USDA Natural Resources
Conservation Service

# Ecological site R040XB205AZ
# Clay Loam Upland 7"-10" p.z.

Accessed: 05/13/2025

## 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.

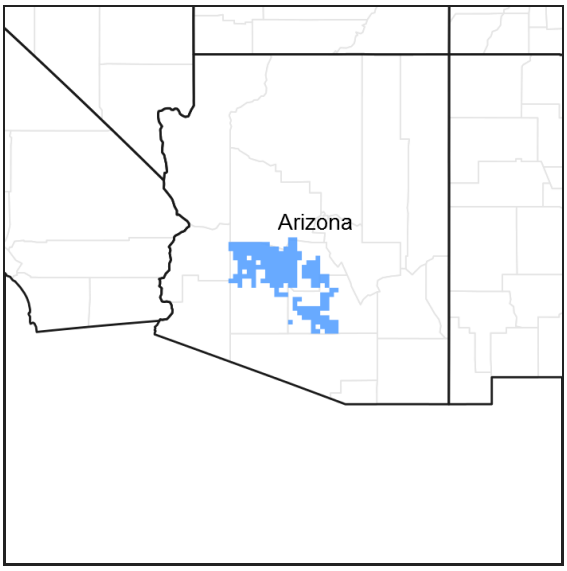


**Figure 1. Mapped extent**

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): 040X–Sonoran Basin and Range

AZ 40.2 – Middle Sonoran Desert

Elevations range from 1200 to 2000 feet and precipitation averages 7 to 10 inches per year. Vegetation includes saguaro, palo verde, creosotebush, triangle bursage, brittlebush, prickly pear, cholla, desert saltbush, wolfberry bush muhly, threeawns, and big galleta. The soil temperature regime is hyperthermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Physiographic Province and is characterized by numerous mountain ranges that rise abruptly from broad, plain-like valleys and basins. Igneous and metamorphic rock classes dominate the mountain ranges and sediments filling the basins represent combinations of fluvial, lacustrine, colluvial and alluvial deposits.

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | (1) *Parkinsonia microphylla*<br>(2) *Prosopis glandulosa* |
| Shrub | (1) *Olneya tesota*<br>(2) *Castela emoryi* |

| | |
|---|---|
| Herbaceous | (1) *Pleuraphis mutica*<br>(2) *Muhlenbergia porteri* |

## Physiographic features

This site occurs on fan terraces and stream terraces. Slopes range from 1 to 3%. Elevations are from 1000 to 2050 feet.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Fan<br>(2) Terrace<br>(3) Stream terrace |
| Elevation | 305–625 m |
| Slope | 1–3% |

## Climatic features

Precipitation in the sub-resource area ranges from 7 to 10 inches. Elevations range from 900 to 2050 feet. Winter-summer rainfall ratios range from 40% to 60% in the southern part along the international boundary, to 60% to 40% in the central and northern parts of the sub-resource area. As one moves from east to west in this resource area rains become more unpredictable and variable with Coefficients of Variation of annual rainfall equal to 38% at Florence and 46% at Aguila. Summer rains fall July- September, originate in the Gulf of Mexico, and are convective, usually brief, intense thunderstorms. Summer precipitation is extremely erratic and undependable in this area. Cool season moisture tends to be frontal, originates in the Pacific and Gulf of California, and falls in widespread storms with long duration and low intensity. This is the dependable moisture supply for vegetation in the area. Snow is very rare and usually melts on contact. May-June is the driest time of the year. Humidity is very low.

Winter temperatures are very mild with very few days recording freezing for short periods of time. Summertime temperatures are hot to very hot with many days in June-July exceeding 105 degrees F. Frost-free days range from 280 at stations in major river valleys with cold air drainage to 320 to 350 days at upland stations.

