USDA Natural Resources Conservation Service

# Ecological site R035XG704AZ
# Cinder Upland 14-18" p.z.

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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.

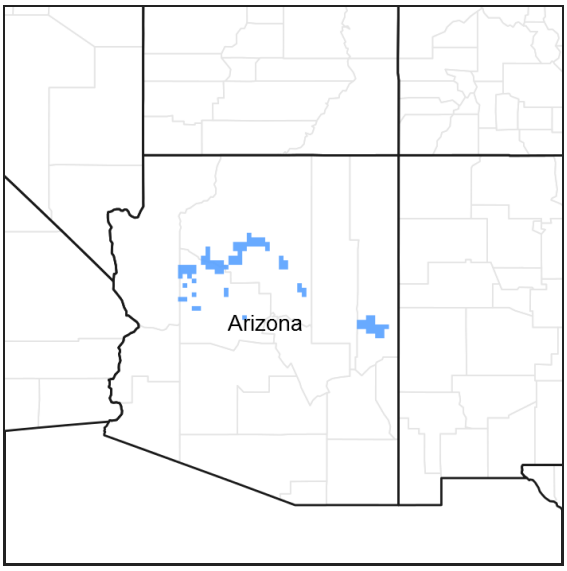



**Figure 1. Mapped extent**

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.

## MLRA notes

Major Land Resource Area (MLRA): 035X–Colorado Plateau

“PROVISIONAL ecological site concepts developed and described. See Project Plan [insert Project Plan Name] for more details and related milestones.”

AZ LRU 35.7 – Colorado Plateau Woodland – Grassland

Elevations range from 5000 to 7000 feet and precipitation averages 14 to 18 inches per year. Vegetation includes one-seed juniper, Colorado pinyon, Stansbury cliffrose, Apache plume, four-wing saltbush, green Mormon tea, needle and thread, sideoats grama, blue grama, black grama, galleta, bottlebrush squirreltail, and muttongrass. The soil temperature regime is mesic and the soil moisture regime is aridic ustic. This unit occurs within the Colorado Plateau Physiographic Province and is characterized by a sequence of flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Sedimentary rock classes dominate the plateau with volcanic fields occurring for the most part near its margin.

## Ecological site concept

“ATTENTION: This ecological site meets the requirements for PROVISIONAL (if not more). A provisional ecological site is established after ecological site concepts are developed and an initial state-and-transition model is drafted. A provisional ecological site typically will include literature reviews, land use history information, legacy data (prior

approved range site descriptions, forage suitability groups, woodland suitability groups, etc.,) , and includes some soils data, and estimates for canopy and/or species composition by weight,. A provisional ecological site provides the conceptual framework of soil-site correlation for the development of the ESD. For more information about this ecological site, please contact your local NRCS office.”

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | (1) *Juniperus*<br>(2) *Pinus edulis* |
| Shrub | (1) *Purshia mexicana*<br>(2) *Ephedra* |
| Herbaceous | (1) *Bouteloua eriopoda*<br>(2) *Bouteloua gracilis* |

## Physiographic features

This ecological site occurs in an upland position on fan terraces and hillsides. The soil is cindery throughout. Unweathered cinders generally occur between 20 to 25 inches. The site neither benefits significantly from run-in moisture nor does it suffer from excessive loss from run-off. It occurs on all exposures.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Hill<br>(2) Fan |
| Flooding frequency | None |
| Ponding frequency | None |
| Elevation | 1,676–2,134 m |
| Slope | 1–60% |
| Aspect | Aspect is not a significant factor |

## Climatic features

The climate of the land resource unit is semiarid with warm summers and cool winters. The mean annual precipitation ranges from 14 to 18 inches, but is very erratic, often varying substantially from year to year. The majority of the precipitation is received from October through April. This precipitation comes as gentle rain or snow from frontal storms coming out of the Pacific Ocean. Snow is common from November through February. Generally no more than a few inches of snow accumulates, melting within a few days, but may last a week or more. The remaining precipitation, approximately 40 percent, is received from July through September as spotty, unreliable and sometimes violent thunderstorms. The moisture for this precipitation originates in the Gulf of Mexico (and the Pacific Ocean in the fall) and flows into the area on the north end of the Mexican monsoon. Late May through late June is generally a dry period. The mean annual temperature ranges from 46 to 52 degrees Fahrenheit (F). The frost-free period (air temperature > 32 degrees F) ranges from 108 to 151 days (@ 50 percent probability). Strong winds are common, especially in the spring.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (average) | 151 days |
| Freeze-free period (average) | 170 days |
| Precipitation total (average) | 457 mm |

