

Ecological site R040XA121AZ

Granitic Upland 10"-13" 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.

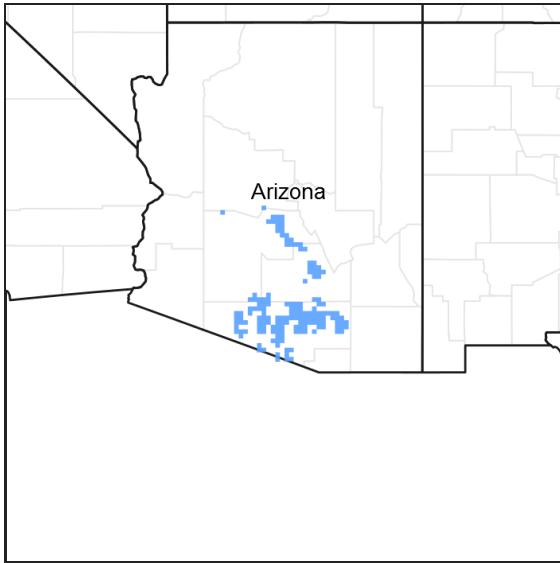


Figure 1. Mapped extent

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): 040X–Sonoran Basin and Range

AZ 40.1 – Upper Sonoran Desert

Elevations range from 2000 to 3200 feet and precipitation averages 10 to 13 inches per year. Vegetation includes saguaro, palo verde, mesquite, creosotebush, triangle bursage, prickly pear, cholla, limberbush, wolfberry, bush muhly, threeawns, ocotillo, and globe mallow. The soil temperature regime is thermic 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.

Associated sites

| | |
|-------------|------------------------------------|
| R040XA105AZ | Shallow Hills 10"-13" p.z. |
| R040XA123AZ | Volcanic Hills 10"-13" P.Z. |

Similar sites

| | |
|-------------|------------------------------------|
| R041XC322AZ | Shallow Upland 12-16" p.z. |
| R040XB220AZ | Granitic Upland 7"-10" p.z. |

Table 1. Dominant plant species

| | |
|------------|--|
| Tree | (1) <i>Parkinsonia microphylla</i> (2) <i>Carnegia gigantea</i> |
| Shrub | (1) <i>Calliandra eriophylla</i> |
| Herbaceous | (1) <i>Janusia gracilis</i> (2) <i>Aristida purpurea</i> |

Physiographic features

This site occurs in the upper elevations of the Sonoran Desert in southern Arizona. This site occurs on gently sloping to moderately steep pediments, flanking mountain areas. Numerous small areas of rock outcrop occur throughout areas of this site.

Table 2. Representative physiographic features

| | |
|--------------------|------------------------------------|
| Landforms | (1) Pediment |
| Flooding frequency | None |
| Ponding frequency | None |
| Elevation | 610–1,006 m |
| Slope | 1–15% |
| Aspect | Aspect is not a significant factor |

Climatic features

Precipitation in the sub resource area ranges from 10 to 13 inches in the southern part, along the Mexican border with elevations from about 1900 to 3200 feet. Precipitation in the northern part of the resource area ranges from 11 to 14 inches with elevations from about 1700 to 3500 feet. Winter-summer rainfall ratios range from 40%-60% in the southern portions of the land resource unit, to 50%-50% in the central portions, to 60%-40% in the northern part of the land resource unit. As one moves from east to west in this resource area rains become slightly more unpredictable and variable with Coefficients of Variation of annual rainfall equal to 29% at Tucson and 36% at Carefree. Summer rains fall July through Sept., originate in the Gulf of Mexico, and are convective, usually brief, intense thunderstorms. Cool season moisture tends to be frontal, originating in the Pacific and Gulf of California. This winter precipitation falls in widespread storms with long duration and low intensity. Snow is rare and seldom lasts more than an hour or two. May and June are the driest months of the year. Humidity is generally very low.

Winter temperatures are mild, with very few days recording freezing temperatures in the morning. Summer temperatures are warm to hot, with several days in June and July exceeding 105 degrees F.

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) | 265 days |
| Freeze-free period (average) | 0 days |
| Precipitation total (average) | 330 mm |

Influencing water features

There are no water features associated with this site.

Soil features

These soils have developed in place on granitic and rhyolitic types of parent material. They are shallow, non-calcareous and the underlying bedrock is fractured and weathered. Soil surfaces are well covered by small gravels. Plant-soil moisture relationships range from fair to poor for shallow and very shallow soils respectively.

Soils mapped on this site include:

SSA-645 Aguila-Carefree area MU's Gran-61 & Wickenburg-61;

SSA-661 Eastern Pinal-Southern Gila Counties MU Anklam-240;

SSA-669 Eastern Pima County MU's Lehman-13, Chimenea-16 & Granolite-58;

SSA-703 Tohono O'odham area MU's Anklam-3 & Granolite-48.

