

Ecological site R040XD201CA Cobbly Fan Remnants

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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.

MLRA notes

Major Land Resource Area (MLRA): 040X–Sonoran Basin and Range

MLRA Statement: Major land resource area (MLRA) 31 is the Lower Colorado Desert. This area is in the extreme southeastern part of California, in areas along the Colorado River, and in Western Arizona. The area is comprised of rough, barren, steep, and strongly dissected mountain ranges, generally northwest to southwest trending that are separated by intermontane basins. Elevation ranges from approximately 275 feet below sea level at the lowest point in the Salton Trough to 2700 feet along low northwest to southeast trending mountain ranges. The average annual precipitation is 2 to 6 inches with high temporal and spatial variability. Winter temperatures are mild, summer temperatures are hot, and seasonal and diurnal temperature fluctuations are large. Monthly minimum temperature averages range from 40 to 80 degrees F (4 to 27 degrees C). Monthly maximum temperature averages range from 65 to 110 degrees F (18 to 43 degrees C) (WRCC 2002). Temperatures are rarely below 28 degrees F, and extremely rarely fall below 24 degrees F. Precipitation is bimodal, with approximately 20 to 40 percent of annual precipitation falling between July and September. This summer rainfall, in combination with very hot temperatures and very few to no days of hard freeze are what characterize this MLRA and distinguish it from the Mojave Desert (MLRA 30). Site Concept: This ecological site occurs on cobbly fan remnants at elevations of 1130 to 2890 feet. Soils are typically very deep with a sandy skeletal or loamy skeletal particle size control section. Soil surfaces are covered with cobbles and stones, with patches of gravelly areas. The high cover of large rock fragments acts to limit shrub density, but provides additional run-on, which increases shrub and cactus diversity. Production Reference Value (RV) is 159 pounds per acre. Creosote bush (*Larrea tridentata*) and brittlebush (*Encelia farinosa*) dominate the site. Blue paloverde (*Parkinsonia florida*) and desert ironwood (*Olneya tesota*) are sporadically present, and there is a diversity of cactus species. Data ranges in the physiographic data, climate data, water features, and soil data sections of this Ecological Site Description are based on major components only (15 percent of map unit or greater).

Associated sites

R040XD009CA	Gravelly Fan Remnants And Fan Aprons This ecological site is on fan remnants, with creosote bush and Schott's dalea dominant. Brittlebush and surface rocks are less abundant.
R040XD034CA	Gravelly, Braided, Ephemeral Stream This ephemeral stream is on occasionally to frequently flooded braided drainageways. Desert lavender, burrobush, blue paloverde and desert ironwood are present.
R040XD200CA	Rarely Flooded Fans This ecological site is similar, but lacks the rocky surface, cacti diversity, and tends to be on fan aprons rather than fan remnants. Creosote bush and brittlebush are dominant.

R040XD202CA	Stony, Occasionally Flooded Ephemeral Stream This ecological site is in adjacent stony, inset fans subject to occasional flash floods. Desert lavender, Schott's dalea, and blue paloverde are present.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Larrea tridentata</i> (2) <i>Encelia farinosa</i>
Herbaceous	Not specified

Physiographic features

This ecological site is found on fan remnants and alluvial fans. Elevations range from 1130 feet to 2890 feet, with slopes ranging from 4 to 15 percent.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant (2) Alluvial fan
Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	None to rare
Ponding frequency	None
Elevation	340 – 880 m
Slope	0 – 20 %
Aspect	Aspect is not a significant factor

Climatic features

The climate of this ecological site is characterized by hot temperatures, aridity, and a bimodal precipitation pattern. Precipitation falls as rain, with 30 percent falling in summer between July and October, and 60 percent falling in winter between November and March. The mean annual precipitation is 2 to 4 inches, and mean annual air temperature is 73 to 79 degrees F. The frost free period is 360 to 365 days, and freeze free period is 363 to 365 days.

Maximum and minimum monthly climate data for this ESD were generated by the Climate Summarizer (http://www.nm.nrcs.usda.gov/technical/handbooks/nrph/Climate_Summarizer.xls) using data from the following climate stations (results are weighted averages; numbers in square brackets represent relative weights):

42598, Eagle Mountain, CA (Period of record = 1933 to 2011) [2]

43855, Hayfield Reservoir, CA (Period of record = 1933 to 2011) [1]

The data from multiple weather were combined to most accurately reflect the climatic conditions of this ecological site.

