# Ecological site R044AP801MT
# Bottomland Group

Last updated: 9/07/2023
Accessed: 05/02/2024

## 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.

## MLRA notes

Major Land Resource Area (MLRA): 044A–Northern Rocky Mountain Valleys

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This MLRA includes the northern portion of the Northern Rocky Mountain Valleys Province of the Rocky Mountain System. The mountain valleys are deeply dissected and are typically bordered by mountains trending north to south. The nearly level broad flood plains are bordered by gently to strongly sloping terraces and alluvial fans. The surrounding mountains and in some areas the valleys experienced glaciation. The average precipitation is 12 to 16 inches generally, though can vary widely. The dominant soil orders are Inceptisols, Mollisols and Andisols. The valleys support coniferous forests, shrublands and grasslands.
Description of MLRAs can be found in: United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

Available electronically at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053624#handbook

## Ecological site concept

• Site does receive any additional water
• Site located in a flood plain
• Dominant Cover: Grassland, Shrubland, Deciduous Woodland
• Soils are
o Generally not saline or saline-sodic or limy (limited extent)
o Moderately deep, deep or very deep
o Not ashy or medial textural family
o Typically less than 15% stone and boulder surface area (<15% max)
• Soil surface texture fine sandy loam to sandy loam, silty loam in surface mineral 4”
• Parent material is alluvium, lacustrine deposits
• Drainage class is very poorly to excessively well drained; rare to frequent flooding frequency
• Site Landform: drainageways, flood plains, abandoned channels on flood plains
• Moisture Regime: aquic
• Temperature Regime: frigid
• Elevation Range: 3100-3800 ft
• Slope: 0-2%

## Associated sites

| | |
|---|---|
| R044AP806MT | **Subirrigated Grassland Group**<br>This associated ecological site resides in areas with subirrigated hydrology in areas adjacent to this ecological site. |

## Similar sites

| | |
|---|---|
| R044AP806MT | **Subirrigated Grassland Group**<br>This ecological site is similar to this ecological site in that it receives additional subirrigated water but different in geography that it resides in a floodplain as opposed to an upland site. |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | (1) *Populus balsamifera ssp. trichocarpa*<br>(2) *Betula occidentalis* |
| Shrub | (1) *Cornus sericea ssp. sericea*<br>(2) *Acer glabrum* |
| Herbaceous | (1) *Deschampsia cespitosa*<br>(2) *Thalictrum occidentale* |

## Physiographic features

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Valley > Drainageway<br>(2) Valley > Flood plain<br>(3) Valley > Abandoned channel |
| Elevation | 3,100–3,800 ft |
| Slope | 0–2% |
| Water table depth | 0–60 in |
| Aspect | W, NW, N, NE, E, SE, S, SW |

## Climatic features

- Moisture Regime: aquic
- Temperature Regime: frigid
- Representative Value (RV) of range of Mean Annual Precipitation: 12-14 inches
- Representative Value (RV) of range of Mean Average Annual Temperature: 41-45 degrees
- Representative Value (RV) of range of Frost Free Days: 90-115 days

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (characteristic range) | 70-103 days |
| Freeze-free period (characteristic range) | 120-140 days |
| Precipitation total (characteristic range) | 16-28 in |
| Frost-free period (actual range) | 35-117 days |
| Freeze-free period (actual range) | 97-145 days |
| Precipitation total (actual range) | 13-36 in |
| Frost-free period (average) | 85 days |
| Freeze-free period (average) | 127 days |
| Precipitation total (average) | 22 in |

