

Ecological site R025XY004ID SHALLOW STONY 12-16

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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.

MLRA notes

Major Land Resource Area (MLRA): 025X—Owyhee High Plateau

MLRA Notes 25—Owyhee High Plateau

This area is in Nevada (56 percent), Idaho (30 percent), Oregon (12 percent), and Utah (2 percent). It makes up about 27,443 square miles. MLRA 25 is characteristically cooler and wetter than the neighboring MLRAs of the Great Basin. The western boundary is marked by a gradual transition to the lower and warmer basins of MLRA 24. The boundary to the south-southeast, with MLRA 28B, is marked by gradual changes in geology marked by an increased dominance of singleleaf pinyon and Utah juniper and a reduced presence of Idaho fescue. The boundary to the north, with MLRA 11, is a rapid transition from the lava plateau topography to the lower elevation Snake River Plain.

Physiography:

All of this area lies within the Intermontane Plateaus. The southern half is in the Great Basin section of the Basin and Range province. This part of the MLRA is characterized by isolated, uplifted fault-block mountain ranges separated by narrow, aggraded desert plains. This geologically older terrain has been dissected by numerous streams draining to the Humboldt River.

The northern half of the area lies within the Columbia Plateaus province. This part of the MLRA forms the southern boundary of the extensive Columbia Plateau basalt flows. Most of the northern half is in the Payette section, but the northeast corner is in the Snake River Plain section. Deep, narrow canyons draining into the Snake River have been incised into this broad basalt plain. Elevation ranges from 3,000 to 7,550 feet on rolling plateaus and in gently sloping basins. It is more than 9,840 feet on some steep mountains. The Humboldt River crosses the southern half of this area

Geology:

The dominant rock types in this MLRA are volcanic. They include andesite, basalt, tuff, and rhyolite. In the north and west parts of the area, Cretaceous granitic rocks are exposed among Miocene volcanic rocks in mountains. A Mesozoic igneous and metamorphic rock complex dominates the south and east parts of the area. Upper and Lower Paleozoic calcareous sediments, including oceanic deposits, are exposed with limited extent in the mountains. Alluvial fan and basin fill sediments occur in the valleys.

Climate:

The average annual precipitation in most of this area is typically 11 to 22 inches. It increases to as much as 49 inches at the higher elevations. Rainfall occurs in spring and sporadically in summer. Precipitation occurs mainly as snow in winter. The precipitation is distributed fairly evenly throughout fall, winter, and spring. The amount of precipitation is lowest from midsummer to early autumn. The average annual temperature is 33 to 51 degrees F. The freeze-free period averages 130 days and ranges from 65 to 190 days, decreasing in length with elevation. It is typically less than 70 days in the mountains.

Water:

The supply of water from precipitation and streamflow is small and unreliable, except along the Owyhee, Bruneau, and Humboldt Rivers. Streamflow depends largely on accumulated snow in the mountains. Surface water from mountain runoff is generally of excellent quality and suitable for all uses. The basin fill sediments in the narrow alluvial valleys between the mountain ranges provide some ground water for irrigation. The alluvial deposits along the large streams have the most ground water. Based on measurements of water quality in similar deposits in

adjacent areas, the basin fill deposits probably contain moderately hard water. The water is suitable for almost all uses. The carbonate rocks in this area are considered aquifers, but they are little used. Springs are common along the edges of the limestone outcrops.

Soils:

The dominant soil orders in this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic or frigid temperature regime and an aridic, aridic bordering on xeric, or xeric moisture regime. Soils with aquic moisture regimes are limited to drainage or spring areas, where moisture originates or runs on and through. These soils are of a very limited extent throughout the MLRA. They generally are well drained, clayey or loamy, and shallow or moderately deep. Most of the soils formed in mixed parent material. Volcanic ash and loess mantle the landscape. Surface soil textures are loam and silt loam with ashy texture modifiers in some areas. Argillic horizons occur on the more stable landforms. They are exposed nearer the soil surface on convex landforms, where ash and loess deposits are more likely to erode. Soils that formed in carbonatic parent material in areas that receive less than 12 inches of precipitation are characterized by calcic horizons throughout the profile, while soils in areas that receive more than 12 inches of precipitation do not have calcic horizons in the upper part of the profile. Soils that formed on stable landforms at the lower elevations are dominated by ochric horizons. Soils that formed at the middle and upper elevations are characterized by mollic epipedons. Soils in drainage areas at all elevations that receive moisture running on or through them are characterized by thicker mollic epipedons.

Biological Resources:

This MLRA supports shrub-grass vegetation. Lower elevations are characterized by Wyoming big sagebrush associated with bluebunch wheatgrass, western wheatgrass, and Thurber's needlegrass. Other important plants include bluegrass, squirreltail, penstemon, phlox, milkvetch, lupine, Indian paintbrush, aster, and rabbitbrush. Black sagebrush occurs but is less extensive. Singleleaf pinyon and Utah juniper occur in limited areas. With increasing elevation and precipitation, vast areas characterized by mountain big sagebrush or low sagebrush/early sagebrush in association with Idaho fescue, bluebunch wheatgrass, needlegrasses, and bluegrass become common. Snowberry, curl-leaf mountain mahogany, ceanothus, and juniper also occur. Mountains at the highest elevations support whitebark pine, Douglas-fir, limber pine, Engelmann spruce, subalpine fir, aspen, and curl-leaf mountain mahogany.

