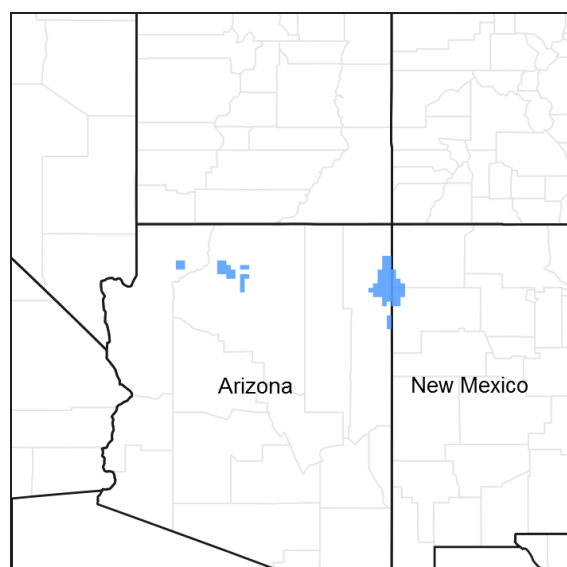


## **Ecological site F035XH808AZ** **Loamy Upland 17-25" p.z. (PIPO)**

Accessed: 05/18/2024

### General information

**Provisional.** A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.



**Figure 1. Mapped extent**

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

### MLRA notes

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

This ecological site occurs in Common Resource Area 35.8 - the Colorado Plateau Ponderosa Pine Forests

The Common Resource Area occurs within the Colorado Plateau Physiographic Province. Elevations range from 6800 to 8500 feet and precipitation averages 17 to 25 inches per year. Vegetation includes ponderosa pine, white fir, aspen, pinyon, juniper, Gambel oak, big sagebrush, ceanothus, blue elderberry, muttongrass, upland sedge, and big wildrye, mountain muhly, Arizona fescue, pine dropseed, and blue grama. The soil temperature regime ranges from mesic to frigid and the soil moisture regime is typic ustic. This unit occurs within the Colorado Plateau Physiographic Province and is characterized by a sequence of flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Sedimentary rock classes dominate the plateau with volcanic fields occurring for the most part near its margin.

### Associated sites

R035XH807AZ	<b>Loamy Upland 17-25" p.z.</b> Deep and very deep soils in wide drainageways and open valleys.
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### Similar sites

F035XH805AZ	<b>Loamy Hills 17-25" p.z. (PIPO)</b> Steeper slopes, hills and escarpments.
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**Table 1. Dominant plant species**

Tree	(1) <i>Pinus ponderosa</i> (2) <i>Quercus gambelii</i>
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> (2) <i>Ceanothus fendleri</i>
Herbaceous	(1) <i>Poa fendleriana</i> (2) <i>Carex rossii</i>

## Physiographic features

This site is a forestland dominated by ponderosa pine. It occurs on nearly level to gently sloping plateaus, benches, and mesas. Soils are typically moderately deep, well-developed and non effervescent. The site can have small inclusions of deeper soils, or shallow soils associated with rock outcrops. Slopes on this site generally range from 1 - 15%, occasionally as high as 20%. The site does not benefit significantly from run-on moisture from adjacent sites.

**Table 2. Representative physiographic features**

Landforms	(1) Plateau (2) Mesa (3) Structural bench
Elevation	2,073–2,591 m
Slope	0–15%
Aspect	Aspect is not a significant factor

## Climatic features

Winter-summer moisture ratios are typically 70:30 on the west side of this LRU and shift to 60:40 on the east side. Late spring is usually the driest period, and early fall moisture can be sporadic. Summer rains fall from June through September; moisture originates in the Gulf of Mexico and creates convective, usually brief, intense thunderstorms. Cool season moisture from October through May tends to be frontal; It originates in the Pacific Ocean and the Gulf of California and falls in widespread storms with longer duration and lower intensity. Precipitation generally comes as snow from October into April. Snowpack can persist for 3-4 months, although it may disappear in exposed areas during prolonged dry weather. Summer daytime temperatures are typically 80-90 but can exceed 95 degrees F. Winter temperatures of around 0 degrees F are common and can reach -25 degrees F.

**Table 3. Representative climatic features**

Frost-free period (average)	100 days
Freeze-free period (average)	130 days
Precipitation total (average)	635 mm

## Influencing water features

The soil moisture on this ecological site comes from precipitation. The site does not benefit significantly from run-on moisture. The loamy surface texture of the soil allows the site to capture the majority of the winter storms and the light to moderate summer storms if the site has good vegetative cover. Intense summer thunderstorms will produce runoff, reducing the amount of effective rainfall.