Table 4. Representative soil features

| | |
|--|--|
| Parent material | (1) Residuum–granite |
| Surface texture | (1) Very gravelly sandy loam (2) Gravelly sandy loam (3) Cobbly sandy loam |
| Family particle size | (1) Loamy |
| Drainage class | Well drained |
| Permeability class | Moderately rapid to moderately slow |
| Soil depth | 13–51 cm |
| Surface fragment cover <=3" | 35–70% |
| Surface fragment cover >3" | 5–25% |
| Available water capacity (0-101.6cm) | 1.52–5.59 cm |
| Calcium carbonate equivalent (0-101.6cm) | 0–5% |
| Electrical conductivity (0-101.6cm) | 0–2 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 0–2 |
| Soil reaction (1:1 water) (0-101.6cm) | 7.4–8 |
| Subsurface fragment volume <=3" (Depth not specified) | 35–65% |
| Subsurface fragment volume >3" (Depth not specified) | 0–20% |

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

MLRA 40-1 (10-13"), Granitic Upland

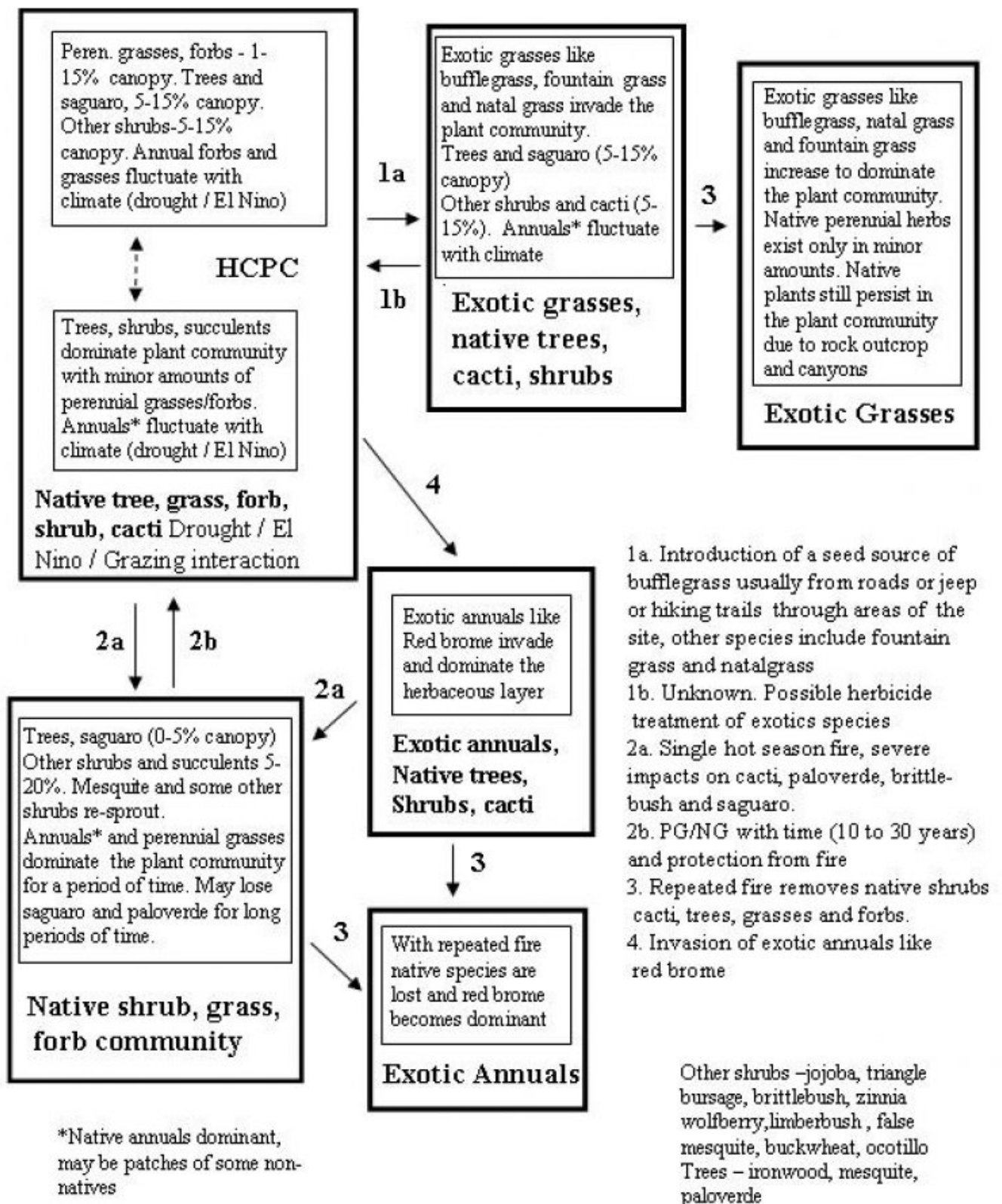


Figure 4. State and Transition model, Granitic Upland 10-13"

State 1
Historical Climax Plant Community

Community 1.1
Historical Climax Plant Community

The potential plant community on the site is a diverse mixture of desert shrubs, cacti, trees and perennial grasses and forbs. Annuals are of minor importance on the site. All of the major shrub and perennial grass and forb species on the site tend to be well dispersed throughout the plant community. The aspect is shrubland. With continuous, heavy grazing, forage species like bush muhly, false mesquite, desert zinnia, janusia, and range ratany are removed from the plant community and replaced by increases in shrubs like triangle bursage, turpentine bush, snakeweed and cacti. Trees tend to be shrubby on this site due to shallow soils. This site generally lacks the cobble and stone cover of adjacent hillsites. Gravel size and cover may be inadequate on moderate slopes in preventing water erosion. Saguaro can usually be found on this site in many age classes due to numerous rocky areas offering good seedling habitat in most years. Stands of mature saguaro will result in fewer trees on the site and vice versa.

