

Ecological site R030XB206AZ

Cobbly Limy Upland 6-9" p.z. Deep

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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): 030X–Mojave Basin and Range

AZ CRA 30.2 – Middle Mohave Desert

Elevations range from 1500 to 3200 feet and precipitation averages 6 to 9 inches per year. Vegetation includes creosotebush, white bursage, yucca, prickly pear and cholla species, Mormon tea, flattop buckwheat, ratany, winterfat, bush muhly, threeawns, and big galleta. The soil temperature regime is thermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Province and is characterized by broad basins, valleys, and old lakebeds. Widely spaced mountains trending north to south occur throughout the area. Isolated, short mountain ranges are separated by an aggraded desert plain. The mountains are fault blocks that have been tilted up. Long alluvial fans coalesce with dry lakebeds between some of the ranges.

Associated sites

|             |                                     |
|-------------|-------------------------------------|
| R030XB214AZ | Limy Upland 6-9" p.z.               |
| R030XC306AZ | Granitic Hills 10-13" p.z. Alkaline |

Table 1. Dominant plant species

|            |  |
|------------|--|
| Tree       | Not specified  |
| Shrub      | (1) <i>Ambrosia dumosa</i><br>(2) <i>Larrea tridentata</i> |
| Herbaceous | (1) <i>Pleuraphis rigida</i>                               |

## Physiographic features

This ecological site is found in an upland position on summits, shoulders and sideslopes of fan terraces and fan piedmonts. The soil surface of the ecological site is covered with gravel, cobbles and stones. Slopes range from 5 to 15 percent.

**Table 2. Representative physiographic features**

|                    |                                    |
|--------------------|------------------------------------|
| Landforms          | (1) Terrace<br>(2) Fan piedmont    |
| Flooding frequency | None                               |
| Ponding frequency  | None                               |
| Elevation          | 579–914 m                          |
| Slope              | 5–15%                              |
| Aspect             | Aspect is not a significant factor |

## Climatic features

The climate is arid and warm. Annual precipitation ranges from 6 to 9 inches. About 65 percent of the rainfall comes from October through May as gentle rain from Pacific storms which may last for a couple of days. The rest of the rainfall comes during the summer monsoon season from July through September as spotty, brief, intense thunderstorms. Snow rarely falls, and only remains on the ground a few hours at most. Annual air temperature ranges from 59 to 70 degrees F. The average frost-free period ranges from 156 to 259 days.

**Table 3. Representative climatic features**

|                               |          |
|-------------------------------|----------|
| Frost-free period (average)   | 259 days |
| Freeze-free period (average)  | 290 days |
| Precipitation total (average) | 229 mm   |

## Influencing water features

### Soil features

The soils of this ecological site are deep to very deep to any plant root restricting layer. Surface textures range from very gravelly sandy loam to very stony sandy loam. Subsurface textures range from very gravelly sandy loam to extremely cobbly loamy coarse sand. The available water capacity is low. Hazard of erosion by water is slight to moderate and by wind is slight. The soil surface may be non-effervescent, but the soil subsurface is slightly to strongly effervescent.

A typical soil profile is as follows:

A--0 to 2 inches; very gravelly sandy loam, 20 percent gravel, 10 percent cobble and 10 percent stones; noneffervescent; moderately alkaline (pH 8.2)

Bk1--2 to 8 inches; gravelly sandy loam, 20 percent gravel and 5 percent cobble; slightly effervescent with disseminated and segregated calcium carbonate as pendants on sand grains and rock fragments, 7 percent calcium

carbonate equivalent; moderately alkaline (pH 8.2)

Bk2--8 to 30 inches; extremely cobbly loamy coarse sand, 35 percent gravel, 25 percent cobble and 10 percent stones; strongly effervescent with disseminated and segregated calcium carbonate as pendants on sand grains and rock fragments, 10 percent calcium carbonate equivalent; moderately alkaline (pH 8.4)

