USDA Natural Resources
Conservation Service

Ecological site R023XF083CA
SHALLOW STONY CLAY LOAM 9-12"

Last updated: 4/10/2025
Accessed: 05/21/2025

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.

Ecological site concept

Currently there is only a draft of the initial concept for this ecological site. The initial concept for this site places it within the Clay or Claypan ,12” PZ Low and Lahontan sagebrush and bluebunch wheatgrass/ Thurber’s needlegrass Ecological Site Group. To view the General STM and other information available for this ESG please go to https://edit.jornada.nmsu.edu/catalogs/esg/023X/R023XY901NV

This site has a similar plant community to the modal site, dominated by bluebunch wheatgrass, Lahontan sagebrush and Thurber’s needlegrass. Spiny hopsage (Grayia spinosa) may also be present. The soils have a shallow effective rooting depth and low soil moisture capacity. Production is lower than the modal site at 600 lbs/ac in a normal year. The soils in this site and Shallow Stony Loam (023XF081CA) are very similar, but are believed to have a higher amount or distribution of clay. This site is similar to the modal site; the model has five stable states.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

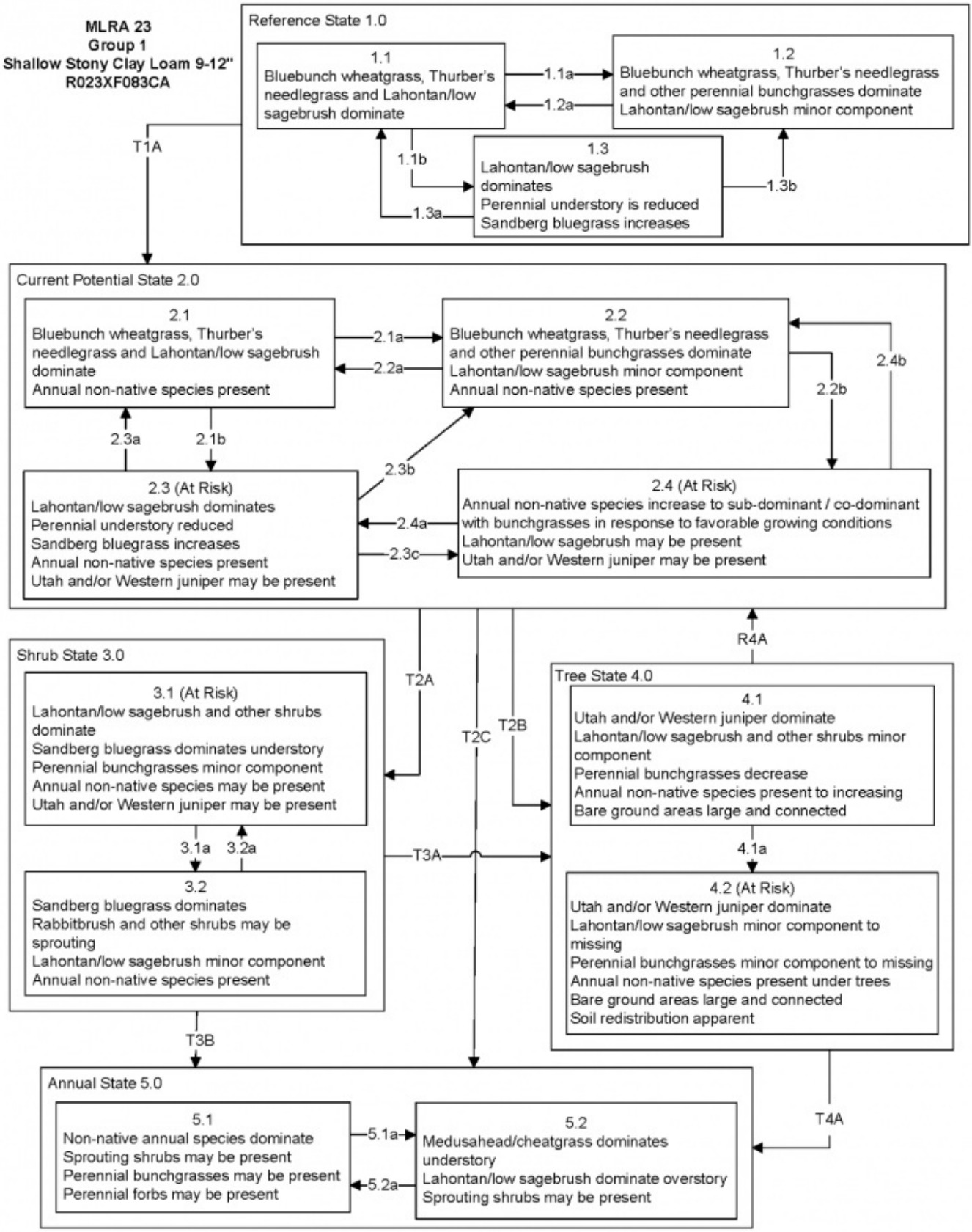
Climatic features

Influencing water features

Soil features

Ecological dynamics

State and transition model


MLRA 23
Group 1
Shallow Stony Clay Loam 9-12"
R023XF083CA
Reference State 1.0
1.1
Bluebunch wheatgrass, Thurber's needlegrass and Lahontan/low sagebrush dominate
1.1a
1.2a
1.2
Bluebunch wheatgrass, Thurber's needlegrass and other perennial bunchgrasses dominate
Lahontan/low sagebrush minor component
T1A
1.1b
1.3a
1.3
Lahontan/low sagebrush dominates
Perennial understory is reduced
Sandberg bluegrass increases
1.3b
Current Potential State 2.0
2.1
Bluebunch wheatgrass, Thurber's needlegrass and Lahontan/low sagebrush dominate
Annual non-native species present
2.1a
2.2a
2.2
Bluebunch wheatgrass, Thurber's needlegrass and other perennial bunchgrasses dominate
Lahontan/low sagebrush minor component
Annual non-native species present
2.4b
2.2b
2.3a
2.1b
2.3b
2.3 (At Risk)
Lahontan/low sagebrush dominates
Perennial understory reduced
Sandberg bluegrass increases
Annual non-native species present
Utah and/or Western juniper may be present
2.4 (At Risk)
Annual non-native species increase to sub-dominant / co-dominant with bunchgrasses in response to favorable growing conditions
Lahontan/low sagebrush may be present
Utah and/or Western juniper may be present
2.4a
2.3c
R4A
Shrub State 3.0
3.1 (At Risk)
Lahontan/low sagebrush and other shrubs dominate
Sandberg bluegrass dominates understory
Perennial bunchgrasses minor component
Annual non-native species may be present
Utah and/or Western juniper may be present
T2A
T2C
T2B
Tree State 4.0
4.1
Utah and/or Western juniper dominate
Lahontan/low sagebrush and other shrubs minor component
Perennial bunchgrasses decrease
Annual non-native species present to increasing
Bare ground areas large and connected
3.1a
3.2a
T3A
4.1a
3.2
Sandberg bluegrass dominates
Rabbitbrush and other shrubs may be sprouting
Lahontan/low sagebrush minor component
Annual non-native species present
4.2 (At Risk)
Utah and/or Western juniper dominate
Lahontan/low sagebrush minor component to missing
Perennial bunchgrasses minor component to missing
Annual non-native species present under trees
Bare ground areas large and connected
Soil redistribution apparent
T3B
Annual State 5.0
5.1
Non-native annual species dominate
Sprouting shrubs may be present
Perennial bunchgrasses may be present
Perennial forbs may be present
5.1a
5.2a
5.2
Medusahead/cheatgrass dominates understory
Lahontan/low sagebrush dominate overstory
Sprouting shrubs may be present
T4A

MLRA 23
Group 1
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KEY

Reference State 1.0 Community Phase Pathways
1.1a: Low severity fire creates grass/sagebrush mosaic; high severity fire significantly reduces sagebrush and leads to early/mid-seral community, dominated by grasses and forbs.
1.1b: Time and lack of disturbance such as fire. Excessive herbivory may also reduce perennial understory.