Table 5. Annual production by plant type

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Grass/Grasslike | 7 | 67 | 269 |
| Shrub/Vine | 52 | 179 | 247 |
| Tree | 67 | 135 | 179 |
| Forb | 11 | 67 | 179 |
| Total | 137 | 448 | 874 |

Table 6. Soil surface cover

| | |
|-----------------------------------|--------|
| Tree basal cover | 0-1% |
| Shrub/vine/liana basal cover | 1-2% |
| Grass/grasslike basal cover | 0-1% |
| Forb basal cover | 0-1% |
| Non-vascular plants | 0% |
| Biological crusts | 0-5% |
| Litter | 5-30% |
| Surface fragments >0.25" and <=3" | 35-70% |
| Surface fragments >3" | 5-15% |
| Bedrock | 1-10% |
| Water | 0% |
| Bare ground | 5-55% |

Table 7. Canopy structure (% cover)

| Height Above Ground (M) | Tree | Shrub/Vine | Grass/ Grasslike | Forb |
|-------------------------|-------|------------|---------------------|-------|
| <0.15 | – | 0-1% | 0-15% | 0-10% |
| >0.15 <= 0.3 | – | 1-5% | 1-5% | 1-5% |
| >0.3 <= 0.6 | – | 2-10% | 0-2% | 0-5% |
| >0.6 <= 1.4 | – | 0-2% | – | – |
| >1.4 <= 4 | 0-1% | – | – | – |
| >4 <= 12 | 1-10% | – | – | – |
| >12 <= 24 | – | – | – | – |
| >24 <= 37 | – | – | – | – |
| >37 | – | – | – | – |

Figure 6. Plant community growth curve (percent production by month). AZ4013, 40.1 10-13" p.z. other sites. Growth begins in the late winter, goes

semi-dormant in the drought period of late May through early July, growth continues in the summer through early fall..

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 5 | 10 | 20 | 15 | 0 | 5 | 20 | 15 | 5 | 5 | 0 |

State 2

Native trees, shrubs, cacti and fire

Community 2.1

Native trees, shrubs, cacti and fire

This plant community occurs as a result of a single hot season fire. Paloverde and saguaro can be severely impacted and may take long periods of time (30-50 years) to recover to pre-fire levels. Annual grasses and forbs dominate the community for some time until perennial grasses, forbs and shrubs can recover. This plant community can produce enough herbaceous fuel from native species of grasses and / or forbs to carry fire only in unusually wet winter or summers. The natural incidence of fire in this MLRA is very low and fires are much more common from man-made ignitions. Areas of the site close to urban zones or along heavily travelled roads and highways will experience a higher rate of fires.

State 3

Exotic perennial grasses with natives

Community 3.1

Exotic perennial grasses with natives

This community occurs where buffleggrass, natal grass or fountain grass invade the native plant community. These species occupy the niches of low shrubs like brittlebush or triangle bursage and woody forbs like janusia, ayenia and deer weed.

State 4

Exotic perennial grasses and fire

Community 4.1

Exotic perennial grasses and fire

This community occurs where a native plant community that has been invaded by buffleggrass or fountain grass has burned one or more times. Increasing amounts of buffleggrass leads to more uniform fine fuels. In areas adjacent to roads and urban areas the risk of repeated fires will increase. As fire frequency increases the dominance of the exotic grasses increase.

State 5

Native plant community with exotic annuals

Community 5.1

Native plant community with exotic annuals

This plant community occurs where the native community has been invaded by red brome, schismus and / or filaree. These species occupy the niche of the native winter annual forbs and grasses. These exotic annual grasses will fluctuate from nearly nothing in a dry winter to dominance of the understory plant community in a El Nino winter.

State 6

Exotic annuals and fire

Community 6.1

Exotic annuals and fire

This plant community occurs where a native plant community which has been invaded by red brome, schismus or filaree has burned repeatedly. As fires become more frequent the native trees, shrubs and succulents are removed from the plant community and these species become dominant. In areas of the site near urban areas and along heavily travelled roads this will be a more common occurrence due to an increased source of ignitions.