Bk3--30 to 62 inches; very gravelly coarse sand, dark yellowish brown (10YR 4/4) moist; single grained; 50 percent gravel and 5 percent cobble; strongly effervescent with disseminated and segregated calcium carbonate as pendants on sand grains and rock fragments, 7 percent calcium carbonate equivalent; moderately alkaline (pH 8.4)

2C--62 to 64 inches; coarse sand, 5 percent gravel; slightly effervescent with disseminated calcium carbonate, 2 percent calcium carbonate equivalent; moderately alkaline (pH 8.4)

Soil map units correlated to this ecological site include 623013, Blind Family and Shelly, Shivwits Area, Arizona SSA.

**Table 4. Representative soil features**

|  |   |
|--|---|
| Surface texture  | (1) Very gravelly sandy loam<br>(2) Very stony sandy loam |
| Family particle size                                     | (1) Sandy   |
| Drainage class   | Somewhat excessively drained to excessively drained       |
| Permeability class                                       | Moderate to very rapid                                    |
| Soil depth   | 152 cm  |
| Surface fragment cover <=3"                              | 20–50%  |
| Surface fragment cover >3"                               | 0–50%   |
| Calcium carbonate equivalent<br>(0–101.6cm)              | 0–25%   |
| Electrical conductivity<br>(0–101.6cm)                   | 0–2 mmhos/cm  |
| Soil reaction (1:1 water)<br>(0–101.6cm)                 | 7.4–8.6   |
| Subsurface fragment volume <=3"<br>(Depth not specified) | 20–50%  |
| Subsurface fragment volume >3"<br>(Depth not specified)  | 0–50%   |

## Ecological dynamics

The historic climax plant community (HCPC) for a site in North America is the plant community that existed at the time of European immigration and settlement. It is the plant community that was best adapted to the unique combination of environmental factors associated with the site at that time. The HCPC was in dynamic equilibrium with its environment and was able to avoid displacement by the suite of disturbances and disturbance patterns (magnitude and frequency) that naturally occurred within the area occupied by the site. Natural disturbances, such as drought, fire, grazing of native fauna, and insects, were inherent in the development and maintenance of the plant community. The effects of these disturbances are part of the range of characteristics of the site that contribute to the dynamic equilibrium. Fluctuations in the plant community's structure and function caused by the effects of these natural disturbances establish the boundaries of dynamic equilibrium. They are accounted for as part of the range of characteristics for the ecological site. The HCPC is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. Variability is apparent in productivity and occurrence of individual species.

The HCPC for this ecological site has been estimated by sampling relict or relatively undisturbed sites and/or reviewing historic records.

A plant community that is subjected to abnormal disturbances and physical site deterioration or that is protected