## Soil features

The soils on this site are moderately deep. They have been formed in place from residuum. Surfaces have a O horizon 1-4 inches deep. The surface textures of the mineral soil range from sandy loam to silt loam, sometimes gravelly. The A horizon is typically no more than 6 inches thick. Subsurface textures are clay loam to clay, occasionally gravelly. An argillic horizon is usually present; in some cases it has been degraded away.

Soil survey map unit components that have been correlated to this ecological site include:

SSA-625 Mohave county NE 12-Godding;

SSA-701 Grand Canyon area 37-Elledge Family, 91-Pinntank;

SSA-713 Chinle Area 21-Jacks/Manuelito, 26-Jacks family/Pachic Haplustolls, 59-Jacks family

SSA-715 Ft Defiance 54-Manuelito, 55-Manuelito

SSA-717 Shiprock area 10-Kunz.

**Table 4. Representative soil features**

Surface texture	(1) Gravelly loam (2) Gravelly sandy loam (3) Gravelly silt loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Very slow to slow
Soil depth	51–102 cm
Surface fragment cover <=3"	0–10%
Available water capacity (0-101.6cm)	6.35–17.78 cm
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	6.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	0–15%

## 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 grazing, fire, 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 shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If 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.

The State and Transition model shows the most common occurring plant communities likely to be encountered on this ecological site. This model may not show every possible plant community, but only those that are most prevalent and observed through field inventory. As more data is collected and research is available, these plant communities may be revised, removed, and even added to reflect the ecological dynamics of this site.