Additional community tables

Table 8. Community 1.1 plant community composition

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|------------------------|-----------------------------------|--------|---|--------------------------------|------------------|
| Grass/Grasslike | | | | | |
| 1 | Dominant perennial grasses | | | 6–90 | |
| | purple threeawn | ARPU9 | <i>Aristida purpurea</i> | 1–45 | – |
| | tanglehead | HECO10 | <i>Heteropogon contortus</i> | 1–45 | – |
| | bush muhly | MUPO2 | <i>Muhlenbergia porteri</i> | 1–45 | – |
| | slim tridens | TRMU | <i>Tridens muticus</i> | 1–34 | – |
| | Parish's threeawn | ARPUP5 | <i>Aristida purpurea var. parishii</i> | 0–22 | – |
| | spidergrass | ARTE3 | <i>Aristida ternipes</i> | 1–22 | – |
| | spidergrass | ARTEG | <i>Aristida ternipes var. gentilis</i> | 0–11 | – |
| | Santa Rita threeawn | ARCAG | <i>Aristida californica var. glabrata</i> | 0–11 | – |
| 2 | Misc perennial grasses | | | 1–22 | |
| | red grama | BOTR2 | <i>Bouteloua trifida</i> | 0–11 | – |
| | blue threeawn | ARPUN | <i>Aristida purpurea var. nealleyi</i> | 0–6 | – |
| | sideoats grama | BOCU | <i>Bouteloua curtipendula</i> | 0–6 | – |
| | black grama | BOER4 | <i>Bouteloua eriopoda</i> | 0–6 | – |
| | cane bluestem | BOBA3 | <i>Bothriochloa barbinodis</i> | 0–2 | – |
| | low woollygrass | DAPU7 | <i>Dasyochloa pulchella</i> | 0–2 | – |
| | Arizona cottontop | DICA8 | <i>Digitaria californica</i> | 0–2 | – |
| | tobosagrass | PLMU3 | <i>Pleuraphis mutica</i> | 0–2 | – |
| | big galleta | PLRI3 | <i>Pleuraphis rigida</i> | 0–2 | – |
| | sand dropseed | SPCR | <i>Sporobolus cryptandrus</i> | 0–2 | – |
| | Havard's threeawn | ARHA3 | <i>Aristida havardii</i> | 0–2 | – |
| | Fendler threeawn | ARPUL | <i>Aristida purpurea var. longiseta</i> | 0–1 | – |
| | desert needlegrass | ACSP12 | <i>Achnatherum speciosum</i> | 0–1 | – |
| | plains bristlegrass | SEVU2 | <i>Setaria vulpiseta</i> | 0–1 | – |
| | spike dropseed | SPCO4 | <i>Sporobolus contractus</i> | 0–1 | – |
| 3 | Dominant short grasses | | | 0–45 | |
| | slender grama | BORE2 | <i>Bouteloua repens</i> | 0–22 | – |
| | curly-mesquite | HIBE | <i>Hilaria belangeri</i> | 0–22 | – |
| | Rothrock's grama | BORO2 | <i>Bouteloua rothrockii</i> | 0–17 | – |
| 4 | Annual grasses | | | 0–112 | |
| | sixweeks threeawn | ARAD | <i>Aristida adscensionis</i> | 0–112 | – |
| | mucronate sprangeltop | LEPAB | <i>Leptochloa panicea ssp. brachiata</i> | 0–22 | – |
| | sixweeks fescue | VUOC | <i>Vulpia octoflora</i> | 0–22 | – |
| | Mexican panicgrass | PAHI5 | <i>Panicum hirticaule</i> | 0–11 | – |
| | needle grama | BOAR | <i>Bouteloua aristidoides</i> | 0–11 | – |

| | | | | | |
|-------------|------------------------------|--------|---|-------|---|
| | sixweeks grama | BOBA2 | <i>Bouteloua barbata</i> | 0-11 | - |
| | prairie threeawn | AROL | <i>Aristida oligantha</i> | 0-6 | - |
| | delicate muhly | MUFR | <i>Muhlenbergia fragilis</i> | 0-2 | - |
| | littleseed muhly | MUMI | <i>Muhlenbergia microsperma</i> | 0-2 | - |
| | Bigelow's bluegrass | POBI | <i>Poa bigelovii</i> | 0-2 | - |
| | desert lovegrass | ERPEM | <i>Eragrostis pectinacea var. miserrima</i> | 0-2 | - |
| | Arizona brome | BRAR4 | <i>Bromus arizonicus</i> | 0-1 | - |
| Forb | | | | | |
| 5 | Perennial forbs | | | 11-67 | |
| | slender janusia | JAGR | <i>Janusia gracilis</i> | 2-22 | - |
| | shrubby deervetch | LORI3 | <i>Lotus rigidus</i> | 1-17 | - |
| | desert globemallow | SPAM2 | <i>Sphaeralcea ambigua</i> | 2-17 | - |
| | brownplume wirelettuce | STPA4 | <i>Stephanomeria pauciflora</i> | 0-11 | - |
| | lacy tansyaster | MAPIP4 | <i>Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida</i> | 1-11 | - |
| | wishbone-bush | MILAV | <i>Mirabilis laevis var. villosa</i> | 0-11 | - |
| | desert marigold | BAMU | <i>Baileya multiradiata</i> | 0-11 | - |
| | Arizona wrightwort | CAAR7 | <i>Carlwrightia arizonica</i> | 0-6 | - |
| | red-gland spurge | CHME5 | <i>Chamaesyce melanadenia</i> | 1-6 | - |
| | San Felipe dogweed | ADPO | <i>Adenophyllum porophylloides</i> | 0-6 | - |
| | bluedicks | DICA14 | <i>Dichelostemma capitatum</i> | 0-6 | - |
| | Parry's false prairie-clover | MAPA7 | <i>Marina parryi</i> | 0-6 | - |
| | desert trumpet | ERIN4 | <i>Eriogonum inflatum</i> | 1-6 | - |
| | dense ayenia | AYMI | <i>Ayenia microphylla</i> | 0-6 | - |
| | Parry's beardtongue | PEPA24 | <i>Penstemon parryi</i> | 0-2 | - |
| | glandleaf milkwort | POMA7 | <i>Polygala macradenia</i> | 0-2 | - |
| | spearleaf | MAPA9 | <i>Matelea parvifolia</i> | 0-2 | - |
| | weakleaf bur ragweed | AMCO3 | <i>Ambrosia confertiflora</i> | 0-2 | - |
| | tuber anemone | ANTU | <i>Anemone tuberosa</i> | 0-1 | - |
| | narrowleaf silverbush | ARLA12 | <i>Argythamnia lanceolata</i> | 0-1 | - |
| | New Mexico silverbush | ARNE2 | <i>Argythamnia neomexicana</i> | 0-1 | - |
| | Braun's rockcress | ARPE3 | <i>Arabis perstellata</i> | 0-1 | - |
| | trailing windmills | ALIN | <i>Allionia incarnata</i> | 0-1 | - |
| | dwarf desertpeony | ACNA2 | <i>Acourtia nana</i> | 0-1 | - |
| | brownfoot | ACWR5 | <i>Acourtia wrightii</i> | 0-1 | - |
| | hairy five eyes | CHSO | <i>Chamaesaracha sordida</i> | 0-1 | - |
| | Parish's larkspur | DEPAP3 | <i>Delphinium parishii ssp. parishii</i> | 0-1 | - |
| | tall mountain larkspur | DESC | <i>Delphinium scaposum</i> | 0-1 | - |
| | desert mariposa lily | CAKE | <i>Calochortus kennedyi</i> | 0-1 | - |
| | lipfern | CHEIL | <i>Cheilanthes</i> | 0-1 | - |
| | scarlet spiderling | BOCO | <i>Boerhavia coccinea</i> | 0-1 | - |
| | wild dwarf morning-glory | EVAR | <i>Evolvulus arizonicus</i> | 0-1 | - |
| | California fagonbush | FAI A | <i>Fagonia laevis</i> | 0-1 | - |