Major wildlife species include mule deer, bighorn sheep, pronghorn, mountain lion, coyote, bobcat, badger, river otter, mink, weasel, golden eagle, red-tailed hawk, ferruginous hawk, Swainson's hawk, northern harrier, prairie falcon, kestrel, great horned owl, short-eared owl, long-eared owl, burrowing owl, pheasant, sage grouse, chukar, gray partridge, and California quail. Reptiles and amphibians include western racer, gopher snake, western rattlesnake, side-blotched lizard, western toad, and spotted frog. Fish species include bull, red band, and rainbow trout.

Classification relationships

Artemisia Wyomingensis/ Agropyron spicatum ht. Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. University of Idaho. Moscow, Idaho. Bulletin Number 35

Ecological site concept

This site is on linear to convex hillslopes at elevations between 4,000 and 6,000 feet (1,219 and 1,829 meters). Slopes are from 2 to 20 percent. The average growing season is 100 to 110 days.

Soils of this site are clayey to loamy textured, shallow to bedrock, and have over 35 percent rock fragments, which reduces the soils water holding capacity.

This site supports a big sagebrush and Thurber's needlegrass community with annual production from 450-1200 lb/ac.

Associated sites

R025XY024ID	LOAMY 12-16
R025XY028ID	LOAMY BOTTOM 12-16
R025XY003ID	LOAMY 12-16

Similar sites

R025XY007ID	ASH 10-14
R025XY041ID	GRAVELLY 10-12
R025XY019ID	LOAMY 10-13

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata subsp. wyomingensis</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i>

Physiographic features

This site is on dissected high lava plateaus, primarily on convex areas of volcanic landforms and secondarily on associated fluvial landforms. Rock outcrops are commonly interspersed, but not part of this site. The landscape topography is nearly level to steep on all aspects at mid-elevations and incised by steep narrow canyons. The ground surface is usually very rough, irregular. Slopes are 1 to 30 percent. The elevations range from 4500 to 6000 feet (1371 to 1829 meters).

Table 2. Representative physiographic features

Landforms	(1) Caldera (2) Lava plateau > Mesa
Runoff class	Medium to high
Flooding frequency	None
Ponding frequency	None
Elevation	4,500–6,000 ft
Slope	1–30%
Ponding depth	0 in
Water table depth	60 in
Aspect	Aspect is not a significant factor

Climatic features

In MLRA 25 summers are hot, especially at lower elevations, and winters are cold and snowy. Precipitation is usually lighter at lower elevations throughout the year. At higher elevations precipitation is much greater, and snow accumulates to a considerable depth. The average total precipitation is 14.39 inches (36cm) (based on 6 long term climate stations located throughout the MLRA).

The mean annual temperature is 45.9 degrees F. The average high is 59.7 degrees F and the average low temperature is 32.1 degrees F. The prevailing wind is from the west. Average wind speed is greatest, at about 10 miles per hour, in March.

The frost-free period ranges from 79 to 103 days and the freeze free period ranges from 114 to 140 days.

*The above data is averaged from the Western Regional Climate Center and NASIS.

Table 3. Representative climatic features

Frost-free period (characteristic range)	79-103 days
Freeze-free period (characteristic range)	114-140 days
Precipitation total (characteristic range)	12-16 in
Frost-free period (average)	92 days