## State and transition model

### 35.8AZ Loamy Upland 17-25" p.z. (PIPO) F035XH808AZ

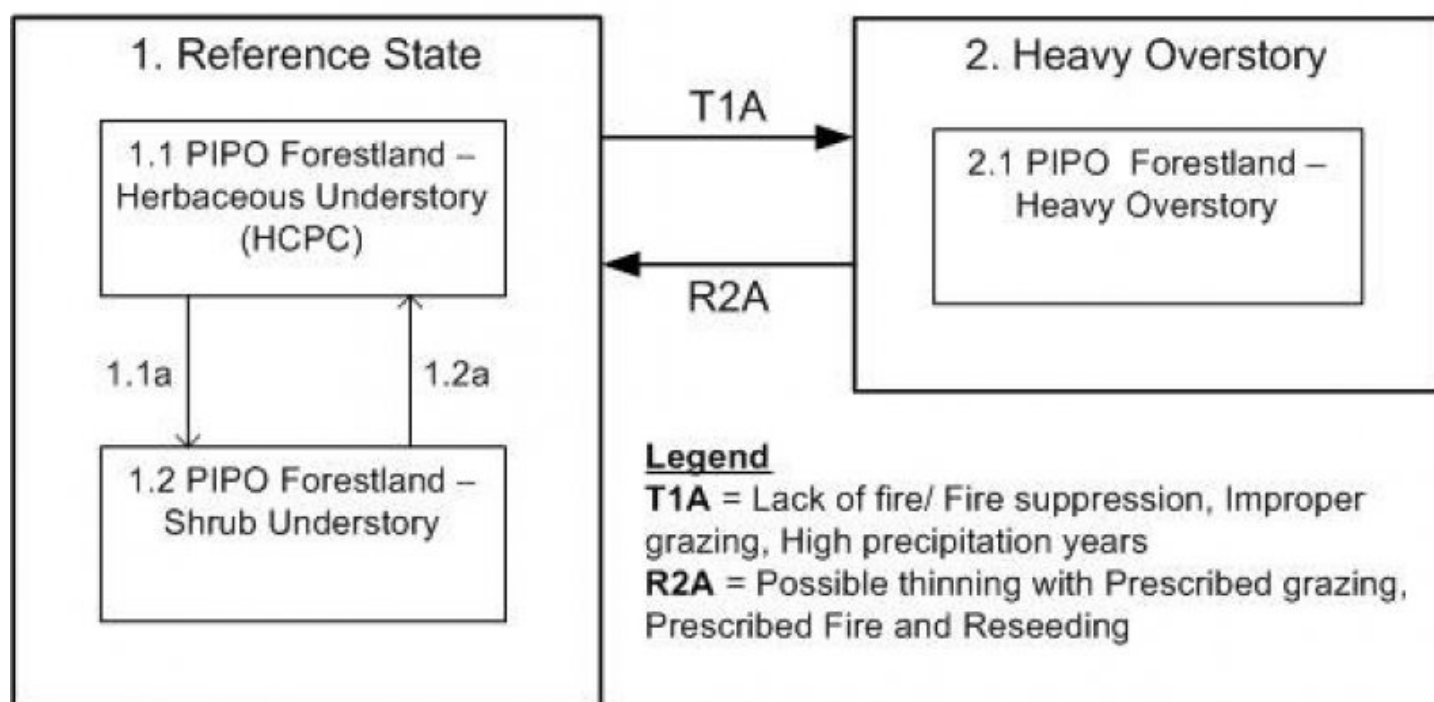


Figure 4. 358 LoamyUpland S&T

## State 1

### Reference State

This is a forest site that is dominated by a ponderosa pine tree overstory. Cool season grasses dominate the understory vegetation with shrubs and forbs as minor components throughout the site. Fire suppression, grazing and favorable climatic conditions have increased shrub and/or tree components of this site. This is in conjunction with decreased amounts of grass cover and an increase in pine needle litter and annuals.

## Community 1.1

### Historic Climax Plant Community



Figure 5. Loamy Upland 17-25" p.z.

1.1 This site was developed under historic Colorado Plateau climatic conditions and reflects the natural influences of herbivores, climate fluctuations and occasional fire. This community has an overstory layer dominated by mature and widely-spaced ponderosa pine. The shrub layer is intermittent. Grasses are dominantly cool-season perennials and make up a substantial part of the vegetation. Perennial and annual forbs are also well represented.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	297	356	415
Forb	84	127	168
Shrub/Vine	6	30	62
Tree	6	31	62
<b>Total</b>	<b>393</b>	<b>544</b>	<b>707</b>

Figure 7. Plant community growth curve (percent production by month). AZ3581, 35.8 17-25" p.z. all sites. Growth begins in the spring, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	4	10	24	21	23	13	5	0	0

Figure 8. Plant community growth curve (percent production by month). AZ3901, 35.8 17-25" p.z. muttongrass. Growth begins in the spring and extends through the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	30	20	20	10	5	0	0

Figure 9. Plant community growth curve (percent production by month). AZ3902, 35.8 17-25" p.z. Arizona fescue. Growth begins in the late spring and extends through the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	5	20	30	30	10	5	0	0

## Community 1.2

### Ponderosa Pine Overstory with Increased Shrub Understory

Fire suppression and grazing have decreased the amount of grass understory and various shrubs have increased on the site.

## Pathway 1.1A

### Community 1.1 to 1.2

Fire suppression and unmanaged grazing.

## Pathway 1.2A

### Community 1.2 to 1.1

Brush treatment and possible grass re-seeding.

## State 2

### Heavy Overstory

This state has a very dense overstory of ponderosa pine trees. Much of the understory vegetation is excluded from this plant community. It takes large amounts of energy to return to the reference plant community.

## Community 2.1

### Heavy Overstory

Thick pondrosa pine overstory with a very diminished plant community understory.

## Transition T1A

### State 1 to 2

Lack of fire/fire suppression, excessive grazing, high precipitation years

## Restoration pathway R2A

### State 2 to 1

Thinning of forest overstory, burning of understory and possible re-seeding

## Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Grasses</b>			297–415	
	muttongrass	POFE	<i>Poa fendleriana</i>	62–179	–
	Ross' sedge	CAR05	<i>Carex rossii</i>	6–90	–
	big squirreltail	ELMU3	<i>Elymus multisetus</i>	11–62	–
	Arizona fescue	FEAR2	<i>Festuca arizonica</i>	0–28	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–28	–
	mountain muhly	MUMO	<i>Muhlenbergia montana</i>	0–28	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–17	–
	pinyon ricegrass	PIFI	<i>Piptochaetium fimbriatum</i>	0–6	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	0–6	–
	Porter brome	BRPO2	<i>Bromus porteri</i>	0–6	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–6	–
	pine dropseed	BLTR	<i>Blepharoneuron tricholepis</i>	0–6	–
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	0–6	–