| | | | | | |
|---|-----------------------------|--------|--|-------|---|
| | desert rosemallow | HICO | <i>Hibiscus coulteri</i> | 0-1 | - |
| | paleface | HIDE | <i>Hibiscus denudatus</i> | 0-1 | - |
| | spreading fleabane | ERDI4 | <i>Erigeron divergens</i> | 0-1 | - |
| | plains blackfoot | MELE2 | <i>Melampodium leucanthum</i> | 0-1 | - |
| | desert tobacco | NIOBO | <i>Nicotiana obtusifolia</i> var. <i>obtusifolia</i> | 0-1 | - |
| | cloak fern | NOTHO | <i>Notholaena</i> | 0-1 | - |
| | cliffbrake | PELLA | <i>Pellaea</i> | 0-1 | - |
| | Arizona spikemoss | SEAR2 | <i>Selaginella arizonica</i> | 0-1 | - |
| | spreading fanpetals | SIAB | <i>Sida abutifolia</i> | 0-1 | - |
| | slender poreleaf | POGR5 | <i>Porophyllum gracile</i> | 0-1 | - |
| 6 | Annual forbs | | | 0-112 | |
| | California poppy | ESCAM | <i>Eschscholzia californica</i> ssp. <i>mexicana</i> | 0-22 | - |
| | coastal bird's-foot trefoil | LOSAB | <i>Lotus salsuginosus</i> var. <i>brevivexillus</i> | 0-22 | - |
| | desert Indianwheat | PLOV | <i>Plantago ovata</i> | 0-22 | - |
| | Coulter's lupine | LUSP2 | <i>Lupinus sparsiflorus</i> | 0-17 | - |
| | exserted Indian paintbrush | CAEXE | <i>Castilleja exserta</i> ssp. <i>exserta</i> | 0-17 | - |
| | smallflowered milkvetch | ASNU4 | <i>Astragalus nuttallianus</i> | 0-11 | - |
| | Coulter's spiderling | BOCO2 | <i>Boerhavia coulteri</i> | 0-11 | - |
| | common fiddleneck | AMMEI2 | <i>Amsinckia menziesii</i> var. <i>intermedia</i> | 0-11 | - |
| | Sonoran sandmat | CHMI7 | <i>Chamaesyce micromera</i> | 0-11 | - |
| | cryptantha | CRYPT | <i>Cryptantha</i> | 0-11 | - |
| | western tansymustard | DEPI | <i>Descurainia pinnata</i> | 0-11 | - |
| | miniature woollystar | ERDI2 | <i>Eriastrum diffusum</i> | 0-11 | - |
| | woolly plantain | PLPA2 | <i>Plantago patagonica</i> | 0-11 | - |
| | combseed | PECTO | <i>Pectocarya</i> | 0-11 | - |
| | foothill deervetch | LOHU2 | <i>Lotus humistratus</i> | 0-11 | - |
| | distant phacelia | PHDI | <i>Phacelia distans</i> | 0-11 | - |
| | thelypody | THELY | <i>Thelypodium</i> | 0-11 | - |
| | woolly tidestromia | TILA2 | <i>Tidestromia lanuginosa</i> | 0-11 | - |
| | American wild carrot | DAPU3 | <i>Daucus pusillus</i> | 0-6 | - |
| | Gordon's bladderpod | LEGO | <i>Lesquerella gordonii</i> | 0-6 | - |
| | shaggyfruit pepperweed | LELA | <i>Lepidium lasiocarpum</i> | 0-3 | - |
| | flatcrown buckwheat | ERDE6 | <i>Eriogonum deflexum</i> | 0-2 | - |
| | Florida pellitory | PAFL3 | <i>Parietaria floridana</i> | 0-2 | - |
| | glandular threadplant | NEGL | <i>Nemacladus glanduliferus</i> | 0-2 | - |
| | Arizona phacelia | PHAR13 | <i>Phacelia arizonica</i> | 0-2 | - |
| | cleftleaf wildheliotrope | PHCR | <i>Phacelia crenulata</i> | 0-2 | - |
| | chia | SACO6 | <i>Salvia columbariae</i> | 0-2 | - |
| | sleepy silene | SIAN2 | <i>Silene antirrhina</i> | 0-2 | - |
| | star gilia | GIST | <i>Gilia stellata</i> | 0-2 | - |
| | woollyhead neststraw | STMI2 | <i>Stylocline micropoides</i> | 0-2 | - |
| | buckwheat | ERIOG | <i>Eriogonum</i> | 0-2 | - |

