range

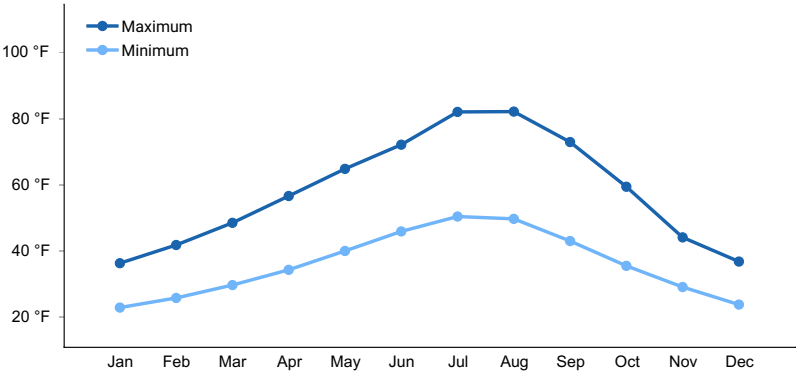


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

In addition to precipitation, the site is dependent upon run-on water from adjacent sites and capillary water from the lower part of the soil profile.

Wetland Description: System Subsystem Class Sub-class
Palustrine NA Forested Wetland
Stream Type: Intermittent or perennial

Soil features

The soils in this site are well drained and have moderate to rapid permeability. They are usually associated with

water courses. Soil depth is deep to very deep. The soils are mainly of mixed gravelly and sandy alluvium. Stoniness occurs on the surface and throughout the profile. The soils usually have very little development. Water tables are greater than 60 inches deep during the spring and summer. Plant growth depends more on the presence of moisture through capillary action from the lower part of the soil profile and from stored precipitation and run-on water than from precipitation during the growing season.

Soil Series Correlated to this Ecological Site.

Bridgewater

Table 4. Representative soil features

Surface texture	(1) Gravelly sandy loam (2) Extremely gravelly
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate to very rapid
Soil depth	60 in
Surface fragment cover <=3"	10–60%
Surface fragment cover >3"	15–35%
Available water capacity (0-40in)	1.5–2.6 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.1–7.3
Subsurface fragment volume <=3" (Depth not specified)	45–60%
Subsurface fragment volume >3" (Depth not specified)	20–35%

Ecological dynamics

The dominant visual aspect of this site is a shrub overstory with grass understory. This site commonly occurs in complex with dry meadow, meadow, and other bottomland and riparian ecological sites. Composition by weight is approximately 30 percent grass, 20 percent forbs, 50 percent shrubs, and a trace to no trees.

During the last few thousand years, this site has evolved in a semi-arid climate characterized by dry summers and cold, wet winters. The site has evolved on flood plains that rarely flood. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include mule deer and Rocky Mountain elk.

Fire has played a role in maintaining the plant community. Fire can cause shrub sprouting to provide regeneration. The fire frequency on the site is often dependent on the frequency of fire on adjacent range sites and moisture in the fuels on the site. The normal fire frequency is 25 to 75 years.

The Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. This plant community is dominated by an overstory of shrubs including common snowberry, Woods’ rose, redosier dogwood, and black hawthorn. The herbaceous layer contains a variety of

grasses and forbs including bluebunch wheatgrass, blue wildrye, sedges, slender wheatgrass, cinquefoil, western yarrow, and lupines. None of these forbs is dominant. The plant species composition of Phase A is listed later under “Reference Plant Community Phase Plant Species Composition”.

The total annual production is 1800 pounds per acre (2016 kilograms per hectare) in a normal year. Production in a favorable year is 2000 pounds per acre (2240 kilograms per hectare). Unfavorable year production is about 1600 pounds per acre (1792 kilograms per hectare). Structurally, shrubs are dominant followed by cool season deep-rooted perennial grasses, followed by perennial forbs.

