

Ecological site R009XY015ID **Dense Stony Clay 22+ PZ DACA3-JUBA**

Last updated: 9/23/2020
 Accessed: 05/10/2025

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
R009XY004ID	South Slope Loamy 16-22 PZ
R009XY008ID	Schist 16-22 PZ PSSPS-FEID
R009XY010ID	South Slope Schist 16-22 PZ PSSPS-POSE
R009XY016ID	Loamy 22+ PZ FEID-PSSPS
R009XY017ID	Very Shallow 12-22 PZ PSSPS-POSE

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level to gently sloping topography. Slopes are generally less than 12 percent but occasionally are up to 25 percent. Elevations range from 3000 to 4500 feet (900-1350 meters).

Table 2. Representative physiographic features

Landforms	(1) Hill
Elevation	3,000–4,500 ft
Slope	0–30%
Water table depth	60 in

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

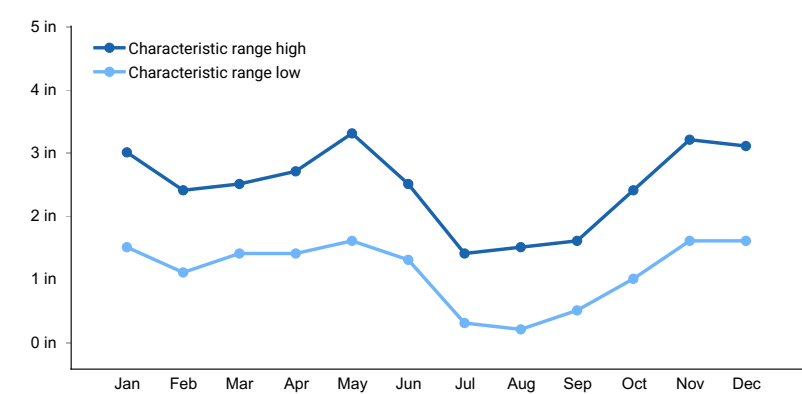


Figure 1. Monthly precipitation range

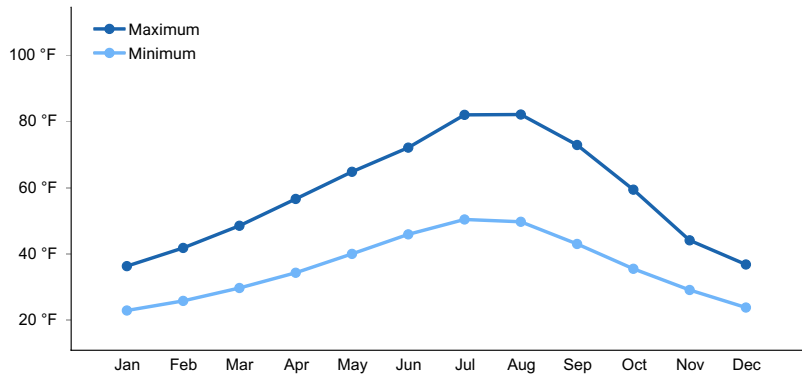


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

This site is not influenced by adjacent wetlands, streams, or run on.

Soil features

The soils on this site are stony phases of vertisols, deep to very deep silty clays. They are well drained, with slow permeability and moderate available water capacity. Runoff is moderate to very high and the water erosion hazard is slight to severe depending on slope. The surface layers are slightly acid to neutral and neutral to moderately alkaline in the underlying material. Segregated lime is between depths of 70 and 160 cm. The extreme stoniness affects available water for vegetation production. Due to the dense clay soils and high surface stones, runoff can be high particularly with summer convection storms. These soils are characterized by a xeric moisture regime. The soil temperature regime is mesic.

Soil Series Correlated to this Ecological Site

Fenn - very stony silty clay, phase

Table 4. Representative soil features

Surface texture	(1) Very stony silty clay loam (2) Stony silty clay (3) Extremely stony
Drainage class	Well drained
Permeability class	Slow
Soil depth	60 in
Surface fragment cover <=3"	4%
Surface fragment cover >3"	12%
Available water capacity (0-40in)	4.8–5.7 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)	5–20%
Subsurface fragment volume >3" (Depth not specified)	15–30%

Ecological dynamics

The dominant visual aspect of this site is grassland with California oatgrass with some Baltic rush and sedges subdominant. Composition by weight is approximately 75 to 85 percent grasses, 15 to 20 percent forbs, and trace to 3 percent shrubs.

During the last few thousand years, this site has evolved in a semi-arid climate characterized by dry summers and cold, moist winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include mule deer and lagomorphs.

Fire has historically occurred on the site at intervals of 20 - 50 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 California oatgrass with Baltic rush and sedges subdominant. There are a variety of forbs in small amounts. Woods' rose can also occur in small amounts. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 1600 pounds per acre (1792 kilograms per hectare) in a normal year. Production in a favorable year is 1800 pounds per acre (2016 kilograms per hectare). Production in an unfavorable year is 1200 pounds per acre (1344 kilograms per hectare). Structurally, cool season deep-rooted perennial bunchgrasses are more dominant than forbs followed by shallow rooted perennial grasses more dominant than shrubs.

This site provides fair to good habitat for various upland wildlife. It is also suited for livestock in the late spring, summer, and fall. This site has limited value for recreation and aesthetics but provides some opportunities for hunting. The site is not easily degraded due to stony surface. Surface stones limit livestock access. Associated

sites will usually degrade before this site.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency and ungulate grazing, Baltic rush, sedges, some forbs, and Woods' rose may increase slightly.

When fires become more frequent than historic levels (20-50 years), California oatgrass can be reduced in the plant community. Sandberg bluegrass will increase significantly. Baltic rush and sedges may increase slightly. Woods' rose, if present, will resprout. With continued short fire frequency, California oatgrass can be completely eliminated along with some forbs. These species may be replaced by bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants. Japanese brome and medusahead may invade the site. These fine fuels will increase the fire frequency.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. This type of management leads to reduced vigor of the bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, an increase in Sandberg bluegrass will occur and noxious and invasive species will invade. Kentucky bluegrass will initially invade the site. But with continued improper grazing management, Japanese brome and medusahead will be the primary annuals invading the site. Medusahead is well adapted to clay soils and can dominate the site with continued improper grazing management.

Continued improper grazing management influences fire frequency by reducing perennial fine fuels and replacing them with flashy annual fine fuels. As annuals increase, fires become more frequent.

Early spring grazing when the soils are wet can damage plants through trampling and can lead to a compaction layer in the soil.

Proper grazing management that addresses frequency, duration, and intensity of grazing can also keep fine fuels from developing, thereby reducing fire frequency.

Weather influences:

Above normal precipitation in April, May, and June 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 viable seed production. Over all plant composition is normally not affected when perennials have good vigor.

An early, hard freeze can occasionally kill some plants. 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 a reduction in fire frequency.

Influence of insects and disease:

Outbreaks can affect vegetation health. 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 plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency. Annual and perennial invasive species 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 animals will use this site occasionally. Their numbers are seldom high enough to adversely affect the plant community.

Watershed:

Decreased infiltration and increased runoff occur with a decrease in perennial bunchgrasses. This composition change can affect nutrient and water cycles. 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.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.

Phase A to B. Develops with improper grazing management and no fire.

Phase A to C. Develops with fire.

Phase B to A. Develops with prescribed grazing.

Phase C to A. Develops with prescribed grazing and no fire.

State 1, Phase B to State 2. Develops through frequent fire and continued improper grazing management. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

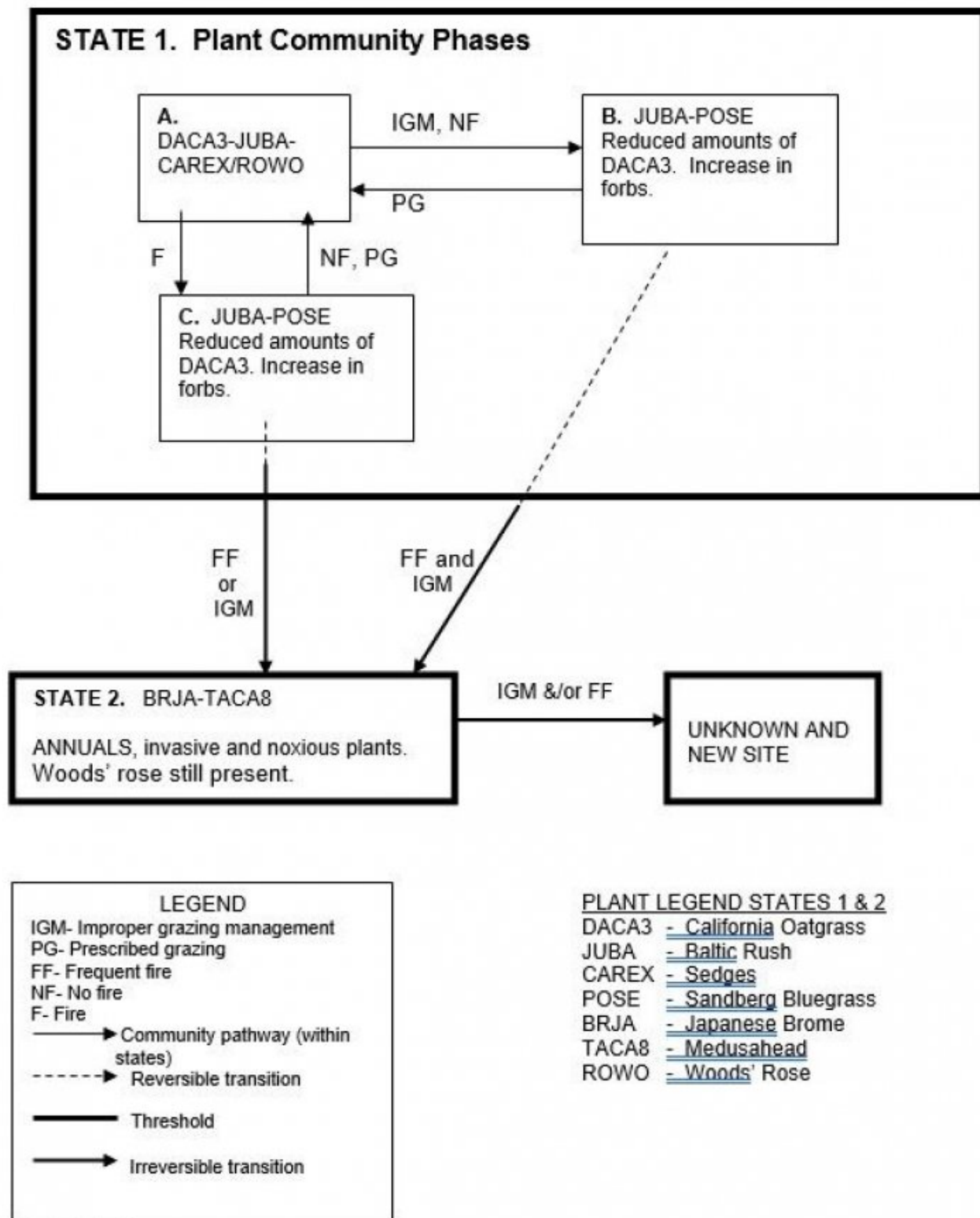
State 1, Phase C to State 2. Develops through frequent fire or continued improper grazing management. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and/or frequent fire cause this state to cross a threshold and retrogress to a new site with reduced potential. It is economically impractical to return this plant community to State 1 with accelerating practices.

Practice Limitations:

Severe limitations exist for seeding on this site due to clay soils and stoniness. Only slight limitations exist for livestock movement on this site due to topography but surface stones can limit livestock movement. Moderate to severe limitations exist for facilitating practices due to surface stones.

State and transition model



State 1

State 1 Phase A

Community 1.1

State 1 Phase A

State 1, Phase A. Reference Plant Community Phase. This plant community is dominated by California oatgrass with Baltic rush and sedges subdominant. There are a variety of forbs in small amounts. Woods' rose can occur in small amounts also. Natural fire frequency is 20-50 years.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	960	1280	1440
Forb	215	290	325
Shrub/Vine	25	30	35
Total	1200	1600	1800

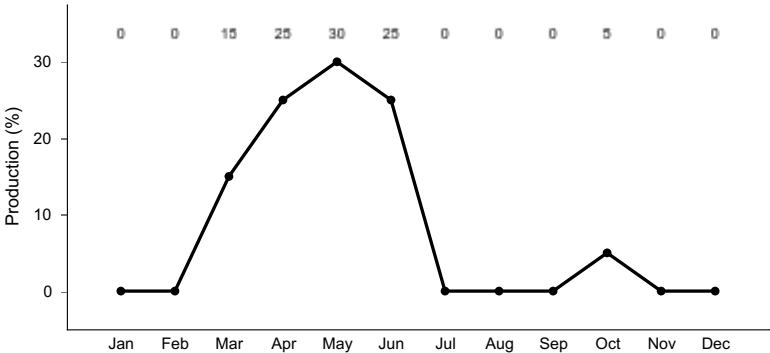


Figure 4. Plant community growth curve (percent production by month).
ID0105, B9 SOUTH SLOPES PSSPS-FEID.

State 2
State 1 Phase B

Community 2.1
State 1 Phase B

State 1, Phase B. This plant community is dominated by Baltic rush and Sandberg bluegrass. Forbs may have increased in the plant community. California oatgrass and sedges have decreased and may be in low vigor. Many forbs have increased. Woods’ rose may have increased in the community. Kentucky bluegrass may have invaded the site as well as Japanese brome and medusahead. This plant community is the result of improper grazing management and no fire.

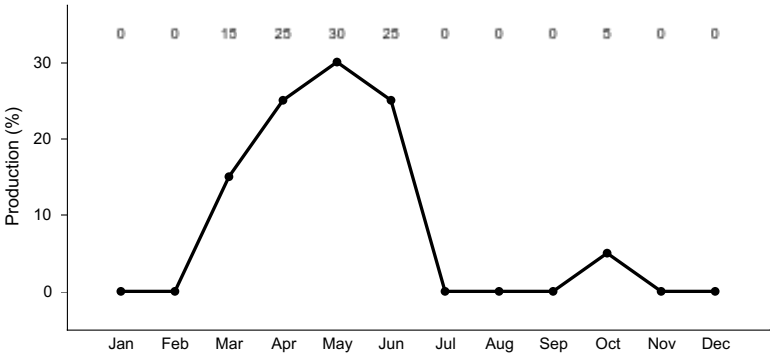


Figure 5. Plant community growth curve (percent production by month).
ID0105, B9 SOUTH SLOPES PSSPS-FEID.

State 3
State 1 Phase C

Community 3.1
State 1 Phase C

State 1, Phase C. This plant community is dominated by Baltic rush with Sandberg bluegrass. Many forbs have increased. California oatgrass has been reduced in the plant community. Woods’ rose has resprouted but has not increased. Some Japanese brome and medusahead may have invaded the site. This plant community is the result of wildfire.

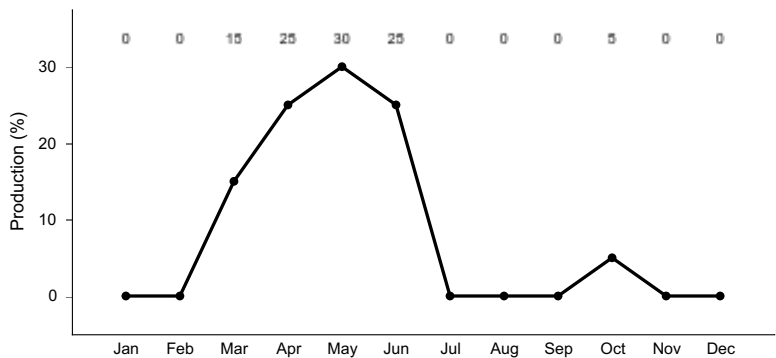


Figure 6. Plant community growth curve (percent production by month). ID0105, B9 SOUTH SLOPES PSSPS-FEID.

State 4
State 2

Community 4.1
State 2

State 2. This plant community is dominated by annual grasses and forbs including invasive and noxious plants. The dominant annuals are Japanese brome and medusahead. Woods’ rose is still present in small amounts. Some soil loss has occurred. This state has developed due to frequent fires and improper grazing management from Phase B, State 1. It also occurs with frequent fire or improper grazing management from Phase C, State 1. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices.

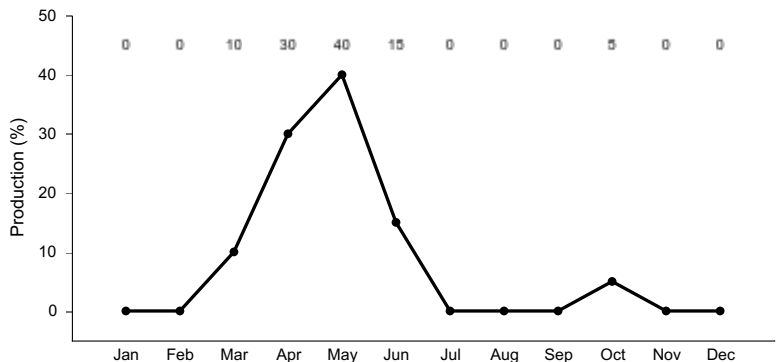


Figure 7. Plant community growth curve (percent production by month). ID0102, B9 BRTE-ANNUALS. State 2.

State 5
State 3

Community 5.1
State 3

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			–	
	California oatgrass	DACA3	<i>Danthonia californica</i>	540–810	–
	mountain rush	JUARL	<i>Juncus arcticus ssp. littoralis</i>	120–180	–
	sedge	CAREX	<i>Carex</i>	90–135	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	35–55	–
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata ssp. spicata</i>	35–55	–
	Canada bluegrass	POCO	<i>Poa compressa</i>	0–10	–
2	Big Bluegrass			–	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0–10	–
Forb					
3	Forbs			–	
	lambstongue ragwort	SEIN2	<i>Senecio integerrimus</i>	90–135	–
	nineleaf biscuitroot	LOTR2	<i>Lomatium triternatum</i>	90–135	–
	knotweed	POLYG4	<i>Polygonum</i>	55–80	–
	cinquefoil	POTEN	<i>Potentilla</i>	35–55	–
	pale agoseris	AGGL	<i>Agoseris glauca</i>	25–35	–
	beardtongue	PENST	<i>Penstemon</i>	25–35	–
	erigenia	ERIGE	<i>Erigenia</i>	25–35	–
	clover	TRIFO	<i>Trifolium</i>	25–35	–
	lupine	LUPIN	<i>Lupinus</i>	25–35	–
	meadow deathcamas	ZIVE	<i>Zigadenus venenosus</i>	1–20	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0–10	–
	hedgemustard	SISYM	<i>Sisymbrium</i>	0–10	–
	longleaf phlox	PHLO2	<i>Phlox longifolia</i>	0–10	–
	fiveleaf cinquefoil	PONIP	<i>Potentilla nivea var. pentaphylla</i>	0–10	–
	largehead clover	TRMA3	<i>Trifolium macrocephalum</i>	0–10	–
	little larkspur	DEBI	<i>Delphinium bicolor</i>	0–10	–
	western pearly everlasting	ANMA	<i>Anaphalis margaritacea</i>	0–10	–
	nodding microseris	MINU	<i>Microseris nutans</i>	0–10	–
	Hooker's balsamroot	BAHO	<i>Balsamorhiza hookeri</i>	0–10	–
Shrub/Vine					
4	Shrubs			–	
	Woods' rose	ROWO	<i>Rosa woodsii</i>	1–35	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–10	–

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This rangeland ecological site provides habitat for many upland wildlife species. The annual precipitation results in abundant forage attracting invertebrate and vertebrate animals to this site. Habitat is provided for resident and migratory animals including western toad, western rattlesnake, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, Ferruginous hawk, prairie falcon, grasshopper sparrow, horned lark, and western meadowlark. Large herbivore use of the ecological site is dominated by mule deer, white-tailed deer, and elk. Native reptiles and amphibians may utilize these sites on a seasonal basis during the year. Area sensitive species that may frequent the site for part of their life include northern leopard frog, ring-necked snake, Coeur d'Alene salamander, long-billed curlew, and Woodhouse's toad. Water features are provided by seasonal runoff, artificial water catchments, and natural springs.

State 1 Phase 1.1 – California Oatgrass/ Baltic Rush/ Sedges/ Wood's Rose Reference Plant Community (RPC): The RPC provides a diversity of grasses and forbs used by native insect communities who assist in pollination of the plant community. The insects are food for the many predator species utilizing the site. California oatgrass provides desirable habitat and is a habitat component for endemic organisms including sensitive butterflies and beetles. The foliage is also eaten by certain caterpillars and the grains are consumed by birds and mammals. The reptile and amphibian community is represented by western rattlesnake, rubber boa, northern alligator lizard, terrestrial gartersnake, western toad, Columbia spotted frog, and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Spring developments that capture all available water would preclude the use of this site by amphibians. The plant community supports a variety of migratory and resident avian species that depend on grassland plant communities for food, brood-rearing, and nesting cover. They may include savannah sparrow, lark sparrow, grasshopper sparrow, Say's phoebe, western kingbird, horned lark, and western meadowlark. The plant community provides spring forage for elk and mule deer. California oatgrass offers fair forage for large herbivores in the spring. A small mammal population including deer mouse, western jumping mouse, white-tailed jackrabbit, meadow vole, Preble's shrew, and Merriam's shrew may utilize the site on a seasonal basis.