| | | | | | |
|-------------------|-----------------------------|--------|---|-------|---|
| | hairy prairie clover | DAMO | <i>Dalea mollis</i> | 0-2 | - |
| | devil's spineflower | CHRI | <i>Chorizanthe rigida</i> | 0-2 | - |
| | Esteve's pincushion | CHST | <i>Chaenactis stevioides</i> | 0-2 | - |
| | New Mexico thistle | CINE | <i>Cirsium neomexicanum</i> | 0-2 | - |
| | pincushion flower | CHFR | <i>Chaenactis fremontii</i> | 0-2 | - |
| | carelessweed | AMPA | <i>Amaranthus palmeri</i> | 0-2 | - |
| | bristly fiddleneck | AMTE3 | <i>Amsinckia tessellata</i> | 0-2 | - |
| | white easterbonnets | ANLA7 | <i>Antheropeas lanosum</i> | 0-2 | - |
| | hoary bowlesia | BOIN3 | <i>Bowlesia incana</i> | 0-2 | - |
| | yellow tackstem | CAPA7 | <i>Calycoseris parryi</i> | 0-2 | - |
| | white tackstem | CAWR | <i>Calycoseris wrightii</i> | 0-2 | - |
| | pitseed goosefoot | CHBE4 | <i>Chenopodium berlandieri</i> | 0-2 | - |
| | brittle spineflower | CHBR | <i>Chorizanthe brevicornu</i> | 0-2 | - |
| | Chiricahua Mountain sandmat | CHFL3 | <i>Chamaesyce florida</i> | 0-1 | - |
| | California suncup | CACA32 | <i>Camissonia californica</i> | 0-1 | - |
| | fringed amaranth | AMFI | <i>Amaranthus fimbriatus</i> | 0-1 | - |
| | sand pygmyweed | CRCO | <i>Crassula connata var. connata</i> | 0-1 | - |
| | wedgeleaf draba | DRCU | <i>Draba cuneifolia</i> | 0-1 | - |
| | Abert's buckwheat | ERAB2 | <i>Eriogonum abertianum</i> | 0-1 | - |
| | sorrel buckwheat | ERPO4 | <i>Eriogonum polycladon</i> | 0-1 | - |
| | Texas stork's bill | ERTE13 | <i>Erodium texanum</i> | 0-1 | - |
| | sand fringe pod | THCU | <i>Thysanocarpus curvipes</i> | 0-1 | - |
| | Louisiana vetch | VILU | <i>Vicia ludoviciana</i> | 0-1 | - |
| | Palmer's grapplinghook | HAPA7 | <i>Harpagonella palmeri</i> | 0-1 | - |
| | California goldfields | LACAC2 | <i>Lasthenia californica ssp. californica</i> | 0-1 | - |
| | flatspine stickseed | LAOCO | <i>Lappula occidentalis var. occidentalis</i> | 0-1 | - |
| | Mexican fireplant | EUHE4 | <i>Euphorbia heterophylla</i> | 0-1 | - |
| | spring pygmyweed | EVVE | <i>Evax verna</i> | 0-1 | - |
| | limestone bedstraw | GAPR | <i>Galium proliferum</i> | 0-1 | - |
| | California desertdandelion | MACA6 | <i>Malacothrix californica</i> | 0-1 | - |
| | slender goldenweed | MAGR10 | <i>Machaeranthera gracilis</i> | 0-1 | - |
| | mesa tansyaster | MATA | <i>Machaeranthera tagetina</i> | 0-1 | - |
| | whitestem blazingstar | MEAL6 | <i>Mentzelia albicaulis</i> | 0-1 | - |
| | Lindley's silverpuffs | MILI5 | <i>Microseris lindleyi</i> | 0-1 | - |
| | Mojave desertstar | MOBE2 | <i>Monoptilon bellioides</i> | 0-1 | - |
| | lyreleaf jewelflower | STCAA | <i>Streptanthus carinatus ssp. arizonicus</i> | 0-1 | - |
| | manybristle chinchweed | PEPA2 | <i>Pectis papposa</i> | 0-1 | - |
| | desert evening primrose | OEPR | <i>Oenothera primiveris</i> | 0-1 | - |
| | Arizona cottonrose | LOAR12 | <i>Logfia arizonica</i> | 0-1 | - |
| Shrub/Vine | | | | | |
| 8 | Dominant low shrubs | | | 22-67 | |