This site is suited for livestock grazing in late spring, summer, and fall. This site can be heavily used by livestock, particularly in the summer, but surface stones can limit access. Prescribed grazing must be planned to avoid degradation of the site. Special management should be used to protect the adjacent water courses and the associated values. This is an important site for wildlife for cover and food. If the site is associated with perennial streams, a fisheries resource could also be present. The site has high value for recreation such as camping and picnicking. Hunting opportunities are good where the site is isolated from human activity. Degradation of the site can occur with improper grazing management and down cutting of the adjacent stream course or upper watershed conditions that alter the flood frequency or duration.

Impacts on the Plant Community:

Influence of fire:

This site can burn from wildfire. Burning usually occurs from fire spreading from an adjacent ecological site when the fuel moisture levels are low in this site. Since the plant community in this site is influenced by a deep water table allowing deep-rooted plants to grow throughout most of the summer, the fuels often are not dry enough to burn. The fire frequency is usually longer than adjacent range sites. Most of this site is associated with the Palouse grasslands and the normal fire frequency is estimated at 25-75 years. A wildfire can kill most of the above ground plant material. Most of the shrubs adapted to the site are root-sprouting plants and regenerate rapidly. The herbaceous layer also contains many rhizomatous species that resprout readily.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. Uncontrolled beaver populations may adversely impact the shrub component in the plant community. Due to improper grazing management grasses, forbs, and shrubs can all decline in the plant community. Shrubs usually increase initially, but with continued improper management, will decline.

Continued improper grazing management will result in a stand of forbs and Kentucky bluegrass with reduced vigor or a community dominated by annuals. The ability of the community to withstand seasonal flooding is reduced and down cutting of adjacent streams can result. This down cutting will lower the water table and thereby reduce the potential of the site. This site is particularly difficult to manage because animals seek out the site for shade and it is usually adjacent to water.

Proper grazing management that addresses frequency, duration, and intensity of grazing can maintain the integrity of the plant community and the water table on which it is dependent. Upstream watershed conditions must be maintained to have normal run-off events.

Weather influences:

Because of the deep soils, the influence of the deep water table and run-on, the production of this site changes little during wet or dry precipitation years. The overall production can be adversely influenced with prolonged drought. Prolonged drought can increase fire frequency. Overall plant composition is normally not affected when perennials have good vigor.

Below normal temperatures in the spring can have an adverse impact on total production, regardless of the run-off

and flooding. An early, hard freeze can occasionally kill some plants. An early frost can stop the growth of shrubs.

Influence of Insects and disease:

Periodic disease and insect outbreaks can affect vegetation health. An outbreak of a particular insect is usually influenced by weather but no specific data for this site is available.

Influence of noxious and invasive plants:

Annual and perennial invasive species can compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory. There are several noxious or invasive plants that are adapted to this site.

Influence of wildlife:

This site is important for many species of mammals and birds for food and life cycles. Total numbers are seldom high enough to adversely affect the plant community. The site is primarily used in the late spring, summer, and fall by big game. Many birds use the site for food, nesting, or brood rearing in the late spring, summer, and fall.

Watershed:

The largest threat to degradation of this site is the lowering of the deep water table and changes in flooding characteristics either from incised channels or upstream conditions. Off-site conditions can affect the gradient of adjacent stream channels that can affect the water table. If the perennial grasses, sedges, and shrubs are depleted, down cutting can be accelerated within the site. High run-off events from the adjacent uplands can severely damage or change the normal stream channel on the site. As the water table is lowered, productive potential is lost. Eventually the water table is below the root zone of the adapted perennial grasses, shrubs, and trees. These are ultimately replaced by perennial forbs and shallow rooted grasses. Extreme down cutting and lowering of the water table can move the site across the threshold to a new, less productive site. Severe down-cutting can result in a plant community that resembles an upland site.