<b>Forb</b>					
2	<b>Perennial Forbs</b>			62–118	
	cinquefoil	POTEN	<i>Potentilla</i>	0–17	–
	ragwort	SENEC	<i>Senecio</i>	0–17	–
	goldenrod	SOLID	<i>Solidago</i>	0–17	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–17	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0–17	–
	silvery lupine	LUAR3	<i>Lupinus argenteus</i>	0–17	–
	Hill's lupine	LUHI2	<i>Lupinus hillii</i>	0–17	–
	tansyaster	MACHA	<i>Machaeranthera</i>	0–17	–
	toadflax penstemon	PELI2	<i>Penstemon linarioides</i>	0–17	–
	Utah bird's-foot trefoil	LOUT3	<i>Lotus utahensis</i>	0–11	–
	Wright's deervetch	LOWR	<i>Lotus wrightii</i>	0–11	–
	larkspur	DELPH	<i>Delphinium</i>	0–11	–
	redroot buckwheat	ERRA3	<i>Eriogonum racemosum</i>	0–11	–
	aspen fleabane	ERSPM	<i>Erigeron speciosus</i> var. <i>macranthus</i>	0–11	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–11	–
	Fendler's sandwort	ARFE3	<i>Arenaria fendleri</i>	0–6	–
	sego lily	CANU3	<i>Calochortus nuttallii</i>	0–6	–
	western yarrow	ACMIO	<i>Achillea millefolium</i> var. <i>occidentalis</i>	0–6	–
	Lewis flax	LILE3	<i>Linum lewisii</i>	0–6	–
	rock goldenrod	PETRA	<i>Petradoria</i>	0–6	–
	beardlip penstemon	PEBA2	<i>Penstemon barbatus</i>	0–6	–
	yellow salsify	TRDU	<i>Tragopogon dubius</i>	0–6	–
3	<b>Annual Forbs</b>			28–56	
	Forb, annual	2FA	<i>Forb, annual</i>	0–11	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–11	–
	Wheeler's thistle	CIWH	<i>Cirsium wheeleri</i>	0–11	–
	trailing fleabane	ERFL	<i>Erigeron flagellaris</i>	0–11	–
	Cooper's rubberweed	HYCO2	<i>Hymenoxys cooperi</i>	0–11	–
	fineleaf hymenopappus	HYFI	<i>Hymenopappus filifolius</i>	0–11	–
	scarlet gilia	IPAG	<i>Ipomopsis aggregata</i>	0–11	–
	lousewort	PEDIC	<i>Pedicularis</i>	0–11	–
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0–11	–
	hillside vervain	VENE	<i>Verbena neomexicana</i>	0–11	–
<b>Shrub/Vine</b>					
4	<b>Shrubs</b>			6–56	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	0–28	–
	Fendler's ceanothus	CEFE	<i>Ceanothus fendleri</i>	0–28	–
	black sagebrush	ARNO4	<i>Artemisia nova</i>	0–22	–
	rubber rabbitbrush	ERNAN5	<i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>nauseosa</i>	0–17	–

	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–11	–
	Gambel oak	QUGA	<i>Quercus gambelii</i>	0–11	–
	wax currant	RICE	<i>Ribes cereum</i>	0–6	–
	New Mexico raspberry	RUNE	<i>Rubus neomexicanus</i>	0–6	–
	blue elderberry	SANIC5	<i>Sambucus nigra ssp. cerulea</i>	0–6	–
	mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>	0–6	–
	pingue rubberweed	HYRI	<i>Hymenoxys richardsonii</i>	0–6	–
	Fremont's mahonia	MAFR3	<i>Mahonia fremontii</i>	0–6	–
	creeping barberry	MARE11	<i>Mahonia repens</i>	0–6	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	0–6	–
	Shrub (>.5m)	2SHRUB	<i>Shrub (&gt;.5m)</i>	0–6	–
<b>Tree</b>					
5	<b>Evergreen Trees</b>			6–56	
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	6–56	–
	white fir	ABCO	<i>Abies concolor</i>	0–6	–
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	0–6	–
	Rocky Mountain juniper	JUSC2	<i>Juniperus scopulorum</i>	0–6	–
	twoneedle pinyon	PIED	<i>Pinus edulis</i>	0–6	–
6	<b>Deciduous trees</b>			0–17	
	Gambel oak	QUGA	<i>Quercus gambelii</i>	0–17	–
	quaking aspen	POTR5	<i>Populus tremuloides</i>	0–6	–

## Animal community

Site is favorable for grazing throughout most of the year except when snow cover restricts availability of forage. With continuous grazing use during winter and spring, the relatively scarce cool season mid grasses are replaced by rabbit brush, snakeweed and lower value forbs and grasses. Planned grazing systems adapt well to use on this site.

## Recreational uses

Winters are cold, however, relatively mild spring, fall and summer months are attractive to recreationists.

Activities include hunting, cross-country riding, photography, hiking, rock collecting, and wildlife observation.

## Other references

Updates and revisions for this ESD were conducted as part of a 2007-2012 Interagency Technical Assistance Agreement between the Bureau of Indian Affairs–Navajo Region and the NRCS-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):**

- 
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:**
-