| | | | | | |
|----|------------------------------|--------|---|-------|---|
| | fairyduster | CAER | <i>Calliandra eriophylla</i> | 6–28 | – |
| | Eastern Mojave buckwheat | ERFA2 | <i>Eriogonum fasciculatum</i> | 0–17 | – |
| | bastardsage | ERWR | <i>Eriogonum wrightii</i> | 0–11 | – |
| | triangle bur ragweed | AMDE4 | <i>Ambrosia deltoidea</i> | 1–11 | – |
| | Coulter's brickellbush | BRCO | <i>Brickellia coulteri</i> | 1–11 | – |
| | littleleaf ratany | KRER | <i>Krameria erecta</i> | 1–11 | – |
| | white ratany | KRGR | <i>Krameria grayi</i> | 0–11 | – |
| | desert zinnia | ZIAC | <i>Zinnia acerosa</i> | 1–11 | – |
| | rough menodora | MESC | <i>Menodora scabra</i> | 0–6 | – |
| | brittlebush | ENFA | <i>Encelia farinosa</i> | 0–6 | – |
| | Palmer's Indian mallow | ABPA | <i>Abutilon palmeri</i> | 0–6 | – |
| | broom snakeweed | GUSA2 | <i>Gutierrezia sarothrae</i> | 0–6 | – |
| | American threefold | TRCA8 | <i>Trixis californica</i> | 0–2 | – |
| 9 | Dominant large shrubs | | | 17–90 | |
| | jojoba | SICH | <i>Simmondsia chinensis</i> | 6–28 | – |
| | ocotillo | FOSP2 | <i>Fouquieria splendens</i> | 6–22 | – |
| | sangre de cristo | JACA2 | <i>Jatropha cardiophylla</i> | 0–17 | – |
| | pelotazo | ABIN | <i>Abutilon incanum</i> | 0–17 | – |
| | whitethorn acacia | ACCO2 | <i>Acacia constricta</i> | 0–11 | – |
| | desert lavender | HYEM | <i>Hyptis emoryi</i> | 0–11 | – |
| | Berlandier's wolfberry | LYBE | <i>Lycium berlandieri</i> | 1–6 | – |
| 10 | Miscellaneous shrubs | | | 1–11 | |
| | Wright's beebrush | ALWR | <i>Aloysia wrightii</i> | 0–3 | – |
| | Tucson bur ragweed | AMCO4 | <i>Ambrosia cordifolia</i> | 0–2 | – |
| | burrobush | AMDU2 | <i>Ambrosia dumosa</i> | 0–2 | – |
| | Warnock's snakewood | COWA | <i>Condalia warnockii</i> | 0–2 | – |
| | sweetbush | BEJU | <i>Bebbia juncea</i> | 0–2 | – |
| | creosote bush | LATRT | <i>Larrea tridentata</i> var. <i>tridentata</i> | 0–2 | – |
| | water jacket | LYAN | <i>Lycium andersonii</i> | 0–1 | – |
| | Arizona desert-thorn | LYEX | <i>Lycium exsertum</i> | 0–1 | – |
| | Arizona mimosa | MIDIL | <i>Mimosa distachya</i> var. <i>laxiflora</i> | 0–1 | – |
| | whitestem paperflower | PSCO2 | <i>Psilostrophe cooperi</i> | 0–1 | – |
| | toothleaf goldeneye | VIDE3 | <i>Viguiera dentata</i> | 0–1 | – |
| | banana yucca | YUBA | <i>Yucca baccata</i> | 0–1 | – |
| | lotebush | ZIOB | <i>Ziziphus obtusifolia</i> | 0–1 | – |
| | spiny hackberry | CEEH | <i>Celtis ehrenbergiana</i> | 0–1 | – |
| | rosary babybonnets | COGL8 | <i>Coursetia glandulosa</i> | 0–1 | – |
| | Nevada jointfir | EPNE | <i>Ephedra nevadensis</i> | 0–1 | – |
| | longleaf jointfir | EPTR | <i>Ephedra trifurca</i> | 0–1 | – |
| | turpentine bush | ERLA12 | <i>Ericameria laricifolia</i> | 0–1 | – |
| | burrobrush | HYSA | <i>Hymenoclea salsola</i> | 0–1 | – |
| | burroweed | ISTE2 | <i>Isocoma tenuisecta</i> | 0–1 | – |
| | fourwing saltbush | ATCA2 | <i>Atriplex canescens</i> | 0–1 | – |