Freeze-free period (average)	120 days
Precipitation total (average)	14 in

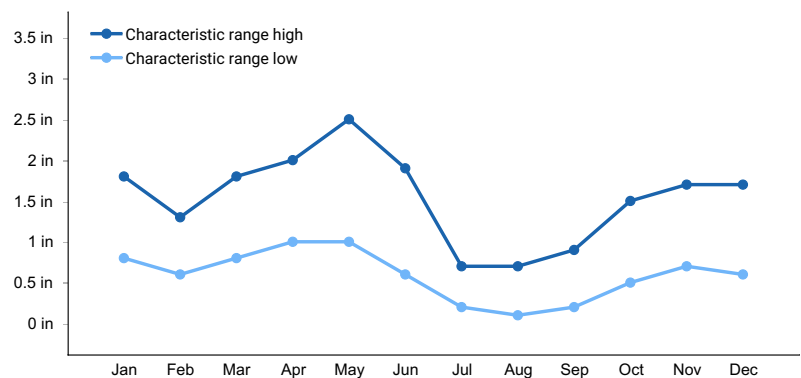


Figure 1. Monthly precipitation range

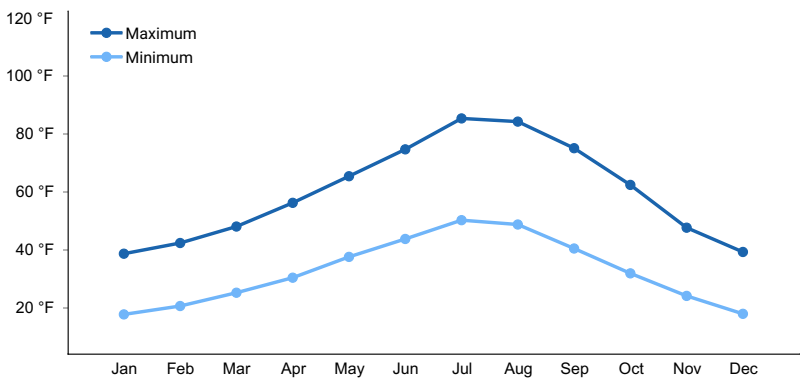


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water or wetland features commonly associated with this site.

Soil features

The soils supporting this range site are shallow, well drained with moderate to slow permeability above bedrock or a duripan. Runoff is low to very high. Erosion hazard for water is slight to high, and slight to high for wind. The available water holding capacity is very low to low. These soils are less than 20 inches (51cm) deep to either a duripan or bedrock. The surface is generally loam or silt loam texture with few or no surface stones. Large rock fragments on the surface are dominantly associated with rock outcrops. The subsurface is moderately well developed with clay content ranging from 28 to 45 percent. These soils are characterized by very limited Available Water Capacity, a torric soil moisture regime that borders on xeric, and shallow restrictive layers. Soil temperature regime is either mesic or frigid.

Soil series correlated with this site are: Flatron and Ragpie

Table 4. Representative soil features

Parent material	(1) Colluvium (2) Residuum
Surface texture	(1) Very cobbly loam (2) Stony silt loam (3) Fine sandy loam
Drainage class	Well drained
Permeability class	Slow to moderate

Depth to restrictive layer	14–20 in
Soil depth	14–20 in
Surface fragment cover <=3"	8–36%
Surface fragment cover >3"	0–30%
Available water capacity (0-20in)	1.2–3.4 in
Calcium carbonate equivalent (0-20in)	0%
Electrical conductivity (0-20in)	0 mmhos/cm
Sodium adsorption ratio (0-20in)	0
Soil reaction (1:1 water) (0-20in)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The dominant visual aspect is sagebrush/grass. Composition by weight is approximately 50 to 60 percent grass, 10 to 20 percent forbs and 15 to 30 percent shrubs.

In the last few thousand years, this site has evolved in an arid climate characterized by dry summers and cold, wet winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, Rocky Mountain elk and lagomorphs. Fire has historically occurred on the site at intervals of 50 to 70 years.

The Historic Climax Plant Community (HCPC) 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 traditional HCPC is Phase 1.1. This plant community is dominated by bluebunch wheatgrass, Thurber needlegrass and Wyoming big sagebrush. Subdominant species include Sandberg bluegrass, bottlebrush squirreltail, Indian ricegrass, arrowleaf balsamroot and tapertip hawksbeard. The plant species composition of Phase 1.1 is listed later under "HCPC Plant Species Composition".

Total annual production is 800 pounds per acre (896 kilograms per hectare) in a normal year. Production in a favorable year is 1200 pounds per acre (1344 kilograms per hectare). Production in an unfavorable year is 450 pounds per acre (504 kilograms per hectare). Structurally, cool season deep rooted perennial bunchgrasses are very dominant, followed by tall shrubs being more dominant than perennial forbs while shallow rooted bunchgrasses are subdominant.

FUNCTION:

This site is well suited for big game for late fall, winter and early spring range. It is also well suited for livestock and recreation use in the spring and fall.

Due to the rainfall, elevation and steep topography on this site, it is susceptible to degradation from erosion. Where the site occurs on gentle slopes, it is more resistant to degradation due to low overland flows of water.

Infiltration can be good and runoff low where the community is in mid to late seral status. Runoff, when it does occur, can be erosive on steeper slopes particularly during high intensity convection storms. Snow accumulates on the site due to high elevation and presence of tall shrubs.

Impact on the Plant Community:

Influence of fire:

In the absence of normal fire frequency, Wyoming big sagebrush can gradually increase on the site. Juniper can invade the site if a seed source is in the proximity. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, Wyoming big sagebrush or juniper can displace most of the primary understory species.

When fire frequency is greater than historic levels (35-55 years), Wyoming big sagebrush is reduced significantly. Dwarf green rabbitbrush can increase slightly. With continued short fire frequency, Wyoming big sagebrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass, Indian ricegrass and Thurber needlegrass. These species may be replaced by cheatgrass, Sandberg bluegrass and bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive weeds. These fine fuels will increase the fire frequency.

Influence of improper grazing management:

Season-long grazing can be very detrimental to this site. Excessive utilization is also detrimental. This type of management leads to reduced vigor of the bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to cheatgrass and/or juniper invasion, an increase in Wyoming big sagebrush and noxious and invasive weeds. Continued improper grazing management influences fire frequency by allowing cheatgrass to increase.