Table 3 Representative climatic features

Frost-free period (average)	370 days
Freeze-free period (average)	370 days
Precipitation total (average)	100 mm

Influencing water features

Soil features

The soils associated with this ecological site are very deep, excessively drained and formed in alluvium from granite or igneous rock. The surface textures are extremely gravelly loam and loamy fine sand. Subsurface horizons are loamy, silty or sandy with very or extremely gravelly modifiers. Surface rock fragments less than 3 inches in diameter range from 55 to 80 percent cover, and fragments greater than 3 inches range from 15 to 30 percent. Subsurface percent by volume of rock fragments less than 3 inches ranges from 15 to 46 percent, and greater than 3 inch rock fragments range from 0 to 14 percent (for a depths of 1 to 60 inches).

This ecological site is correlated with major components (greater than 15 percent of map unit) of the Rizzo and Rockhound soil series. The Rockhound soils are loamy-skeletal, mixed, superactive, hyperthermic Typic Haplargids. The Rizzo soils are sandy-skeletal, mixed, hyperthermic Typic Torriorthents. The Rockhound soils have loamy and silty subsurface textures, and have slow to moderately slow permeability. The Rizzo soils have sandy subsurface textures, and have rapid permeability. Both these soils have greater than 35% rock fragments in the particle control section.

The Kenalduma soils are associated with this ecological site as a minor component. These soils are loamy-skeletal, mixed, superactive, hyperthermic Argidic Argidurids. These soils have a duripan at about 16 inches below the surface.

The following map units and soil components are associated with this ecological site the Joshua Tree National Park Soil Survey (CA794):

Map unit ID; Map unit name; Component; Phase; Percent

1504; Rizzo association, 4 to 15 percent slopes, rubbly; Rizzo; rarely flooded, stony; 50 and Rockhound; cobbly; 8

2090; Deprave-Rockhound-Rizzo complex, 2 to 4 percent slopes; Kenalduma; ; 2

2140; Rockhound silt loam, 4 to 15 percent slopes; Rockhound; cobbly; 85

Table 4. Representative soil features

Parent material	(1) Alluvium – granite
Surface texture	(1) Extremely gravelly loam (2) Loamy fine sand
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained

Permeability class	Slow to rapid
Soil depth	150 cm
Surface fragment cover <=3"	60 – 80 %
Surface fragment cover >3"	20 – 30 %
Available water capacity (0-101.6cm)	2.54 – 7.87 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	20 – 50 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

Extreme hot temperatures and aridity, and high large rock fragment cover and content by volume drives the vegetation community of this ecological site. This ecological site occurs on non-flooded to rarely flooded fan remnants with a cobbly surface. This site is in an extremely arid portion of the Colorado Desert. Mean annual precipitation is 2 to 4 inches, mean maximum temperatures are over 90 F for five months of the year, and strong winds are typical during the summer months. A heterogeneous soil surface provides microsites that support high shrub diversity and cover relative to adjacent landforms. Creosote bush and brittlebush dominate the site. Scattered blue paloverde, desert ironwood, ocotillo (*Fouquieria splendens*) and several cactus species are secondary species.

Brittlebush is an extremely drought-tolerant, drought-deciduous shrub. Adaptations in degree of leaf pubescence and leaf size allow brittlebush to occupy sites ranging from relatively mesic coastal environments to extremely arid deserts (Ehleringer and Cook 1990, Sandquist and Ehleringer 1997, Housman et al. 2002, Sandquist and Ehleringer 2003). Desert plants have smaller, more pubescent

leaves, and a more compact growth form. Smaller more pubescent leaves reduce leaf temperatures and increases water use efficiency. The tradeoff is that plant productivity declines because smaller leaves have less surface area available for photosynthesis, and because pubescence reduces the absorption of solar radiation (Housman et al. 2002, Sandquist and Ehleringer 2003).

Creosote bush is a long-lived, deep-rooted evergreen shrub dominant across vast areas of the North American warm deserts. Creosote bush maintains its evergreen status by using water held in deep soil layers. Creosote bush is typically the dominant shrub on deep coarse soils with little development (Hamerlynk et al. 2002, Hamerlynk and McAuliffe 2008), such as on this ecological site.