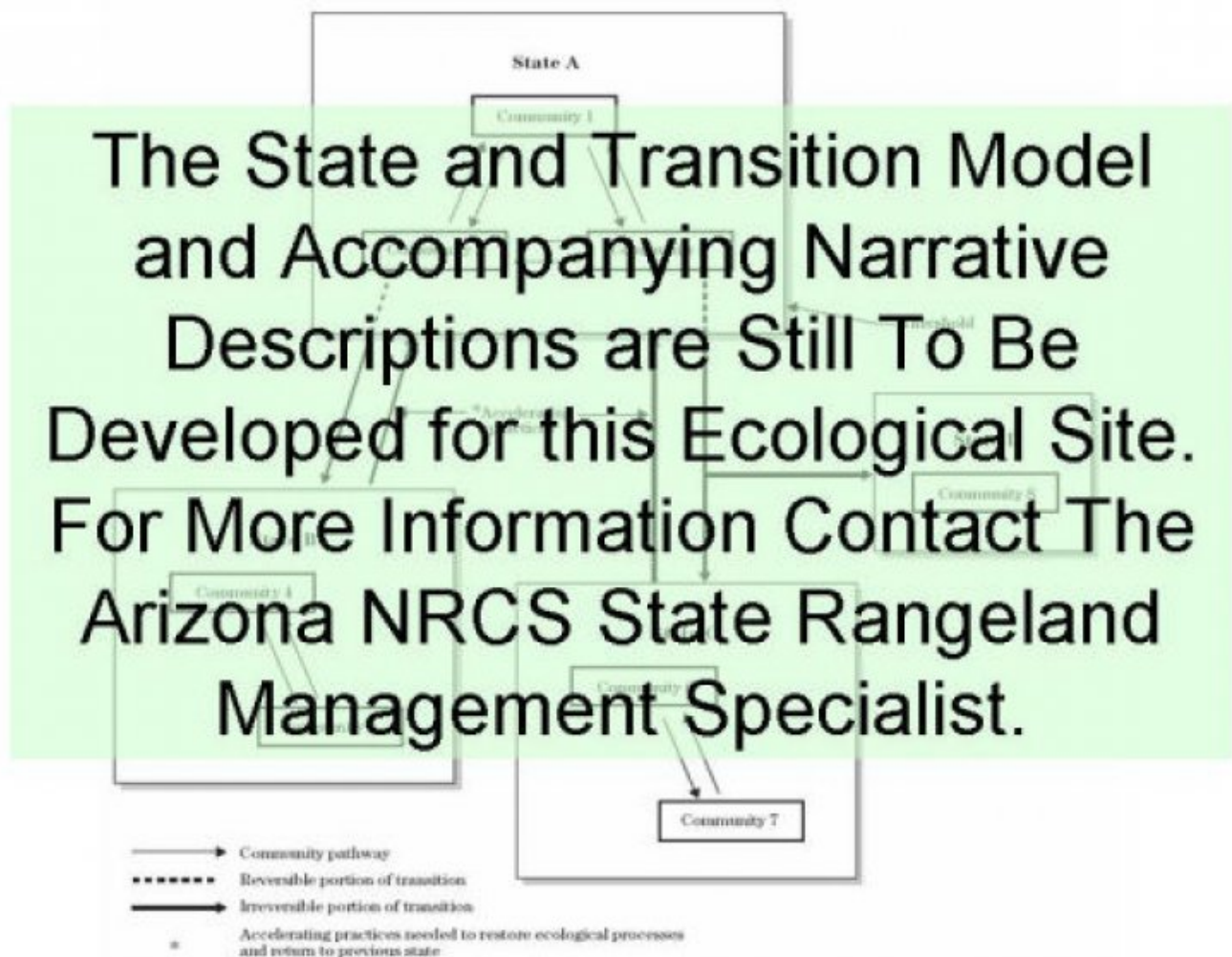
from natural influences, such as fire and grazing, for long periods seldom typifies the HCPC. Any physical site deterioration caused by the abnormal disturbance may result in the crossing of a threshold or irreversible boundary to another state, or equilibrium, for the ecological site. There may be multiple thresholds and states possible for an ecological site, determined by the type and or severity of abnormal disturbance. The known states and transition pathways for this ecological site are described in the accompanying state and transition model.

The “Plant Community Plant Species Composition” table provides a list of species and each species or group of species’ annual production in pounds per acre (air-dry weight) expected in a normal rainfall year. Low and high production yields represent the modal range of variability for that species or group of species across the extent of the ecological site.

The “Annual Production by Plant Type” table provides the median air-dry production and the fluctuations to be expected during favorable, normal, and unfavorable years.

The present plant community on an ecological site can be compared to the various common vegetation states that can exist on the site. The degree of similarity is expressed through a similarity index. To determine the similarity index, compare the production 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 shown for the group. Divide the resulting total by the total representative value shown in the “Annual Production by Plant Type” table for the reference plant community. Variations in production due to above or below normal rainfall, incomplete growing season or utilization must be corrected before comparing it to the site description. The “Worksheet for Determining Similarity Index” is useful in making these corrections. The accompanying growth curve can be used as a guide for estimating percent of growth completed.