Good grazing management that addresses frequency, duration and intensity of grazing can also keep fine fuels from developing thus reducing fire frequency. This can lead to gradual increases in Wyoming big sagebrush and/or western juniper. A planned grazing system can be developed to intentionally accumulate fine fuels in anticipation of a prescribed fire.

Weather influences:

Above normal precipitation in March, April and May can dramatically increase total annual production of the plant community. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. Likewise, below normal precipitation during these spring months can significantly reduce total annual production and be detrimental to good seed production. Overall plant composition is normally not effected when perennials have good vigor.

Below normal temperatures in the spring can have an adverse impact on total production regardless of the precipitation. A hard, early freeze can kill some plants occasionally.

Prolonged drought adversely affects this plant community in several ways. Vigor, recruitment and production are usually reduced. Mortality can occur. Prolonged drought can lead to changes in fire frequency.

Influence of Insects and disease:

Outbreaks can affect health of vegetation. Two or more consecutive years may cause mortality of some species. The sagebrush defoliator moth (*Aroga websterii*) causes mortality in relatively small patches. It seldom kills the entire stand. Mormon cricket and grasshopper outbreaks occur periodically. Outbreaks seldom cause plant mortality since defoliation of the plant occurs only once during the year of the outbreak.

Influence of noxious and invasive weeds:

Many of these species add to the fine-fuel component and lead to increased fire frequency. Many of the perennial weeds with deep root systems compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:

Big game use this site in the spring, fall and winter. Their numbers are seldom high enough to adversely effect the plant community. Rodents provide bare ground areas that allow invasion of weedy species.

Watershed:

Decreased infiltration and increased runoff occur with the invasion of juniper or an increase in Wyoming big sagebrush. Desired understory species can be reduced. This composition change can affect nutrient and water cycles. Juniper invasion can be triggered by lack of fire, improper grazing management and prolonged drought. The increased runoff also causes sheet and rill erosion. Abnormally short fire frequency also gives the same results but to a lesser degree. The long term effect is a transition to a different state.

Practice Limitations:

Severe limitations exist for seeding on this site with ground moving equipment due to stoniness.