California barrel cactus (*Ferocactus cylindraceus*), branched pencil cholla (*Cylindropuntia ramosissima*), Engelmann's hedgehog cactus (*Echinocereus engelmannii*) and ocotillo are present on this ecological site. Cacti and stem succulents are adapted to the most arid of environments with their ability to store large amounts of water with stem succulence; which provides plasticity to expand and contract with water gain or loss. They have rapid root growth in response to even small amounts of moisture to capture water when it is available. They have spines, which are modified leaves that shade the stem and do not lose water like typical leaves. They photosynthesis using and Crassulacean acid metabolism (CAM) whereby photosynthesis occurs at night so that stomata are open during the cool of the night and water losses are minimized. Cacti can store so much water in their succulent stems that they can withstand water losses of 70 to 90 percent (Ingram 2008).

The distribution of rock fragments on the soil surface and within the soil horizon has a significant effect on the distribution and availability of soil water (Poesen and Lavee 1994, Cerda 2001, Martre et al. 2002, Li et al. 2007). Soils with greater rock content by volume have less water availability, which limits productivity relative to sandier soils (Martre et al. 2002). Small surface rock fragments can increase infiltration rates (Poesen and Lavee 1994, Cerda 2001), while large surface rock fragments increase run-on. Thus, surfaces where gravel and large fragments are heterogeneously distributed, such as this ecological site, have localized patches of relatively high water availability (i.e. patches of gravel adjacent to patches of large surface fragments). Further, large rock fragments on the soil surface and within soil horizons can act as mulch, reducing evaporation rates, increasing the temporal availability of water (Martre et al. 2002, Li et al. 2007, Hamerlynk and McAuliffe 2008), and buffering soil temperatures (Cerda 2001). These provide microsites for plant establishment.

The primary disturbances influencing this ecological site are drought, invasion by non-native annual plants, and fire.

Desert regions are characterized by low mean annual precipitation and extreme variability in the amount of precipitation received in any year or decade (Hereford et al. 2006). Thus, episodic mortality in response to periods of drought is important in shaping desert community dynamics (Hereford et al. 2006, Miriti et al. 2007). This ecological site is already shaped by extremely arid conditions; nevertheless, extreme drought can still have an impact. Drought can cause reductions in cover and production due to mortality of short-lived species, branch-pruning and mortality of longer-lived species, lack of recruitment, and lack of emergence of annual species (Webb, 2003; Bowers, 2005; Hereford, 2006; Miriti, 2007).

Non-native annual species such as Mediterranean grass (*Schismus barbatus*), redstem stork's bill (*Erodium cicutarium*) and Asian mustard (*Brassica tournefortii*) have become naturalized in the Colorado Desert over the past century (Brown and Minnich 1986, D'Antonio and Vitousek 1992, Brooks and Berry 2006). In lower elevations, where soil temperature regimes are hyperthermic and soil moisture is more limiting, Mediterranean grass is the dominant non-native grass (Brooks and Berry 2006). Like native annuals, nonnative annual cover and production is directly related to winter precipitation (Beatley 1969, Brooks and Berry 2006, Barrows et al. 2009). When undisturbed, the high surface rock fragment restrict establishment and biomass of non-native species, but when the soil surface is disturbed, Mediterranean grass may become more abundant.

Soil disturbance, such as from construction or off-road vehicle use not only increases the susceptibility of this site to invasion by non-native species, but increases establishment opportunities for native species as well. This can lead to higher diversity, productivity and cover in this ecological site.

The low potential for high biomass of annual species limits the continuity of fine fuels in this site, and reduces the susceptibility of this site to fire. However, this site has relatively high shrub cover, and native annual forbs and grasses can reach high cover with high precipitation, which may fuel fire (Brown and Minnich, 1986). Creosote bush is poorly adapted to fire (Webb et al. 2010), while a brittlebush dominated community recovers rapidly (Brown and Minnich 1986, Steers and Allen 2011). Repeat burning could trigger a transition to an altered state dominated by brittlebush.