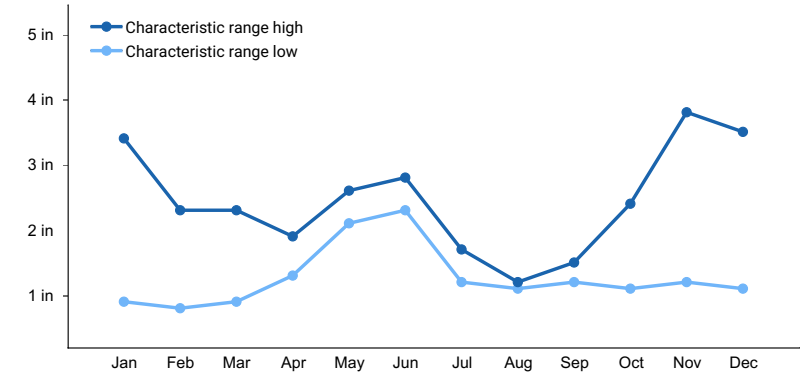



**Figure 1. Monthly precipitation range**

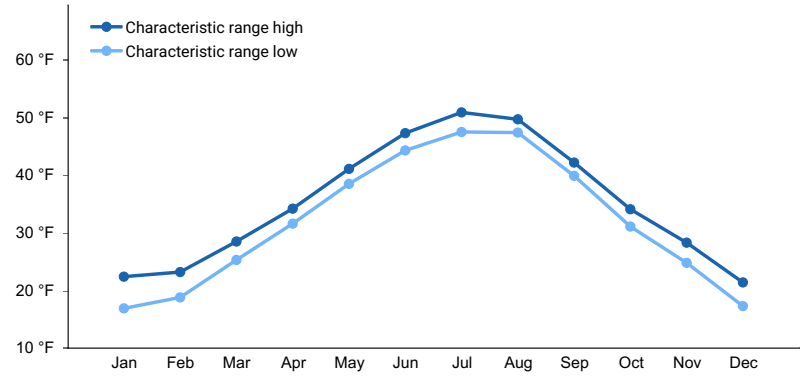



**Figure 2. Monthly minimum temperature range**

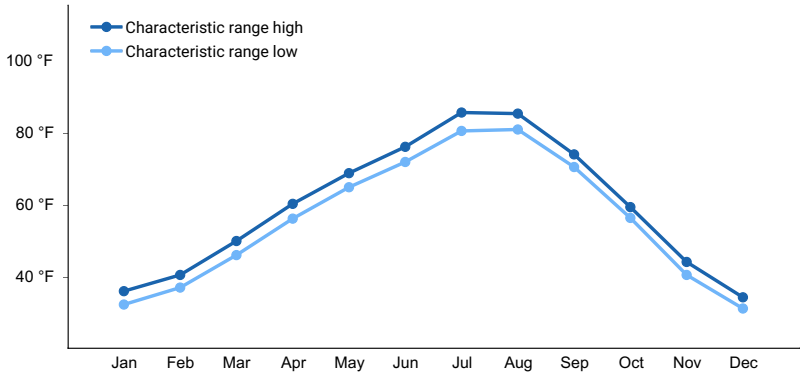



**Figure 3. Monthly maximum temperature range**

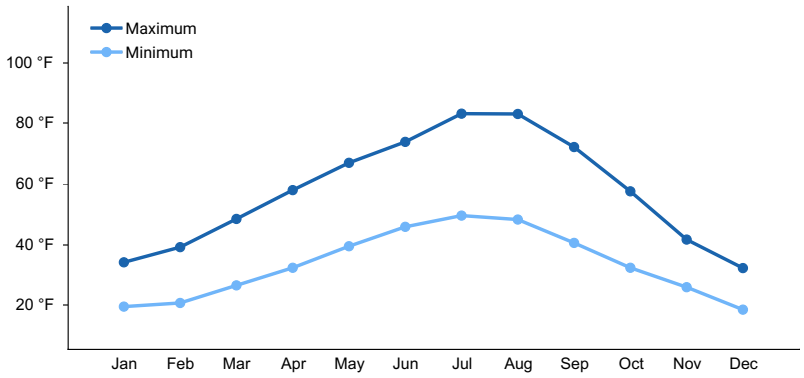



**Figure 4. Monthly average minimum and maximum temperature**

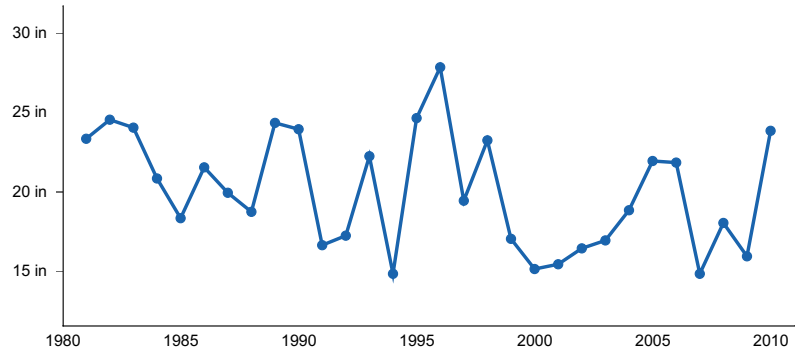



**Figure 5. Annual precipitation pattern**

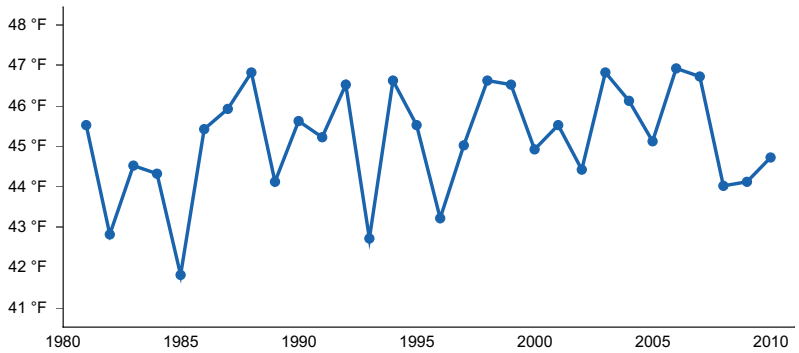



**Figure 6. Annual average temperature pattern**

## Climate stations used

- (1) OLNEY [USC00246218], Whitefish, MT
- (2) KALISPELL 9 NNE [USC00244560], Kalispell, MT
- (3) BONNERS FERRY [USC00101079], Bonners Ferry, ID
- (4) SANDPOINT EXP STN [USC00108137], Sandpoint, ID
- (5) TROUT CREEK RS [USC00248380], Trout Creek, MT
- (6) MULLAN [USC00106230], Mullan, ID
- (7) CRESTON [USC00242104], Kalispell, MT
- (8) POLSON KERR DAM [USC00246640], Polson, MT
- (9) SAINT IGNATIUS [USC00247286], Saint Ignatius, MT
- (10) STEVENSVILLE [USC00247894], Stevensville, MT
- (11) TRIDENT [USC00248363], Three Forks, MT

## Influencing water features

• Site does receive additional water
• Site located in a flood plain
• Dominant Cover: Grassland, Shrubland, Deciduous Woodland

## Wetland description

Cowardin Classification: Paustrine: Class=forested wetland; subclass=broad-leaved deciduous; Water regime= temporarily flooded to intermittently flooded.

## Soil features

• Soils are
o Generally not saline or saline-sodic or limy (limited extent)
o Moderately deep, deep or very deep
o Not ashy or medial textural family
o Typically less than 15 percent stone and boulder surface area (less than 15 percent max)

• Soil surface texture fine sandy loam to sandy loam, silty loam in surface mineral 4 inches
• Parent material is alluvium, lacustrine deposits
• Drainage class is very poorly to excessively well drained; rare to frequent flooding frequency

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Alluvium<br>(2) Lacustrine deposits |
| Surface texture | (1) Fine sandy loam<br>(2) Sandy loam<br>(3) Silt loam |
| Drainage class | Very poorly drained to excessively drained |
| Soil depth | 20–60 in |
| Surface fragment cover >3" | 0–15% |

## Ecological dynamics

Legend
State 1.0: This represents the historic state in which there are no weedy species present at the site. The community is the same composition as currently but without any weedy species.