State and transition model

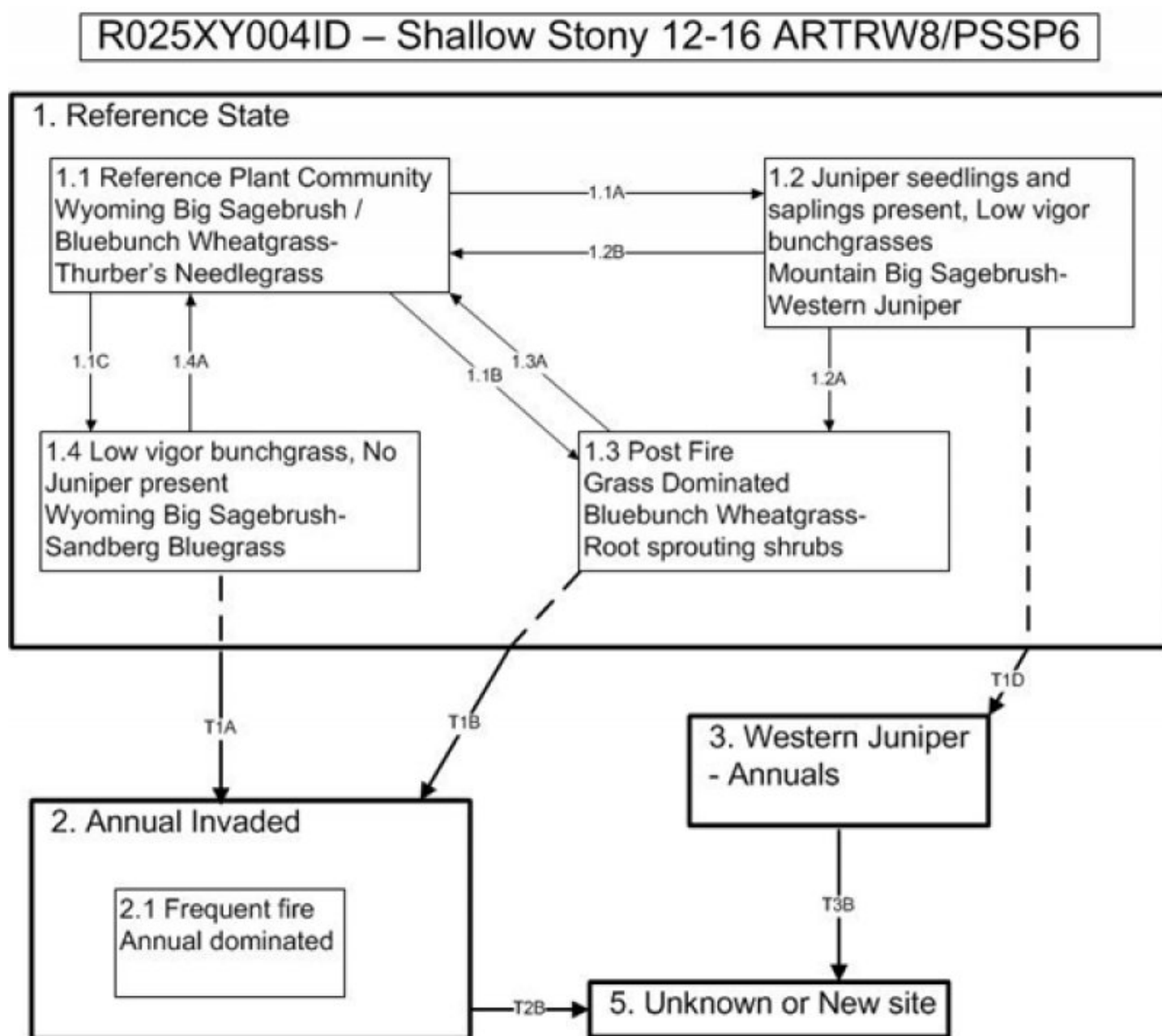


Figure 3. 25x-04

State 1

Reference State

The Reference State moves through many phases depending on the natural and human-made forces that impact the community over time. State 1, described later, indicates some of these phases. The traditional HCPC is Phase

1.1. This plant community is dominated by bluebunch wheatgrass, Thurber needlegrass and Wyoming big sagebrush. Subdominant species include Sandberg bluegrass, bottlebrush squirreltail, Indian ricegrass, arrowleaf balsamroot and tapertip hawksbeard. The plant species composition of Phase 1.1 is listed later under “HCPC Plant Species Composition”.

Community 1.1
Reference Plant Community

This plant community has Wyoming big sagebrush in the overstory with bluebunch wheatgrass in the understory. Other significant species in the plant community are Thurber’s needlegrass, bottlebrush squirreltail, Indian ricegrass, Sandberg bluegrass, arrowleaf balsamroot and tapertip hawksbeard. Natural fire frequency is 50-70 years.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	270	450	700
Shrub/Vine	110	200	300
Forb	70	150	200
Total	450	800	1200

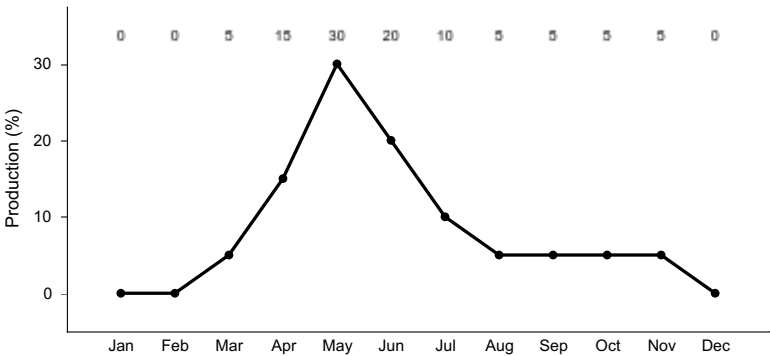


Figure 5. Plant community growth curve (percent production by month). ID0903, D25 JUOC/POSE/ANNUALS.

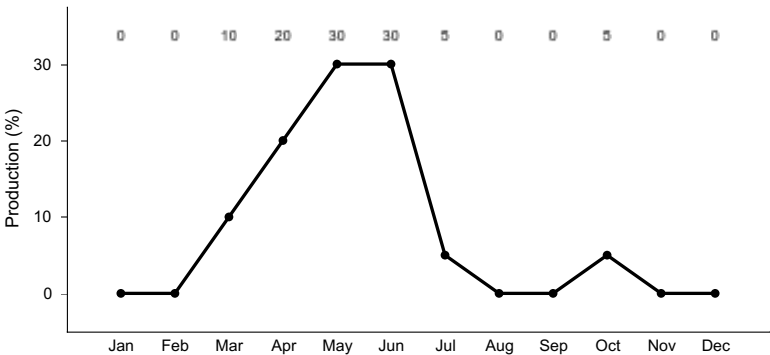


Figure 6. Plant community growth curve (percent production by month). ID0904, ARTRW8/PSSPS/ACTH7 HIGH PRECIP.

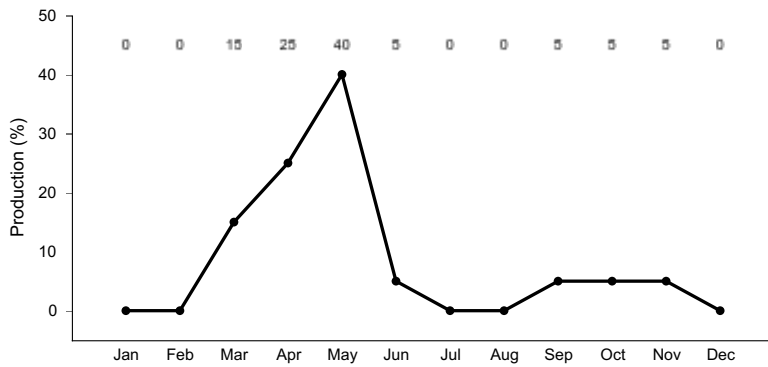


Figure 7. Plant community growth curve (percent production by month). ID0911, D25 POSE/BRTE/ANNUALS.

Community 1.2

Juniper seedlings - Low Vigor Bunchgrasses

This plant community is dominated in the overstory by Wyoming big sagebrush with some invaded juniper saplings and small trees. Bluebunch wheatgrass, Thurber's needlegrass, Indian ricegrass and Sandberg bluegrass are present in the understory but some bunchgrasses may be in reduced vigor. Some forbs such as arrowleaf balsamroot and lupine have increased. A juniper seed source is present in nearby sites. This state has developed due to fire frequency being much longer than normal or improper grazing management with no fire.

Community 1.3

Post Fire - Grass Dominated

This plant community is dominated by bluebunch wheatgrass. Thurber's needlegrass, Sandberg bluegrass, Indian ricegrass and other perennial grasses and forbs are subdominant. Most shrubs are absent from the site due to frequent fires except that some rabbitbrush may be present.

Community 1.4

Low Vigor - No Juniper

This plant community is dominated by Wyoming big sagebrush with a Sandberg bluegrass understory. Remnants of bluebunch wheatgrass and Thurber's needlegrass in low vigor are present. This plant community is the result of improper grazing management and no fire.

Pathway 1.1a

Community 1.1 to 1.2

Develops in the absence of fire. Improper grazing management could also be present. There is a juniper seed source near the site.

Pathway 1.1b

Community 1.1 to 1.3

Usually results from wildfire or brush management.

Pathway 1.1c

Community 1.1 to 1.4

Results from improper grazing management and no fire.

Pathway 1.2b

Community 1.2 to 1.1

Occurs with prescribed grazing and brush management or prescribed burning.

Pathway 1.2a
Community 1.2 to 1.3

Results from wildfire or brush management.

Pathway 1.3a
Community 1.3 to 1.1

Results from prescribed grazing and no fire.

Pathway 1.4a
Community 1.4 to 1.1

Occurs with proper grazing management.

State 2
Annual Invaded

Non-native annual plants have established in the plant community and have reduced resistance and resilience to disturbances.

Community 2.1
Frequent Fire

This plant community is dominated by cheatgrass, Sandberg bluegrass and other annuals. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices. This state has developed due to improper grazing management and frequent fire.

State 3
Western Juniper- Annuals

Western juniper dominated the plant community and few shrubs remain in the understory.

Community 3.1
Western Juniper- Annuals

This plant community is dominated by juniper. Remnants of bluebunch wheatgrass can be found in the understory. Shallow-rooted grasses, such as Sandberg bluegrass, cheatgrass and other annuals, can be found in the interspaces. Few shrubs are present. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices. This state has developed in the absence of fire. Improper grazing management can contribute to this state.

State 4
Unknown new site

Community 4.1
Unknown new site

This plant community has gone over the threshold to a new site. Site potential has been reduced. Significant soil loss has occurred. Infiltration has been reduced and run-off has become more rapid. This state has developed due to continued improper grazing management and/or frequent fires or the continued absence of fire where a juniper seed source is present. It is economically impractical to return this plant community to State 1 with accelerating practices.

Transition T1A
State 1 to 2

Develops through improper grazing management and frequent fire.

Transition T1B

State 1 to 3

Develops with no fire and improper grazing management from a juniper invaded phase of State 1.

Transition T2A

State 2 to 4

Excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and no fire or frequent fire cause this state to retrogress to a new site with reduced potential.

Transition T3A

State 3 to 4

Continued lack of fire and improper grazing management cause this state to retrogress to a new site with reduced potential due to significant soil loss and changes in hydrology.

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				270–700	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	125–330	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	45–120	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	45–120	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	20–60	–
	squirrealtail	ELEL5	<i>Elymus elymoides</i>	20–60	–
	thickspike wheatgrass	ELLA3	<i>Elymus lanceolatus</i>	15–35	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	15–35	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	15–35	–
	sedge	CAREX	<i>Carex</i>	0–10	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	1–5	–
Forb					
2				70–200	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	45–120	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	20–60	–
	longleaf phlox	PHLO2	<i>Phlox longifolia</i>	1–35	–
	desertparsley	LOMAT	<i>Lomatium</i>	1–20	–
	milkvetch	ASTRA	<i>Astragalus</i>	1–20	–
	aster	ASTER	<i>Aster</i>	1–15	–
	fleabane	ERIGE2	<i>Erigeron</i>	1–15	–
	lupine	LUPIN	<i>Lupinus</i>	1–10	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	1–10	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	0–5	–
	beardtongue	PENST	<i>Penstemon</i>	1–5	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	1–5	–
	buckwheat	ERIOG	<i>Eriogonum</i>	1–5	–
	thistle	CIRSI	<i>Cirsium</i>	1–5	–
	onion	ALLIU	<i>Allium</i>	1–5	–
	pussytoes	ANTEN	<i>Antennaria</i>	1–5	–
Shrub/Vine					
3				110–300	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata ssp. wyomingensis</i>	65–180	–
	yellow rabbitbrush	CHVIV4	<i>Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus</i>	1–35	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	1–35	–

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This rangeland ecological site provides diverse habitat for many native wildlife species. The plant community exhibits a diverse mixture of forbs throughout the growing season offering excellent habitat for invertebrates. Mule deer, pronghorn antelope, and elk may utilize the site at different times of the year. The rangeland provides seasonal habitat for resident and migratory animals including western toad, shrews, bats, ground squirrels, mice, coyote, red fox, badger, Ferruginous hawk, and prairie falcon. Area sensitive bird species include Brewer's sparrow, sage thrasher, sage sparrow, and greater sage-grouse. Water features are sparse provided by seasonal runoff, artificial water catchments, and springs.

State 1 Phase 1.1 –Wyoming Big Sagebrush/ Bluebunch Wheatgrass/ Thurber's Needlegrass/ Sandberg Bluegrass Reference Plant Community (RPC): This plant community provides a diversity of grasses, forbs, and shrubs used by native insect communities that assist in pollination. An extensive array of forbs is represented throughout the growing season leading to a diverse insect community. Many avian and mammal species utilize this habitat based on the availability of invertebrate prey species. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, western toad, and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Development of spring sites that collect all available water would exclude amphibian use on these sites. Native shrub-steppe obligate bird species utilizing the habitat include the Brewer's sparrow, sage sparrow, sage grouse, and sage thrasher. Sage-grouse habitat (leks, nesting, brood-rearing, and winter) is provided by this plant community. The plant community provides seasonal food and cover for large mammals including mule deer, pronghorn, and elk. A diverse small mammal population including golden-mantled ground squirrels, Merriam's shrew, pygmy rabbit, Columbia Plateau ground squirrel, bushy-tailed woodrat, jackrabbit, and yellow-bellied marmots may utilize this plant community.

State 1 Phase 1.2- Wyoming Big Sagebrush/ Western Juniper/ Bluebunch Wheatgrass/ Thurber's Needlegrass/ Sandberg Bluegrass Plant Community: This phase has developed due to fire frequency intervals being much longer than normal or improper grazing management with no fire. An increase in canopy cover of sagebrush and junipers contributes to a sparse herbaceous understory. A reduced herbaceous understory results in lower diversity and numbers of insects. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, and western toad. The reduced diversity of insects and understory cover may reduce the quality of food and cover for reptiles. As juniper increases, habitat quality for Brewer's sparrow, sage thrasher, and sage sparrow may decrease. Remaining sagebrush provides brood-rearing, winter cover, and winter food for sage-grouse but as juniper encroaches the quality of this habitat is severely reduced or eliminated. The plant community supports limited seasonal habitat for elk. The quality of winter habitat for mule deer will increase. As juniper encroaches the site will provide additional thermal cover for large mammals. A diverse small mammal population including golden-mantled ground squirrels, Merriam's shrew, Columbia Plateau ground squirrel, bushy-tailed woodrat, jackrabbit, and yellow-bellied marmots utilize this plant community.

State 1 Phase 1.3 – Bluebunch Wheatgrass/ Thurber's Needlegrass/ Sandberg Bluegrass Plant Community: This plant community is a result of recent wildfire, prescribed burning, or brush management. The plant community, dominated by herbaceous vegetation with little or no sagebrush would provide less vertical structure for animals. Patches of root sprouting shrubs (rabbitbrushes) may be present to provide limited vertical structure for wildlife. Insect diversity would be reduced but a native forb plant community similar to the one in State 1 Phase 1.1 would still support select pollinators. Habitat for common sagebrush lizard and western rattlesnake would be limited due to the loss of sagebrush. The dominance of herbaceous vegetation with little sagebrush canopy cover would limit use of these areas as nesting habitat by Brewer's sparrow, sage sparrow, sage grouse, and sage thrasher. Brood-rearing habitat for sage-grouse would be provided if the site is adjacent to sagebrush cover. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark, savannah sparrow, vesper sparrow, and western meadowlark). Mule deer and elk use would be seasonal but the site would offer little thermal or young of year cover due to the loss of shrub cover. The populations of small mammals would be dominated by open grassland species. Large blocks of this plant community would fragment the reference plant community and reduce the quality of the habitat for shrub-steppe obligate animal species.

State 1 Phase 1.4 –Wyoming Big Sagebrush / Sandberg Bluegrass Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. The reduced herbaceous understory results in lower diversity of insects. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, and western toad. Amphibians are associated with springs adjacent to the site. The reduced diversity of insects may reduce reptile diversity and populations. Reduced herbaceous understory is a key factor in limiting the use of this plant community by ground nesting bird species. Shrub-steppe obligate birds include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Habitat (brood-rearing and nesting cover) quality for sage-grouse is reduced due to a less diverse herbaceous plant community. Winter habitat (cover and food) for sage-grouse is provided. The reduced vigor of understory vegetation provides a shorter forage season for mule deer and elk. Young of year cover would be provided for deer. Small mammal diversity and populations would be similar to those in State 1 Phase 1.1.