Plant Community and Sequence:

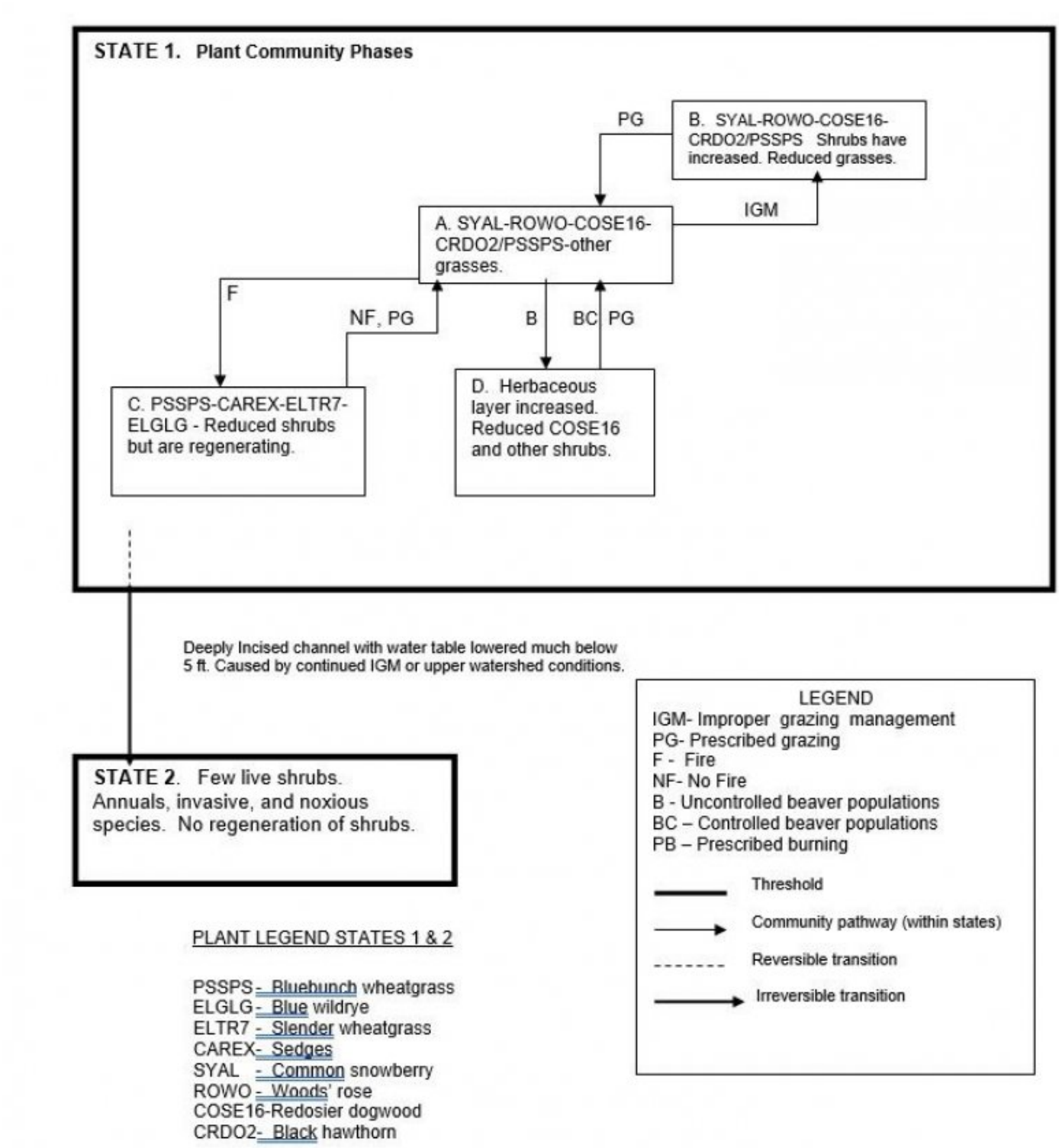
Transition pathways between common vegetation states and phases:

State 1.
Phase A to B. Develops with improper grazing management.
Phase A to C. Develops with wildfire.
Phase A to D. Develops with uncontrolled beaver populations.
Phase B to A. This results from prescribed grazing.
Phase C to A. Results from no recent fires and prescribed grazing.
Phase D to A. Results from controlling the beaver population and prescribed grazing.
.
State 1 to State 2. This results from a deeply incised channel that reduces the water table much below 5 ft. Improper grazing management has continued. Improper grazing management can cause down cutting which results in a lowered water table or upstream watershed conditions can cause runoff events that down-cut the channel. The site has crossed the threshold. This state cannot be returned to State 1 without raising the water table and/or controlling the invasive species that have resulted in crossing a vegetative threshold. Raising the water table can only be done using a combination of grazing management, structures, or bio-engineering practices. It very likely is economically impractical to do this unless it has some unique circumstances pertaining to the specific area.

Practice Limitations:

Use of equipment is usually not feasible for seeding due to surface stones. Hand seeding or aerial seeding can be considered following a fire. Brush management is not recommended. The brush has high value for stream bank stabilization and channel protection and wildlife habitat. Special management practices need to be used to protect this site from deterioration.

State and transition model



State 1
State 1 Phase A

Community 1.1
State 1 Phase A

State1, Phase A. Reference Plant Community Phase. This plant community is dominated by a shrub layer of common snowberry, Woods' rose, redosier dogwood, and black hawthorn. The herbaceous layer is dominated by bluebunch wheatgrass, blue wildrye, sedges, slender wheatgrass, cinquefoil, western yarrow, and lupine. None of these are dominant. There are a variety of forbs that occur in small amounts. The composition varies due to the variability of soil textures and depths due past flooding and deposition events. Fire can occur when adjacent sites

burn and the normal fire frequency is estimated at 25-75 years.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	800	900	1000
Grass/Grasslike	480	540	600
Forb	320	360	400
Total	**1600**	**1800**	**2000**

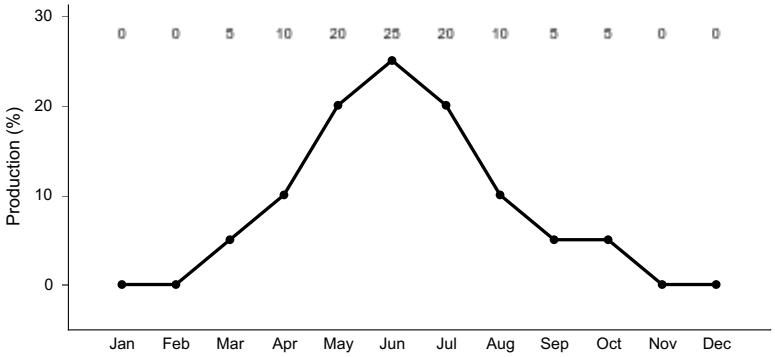


Figure 4. Plant community growth curve (percent production by month). ID0117, BLACK COTTONWOOD. STATE 1.

State 2
State 1 Phase B

Community 2.1
State 1 Phase B

State 1. Phase B. This plant community is dominated in the overstory with shrubs including common snowberry, Woods' rose, redosier dogwood, and black hawthorn. This shrub layer has increased but some of the shrubs are hedged. The herbaceous layer is reduced due to improper grazing management and increased shading from the shrubs. Bluebunch wheatgrass and sedges are reduced in vigor. This community is the result of improper grazing management.

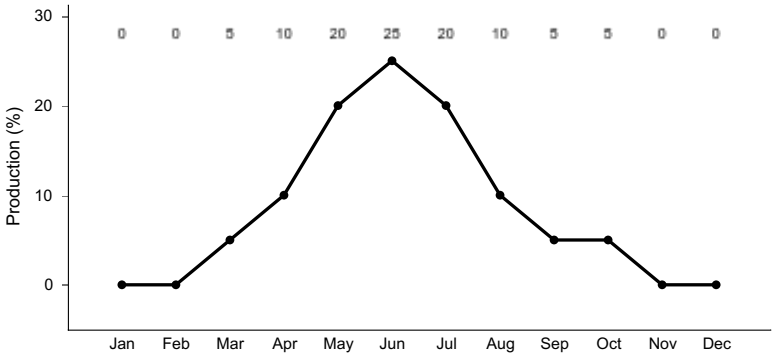


Figure 5. Plant community growth curve (percent production by month). ID0117, BLACK COTTONWOOD. STATE 1.