## Influencing water features

## Soil features

Soils are very shallow to moderately deep to a hardpan or very shallow to moderately deep to cinders. Surface soil texture ranges from loam to very gravelly silt loam about 2-6" thick. Subsurface horizons have textures of gravelly and very gravelly loam and gravelly and very gravelly clay loam overlying a hardpan or cinders. Soil on less steep slopes can absorb and hold most of the moisture the climate provides; some moisture is lost in runoff and rill erosion occurs on steeper slopes. Soil reaction ranges from mildly to strongly alkaline (pH 7.5-9.0).

Typical taxonomic units include:

SSA-637 Yavapai County - map units Waldroup WcC;
SSA-635 Apache County - map units Ziegler ZeC, ZGB, ZGE, Bandera BDB, BDE, BEB;
SSA-631 Coconino County - map units Ziegler 70, 71, 71 Wilaha 58, 59, 72;
SSA-707 Little Colorado River Area MU 65 Wilaha.

**Table 4. Representative soil features**

| | |
|---|---|
| Surface texture | (1) Gravelly loam<br>(2) Channery loam |
| Family particle size | (1) Loamy |
| Drainage class | Well drained |
| Permeability class | Moderately slow to slow |
| Soil depth | 38–61 cm |
| Surface fragment cover <=3" | 20–30% |
| Available water capacity (0-101.6cm) | 5.18–7.04 cm |
| Calcium carbonate equivalent (0-101.6cm) | 0–30% |
| Electrical conductivity (0-101.6cm) | 0–2 mmhos/cm |
| Soil reaction (1:1 water) (0-101.6cm) | 7.4–8.4 |
| Subsurface fragment volume <=3" (Depth not specified) | 20–25% |