Both the spring and the summer growing seasons are equally important for perennial grass, forb and shrub growth. Cool and warm season annual forbs and grasses can be common in their respective seasons with above average rainfall. Perennial forage species can remain green throughout the year with available moisture.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (average) | 350 days |
| Freeze-free period (average) | 0 days |
| Precipitation total (average) | 254 mm |

## Influencing water features

## Soil features

These are old soils formed in clayey alluvium from mixed origins. They are deep and have moderate shrink-swell potentials. They do not crack and churn with wetting and dryng. Plant-soil moisture relationships are fair.
Soils mapped on this site include: in SSA-645 Aguila-Carefree area MU's Contine-22 & 46, Eba-39, Ebon-44, 45, 46, 47 & 48, Luke-74 & Mohall-77; SSA-651 Central Maricopa County MU's Tremant-AkB, Cs, MTB, Tg, Th, TPB, TrA, TrB & TSC, Ebon-CeD, EbD & EPD, Glenbar-Go3 & Gt, Laveen-Le, Mohall-Mr & MV, Trix-Tt; SSA-659 Western Pinal County MU's Contine-9 & Mohall-32; SSA-661 Eastern Pinal-Southern Gila Counties MU's Ebon-207 & 580.

**Table 4. Representative soil features**

| | |
|---|---|
| Surface texture | (1) Gravelly loam<br>(2) Very gravelly clay loam |
| Family particle size | (1) Clayey |
| Drainage class | Well drained |
| Permeability class | Moderately slow to slow |
| Soil depth | 102–152 cm |
| Surface fragment cover <=3" | 1–45% |
| Surface fragment cover >3" | 0–5% |
| Available water capacity (0-101.6cm) | 8.13–22.86 cm |
| Calcium carbonate equivalent (0-101.6cm) | 5–30% |
| Electrical conductivity (0-101.6cm) | 0 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 0 |
| Soil reaction (1:1 water) (0-101.6cm) | 7.4–8.4 |
| Subsurface fragment volume <=3" (Depth not specified) | 1–45% |
| Subsurface fragment volume >3" (Depth not specified) | 0–5% |

## 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 the group. Divide the resulting total by the total normal year production shown in the plant community description. If the rainfall has been 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


The State and Transition Model and Accompanying Narrative Descriptions are Still To Be Developed for this Ecological Site. For More Information Contact The Arizona NRCS State Rangeland Management Specialist.

**State 1**
**Historical Climax Plant Community**

**Community 1.1**
**Historical Climax Plant Community**

The potential plant community on this site is a mixture of perennial and annual grasses and forbs and desert shrubs and cacti. The aspect is shrubland. With continuous, heavy grazing, forage species like Tobosa, threeawns and globemallow are removed from the plant community and replaced by species like; creosote bush, triangle bursage, mesquite and cacti. Several cool season, introduced annual species have become entrenched on areas of this site and have displaced native grasses and forbs. These species include; red brome, mediterranean grass, filaree, tumbleweed, and London rocket mustard. This site is a poor user of intense summer thunderstorms. Heavy surface textures, low plant cover and a lack of cracking combine to inefficient use of summer precipitation. In areas where perennial plant cover has been lost and erosion is accelerated, mechanical treatments to harvest water onto seeded strips (contour borders, basins) has resulted in excellent stands of native trees and shrubs like; fourwing saltbush, mesquite and Mexican paloverde. Trees on this site occur as shrubby individuals due to the clayey soil textures near the surface. Cryptogam cover can be moderate on non-gravelly surfaces.

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

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|---|---|---|---|
| Shrub/Vine | 157 | – | 247 |
| Grass/Grasslike | 112 | – | 157 |
| Forb | 67 | – | 112 |
| **Total** | **336** | **–** | **516** |