State and transition model

Figure 3. R031XY201CA Model

Additional community tables

Table 5. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Tree					
1	Trees			0-11	

	desert ironwood	OLTE	<i>Oleña tesota</i>	0-6	0-1
	blue paloverde	PAFL6	<i>Parkinsonia florida</i>	0-6	0-1
Shrub/Vine					
1	Shrubs			56-184	
	creosote bush	LATR2	<i>Larrea tridentata</i>	28-84	2-5
	brittlebush	ENFA	<i>Encelia farinosa</i>	9-67	2-5
	California fagonbush	FALA	<i>Fagonia laevis</i>	1-17	1-3
	California barrel cactus	FECY	<i>Ferocactus cylindraceus</i>	0-11	0-1
	branched pencil cholla	CYRA9	<i>Cylindropuntia ramosissima</i>	0-9	0-1
	white ratany	KRGR	<i>Krameria grayi</i>	0-7	0-1
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	0-6	0-1
	desert lavender	HYEM	<i>Hyptis emoryi</i>	0-6	0-1
	beavertail pricklypear	OPBA2	<i>Opuntia basilaris</i>	0-2	0-1
	Engelmann's hedgehog cactus	ECEN	<i>Echinocereus engelmannii</i>	0-2	0-1
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	0-2	0-1
Forb					
2	Forbs			6-55	
	chia	SACO6	<i>Salvia columbariae</i>	1-17	1-3
	lupine	LUPIN	<i>Lupinus</i>	0-17	0-2
	sowthistle desertdandelion	MASO	<i>Malacothrix sonchoides</i>	6-11	5-11
	curvenut combseed	PERE	<i>Pectocarya recurvata</i>	0-11	0-4
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0-7	0-2
	New Mexico silverbush	ARNE2	<i>Argythamnia neomexicana</i>	0-1	0-1
	whitemargin sandmat	CHAL11	<i>Chamaesyce albomarginata</i>	0-1	0-1
	cryptantha	CRYPT	<i>Cryptantha</i>	0-1	0-1
	Western Mojave buckwheat	ERMO3	<i>Eriogonum mohavense</i>	0-1	0-1
Grass/Grasslike					
3	Perennial grass			1-11	
	purple threeawn	ARPU9	<i>Aristida purpurea</i>	1-11	1-3
4	non-native annual grass			0-1	
	common Mediterranean grass	SCBA	<i>Schismus barbatus</i>	0-1	0-1

Table 6. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Animal community

Creosote bush shrublands provides a home for an abundance of specialist insect species, for example, creosote bush flowers provide nutrition for over twenty species of bees, and the creosote bush grasshopper (*Boottettix argentatus*) feeds solely on creosote leaves (Pavlik 2008). The diverse vegetation provides shelter and forage for rodents, lizards, and birds. The cactus fruits are edible and nutritious.

Recreational uses

This ecological site has a variety of shrubs, which provide a display of colors when they bloom, dominated by yellow from brittlebush, and the red flowers of ocotillo, and a diversity of cacti.

Other products

Creosote bush is an important medicinal plant for Native Americans. It has a very wide range of uses from treatment for consumption, bowl complaints, and menstrual cramps, to induce vomiting, relief for arthritis, rheumatism, aching bones and sprains, congestion and cold, as an antiseptic and disinfectant, dandruff, antispasmodic, to induce urination, gonorrhea, and to cancer treatment. (This list is not exhaustive). <http://herb.umd.umich.edu/herb/search.pl?searchstring=Larrea+tridentata>. Creosote bush stems are used to make weapons, digging tools, and basket handles, and creosote gum is used for knife and awl handles. Creosote bush branches are used as thatch in dwelling construction. <http://herb.umd.umich.edu/herb/search.pl?searchstring=Larrea+tridentata>. Brittlebush has medicinal uses for Native Americans, including as a poultice for pain and for toothaches. Brittlebush resin is used as chewing gum, to fasten arrow points to twigs, to waterproof water bottles, and is melted to make a varnish. Brittlebush twigs were used as kindling for quick fires. <http://herb.umd.umich.edu/herb/search.pl?searchstring=Encelia+farinosa>. Brittlebush resin is burned as incense in churches in Mexico (Tesky 1993).

Inventory data references

The following NRCS vegetation plots were used to describe this ecological site. 1247710306- Type location 1248617612 WP003

Type locality

Location 1: Riverside County, CA	
UTM zone	N
UTM northing	3726436
UTM easting	601862
General legal description	The type location is about 5 miles east of Cactus City, CA. It is about .25 miles north of HW 10, on BLM property.

Other references

Barrows, C. W., E. B. Allen, M. L. Brooks, and M. F. Allen. 2009. Effects of an invasive plant on a desert sand dune landscape. *Biological Invasions* 11:673-686.