| | | | | | |
|-------------|------------------------------|--------|---|--------|---|
| | prairie acacia | ACANH | <i>Acacia angustissima var. hirta</i> | 0–1 | – |
| | rayless goldenhead | ACSP | <i>Acamptopappus sphaerocephalus</i> | 0–1 | – |
| 11 | Succulents | | | 11–90 | |
| | saguaro | CAGI10 | <i>Carnegiea gigantea</i> | 6–56 | – |
| | walkingstick cactus | CYSP8 | <i>Cylindropuntia spinosior</i> | 0–11 | – |
| | staghorn cholla | CYVE3 | <i>Cylindropuntia versicolor</i> | 1–11 | – |
| | cactus apple | OPEN3 | <i>Opuntia engelmannii</i> | 1–11 | – |
| | purple pricklypear | OPMA8 | <i>Opuntia macrocentra</i> | 0–11 | – |
| | tulip pricklypear | OPPH | <i>Opuntia phaeacantha</i> | 0–11 | – |
| | candy barrelcactus | FEWI | <i>Ferocactus wislizeni</i> | 1–6 | – |
| | Christmas cactus | CYLE8 | <i>Cylindropuntia leptocaulis</i> | 1–6 | – |
| | teddybear cholla | CYBI9 | <i>Cylindropuntia bigelovii</i> | 0–6 | – |
| | jumping cholla | CYFU10 | <i>Cylindropuntia fulgida</i> | 0–6 | – |
| | pinkflower hedgehog cactus | ECFA | <i>Echinocereus fasciculatus</i> | 1–6 | – |
| | buck-horn cholla | CYAC8 | <i>Cylindropuntia acanthocarpa</i> | 0–6 | – |
| | Arizona pencil cholla | CYAR14 | <i>Cylindropuntia arbuscula</i> | 0–2 | – |
| | Schott's century plant | AGSC3 | <i>Agave schottii</i> | 0–2 | – |
| | Graham's nipple cactus | MAGR9 | <i>Mammillaria grahamii</i> | 1–2 | – |
| | Thornber's nipple cactus | MATH | <i>Mammillaria thornberi</i> | 0–1 | – |
| | soaptree yucca | YUEL | <i>Yucca elata</i> | 0–1 | – |
| | rainbow cactus | ECPE | <i>Echinocereus pectinatus</i> | 0–1 | – |
| | spiny star | ESVIV | <i>Escobaria vivipara var. vivipara</i> | 0–1 | – |
| | candle cholla | CYKL | <i>Cylindropuntia kleiniae</i> | 0–1 | – |
| | Engelmann's hedgehog cactus | ECEN | <i>Echinocereus engelmannii</i> | 0–1 | – |
| | redspine fishhook cactus | ECER2 | <i>Echinomastus erectocentrus</i> | 0–1 | – |
| | long-tubercle beehive cactus | COROR | <i>Coryphantha robustispina ssp. robustispina</i> | 0–1 | – |
| | desert agave | AGDE | <i>Agave deserti</i> | 0–1 | – |
| Tree | | | | | |
| 12 | Trees | | | 67–179 | |
| | yellow paloverde | PAMI5 | <i>Parkinsonia microphylla</i> | 67–135 | – |
| | desert ironwood | OLTE | <i>Olneya tesota</i> | 0–90 | – |
| | velvet mesquite | PRVE | <i>Prosopis velutina</i> | 0–28 | – |
| | catclaw acacia | ACGR | <i>Acacia greggii</i> | 0–17 | – |

Animal community

This site produces very little herbaceous forage for livestock. The plant community has a good variety of evergreen browse species making it suitable for winter grazing. Areas of this site are associated with steep rough hillsites and will be over used unless grazing systems allow enough rest for recovery or unless fencing is used to isolate the site from the hillsites. Water may be available in the bedrock canyons bisecting the site in both the winter and summer. The site provides good habitat for a variety of desert wildlife including the larger mammals. Water developments are very important to wildlife on this site.

Although free water may be found in rocky drainages in the rainy seasons, water developments would help ensure year-round use of the site by the large desert mammals. Cover, forage plant diversity and topography are good enough for a great variety of wildlife.

Hydrological functions

This site is a fair to good producer of runoff due to moderate slopes and shallow to very shallow soils. Very gravelly soil surfaces help to hold water on the site.

Recreational uses

Hunting, hiking, birdwatching, photography, horseback riding, rock hounding, recreational mining

Wood products

Some paloverde, ironwood and mesquite for camp-fires and branding fires.

Other products

Stones and cobbles, decomposed granite, saguaro ribs, cholla skeletons. Traditional foods like saguaro fruits, prickly pear tunas, cactus flower buds and jojoba nuts. Traditional herbs like coyote tobacco, mint bush, club moss, globe mallow and limberbush.

Type locality

| | |
|-----------------------------|---|
| Location 1: Pima County, AZ | |
| Township/Range/Section | T14S R16E S28 |
| General legal description | Tucson FO - Saguaro Nat'l. Monument East |
| Location 2: Pima County, AZ | |
| General legal description | Sells FO - Quijotoa Mountains 112 7' X 32 11' (unsurveyed) |
| Location 3: Pima County, AZ | |
| Township/Range/Section | T15S R9E S9 |
| General legal description | La Tortuga Ranch, in the Tortuga pasture 2 miles south of Turtle well. Ungrazed 15 years. |

Contributors

Dan Robinett
Larry D. Ellicott

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 | 03/08/2005 |
| Approved by | S Cassady |
| Approval date | |

Indicators

1. **Number and extent of rills:** Rills are present on this site but follow joints, bedding planes, and fractures in the bedrock parent materials.

2. **Presence of water flow patterns:** Discontinuous, 10-15 feet in length.

3. **Number and height of erosional pedestals or terracettes:** No pedestals on plants, 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):** 10-60% (low values due to high rock and gravel cover).

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

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

7. **Amount of litter movement (describe size and distance expected to travel):** Most litter size classes stay in place. Herbaceous litter moves 10-15 feet in flow paths.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Expect ratings of 1-3 in perennial plant interspaces, 4-5 under shrub canopies.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Weak thin platy to granular; color is 7.5-10YR5/4 dry, 7.5-10YR4/4 moist; thickness to 2 inches.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Canopy 15-20%; 50-65% shrubs, 15-20% trees, 5-10% succulents, 2-5% perennial grasses. Cove is well dispersed throughout site.

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: sub shrubs > trees > winter annuals > shrubs > perennial forbs > perennial grasses > summer annuals > succulents

Sub-dominant:

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** 20-50% tree & shrub canopy mortality; 75-90% perennial grass mortality
-

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):** 122 lbs/ac unfavorable precipitation; 400 lbs/ac normal precipitation; 780 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:** triangle bursage, turpentine bush, snakeweed, cacti, buffleggrass
-

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