## 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 | | | | 45–90 | |
| | tobosagrass | PLMU3 | *Pleuraphis mutica* | 45–90 | – |
| 2 | | | | 22–45 | |
| | purple threeawn | ARPU9 | *Aristida purpurea* | 0–6 | – |
| | bush muhly | MUPO2 | *Muhlenbergia porteri* | 0–6 | – |
| | Parish's threeawn | ARPUP5 | *Aristida purpurea var. parishii* | 0–3 | – |
| | Wright's threeawn | ARPUW | *Aristida purpurea var. wrightii* | 0–3 | – |
| | big galleta | PLRI3 | *Pleuraphis rigida* | 0–3 | – |
| | spidergrass | ARTE3 | *Aristida ternipes* | 0–2 | – |
| | spidergrass | ARTEG | *Aristida ternipes var. gentilis* | 0–2 | – |
| | red grama | BOTR2 | *Bouteloua trifida* | 0–1 | – |
| | Arizona cottontop | DICA8 | *Digitaria californica* | 0–1 | – |
| | whiplash pappusgrass | PAVA2 | *Pappophorum vaginatum* | 0–1 | – |
| | plains bristlegrass | SEVU2 | *Setaria vulpiseta* | 0–1 | – |
| 3 | **Annuals** | | | 22–67 | |
| | sixweeks threeawn | ARAD | *Aristida adscensionis* | 0–11 | – |
| | prairie threeawn | AROL | *Aristida oligantha* | 0–11 | – |
| | needle grama | BOAR | *Bouteloua aristidoides* | 0–11 | – |
| | sixweeks grama | BOBA2 | *Bouteloua barbata* | 0–11 | – |
| | Eastwood fescue | VUMIC | *Vulpia microstachys var. ciliata* | 0–11 | – |
| | Pacific fescue | VUMIP | *Vulpia microstachys var. pauciflora* | 0–11 | – |
| | sixweeks fescue | VUOC | *Vulpia octoflora* | 0–11 | – |
| | Rothrock's grama | BORO2 | *Bouteloua rothrockii* | 0–6 | – |
| | Arizona brome | BRAR4 | *Bromus arizonicus* | 0–1 | – |
| | feather fingergrass | CHVI4 | *Chloris virgata* | 0–1 | – |
| | desert lovegrass | ERPEM | *Eragrostis pectinacea var. miserrima* | 0–1 | – |
| | tufted lovegrass | ERPEP2 | *Eragrostis pectinacea var. pectinacea* | 0–1 | – |
| | bearded sprangletop | LEFUF | *Leptochloa fusca ssp. fascicularis* | 0–1 | – |
| | mucronate sprangletop | LEPA6 | *Leptochloa panicea* | 0–1 | – |
| | delicate muhly | MUFR | *Muhlenbergia fragilis* | 0–1 | – |

| | | | | | |
|---|---|---|---|---|---|
| | littleseed muhly | MUMI | *Muhlenbergia microsperma* | 0–1 | – |
| | Bigelow's bluegrass | POBI | *Poa bigelovii* | 0–1 | – |
| | Arizona signalgrass | URAR | *Urochloa arizonica* | 0–1 | – |
| 4 | | | | 4–22 | |
| | Alga | 2ALGA | *Alga* | 2–11 | – |
| | Lichen | 2LICHN | *Lichen* | 1–6 | – |
| | Moss | 2MOSS | *Moss* | 1–3 | – |
| | Fungus | 2FUNGI | *Fungus* | 1–2 | – |
| **Forb** | | | | | |
| 5 | | | | 22–45 | |
| | desert globemallow | SPAM2 | *Sphaeralcea ambigua* | 0–6 | – |
| | Louisiana vetch | VILU | *Vicia ludoviciana* | 0–6 | – |
| | Emory's globemallow | SPEM | *Sphaeralcea emoryi* | 0–3 | – |
| | spear globemallow | SPHA | *Sphaeralcea hastulata* | 0–3 | – |
| | Indian rushpea | HOGL2 | *Hoffmannseggia glauca* | 0–2 | – |
| | dwarf desertpeony | ACNA2 | *Acourtia nana* | 0–1 | – |
| 6 | | | | 45–90 | |
| | bristly fiddleneck | AMTE3 | *Amsinckia tessellata* | 0–11 | – |
| | western tansymustard | DEPI | *Descurainia pinnata* | 0–11 | – |
| | common fiddleneck | AMMEI2 | *Amsinckia menziesii var. intermedia* | 0–11 | – |
| | shaggyfruit pepperweed | LELA | *Lepidium lasiocarpum* | 0–6 | – |
| | Arizona lupine | LUAR4 | *Lupinus arizonicus* | 0–6 | – |
| | Coulter's lupine | LUSP2 | *Lupinus sparsiflorus* | 0–6 | – |
| | sleepy silene | SIAN2 | *Silene antirrhina* | 0–3 | – |
| | Coulter's globemallow | SPCO2 | *Sphaeralcea coulteri* | 0–1 | – |
| | woollyhead neststraw | STMI2 | *Stylocline micropoides* | 0–1 | – |
| | cutleaf thelypody | THLA | *Thelypodium laciniatum* | 0–1 | – |
| | woolly tidestromia | TILA2 | *Tidestromia lanuginosa* | 0–1 | – |
| | Bigelow's linanthus | LIBI2 | *Linanthus bigelovii* | 0–1 | – |
| | linanthus | LINAN2 | *Linanthus* | 0–1 | – |
| | coastal bird's-foot trefoil | LOSA | *Lotus salsuginosus* | 0–1 | – |
| | brownfoot | ACWR5 | *Acourtia wrightii* | 0–1 | – |
| | weakleaf bur ragweed | AMCO3 | *Ambrosia confertiflora* | 0–1 | – |
| | fringed amaranth | AMFI | *Amaranthus fimbriatus* | 0–1 | – |
| | disc mayweed | MADI6 | *Matricaria discoidea* | 0–1 | – |
| | Nuttall's povertyweed | MONU | *Monolepis nuttalliana* | 0–1 | – |
| | bristly nama | NAHI | *Nama hispidum* | 0–1 | – |
| | evening primrose | OENOT | *Oenothera* | 0–1 | – |
| | lineleaf whitepuff | OLLI | *Oligomeris linifolia* | 0–1 | – |
| | locoweed | OXYTR | *Oxytropis* | 0–1 | – |
| | Florida pellitory | PAFL3 | *Parietaria floridana* | 0–1 | – |
| | combseed | PECTO | *Pectocarya* | 0–1 | – |
| | manybristle chinchweed | PEPA2 | *Pectis papposa* | 0–1 | – |