Beatley, J. C. 1969. Dependence of desert rodents on winter annuals and precipitation. *Ecology* 50:721-724.

Brooks, M. L. and K. H. Berry. 2006. Dominance and environmental correlates of alien annual plants in the Mojave Desert, USA. *Journal of Arid Environments* 67:100-124.

Brown, D. E. and R. A. Minnich. 1986. Fire and Changes in Creosote Bush Scrub of the Western Sonoran Desert, California. *American Midland Naturalist* 116:411-422.

Cerda, A. 2001. Effects of rock fragment cover on soil infiltration, interrill runoff and erosion. *European Journal of Soil Science* 52:59-68.

D'Antonio, C. M. and P. M. Vitousek. 1992. Biological invasions by exotic grasses, the grass/fire cycle, and global change. *Annual Review of Ecology and Systematics* 23:63-87.

Ehleringer, J. R. and C. S. Cook. 1990. Characteristics of *Encelia* species differing in leaf reflectance and transpiration rate under common garden conditions. *Oecologia* 82:484-489.

Hamerlynk, E. P. and J. R. McAuliffe. 2008. Soil-dependent canopy die-back and plant mortality in two Mojave Desert shrubs. *Journal of*

Hamerlynk, E. P., J. R. McAuliffe, E. V. McDonald, and S. D. Smith. 2002. Ecological responses of two Mojave desert shrubs to soil horizon development and soil water dynamics. *Ecology* 83:768-779.

Hereford, R., R. H. Webb, and C. I. Longpre. 2006. Precipitation history and ecosystem response to multidecadal precipitation variability in the Mojave Desert region, 1893-2001. *Journal of Arid Environments* 67:13-34.

Housman, D. C., M. V. Price, and R. A. Redak. 2002. Architecture of coastal and desert *Encelia farinosa* (Asteraceae): consequences of plastic and heritable variation in leaf characteristics. *American Journal of Botany* 89:1303-1310.

Ingram, S. 2008. Cacti, agaves, and yuccas of California and Nevada. Cachuma Press, Los Olivos, California.

Jordan, P. W. and P. S. Nobel. 1981. Seedling establishment of *Ferocactus acanthodes* in relation to drought. *Ecology* 62:901-906.

Li, X.-Y., S. Contreras, and A. Sole-Benet. 2007. Spatial distribution of rock fragments in dolines: A case study in a semiarid Mediterranean mountain-range (Sierra de Gador, SE Spain). *Catena* 70:366-374.

Martre, P., G. B. North, E. G. Bobich, and P. S. Nobel. 2002. Root deployment and shoot growth for two desert species in response to soil rockiness. *American Journal of Botany* 89:1933-1939.

Miriti, M. N., S. Rodriguez-Buritica, S. J. Wright, and H. F. Howe. 2007. Episodic death across species of desert shrubs. *Ecology* 88:32-36.

Pavlik, B. M. 2008. The California Deserts: an ecological rediscovery. University of California Press, Ltd., Berkeley and Los Angeles, California.

Poesen, J. and H. Lavee. 1994. Rock fragments in top soils: significance and processes. *Catena* 23:1-28.

Sandquist, D. R. and J. R. Ehleringer. 1997. Intraspecific variation in leaf pubescence and drought response in *Encelia farinosa* associated with contrasting desert environments. *New Phytologist* 135:635-644.

Sandquist, D. R. and J. R. Ehleringer. 2003. Population- and family-level variation of brittlebush (*Encelia farinosa*, Asteraceae) pubescence: its relation to drought and implications for selection in variable environments. *American Journal of Botany* 90:1481-1486.

Steers, R. J. and E. B. Allen. 2011. Fire effects on perennial vegetation in the western Colorado Desert, USA. *Fire Ecology* 7:59-74.

Tesky, J. L. 1993. *Hymenoclea salsola*. In: Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory.

Webb, R. H., D. E. Boyer, and R. M. Turner. 2010. Repeat photography: Methods and Applications in the Natural Sciences. Island Press.

WRCC, W. R. C. C. 2002. Western U.S. Climate Historical Summaries [Online]. Desert Research Institute, Reno, NV.

Contributors

Marchel Munnecke

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:

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

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

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

16. Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:

17. Perennial plant reproductive capability:
