

# Ecological site R023XY301OR DROUGHTY SOUTH SLOPES 11-13 PZ

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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.



Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

## Associated sites

R023XY216OR	<b>CLAYPAN 12-16 PZ</b> Claypan 12-16" PZ
R023XY310OR	<b>NORTH SLOPES 12-16 PZ</b> North Slopes 12-16" PZ
R023XY316OR	<b>DROUGHTY LOAM 11-13 PZ</b> Droughty Loam 11-13" PZ
R023XY318OR	<b>LOAMY 12-16 PZ</b> Loamy 12-16" PZ

## Similar sites

R023XY300OR	<b>SOUTH SLOPES 10-12 PZ</b> South Slopes 8-10" PZ
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>tridentata</i>

Herbaceous	(1) <i>Pseudoroegneria spicata</i> ssp. <i>spicata</i> (2) <i>Achnatherum thurberianum</i>
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## Physiographic features

This site occurs on south exposures of escarpments and mountain side slopes. Slopes range from 20 to 70 percent. Elevation varies from 4500 to 6500 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Escarpment (2) Mountain slope
Elevation	4,500–6,500 ft
Slope	20–70%
Aspect	S

## Climatic features

The annual precipitation ranges from 11 to 13 inches, most of which occurs in the form of snow during the months of December through March. Spring rains are common. Localized convection storms occasionally occur during the summer. The soil temperature regime is frigid (aspect puts this site in the warmer portion of frigid) with a mean annual air temperature of 47 degrees F. Temperature extremes range from 100 to -30 degrees F. The frost-free period ranges from 50 to 80 days. The optimum growth period for native plants is from April through June.

**Table 3. Representative climatic features**

Frost-free period (average)	80 days
Freeze-free period (average)	0 days
Precipitation total (average)	13 in

## Influencing water features

### Soil features

The soils of this site are shallow to moderately deep and well-drained. Typically the surface layer is a very stony loam about 10 inches thick. The subsoil is a clay loam about 10 to 20 inches thick. Depth to bedrock or an indurated pan is less than 40 inches. Permeability is moderate. The available water holding capacity (AWC) is about 1 to 4 inches for the profile. The potential for water erosion is moderate to severe.

**Table 4. Representative soil features**

Parent material	(1) Residuum–basalt (2) Colluvium–welded tuff
Surface texture	(1) Very stony loam (2) Very stony sandy loam (3) Gravelly clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderate
Soil depth	20–40 in
Surface fragment cover <=3"	10–25%

Surface fragment cover >3"	25–40%
Available water capacity (0-40in)	1.1–3.8 in
Soil reaction (1:1 water) (0-40in)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	13–33%
Subsurface fragment volume >3" (Depth not specified)	30–40%

## Ecological dynamics

Range in Characteristics:

The reference native plant community is dominated by basin big sagebrush and bluebunch wheatgrass. Thurber's needlegrass, Idaho fescue, and Sandberg bluegrass are prominent in the stand. The vegetative composition of the community is approximately 80 percent grasses, 5 percent forbs, and 15 percent shrubs.

Bluebunch wheatgrass will increase as the soil surface texture becomes finer. Thurber needlegrass increases on coarse surface textures. Production will increase at the upper end of the precipitation zone and on deeper foot slope soils. As a fire susceptible site, the amount of basin big sagebrush is influenced by fire frequency.

Four states have been identified for this site: a reference state; a state with the presence of annuals; a state with a shrub/annual co-dominance; and a state with annual dominance.

Reference State: Plant community phase change is driven by infrequent fire. Mountain and basin big sagebrush decline after fire while Thurber's needlegrass, and other grasses increase. Rabbitbrush may temporarily increase after fire. Time facilitates the reintroduction of sagebrush. The introduction of invasive annual grasses and forbs transitions into state 2.

State 2: Compositionally similar to the reference state with a trace of cheatgrass and weedy forbs. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. Prescribed grazing and infrequent fire (> 50 year return interval) maintain state dynamics. Improper timing and/or intensity of grazing or prolonged drought favors mountain and basin big sagebrush, squirreltail and Sandberg's bluegrass. Prescribed grazing and/or release from drought may reverse the decline in needlegrass and other bunchgrass production. Infrequent fire reduces the shrub community and promotes the bunchgrass component. Mismanaged grazing and/or prolonged drought leads to a biotic threshold and into state 3.

State 3: Mountain and basin big sagebrush is decadent with little recruitment. The perennial grass component is significantly reduced in both density and productivity. Cheatgrass and/or annual forbs and/or Sandberg bluegrass along with sagebrush control site resources and drive ecological dynamics. Bare ground is abundant. Spatial and temporal energy capture and nutrient cycling has been truncated. Infiltration may be reduced due to lack of ground cover. Risk of soil erosion by both wind and water is increased. Catastrophic wildfire will lead to an abiotic threshold and into state 4.

State 4: Cheatgrass and/or annual weed dominated plant community with limited to no shrub or perennial grass component. Soil erosion and redistribution along with changes in dynamic soil properties affect the hydrologic cycle and thus the nutrient cycle. Harsh environmental factors increase state resiliency to change.

Response to Disturbance:

If the condition of the site deteriorates as a result of overgrazing, bluebunch wheatgrass, and Thurber's needlegrass decrease while big sagebrush and Sandberg bluegrass increase. With further deterioration annuals invade and bareground increases. Excess erosion in the bare interspaces reduces the site productivity and contributes to downstream sedimentation.

## State and transition model

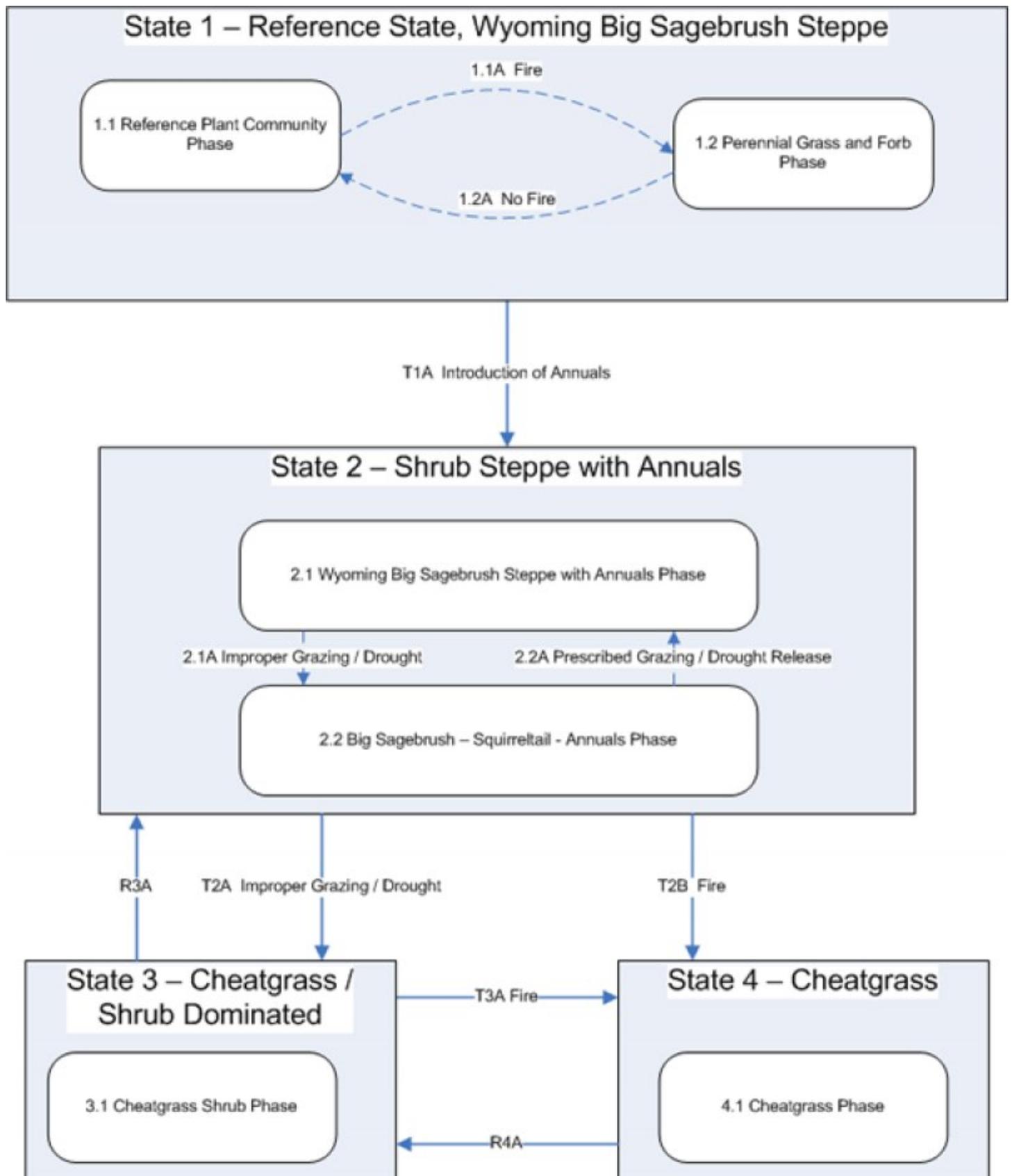


Figure 2. Group 6, STM

**State 1**  
**Reference State**

**Community 1.1**  
**Reference Plant Community**

The potential native plant community is dominated by basin big sagebrush and bluebunch wheatgrass. Thurber's needlegrass, Idaho fescue, and Sandberg bluegrass are prominent in the stand. The vegetative composition of the community is approximately 80 percent grass, 5 percent forbs, and 15 percent shrubs. Approximate ground cover is 50-70 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	560	720	960
Shrub/Vine	105	135	180
Forb	35	45	60
<b>Total</b>	<b>700</b>	<b>900</b>	<b>1200</b>

## Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Perennial, deep-rooted, dominant</b>			450–720	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	270–450	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	180–270	–
2	<b>Perennial, deep-rooted, sub-dominant</b>			54–108	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	45–90	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	9–18	–
4	<b>Perennial, shallow-rooted, sub-dominant</b>			18–45	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	18–45	–
5	<b>Other perennial grasses, all</b>			18–36	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0–18	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–18	–
<b>Forb</b>					
7	<b>Perennial, all, dominant</b>			18–45	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	18–45	–
8	<b>Perennial, all, sub-dominant</b>			18–36	
	milkvetch	ASTRA	<i>Astragalus</i>	9–18	–
	lupine	LUPIN	<i>Lupinus</i>	9–18	–
9	<b>Other perennial forbs, all</b>			9–36	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0–9	–
	agoseris	AGOSE	<i>Agoseris</i>	0–9	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–9	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0–9	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	0–9	–
	fleabane	ERIGE2	<i>Erigeron</i>	0–9	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–9	–
	desertparsley	LOMAT	<i>Lomatium</i>	0–9	–
	phlox	PHLOX	<i>Phlox</i>	0–9	–

	deatncamas	ZIGAD	<i>Zigadenus</i>	0-9	-
<b>Shrub/Vine</b>					
11	<b>Perennial, evergreen, dominant</b>			45-90	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	45-90	-
12	<b>Perennial, evergreen, sub-dominant</b>			18-45	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	18-45	-
15	<b>Other perennial shrubs, all</b>			9-27	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata ssp. wyomingensis</i>	0-9	-
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0-9	-
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0-9	-
	currant	RIBES	<i>Ribes</i>	0-9	-
	horsebrush	TETRA3	<i>Tetradymia</i>	0-9	-
<b>Tree</b>					
16	<b>Perennial, evergreen, dominant</b>			0-9	
	western juniper	JUOC	<i>Juniperus occidentalis</i>	0-9	-

## Animal community

Livestock Grazing:

This site is suited to use by cattle, sheep, and horses in late spring and fall under a planned grazing system. Use should be postponed until the soils are firm enough to prevent trampling damage and soil compaction.

Native Wildlife Associated with the Potential Climax Community:

Deer  
Antelope  
Hawks  
Songbirds  
Rodents

This site will offer food and cover for mule deer, antelope, rodents, and a variety of birds. It is an important wintering area for mule deer.

## Hydrological functions

The soils are in hydrologic group C. The soils of this site have moderately high runoff potential.

## Contributors

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## 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)	Jeff Repp and Bruce Frannsen
Contact for lead author	State Rangeland Management Specialist for NRCS - OR
Date	08/17/2012
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** None to some, Moderate to severe sheet & rill erosion hazard  


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2. **Presence of water flow patterns:** None to some  


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3. **Number and height of erosional pedestals or terracettes:** None to some terracettes  


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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5-20%  


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


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6. **Extent of wind scoured, blowouts and/or depositional areas:** None, Slight wind erosion hazard  


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7. **Amount of litter movement (describe size and distance expected to travel):** Fine - limited movement  


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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):** Moderately resistant to erosion: aggregate stability = 3-5  


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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Shallow to moderately deep well drained very stony loam (10 inches) with a medium granular structure and dry color value of 4-5: Moderate OM (1-3%)  


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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate to significant ground cover (50-70%) and moderate to steep slopes (20-70%) moderately limit rainfall impact and overland flow  


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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): None

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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: Bluebunch wheatgrass > Thurber needlegrass > Idaho fescue = Basin big sagebrush > forbs > other grasses > other shrubs

Sub-dominant:

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Normal decadence and mortality expected
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14. **Average percent litter cover (%) and depth ( in):**
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Favorable: 1200, Normal: 900, Unfavorable: 700 lbs/acre/year at high RSI (RPC)
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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:** Western Juniper readily invades the site. Cheatgrass and Medusahead invade sites that have lost deep rooted perennial grass functional groups.
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17. **Perennial plant reproductive capability:** All species should be capable of reproducing annually
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