| | | | | | |
|---|---|---|---|---|---|
| | phacelia | PHACE | *Phacelia* | 0–1 | – |
| | slimjim bean | PHFI3 | *Phaseolus filiformis* | 0–1 | – |
| | desert Indianwheat | PLOV | *Plantago ovata* | 0–1 | – |
| | redseed plantain | PLRH | *Plantago rhodosperma* | 0–1 | – |
| | New Mexico plumeseed | RANE | *Rafinesquia neomexicana* | 0–1 | – |
| | bluedicks | DICA14 | *Dichelostemma capitatum* | 0–1 | – |
| | touristplant | DIWI2 | *Dimorphocarpa wislizeni* | 0–1 | – |
| | flatcrown buckwheat | ERDE6 | *Eriogonum deflexum* | 0–1 | – |
| | miniature woollystar | ERDI2 | *Eriastrum diffusum* | 0–1 | – |
| | fleabane | ERIGE2 | *Erigeron* | 0–1 | – |
| | common woolly sunflower | ERLA6 | *Eriophyllum lanatum* | 0–1 | – |
| | Texas stork's bill | ERTE13 | *Erodium texanum* | 0–1 | – |
| | California poppy | ESCAM | *Eschscholzia californica ssp. mexicana* | 0–1 | – |
| | pygmy poppy | ESMI | *Eschscholzia minutiflora* | 0–1 | – |
| | hairy desertsunflower | GECA2 | *Geraea canescens* | 0–1 | – |
| | gilia | GILIA | *Gilia* | 0–1 | – |
| | morningglory | IPER | *Ipomoea eriocarpa* | 0–1 | – |
| | Arizona poppy | KAGR | *Kallstroemia grandiflora* | 0–1 | – |
| | California goldfields | LACA7 | *Lasthenia californica* | 0–1 | – |
| | Gordon's bladderpod | LEGO | *Lesquerella gordonii* | 0–1 | – |
| | tuber anemone | ANTU | *Anemone tuberosa* | 0–1 | – |
| | milkvetch | ASTRA | *Astragalus* | 0–1 | – |
| | wheelscale saltbush | ATELF | *Atriplex elegans var. fasciculata* | 0–1 | – |
| | big saltbush | ATLE | *Atriplex lentiformis* | 0–1 | – |
| | Wright's saltbush | ATWR | *Atriplex wrightii* | 0–1 | – |
| | spiderling | BOERH2 | *Boerhavia* | 0–1 | – |
| | hoary bowlesia | BOIN3 | *Bowlesia incana* | 0–1 | – |
| | exserted Indian paintbrush | CAEXE | *Castilleja exserta ssp. exserta* | 0–1 | – |
| | yellow tackstem | CAPA7 | *Calycoseris parryi* | 0–1 | – |
| | white tackstem | CAWR | *Calycoseris wrightii* | 0–1 | – |
| | southern Sierra pincushion | CHAL | *Chaenactis alpigena* | 0–1 | – |
| | whitemargin sandmat | CHAL11 | *Chamaesyce albomarginata* | 0–1 | – |
| | brittle spineflower | CHBR | *Chorizanthe brevicornu* | 0–1 | – |
| | aridland goosefoot | CHDE | *Chenopodium desiccatum* | 0–1 | – |
| | hyssopleaf sandmat | CHHY3 | *Chamaesyce hyssopifolia* | 0–1 | – |
| | devil's spineflower | CHRI | *Chorizanthe rigida* | 0–1 | – |
| | New Mexico thistle | CINE | *Cirsium neomexicanum* | 0–1 | – |
| | sand pygmyweed | CRCO34 | *Crassula connata* | 0–1 | – |
| | cryptantha | CRYPT | *Cryptantha* | 0–1 | – |
| | fingerleaf gourd | CUDI | *Cucurbita digitata* | 0–1 | – |
| | hairy prairie clover | DAMO | *Dalea mollis* | 0–1 | – |
| | American wild carrot | DAPU3 | *Daucus pusillus* | 0–1 | – |
| | carelessweed | AMPA | *Amaranthus palmeri* | 0–1 | – |