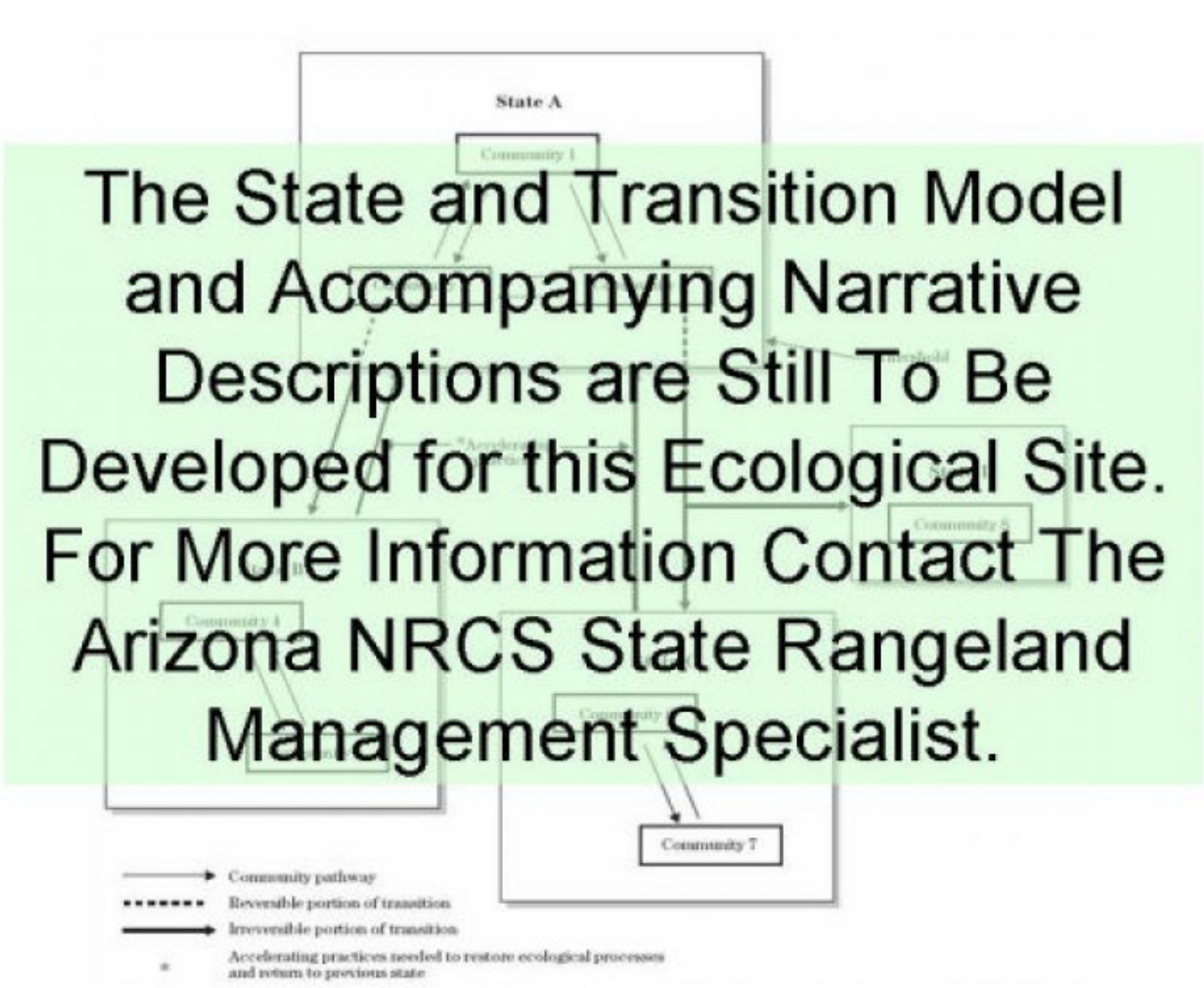
## Ecological dynamics

The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The Historical Climax Plant Community represents the natural potential plant communities found on relict or relatively undisturbed sites. Other plant communities described here represent plant communities that are known to occur when the site is disturbed by factors such as fire, grazing, or drought.

Production data provided in this site description is standardized to air dry weight at the end of the summer growing season. The plant communities described in this site description are based on near normal rainfall years.

NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in this site description. To determine Similarity index, compare the production (air dry weight) of each species to that shown in the plant community description. For each species, count no more than the maximum amount shown for the species, and for each group, count no more than the maximum amount shown for each group. Divide the resulting total by the total normal year production shown in the plant community description. If the rainfall has ben significantly above or below normal, use the total production shown for above or below normal years. If field data is not collected at the end of the summer growing season, then the field data must be corrected to the end of the year production before comparing it to the site description. The growth curve can be used as a guide for estimating production at the end of the summer growing season.

## State and transition model




### State 1
### Histo1ric Climax Plant Community

### Community 1.1
### Histo1ric Climax Plant Community

This range site has a mixed plant community made up of junipers and pinyon pine and an understory of mid and shrot grasses, shrubs and a relatively small percentage of forbs. In the original plant commuity there is a mixture of both cool and warm season grasses. Plants most likely to invade or increase when this site deteriorates are broom snakeweed, annuals, cacti, rabbitbrush, groundsel and juniper. Even aged stands of juniper increases are common on the site. The increases of juniper correspond to wet cycle weather patterns. Once established, these juniper stands strongly resemble climax woodland sites.

**Table 5. Annual production by plant type**

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|---|---|---|---|
| Grass/Grasslike | 639 | – | 852 |
| Shrub/Vine | 160 | – | 213 |
| Tree | 54 | – | 159 |
| Forb | 21 | – | 54 |
| **Total** | **874** | **–** | **1278** |