## State and transition model



## State 1

### Historic Climax Plant Community

#### Community 1.1

##### Historic Climax Plant Community

This ecological site is dominated by creosotebush and white bursage with an aesthetically pleasing distribution of Joshua Trees. There are minor amounts of perennial grasses on this site. The cobbles and stones inhibit livestock movement. Degradation occurs only because of catastrophic events such as fire or man caused disturbances. The soil will always be protected by the gravels and cobbles. The site's total biomass production by weight (air-dried) is comprised of: grasses and grasslike plants - 5 to 10 percent, forbs 1 to 5 percent, shrubs 80 to 90 and trees 5 to 10 percent.

Table 5. Annual production by plant type

| Plant Type      | Low<br>(Kg/Hectare) | Representative Value<br>(Kg/Hectare) | High<br>(Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Shrub/Vine      | 99                  | 235                                  | 351                  |
| Tree            | 6                   | 17                                   | 39                   |
| Grass/Grasslike | 6                   | 20                                   | 39                   |
| Forb            | 2                   | 8                                    | 19                   |
| <b>Total</b>    | <b>113</b>          | <b>280</b>                           | <b>448</b>           |

Table 6. Ground cover

|                                   |      |
|-----------------------------------|------|
| Tree foliar cover                 | 0-2% |
| Shrub/vine/liana foliar cover     | 0-2% |
| Grass/grasslike foliar cover      | 0-1% |
| Forb foliar cover                 | 0-1% |
| Non-vascular plants               | 0%   |
| Biological crusts                 | 0%   |
| Litter                            | 0%   |
| Surface fragments >0.25" and <=3" | 0%   |
| Surface fragments >3"             | 0%   |
| Bedrock                           | 0%   |
| Water                             | 0%   |
| Bare ground                       | 0%   |

Table 7. Canopy structure (% cover)

| Height Above Ground (M) | Tree | Shrub/Vine | Grass/<br>Grasslike | Forb |
|-------------------------|------|------------|---------------------|------|
| <0.15                   | —    | —          | —                   | 0-1% |
| >0.15 <= 0.3            | —    | —          | 0-2%                | —    |
| >0.3 <= 0.6             | —    | 4-7%       | —                   | —    |
| >0.6 <= 1.4             | —    | —          | —                   | —    |
| >1.4 <= 4               | 0-2% | —          | —                   | —    |
| >4 <= 12                | —    | —          | —                   | —    |
| >12 <= 24               | —    | —          | —                   | —    |
| >24 <= 37               | —    | —          | —                   | —    |
| >37                     | —    | —          | —                   | —    |

Figure 5. Plant community growth curve (percent production by month). AZ3022, 30.2 6-9" p.z. upland sites. Growth begins in the late winter, most growth occurs in the spring..

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0   | 2   | 19  | 33  | 18  | 7   | 7   | 11  | 3   | 0   | 0   | 0   |

Figure 6. Plant community growth curve (percent production by month). AZ3030, 40-3AZ 7-10" p.z. big galleta. Growth begins in the spring, goes dormant in May through June, most growth occurs during the summer rainy season..

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0   | 0   | 10  | 10  | 0   | 0   | 15  | 55  | 10  | 0   | 0   | 0   |

### 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               |                    |        |                               | 13–28                          |                  |
|                 | big galleta        | PLRI3  | <i>Pleuraphis rigida</i>      | 13–28                          | —                |
| 2               |                    |        |                               | 0–2                            |                  |
|                 | low woollygrass    | DAPU7  | <i>Dasyochloa pulchella</i>   | 0–2                            | —                |
| 3               |                    |        |                               | 0–6                            |                  |
|                 | threeawn           | ARIST  | <i>Aristida</i>               | 0–6                            | —                |
| 4               |                    |        |                               | 0–6                            |                  |
|                 | bush muhly         | MUPO2  | <i>Muhlenbergia porteri</i>   | 0–6                            | —                |
| 5               |                    |        |                               | 0–6                            |                  |
|                 | Indian ricegrass   | ACHY   | <i>Achnatherum hymenoides</i> | 0–6                            | —                |
| 6               |                    |        |                               | 2–6                            |                  |
|                 | Grass, annual      | 2GA    | <i>Grass, annual</i>          | 2–6                            | —                |
| Forb            |                    |        |                               |                                |                  |
| 7               |                    |        |                               | 0–2                            |                  |
|                 | desert globemallow | SPAM2  | <i>Sphaeralcea ambigua</i>    | 0–2                            | —                |
| 8               |                    |        |                               | 2–6                            |                  |
|                 | Forb, annual       | 2FA    | <i>Forb, annual</i>           | 2–6                            | —                |