| | | | | | |
|---|---|---|---|---|---|
| **Shrub/Vine** | | | | | |
| 7 | | | | 45–90 | |
| | triangle bur ragweed | AMDE4 | *Ambrosia deltoidea* | 6–17 | – |
| | burrobush | AMDU2 | *Ambrosia dumosa* | 6–11 | – |
| | white ratany | KRGR | *Krameria grayi* | 2–11 | – |
| | littleleaf ratany | KRER | *Krameria erecta* | 2–6 | – |
| | Nevada jointfir | EPNE | *Ephedra nevadensis* | 0–3 | – |
| 8 | | | | 45–90 | |
| | fourwing saltbush | ATCA2 | *Atriplex canescens* | 6–17 | – |
| | water jacket | LYAN | *Lycium andersonii* | 0–3 | – |
| | Berlandier's wolfberry | LYBE | *Lycium berlandieri* | 0–3 | – |
| | Arizona desert-thorn | LYEX | *Lycium exsertum* | 0–3 | – |
| | yellow paloverde | PAMI5 | *Parkinsonia microphylla* | 0–3 | – |
| | desert ironwood | OLTE | *Olneya tesota* | 0–2 | – |
| | Jerusalem thorn | PAAC3 | *Parkinsonia aculeata* | 0–2 | – |
| | whitethorn acacia | ACCO2 | *Acacia constricta* | 0–2 | – |
| | catclaw acacia | ACGR | *Acacia greggii* | 0–1 | – |
| | crucifixion thorn | CAEM4 | *Castela emoryi* | 0–1 | – |
| | creosote bush | LATR2 | *Larrea tridentata* | 0–1 | – |
| | blue paloverde | PAFL6 | *Parkinsonia florida* | 0–1 | – |
| | velvet mesquite | PRVE | *Prosopis velutina* | 0–1 | – |
| | lotebush | ZIOB | *Ziziphus obtusifolia* | 0–1 | – |
| 9 | | | | 4–22 | |
| | alkali goldenbush | ISACA2 | *Isocoma acradenia var. acradenia* | 6–11 | – |
| | burroweed | ISTE2 | *Isocoma tenuisecta* | 0–3 | – |
| | desertbroom | BASA2 | *Baccharis sarothroides* | 0–2 | – |
| | broom snakeweed | GUSA2 | *Gutierrezia sarothrae* | 0–2 | – |
| 10 | | | | 22–45 | |
| | Leconte's barrel cactus | FECYL | *Ferocactus cylindraceus var. lecontei* | 0–2 | – |
| | Emory's barrel cactus | FEEM | *Ferocactus emoryi* | 0–2 | – |
| | candy barrelcactus | FEWI | *Ferocactus wislizeni* | 0–2 | – |
| | beavertail pricklypear | OPBA2 | *Opuntia basilaris* | 0–2 | – |
| | dollarjoint pricklypear | OPCH | *Opuntia chlorotica* | 0–2 | – |
| | nightblooming cereus | PEGR3 | *Peniocereus greggii* | 0–1 | – |
| | banana yucca | YUBA | *Yucca baccata* | 0–1 | – |
| | twistspine pricklypear | OPMAM3 | *Opuntia macrorhiza var. macrorhiza* | 0–1 | – |
| | Engelmann's hedgehog cactus | ECEN | *Echinocereus engelmannii* | 0–1 | – |

## Animal community

Perennial grasses grow year-round with available moisture. The potential plant community on this site is deficient in digestible protein in the fall and winter. Due to the coarseness of tobosa, the other perennial grasses will usually be over-used before tobosa in grazed. Utilization of these grasses should not exceed 50% in either the spring or

summer growing season. In wet winters the produciton of annual grasses and forbs can provide for very high stocking rates for a March-May grazing season.

Water developments are very important to wildlife species on this site. Cover and diversity are often lacking for the larger desert mammals like mule deer and javalina but the high production of winter annuals makes this site an important springtime forage area for those species. This site is home to a variety of small mammals and their predators.

## Other information

T&E: Antilocarpa Americana sonoriensis
Sonoran pronghorn

## Type locality

| | |
|---|---|
| Location 1: Maricopa County, AZ | |
| Township/Range/Section | T1S R7E S15 |
| General legal description | Chandler FO - General Motors Proving Grounds |
| Location 2: Pima County, AZ | |
| Township/Range/Section | T8S R10E S29 |
| General legal description | Tucson FO - Deep Well Ranch |
| Location 3: Pima County, AZ | |
| General legal description | Sells FO - Shuck Toak Dist. Flat between the Vaca Hills west of Queen Well |

## 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) | Dave Womack, Dan Robinett, Emilio Carrillo |
| Contact for lead author | NRCS Tucson Area Office |
| Date | 03/07/2005 |
| Approved by | S. Cassady |
| Approval date | |
| Composition (Indicators 10 and 12) based on | Annual Production |

## Indicators

1. **Number and extent of rills:** Rills are common and continuous in absence of high gravel cover.

2. **Presence of water flow patterns:** Water flow patterns are common, continuous, occupy 15-20% of area.

3. **Number and height of erosional pedestals or terracettes:** Shrubs have symmetrical mounds caused by the actions of splash, erosion and rodent activity. There are no pedestals on rock or gravel fragments and no terracettes are present.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 10-60%. Expect low values in dry years.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** No evidence of soil movement by wind.

7. **Amount of litter movement (describe size and distance expected to travel):** Woody litter remains under shrub canopies.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface resistance to erosion is good under shrub canopies to moderate in interspaces due to crusts formed by raindrop impact.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak thir platy to granular to subgranular blocky; 5-7.5YR5/6 dry, 5-7.5YR4/6 moist, to 4 inches thick

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Canopy 15-25%. Herbaceous litter is present in some years and absent in others. Large shrubs with large coppice mounds with high infiltration rates. Subshrubs with small mounds with high infiltration rates. Mounds occupy 15-30% of the surface and are evenly spaced over the area.

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

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: subshrubs = large shrubs & trees > winter annuals > summer annuals > perennial grasses and forbs > succulents > cryptogams (Note: in El Nino years, annual forbs and grasses are #1 in above ground weight).

    Sub-dominant:

    Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 0-50% canopy mortality on trees & shrubs; 100% mortality on perennial grasses.

14. **Average percent litter cover (%) and depth ( in):** Herbaceous litter is not persistent on the site.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 250 lbs/ac unfavorable precipitation; 400 lbs/ac normal precipitation; 650 lbs/ac favorable precipitation

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:** Sahara mustard (potential)

17. **Perennial plant reproductive capability:** Not impaired for shrubs, drought impaired for perennial grasses and forbs