Community Phase 1.1: This represents mature black cottonwood in the overstory with a significant presence of shorter statured water birch present. The understory is multistoried with medium statured shrubs common snowberry and rose species and forbs and grasses. Cowardin Classification: Paustrine: Class=forested wetland; subclass=broad-leaved deciduous; Water regime= temporarily flooded to intermittently flooded.

State 2.0: This represents the current reference state in which the same dominant species exist as in State 1.0 but there is a low presence of weedy species.
Community Phase 2.1: This represents the reference state in which tall, mature black cottonwood dominate the overstory with a minor amount of water birch. The understory has a mixture of shrubs including: redosier dogwood (*Cornus sericea* ssp. sericea), common snowberry ( *Symphoricarpos albus*), and Rocky mountain maple (*Acer glabrum*). There is a mixture of herbaceous forbs. There can be small gap dynamics in which one or two trees die, opening the canopy and allowing sunlight into the forest floor. Cowardin Classification: Paustrine: Class=forested wetland; subclass=broad-leaved deciduous; Water regime= temporarily flooded to intermittently flooded.

Community Phase 2.2: This represents the community post disturbance from flooding or fire. It represents an early seral stage. If the flooding event or fire is substantial, than the site will not have trees. The mineral soil will allow for re-establishment by herbaceous forbs, grasses and resprouting shrubs. Tree species, especially black cottonwood, will become established on the mineral soil. Over time, the trees will over-top the shrubs and herbaceous species, and dominate. This phase is very susceptible to flooding and may be eliminated after just a year or two of growth. Ice can also damage this phase by mechanical damage (bending, shearing or pulling out of young stems or tilting or pushing over of mature trees) or flooding. Seedlings and sapling black cottonwoods are particularly susceptible to fire since their bark is thin and the root system shallow. Young black cottonwoods are very susceptible to defoliation by livestock, wildlife and beaver use, and can be eliminated. Cowardin: System=palustrine; Class=forested wetland; Subclass=broad-leaved deciduous; Water Regime (nontidal) = seasonally flooded.

Community Phase 2.3: This represents the community in competitive exclusion phase in which the tree seedlings have grown to sapling and pole sized trees and are competing with each other for resources. The canopy cover is very high, shading out the forest floor and limiting the understory to shade-tolerant species. Cowardin Classification: Paustrine: Class=forested wetland; subclass=broad-leaved deciduous; Water regime= temporarily flooded to intermittently flooded.

Community Phase 2.4: This site is directly adjacent to the active floodplain that is slightly higher and drier and sustains a ponderosa pine overstory with an understory of shrubs, forbs and perennial bunchgrasses. The mature trees are able to access the subsurface water and grow very large.

State 3.0: This community has sustained a long period of heavy utilization grazing in which the native community

has been impacted and increaser species, such as baltic rush are dominant. There is increased hummocking and trailing throughout the site, which can impact roots of the native plant community and cause a decrease in productivity of the site.

State 4.0 Native with introduced annuals state:
4.1: This represents the community after heavy grazing resulting in a decrease of shrubs species except western snowberry and rose species and an introduction of weedy species such as timothy and Kentucky bluegrass. This represents a moderately disturbed secondary successional stage. Cowardin Classification: Paustrine: Class=forested wetland; subclass=broad-leaved deciduous; Water regime= temporarily flooded to intermittently flooded.

4.2: This represents the community after severe grazing in which all shrub species have been eliminated and the cover of weedy species has increased dramatically. Secondary successional state. This depauperate state has only an overstory of black cottonwood and an understory of wood's rose, common timothy and Kentucky bluegrass. Cowardin Classification: Paustrine: Class=forested wetland; subclass=broad-leaved deciduous; Water regime= temporarily flooded to intermittently flooded.

Community Phase Pathway 2.1.A: This pathway represents flooding disturbance intense enough to kill trees and set the site back to mineral soil and colonizing herbaceous species, resprouting shrubs and tree seedlings.

Community Phase Pathway 2.2A: This pathway represents time without disturbance.

Community Phase Pathway 2.3A: This pathway represents time without disturbance.

Community Phase Pathway 2.3B: This pathway represents flooding disturbance intense enough to kill trees and set the site back to mineral soil and colonizing herbaceous species, resprouting shrubs and tree seedlings.

Transition 1: This represents the pathway from the historic state 1.0 without any weedy species present in the vegetation community to State 2.0 in which there are very low covers of weedy species present in the vegetation community.

Transition 2: This represents the pathway from the current state to one in which increaser species such as baltic rush dominate the vegetation community due to sustained, heavy grazing.