State 2 – Cheatgrass/ Sandberg/ Annuals Plant Community:

This community has developed due to continued improper grazing management and frequent fire. The plant community does not support a diverse insect community. The reduced forb and shrub components in the plant community would support a very limited population of pollinators. Most reptilian species are not supported with food or cover. This plant community does not support the habitat requirements for sage thrasher, Brewer's sparrow, sage-grouse, or sage sparrow. Diversity of grassland avian species is reduced due to poor food and cover conditions. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Large mammals may utilize the herbaceous vegetation in spring and summer when the vegetation is more palatable. The populations of small mammals would be dominated by open grassland species. Large blocks of this plant community would fragment the reference plant community and reduce the quality of the habitat for shrub-steppe obligate animal species.

State 3 - Utah Juniper/ Sandberg Bluegrass/ Annuals Plant Community: This state has developed due to improper grazing management and no fire. The loss of native understory vegetation will reduce insect diversity on the site. This plant community does not support the habitat requirements for sage-grouse. Birds using this site as resident or migratory habitat include Juniper titmouse, western bluebird, and Virginia's warbler. The Juniper titmouse relies heavily on juniper seeds for winter food. Raptor hunting success may decrease due to a heavy overstory of juniper. Hunting success by raptors on adjacent ecological sites may increase due to an increase in roosting sites. The plant community supports limited seasonal habitat for mule deer and elk in the spring and fall. As juniper encroaches the site will provide additional thermal cover for large mammals. This site can provide food and cover for mule deer in winter.

Grazing Interpretations.

This site is best suited for livestock grazing in the spring and fall.

Estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory, past use history and type, condition of vegetation, production, season of use and seasonal preference.

Hydrological functions

The soils in this site are in hydrologic group D. When the hydrologic conditions of the vegetative cover is good, natural erosion hazard is slight.

Recreational uses

Recreation use of this site includes hunting, hiking, horseback riding, plant and animal observation. Due to the relative abundance of wildlife that use this site, hunting opportunities are good.

Wood products

Mature juniper that has invaded on the site can be cut for posts, poles, firewood and lumber.

Other products

None.

Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. Those involved in developing this site description include:

Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC

Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC

Jim Cornwell, State Rangeland Management Specialist, NRCS, Idaho

Type locality

Location 1: Twin Falls County, ID	
Latitude	42° 21' 7"
Longitude	114° 24' 7"

Other references

Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush- Grass Habitat Types of Southern Idaho. University of Idaho. Moscow, Idaho. Bulletin Number 35

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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

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Contributors

Dave Franzen And Jacy Gibbs

Approval

Kendra Moseley, 4/24/2024

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.

Author(s)/participant(s)	
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Date	07/03/2007
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills can occur on this site, but not extensively. If rills are present, they are likely to occur on slopes greater than 20 percent and immediately following wildfire. Rills are most likely to occur on soils with surface textures of silt loam and clay loam.

2. **Presence of water flow patterns:** Water-flow patterns occur on this site. When they occur, they are short and disrupted by cool season grasses and tall shrubs and are not extensive. Gravelly surface texture interrupts flows on lesser slopes.

3. **Number and height of erosional pedestals or terracettes:** Pedestals and/or terracettes occur on this site but are not extensive. In areas where slopes approach 20 percent and where flow patterns and/or rills are present, a few pedestals may be expected. Terracettes also occur on the site uphill from tall shrub bases and large bunchgrasses. They are not extensive.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** On sites in mid-seral status, bare ground may range from 30-50 percent.

5. **Number of gullies and erosion associated with gullies:** None.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind-scoured, blowouts, and/or deposition areas usually are not present. Immediately following wildfire, some soil movement may occur on lighter textured soils.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter in the interspaces may move up to 3 feet following a significant run-off event. Coarse litter generally does not move. Gravels on the surface help reduce fine litter movement.

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.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface is typically 4 inches thick. Structure ranges from weak thin to moderate medium platy, fine or moderate medium subangular blocky, and weak very fine or moderate granular. Soil organic matter (SOM) ranges from 1 to 2 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses, especially deep-rooted perennials, slow run-off and increase infiltration. Tall shrubs accumulate snow in the interspaces.

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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):** Compaction layer is 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: Cool season, deep-rooted perennial bunchgrasses>>tall shrubs

Sub-dominant: Perennial forbs>shallow rooted bunchgrasses

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Wyoming big sagebrush will become decadent in the absence of normal fire frequency. Grass and forb mortality will occur as tall shrubs increase.
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14. **Average percent litter cover (%) and depth (in):** Additional litter cover data is needed but is expected to be 15-20 percent to a depth of 0.1 inches. Under mature shrubs, litter is >0.5 inches deep and is 90-100 percent ground cover.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual Production is 800 pounds per acre (896 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 50-60 percent of the total production, forbs 10-20 percent and shrubs 15-30 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:** Invasive Plants include cheatgrass, bulbous bluegrass, rush skeletonweed, musk and scotch thistle and diffuse and spotted knapweed.
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17. **Perennial plant reproductive capability:** All functional groups have the potential to reproduce in most years.
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