State 1 Phase 1.2 - Baltic Rush/ Sandberg Bluegrass Plant Community: This phase has developed due to improper grazing management. Reduced amount and vigor of California oatgrass would lower the quality of the habitat for insects. Continued improper grazing management would lower the quality of amphibian and reptile habitat due to a more open landscape and reduced vertical plant structure. The quality of habitat for ground nesting birds would decrease with the loss of vigor of California oatgrass and sedges. The quality of forage for large herbivores would be reduced. Baltic rush is not considered desirable forage for large herbivores. Small mammal populations and diversity would be reduced due to poor cover and food conditions resulting from poor grazing management.

State 2 –Japanese Brome/ Medusahead Rye Plant Community: This state has developed due to frequent fires and improper grazing management from State 1 Phase 1.2. The diversity and amount of pollinators would decrease with the loss of native forbs. Quality of cover and forage habitat for amphibians and reptiles would be reduced due to a conversion to an annual plant dominated community. Habitat quality for grassland bird species described in State 1 Phase 1.1 would decrease due to a loss of the perennial plant community. Birds of prey (northern harrier and Ferruginous hawk) may range throughout these areas looking for prey species. Large herbivores may utilize the herbaceous vegetation in early spring when invasive annuals are more palatable. They would not utilize the site in other seasons. Small mammal populations would be reduced due to reduced vertical structure and increased hunting success of predators. Large blocks of this plant community would fragment the reference plant community and reduce the quality of the habitat for animal species that historically used the site.

Grazing Interpretations.

This site is best suited to grazing in late spring, summer, and fall by domestic livestock. Extremely stony areas can somewhat limit livestock movement. Avoid grazing the site when soils are wet as trampling damage and/or compaction can occur.

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 D. When hydrologic conditions of the vegetative cover are good, natural erosion hazard is slight.

Recreational uses

This site has limited value for recreation and aesthetics.

Wood products

None.

Other products

None.

Other information

Field Offices

Grangeville, ID
Nezperce, ID
Orofino, ID
Lewiston, ID
Moscow, ID
Plummer, ID
Coeur d'Alene, ID

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, Range Management Specialist, IASCD
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho
Bruce Knapp, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Range Management Specialist, IASCD

Type locality

Location 1: Idaho County, ID	
General legal description	South of Grangeville.

Other references

USDA Forest Service, Rocky Mountain Research Station. 2004. Restoring Western Ranges and Wildlands. General Technical Report RMRS-GTR-136-vols. 1-3.
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/feis.
USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland 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	04/16/2009
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** Rills rarely occur on this site. If rills are present they are likely to occur on slopes greater than 15 percent and immediately following wildfire. Surface stones reduce rill development.

- Presence of water flow patterns:** Water-flow patterns can occur on this site, particularly on slopes greater than 10 percent. When they occur they are short and disrupted by cool season grasses and surface stones and are not extensive.

- Number and height of erosional pedestals or terracettes:** Both are rare on this site. In areas where slopes approach 10 percent and where flow patterns and/or rills are present, a few pedestals may be expected. Do not mistake frost heaving for pedestals.

- 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 25-35 percent.

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

- Extent of wind scoured, blowouts and/or depositional areas:** None are present.

- Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces may move

up to 2 feet following a significant run-off event or fall into cracks in the soil. Coarse litter generally does not move.

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 3 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):** Structure is strong fine and very fine granular; very hard, firm, very sticky and very plastic. Soil organic matter ranges from 2 to 4 percent. The Ap horizon is typically 6 inches thick. Moist surface color is very dark gray.
-
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.
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Is not present. Do not mistake an increase in clay content for a compaction layer.
-
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
- Sub-dominant: perennial forbs
- Other: shallow rooted bunchgrasses
- Additional: shrubs
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant decadence usually does not occur. Some mortality may occur from the shrink-swell of the clay soils.
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14. **Average percent litter cover (%) and depth (in):** Additional litter cover data is needed but is expected to be 20-25 percent to a depth of < 0.1 inches.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Is 1600 pounds per acre (1792 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 75-85 percent of the total production, forbs 15-20 percent, and shrubs a trace to 3 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 cheatgrass, bulbous bluegrass, rush skeletonweed, musk and scotch thistle, diffuse and spotted knapweed, leafy spurge, Kentucky bluegrass, medusahead, and tarweed.

17. **Perennial plant reproductive capability:** All functional groups have the potential to reproduce in most years.
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