|                   |                    |        |                                      |         |   |
|-------------------|--------------------|--------|--------------------------------------|---------|---|
| 9                 |                    |        |                                      | 2–9     |   |
|                   | Forb, perennial    | 2FP    | <i>Forb, perennial</i>               | 2–9     | – |
| <b>Shrub/Vine</b> |                    |        |                                      |         |   |
| 10                |                    |        |                                      | 56–84   |   |
|                   | creosote bush      | LATR2  | <i>Larrea tridentata</i>             | 56–84   | – |
| 11                |                    |        |                                      | 112–140 |   |
|                   | burrobush          | AMDU2  | <i>Ambrosia dumosa</i>               | 112–140 | – |
| 12                |                    |        |                                      | 6–13    |   |
|                   | littleleaf ratany  | KRER   | <i>Krameria erecta</i>               | 2–13    | – |
|                   | white ratany       | KRGR   | <i>Krameria grayi</i>                | 2–13    | – |
| 13                |                    |        |                                      | 0–2     |   |
|                   | turpentinebroom    | THMO   | <i>Thamnosma montana</i>             | 0–2     | – |
| 14                |                    |        |                                      | 2–9     |   |
|                   | pricklypear        | OPUNT  | <i>Opuntia</i>                       | 2–9     | – |
| 15                |                    |        |                                      | 2–6     |   |
|                   | spiny menodora     | MESP2  | <i>Menodora spinescens</i>           | 2–6     | – |
| 16                |                    |        |                                      | 0–6     |   |
|                   | winterfat          | KRLA2  | <i>Krascheninnikovia lanata</i>      | 0–6     | – |
| 17                |                    |        |                                      | 0–9     |   |
|                   | Nevada jointfir    | EPNE   | <i>Ephedra nevadensis</i>            | 0–9     | – |
| 18                |                    |        |                                      | 2–13    |   |
|                   | rayless goldenhead | ACSP   | <i>Acamptopappus sphaerocephalus</i> | 0–11    | – |
|                   | burrobrush         | HYSA   | <i>Hymenoclea salsola</i>            | 0–11    | – |
|                   | water jacket       | LYAN   | <i>Lycium andersonii</i>             | 0–11    | – |
|                   | Shrub (>.5m)       | 2SHRUB | <i>Shrub (&gt;.5m)</i>               | 0–2     | – |
| <b>Tree</b>       |                    |        |                                      |         |   |
| 19                |                    |        |                                      | 13–28   |   |
|                   | Joshua tree        | YUBR   | <i>Yucca brevifolia</i>              | 13–28   | – |

## Type locality

|                               |   |
|-------------------------------|---|
| Location 1: Mohave County, AZ |   |
| Township/Range/Section        | T27 N. R20 W. S27   |
| Latitude                      | 35° 42' 0"  |
| Longitude                     | 114° 24' 0"   |
| General legal description     | Mt. Tipton 3 NW Quad. - Sec. 27, T. 27 N., R. 20 W.; Lat 35 42'00" Long. 114 24'00"; Mohave County, Arizona |
| Location 2: Mohave County, AZ |   |
| Township/Range/Section        | T41 N. R14 W. S6  |
| General legal description     | Upper fan west of the Beaver Dam Mountains; Sec. 6, T. 41 N., R. 14 W.; Mohave County, Arizona.             |

## 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)                    |                   |
| 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:**

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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:**

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

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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:**

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