## Additional community tables

**Table 6. Community 1.1 plant community composition**

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|---|---|---|---|---|---|
| **Grass/Grasslike** | | | | | |
| 1 | | | | 106–319 | |
| | blue grama | BOGR2 | *Bouteloua gracilis* | 106–319 | – |
| 2 | | | | 267–426 | |
| | black grama | BOER4 | *Bouteloua eriopoda* | 267–426 | – |
| 3 | | | | 54–85 | |
| | squirreltail | ELELE | *Elymus elymoides ssp. elymoides* | 54–85 | – |
| 4 | | | | 54–106 | |
| | needle and thread | HECOC8 | *Hesperostipa comata ssp. comata* | 54–106 | – |
| 5 | | | | 21–54 | |
| | muttongrass | POFE | *Poa fendleriana* | 21–54 | – |
| 6 | | | | 11–54 | |
| | threeawn | ARIST | *Aristida* | 11–54 | – |
| 7 | | | | 11–54 | |
| | sand dropseed | SPCR | *Sporobolus cryptandrus* | 11–54 | – |
| 8 | | | | 11–54 | |
| | little bluestem | SCSCS | *Schizachyrium scoparium var. scoparium* | 11–54 | – |
| **Forb** | | | | | |
| 9 | | | | 21–54 | |
| | Forb, annual | 2FA | *Forb, annual* | 21–54 | – |
| | Forb, perennial | 2FP | *Forb, perennial* | 21–54 | – |
| | aster | ASTER | *Aster* | 21–54 | – |
| | buckwheat | ERIOG | *Eriogonum* | 21–54 | – |
| | globemallow | SPHAE | *Sphaeralcea* | 21–54 | – |
| **Shrub/Vine** | | | | | |
| 10 | | | | 11–31 | |
| | algerita | MATR3 | *Mahonia trifoliolata* | 11–31 | – |
| 11 | | | | 11–47 | |
| | Mexican cliffrose | PUME | *Purshia mexicana* | 11–47 | – |
| 12 | | | | 11–54 | |
| | jointfir | EPHED | *Ephedra* | 11–54 | – |
| 13 | | | | 11–54 | |
| | skunkbush sumac | RHTR | *Rhus trilobata* | 11–54 | – |
| 14 | | | | 11–54 | |
| | wax currant | RICE | *Ribes cereum* | 11–54 | – |
| 15 | | | | 11–21 | |
| | bastardsage | ERWR | *Eriogonum wrightii* | 11–21 | – |
| 16 | | | | 11–54 | |

| | | | | | |
|---|---|---|---|---|---|
| | globe cactus | MAMMI | *Mammillaria* | 11–54 | – |
| | yucca | YUCCA | *Yucca* | 11–54 | – |
| 17 | | | | 47–106 | |
| | rabbitbrush | CHRYS9 | *Chrysothamnus* | 47–106 | – |
| | broom snakeweed | GUSA2 | *Gutierrezia sarothrae* | 47–106 | – |
| 18 | | | | 11–54 | |
| | Apache plume | FAPA | *Fallugia paradoxa* | 11–54 | – |
| **Tree** | | | | | |
| 19 | | | | 54–159 | |
| | juniper | JUNIP | *Juniperus* | 54–159 | – |
| | twoneedle pinyon | PIED | *Pinus edulis* | 54–159 | – |
| | ponderosa pine | PIPO | *Pinus ponderosa* | 54–159 | – |

## Animal community

This site is suitable for yearlong grazing by all classes of livestock. Short duration snow may partially cover many of the forage plants during the winter. Water developments are normally lacking on the site. Steeper portions of the site and escarpments within the site provide protection from winter and spring winds. The site readily responds to planned grazing systems.

The diversity of the plant community is somewhat lacking except at higher elevations or where it borders a woodland site. The site is primarily adapted to grassland wildlife species unless retrogression has increased the brushy species. Free water is lacking on the site.

## Recreational uses

This site is characterized by rolling hills and sideslopes of cinder hills. It is grassland intermixed with shrubs and pinyon-juniper. Winters are cold; summers are warm. Hunting is the primary activity on the site. Other activities include horseback riding, hiking and photography.

## Other information

T&E Species: golden eagles may use the area as a feeding ground.

## Contributors

Larry D. Ellicott
Peter Lefebvre
Stephen Cassady
Steve Barker
Unknown
Unknown Author

## 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 | |
| Approved by | |
| 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):**

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:

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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:**

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