USDA Natural Resources
Conservation Service

Ecological site F039XC311AZ
Clayey Pinon-Juniper

Last updated: 5/07/2020
Accessed: 05/20/2024

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

Elevation: 1737-2021 meters (5700-6630 ft.). This is a pinon-juniper site existing in soils that are high in clay.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site exists on plateaus associated with the Grand Canyon, mostly residing on fan remnants.

Climatic features

Table 2. Representative climatic features

Frost-free period (characteristic range)	54 days
Freeze-free period (characteristic range)	95 days
Precipitation total (characteristic range)	406 mm
Frost-free period (actual range)	54 days
Freeze-free period (actual range)	95 days
Precipitation total (actual range)	406 mm
Frost-free period (average)	54 days
Freeze-free period (average)	95 days
Precipitation total (average)	406 mm

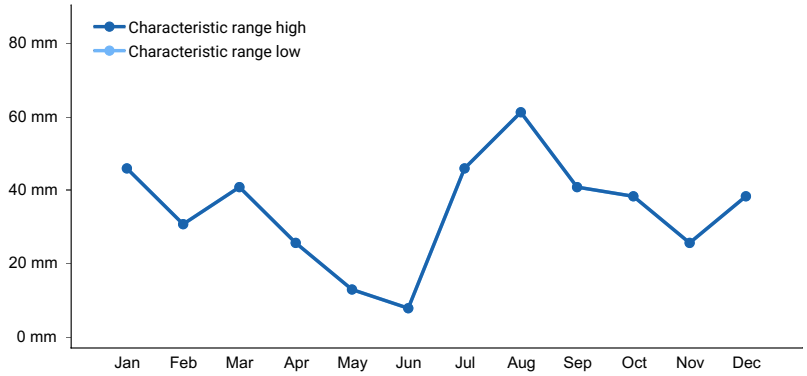


Figure 1. Monthly precipitation range

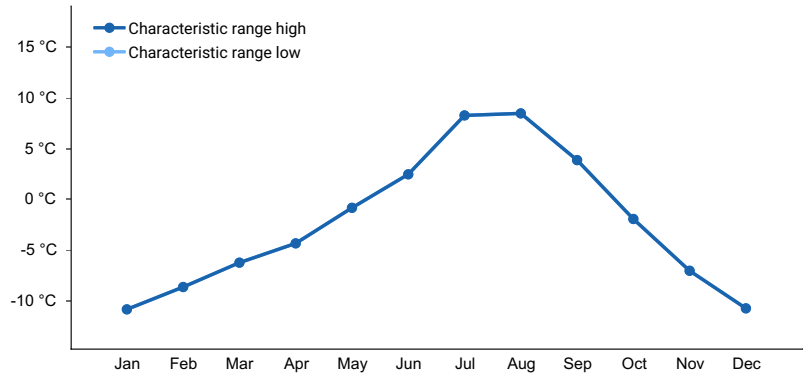


Figure 2. Monthly minimum temperature range

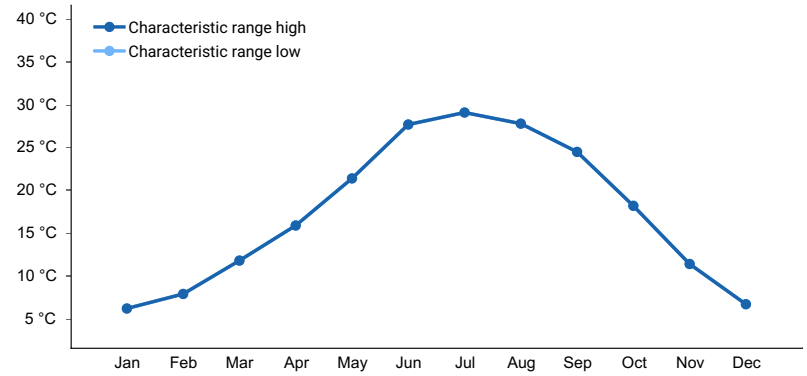


Figure 3. Monthly maximum temperature range

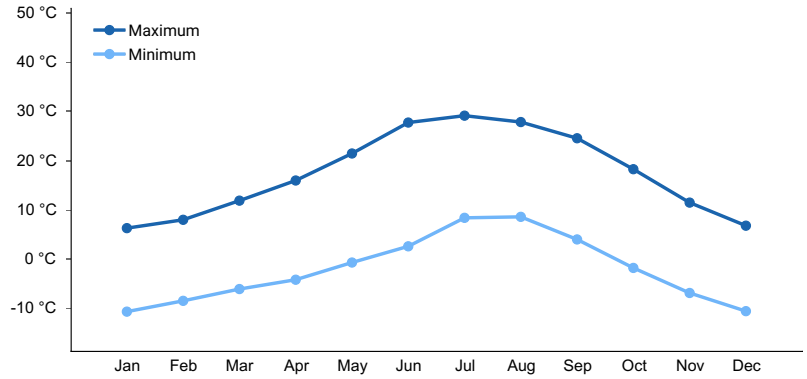


Figure 4. Monthly average minimum and maximum temperature

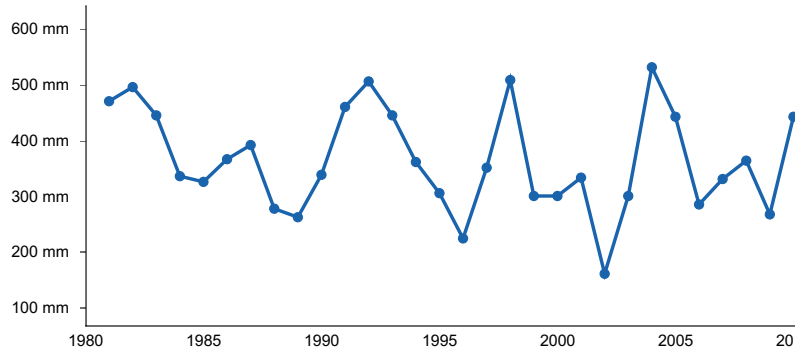


Figure 5. Annual precipitation pattern

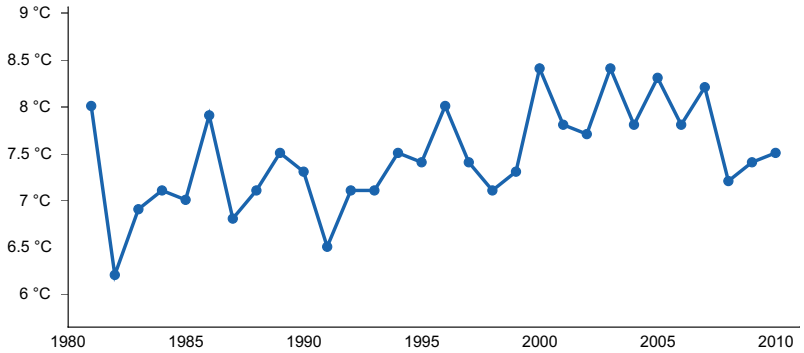


Figure 6. Annual average temperature pattern

Climate stations used

- (1) GRAND CANYON NP AP [USW00003195], Grand Canyon, AZ

Influencing water features

Soil features

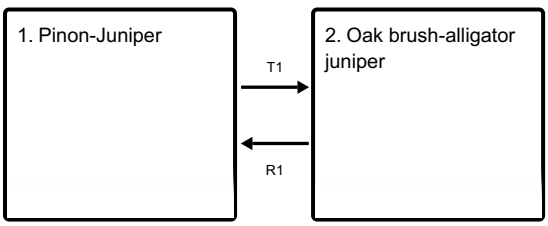
This site resides on clayey soils derived from shale. A common classification is vertic haplustalfs.

Ecological dynamics

This site is dominated by one seed juniper and pinon with a few shrubs, grasses and forbs. Fire will change the species composition reducing trees and shrubs and increasing grasses.

State and transition model

Ecosystem states



State 1
Pinon-Juniper

Reference condition has a structure of dominant pinon pine, one seed and alligator juniper. Shrub species include gambel oak and mountain mahogany. Common grasses include blue grama, bottlebrush squirreltail, western wheat, and junegrass.

State 2
Oak brush-alligator juniper

This is a degraded state with an increase in basal sprouting shrubs.

Transition T1
State 1 to 2

A crown burning fire, knocking the pinon and juniper back and increasing basal sprouting shrubs.

Restoration pathway R1
State 2 to 1

Slow brush control of basal sprouting shrubs, removing small diameter tillers and leaving the largest diameter shrubs to promote oak trees and the re-colonization of pinon and juniper.

Approval

Scott Woodall, 5/07/2020

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.

Author(s)/participant(s)	
Contact for lead author	
Date	05/20/2024
Approved by	Scott Woodall
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

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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):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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

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

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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:**