1.2a: Time and lack of disturbance allows for shrub reestablishment.
1.3a: Low severity fire, herbivory or combinations reduces sagebrush.
1.3b: High severity fire significantly reduces sagebrush and leads to early/mid-seral community, dominated by grasses and forbs.

Transition T1A: Introduction of non-native annual species.

Current Potential State 2.0 Community Phase Pathways
2.1a: Low severity fire creates grass/sagebrush mosaic; high severity fire significantly reduces sagebrush and leads to early/mid-seral community, dominated by grasses and forbs: non-native annual species present.
2.1b: Time and lack of disturbance such as fire. Inappropriate grazing management may also reduce perennial understory.
2.2a: Time and lack of disturbance allows for shrub reestablishment.
2.2b: Fall and spring growing conditions that favors the germination and production of non-native, annual grasses. Pathway typically occurs 3 to 5 years post-fire and 2.4 may be a transitory plant community.
2.3a: Low severity fire creates sagebrush/ grass mosaic, herbivory, or combination or brush management with minimal soil disturbance.
2.3b: High severity fire significantly reduces sagebrush and leads to early/mid-seral community or brush management with minimal soil disturbance reduces sagebrush.
2.3c: Fall and spring growing season conditions that favors the germination and production of non-native annual grasses. 2.4 may be a transitory plant community.
2.4a: Growing season conditions favoring perennial bunchgrass production and reduced cheatgrass production.
2.4b: Growing season conditions favoring perennial bunchgrass production and reduced cheatgrass production.

Transition T2A: Time and lack of disturbance and/or inappropriate grazing management (to 3.1). Brush management of Community Phase 2.3 may result in Community Phase 3.2.
Transition T2B: Time and lack of fire allows Utah/Western juniper to establish and overtop the sagebrush, dominating site resources; may be coupled with inappropriate grazing management.
Transition T2C: Severe fire and/or multiple fires.

Shrub State 3.0 Community Phase Pathways
3.1a: High severity fire; brush management with minimal soil disturbance.
3.2a: Time and lack of disturbance (unlikely/may take many years).

Transition T3A: Time and lack of fire allows Utah/Western juniper to establish and dominate site resources; may be coupled with inappropriate grazing management that reduces perennial grass density and increases tree establishment.
Transition T3B: Invasive annual grasses increase under shrubs, or, high-severity fire or multiple fires and/or treatments that disturb the soil surface in the presence of non-native annual grasses. (to 5.1).

Tree State 4.0 Community Phase Pathways
4.1a: Time without disturbance allows maturation of the tree community.

Restoration R4A: Tree removal would decrease tree cover and allow for the understory to recover (to 4.1).
Transition T4A: Catastrophic fire and/or inappropriate tree removal practices (to 5.1).

Annual State 5.0 Community Phase Pathways
5.1a: Time and lack of disturbance.
5.2a: Fire.

Approval

Kendra Moseley, 4/10/2025

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)	
Contact for lead author	
Date	05/21/2025
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

   _____

2. **Presence of water flow patterns:**

   _____

3. **Number and height of erosional pedestals or terracettes:**

   _____

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

   _____

5. **Number of gullies and erosion associated with gullies:**

   _____

6. **Extent of wind scoured, blowouts and/or depositional areas:**

   _____

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

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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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:

    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):**

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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):**

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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:**

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17. **Perennial plant reproductive capability:**