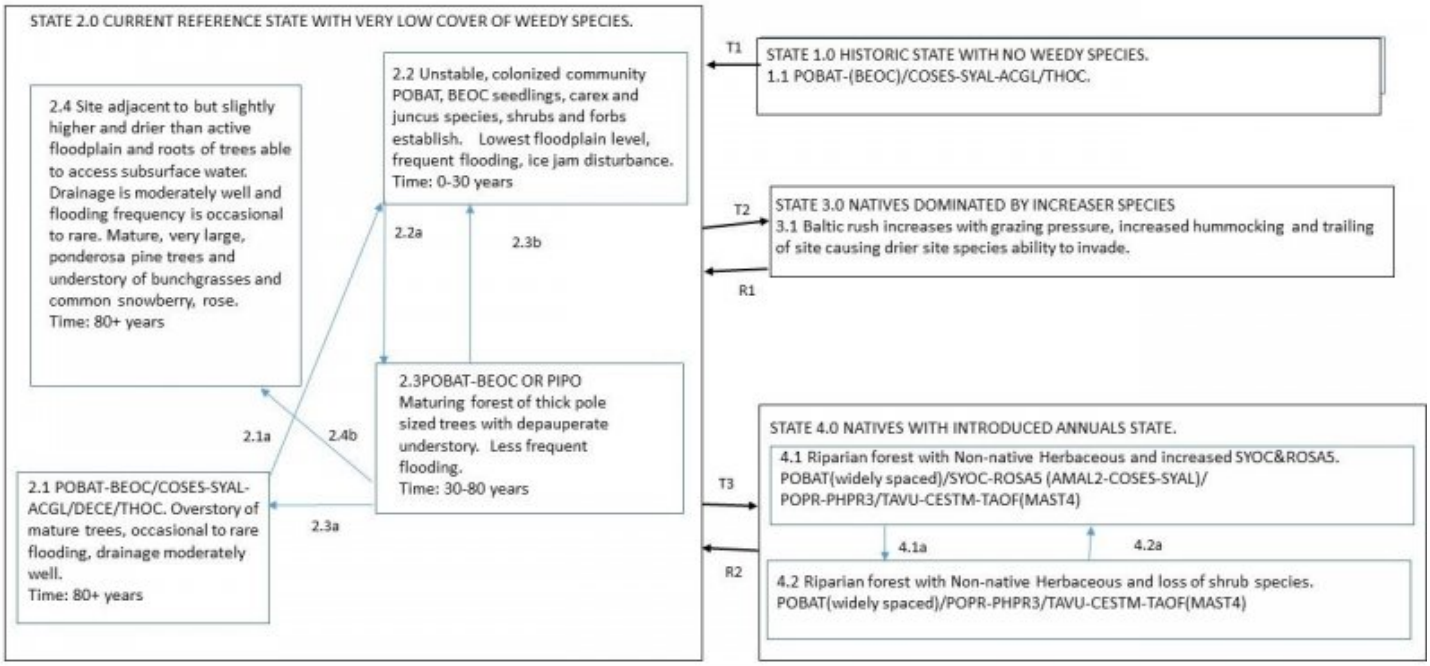
Transition 3: This represents the pathway from State 2.0 the current reference state in which the cover of weedy species is very low to State 4.0 in which there has been a dramatic increase of weedy species through heavy continuous livestock grazing.

Community Phase Pathway 4.1.A: This pathway represents the community after heavy grazing with a concomitant loss of shrub species except western snowberry and rose species.

Community Phase Pathway 4.2A: This pathway represents the community after cessation heavy grazing or establishment of prescribed grazing methods in which there is an increase of shrub species such as serviceberry, redosier dogwood and western snowberry and a decrease in shrub species such as western snowberry and rose species.

## State and transition model

44A Bottomland




Legend

Pathways

2.1.A: flooding disturbance intense enough to kill trees and set the site back to mineral

2.2A: time without disturbance.

2.3A: time without disturbance.

2.3B: flooding disturbance intense enough to kill trees and set the site back to mineral soil

4.1.A: after heavy grazing with a concomitant loss of shrub species

4.2A: after cessation heavy grazing or establishment of prescribed grazing methods in which there is an increase of shrub species

Transitions

T1: very low covers of weedy species present

T2: increaser species such as Baltic rush dominate the vegetation community due to sustained, heavy grazing.

T3: a dramatic increase of weedy species through heavy continuous livestock grazing.

## Animal community

Livestock use ranges from low to moderate depending on shrub density and its limiting effect on livestock. Red osier dogwood is very palatable to livestock and wildlife and therefore if animals are not impeded by thickets, this site could sustain moderate use. If use is heavy and sustained than there can be a reduction in shrubs with a

concomitant increase in herbaceous plants with seeds in the seedbank or weedy species. In areas with common or western snowberry, the palatability of the forage decreases for cattle and sheep. In areas with Wood's rose, palatability is only fair for livestock.
Wildlife use is high and includes big games, bald eagles, ospreys, Canada geese, woodpeckers, great horned owls, wood ducks, raccoons, beaver, small birds and mammals.
This site is very important in providing thermal cover for fish.

## Hydrological functions

Water regime= temporarily flooded to intermittently flooded.
This site functions in debris recruitment and streambank stability and therefore limits soil erosion.

## Recreational uses

Fishing, hunting and bird watching, campgrounds, trails.

## Wood products

Productivity of cottonwoods can be high, although conifers are not common on this site.

## Other references

Hansen, Paul L. Classification and management of Montana's riparian and wetland sites. No. 54. Montana Forest and Conservation Experiment Station, School of Forestry, The University of Montana, 1995.

Pfister, Robert D., et al. "Forest habitat types of Montana." Gen. Tech. Rep. INT-GTR-34. Ogden, UT: US Department of Agriculture, Forest Service, Intermountain Forest & Range Experiment Station. 174 p. 34 (1977).

## Contributors

Jay Skovlin
Stephanie Shoemaker

## Approval

Kirt Walstad, 9/07/2023

## 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 | 05/02/2024 |
| Approved by | Kirt Walstad |
| 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):**

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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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