State 3
State 1 Phase C

Community 3.1
State 1 Phase C

State 1, Phase C. This plant community is dominated by bluebunch wheatgrass, blue wildrye, sedges, slender

wheatgrass, and a variety forbs. Shrubs are low in stature but are regenerating from sprouting and will be in high vigor within two to three years. This community is the result of wild fire.

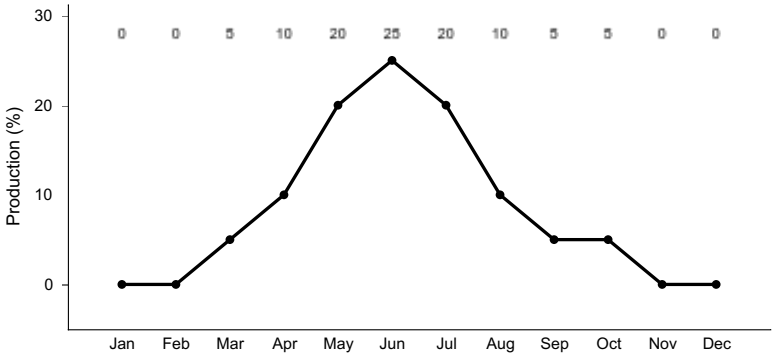


Figure 6. Plant community growth curve (percent production by month). ID0117, BLACK COTTONWOOD. STATE 1.

State 4
State 1 Phase D

Community 4.1
State 1 Phase D

State 1. Phase D. This plant community has a shrub layer that has been significantly reduced due to uncontrolled beaver populations. Grasses and forbs have increased significantly. The shrubs have sprouted from the crown but are only small twigs. The beavers keep larger branches from developing, particularly redosier dogwood.

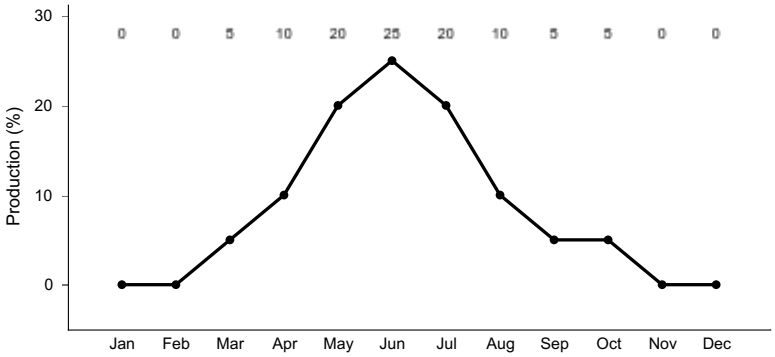


Figure 7. Plant community growth curve (percent production by month). ID0117, BLACK COTTONWOOD. STATE 1.

State 5
State 2

Community 5.1
State 2

State 2. This plant community has few live shrubs. The understory is dominated by invasive and noxious species including annuals. There is no regeneration of shrubs. This plant community has developed through continued improper grazing management and a much lowered water table. The reduced water table is caused by an incised channel and/or upstream conditions that have changed the hydrologic cycles. The community has crossed the threshold to a new state. It is most likely economically impractical to return this state to State 1. To return it to State 1, you would have to raise the water table and this could only be done using grazing management, structures, or bio-engineering practices. Unless there were some unique circumstances attached to the specific area, it probably would not pay to attempt to return it to State 1 with expensive structural measures.

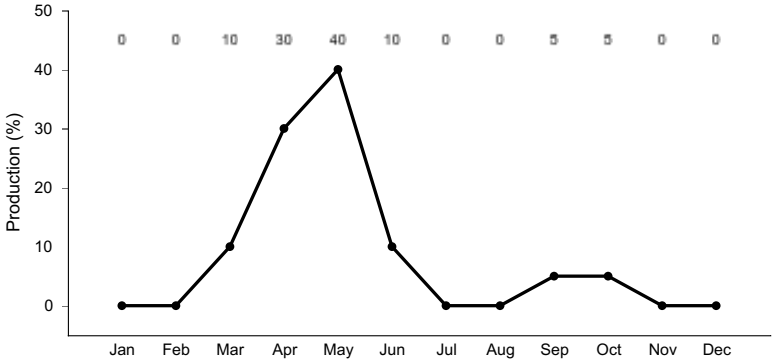


Figure 8. Plant community growth curve (percent production by month). ID0109, LOW SERAL. STATE 2.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Grass and Grasslike**			–	
	blue wildrye	ELGLG	*Elymus glaucus ssp. glaucus*	160–200	–
	sedge	CAREX	*Carex*	160–200	–
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	160–200	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	160–200	–
Forb					
2	**Forbs**			–	
	cinquefoil	POTEN	*Potentilla*	80–100	–
	common yarrow	ACMI2	*Achillea millefolium*	80–100	–
	lupine	LUPIN	*Lupinus*	80–100	–
Shrub/Vine					
3	**Shrubs**			–	
	Woods' rose	ROWO	*Rosa woodsii*	200–250	–
	redosier dogwood	COSE16	*Cornus sericea*	200–250	–
	common snowberry	SYAL	*Symphoricarpos albus*	200–250	–
	black hawthorn	CRDO2	*Crataegus douglasii*	200–250	–

Animal community

Wildlife Interpretations.
Animal Community – Wildlife Interpretations

This riparian ecological site provides diverse habitat for wetland and upland wildlife species. The site provides critical travel corridors for all animal species. Important seasonal habitat is provided for over 80% of adjacent rangeland resident and migratory animals including western toad, western rattlesnake, shrews, bats, ground squirrels, beaver, mice, coyote, red fox, Swainson’s hawk, northern harrier, dusky flycatcher, and yellow warbler. Large herbivore use of this ecological site includes mule deer, white-tailed deer, and elk. Native reptiles and amphibians are reliant on these riparian sites throughout the year. Loss of site hydrology significantly reduces habitat value of the riparian site and adjacent ecological sites. Streams are associated with this site and provide a native fishery. Area sensitive species include Woodhouse’s toad, ring-necked snake, Coeur d’Alene salamander, mountain quail, steelhead trout, sand roller, and west-slope cutthroat. Open water is seasonal being provided by

seasonal runoff, ponding, flooding, seasonal high water table, natural springs, and adjacent streams.

State 1 Phase 1.1 – Common Snowberry/ Wood's Rose/ Redosier Dogwood/ Black Hawthorn/ Bluebunch Wheatgrass Reference Plant Community (RPC): The RPC provides a diversity of herbaceous and woody plants used by native insect communities who assist in pollination. The insects are food for the many predator species utilizing the site. The reptile and amphibian community may include western rattlesnake, gopher snake, Woodhouse's toad, Coeur d'Alene salamander, western skink, ring-necked snake, rubber boa, terrestrial gartersnake, western toad, Columbia spotted frog, and northern leopard frog. A diverse amphibian population is a key indicator of good ecological health on this site. Loss of hydrology will limit or exclude amphibians from this ecological site. Fish species in adjacent streams can include rainbow trout, brook trout, west-slope cutthroat, steelhead trout, and sand roller. Woody vegetation adds horizontal and vertical structure for nesting and roosting sites for resident and migratory avian species. Bird species can include willow flycatcher, common yellowthroat, yellow warbler, black-capped chickadee, MacGillivray's warbler, fox sparrow, song sparrow, mountain quail, and common snipe, utilizing the plant community for breeding, resting, and nesting cover. The plant community provides year round forage for mule deer, white-tailed deer, and elk. Thermal cover and young of year cover for large herbivores is provided by woody vegetation within the plant community. A small mammal population including deer mouse, western jumping mouse, beaver, and muskrat may utilize available habitat on a seasonal basis.

State 1 Phase 1.2- Common Snowberry/ Wood's Rose/ Redosier Dogwood/ Black Hawthorn Plant Community: This community has developed with improper grazing management. Insect diversity will be similar to that in State 1, Phase 1.1 but the reduction of understory vegetation, specifically grasses, would reduce the quality of the habitat. An increase in flowering shrubs may offset the loss of forbs used by pollinators. The amphibian community will be similar to the State 1, Phase 1.1 community. Fish species in adjacent streams can include rainbow trout, brook trout, west-slope cutthroat, steelhead trout, and sand roller. Habitat may begin to favor non-native fish species, if water quality decreases overtime. Bird species can include willow flycatcher, common yellowthroat, yellow warbler, black-capped chickadee, MacGillivray's warbler, fox sparrow, song sparrow, mountain quail, and common snipe, utilizing the plant community for breeding, resting, and nesting cover. The plant community provides year round forage for mule deer, white-tailed deer, and elk. Thermal cover and young of year cover for large herbivores is provided by woody vegetation within the plant community. Small mammal populations include deer mouse, montane vole, beaver, muskrat, and western jumping mouse.

State 1 Phase 1.3- Bluebunch Wheatgrass/ Sedges/ Slender Wheatgrass/ Blue Wildrye Plant Community: This plant community has developed due to a recent wildfire. The animal community would be represented by species similar to the State 1 Phase 1.1 community but at reduced populations. The quality of habitat for species that favor grass and woody plants would decrease. Habitat quality for mountain quail and beaver may decline. Available nesting and perching sites for songbirds would be reduced. Forage for large herbivores would be provided, although quality of thermal cover and young of year cover would decrease until shrubs mature. Under proper management as woody plants re-establish, you could expect the animal community to return to the diversity and populations exhibited in State 1, Phase 1.1. Until shrubs re-establish, the historic travel corridor would be fragmented for small and large mammals, amphibians, reptiles, and birds.

State 1 Phase 1.4 – Grasses/ Forbs Species Plant Community: This community is the result of uncontrolled beaver populations. The animal community would be represented by species similar to those in State 1, Phase 1.1 but at reduced populations. The quality of habitat for species that favor grass and woody plants would decrease. Habitat quality for mountain quail and beaver may decline. Available nesting and perching sites for songbirds would be reduced. Forage for large herbivores would be provided, although quality of thermal cover and young of year cover would decrease until shrubs are allowed to mature. Under proper management as woody plants re-establish, you could expect the animal community to return to the diversity and populations exhibited in State 1, Phase 1.1. The historic travel corridor for small and large mammals, amphibians, reptiles, and birds would be fragmented. You could expect beaver activity to create ponded sites suitable for native and non-native fish

State 2 –Annuals/ Invasives/ Noxious Weeds Plant Community: This plant community has developed through continued improper grazing management and lowered water table. Loss of historic hydrology has reduced the habitat value for many animals present in State 1. The invasive plant community would not provide pollinator habitat in all seasons. The loss of historic hydrology will limit or exclude use of the site by amphibians and many reptiles. Quality of fishery habitat is lowered due to poor streamside plant condition, resulting in poor water quality and less instream food and cover. Fish species may now be dominated by non-native brook trout. With continued improper grazing management the loss of vertical and horizontal structure would reduce diversity and populations of species

of birds identified in State 1. With the loss of shrubs the site would be more suitable for killdeers, western meadowlark, and horned larks. Birds of prey (northern harrier and Cooper's hawk) may range throughout this area looking for prey species. With improper grazing management, forage for large herbivores would be available for a shorter duration in the summer and fall. Small mammal diversity would favor grass seed eating species (deer mouse). Predation success on small mammals would increase due to poor quality cover habitat. The loss of shrubs would fragment the historic travel corridor for small and large mammals, amphibians, reptiles, and birds.

Grazing Interpretations.

This site is suited for livestock grazing in late spring, summer, and fall. This site is usually heavily used by livestock, particularly in the summer, but surface stones can limit access. Prescribed grazing must be planned to avoid degradation of the site. Special management should be used to protect the adjacent water course and the associated values.
Estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory which includes species, composition, similarity index, production, past use history, season of use, and seasonal preference. Calculations used to determine estimated initial stocking rate will be based on forage preference ratings.

Hydrological functions

The soils in this site are in hydrologic group B and C. They have moderately low to moderately high runoff potential.

Recreational uses

This site has moderate value for recreation such as camping, picnicking, hunting, and possibly fishing. Surface stones can reduce recreational use. This site provides visual diversity to the range ecosystem.

Wood products

None.

Other products

None.

Other information

Field Offices

Grangeville, ID
Craigmont, ID
Orofino, ID
Lewiston, ID
Moscow, ID
St. Maries, ID
Coeur d'Alene, ID

Other references

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USDA, NRCS.2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov.). National Plant Data Center, Baton Rouge, LA 70874-4490 USA
USDA, Forest Service, Fire Effects Information Database. 2004. www.fs.fed.us/database.
USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service,

Agricultural Research Service; Interpreting Indicators of Range Health. Technical Reference 1734-6; Version 4-2005.

Approval

Kendra Moseley, 9/23/2020

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

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Date	04/20/2009
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** rills do not occur on this site.

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2. **Presence of water flow patterns:** water flows over and through the plant community from run-on and rare flooding. Flows can deposit sediments. Rarely are flows detrimental to the shrub components of the plant community. These plants have adapted or evolved with this occurrence. Understory species can be damaged or buried.

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3. **Number and height of erosional pedestals or terracettes:** pedestals do not occur on this site. Terracettes do not occur as classically defined, but deposition areas can give a hummocky surface.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** data is not available. On sites in mid-seral status bare ground may range from 15-20 percent. Immediately following a significant flood event, bare ground may be as high.

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5. **Number of gullies and erosion associated with gullies:** does not exist.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** does not occur.

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7. **Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces may move 2 feet or off the site due to rare flooding events. Coarse litter can move within the site or off the site due to rare flooding. Some debris may hang up or be deposited in piles within the site.

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** values should range from 4 to 6 but needs to be tested.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The thickness of the A or A1 horizon ranges from 8 to 16 inches. Structure is weak fine and medium granular. Soil organic matter (SOM) ranges from 2 to 4 percent. These soils may not show distinct horizons due to weak development.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** a mixed age stand of shrubs and herbaceous plants is needed to slow run-off and increase infiltration.

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** not present.

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: shurbs are >

    Sub-dominant: perennial grasses

    Other: forbs

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** normal mortality of grass, grass-like, and forbs occur with deposition from run-on. Some mortality can occur in the herbaceous layer and may occur as the shrub canopy closes.

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14. **Average percent litter cover (%) and depth (in):** additional litter cover data is needed but is expected to be ___percent to a depth of 0.5-1.5 inches at the end of the growing season, but may be removed following flooding.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 1800 pounds per acre (2016 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses and sedges produce 30 percent of the total production, forbs 20 percent, and shrubs 50 percent.

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize**

degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site: includes whitetop, leafy spurge, dock, Canadian thistle, reed canarygrass, foxtail barley, perennial pepperweed, and teasel. Other invasive species may include meadow foxtail and Kentucky bluegrass.

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17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in most years. Many of the plants reproduce vegetatively.
