USDA Natural Resources Conservation Service

# Ecological site R023XY312OR
# SHALLOW NORTH 12-16 PZ

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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.

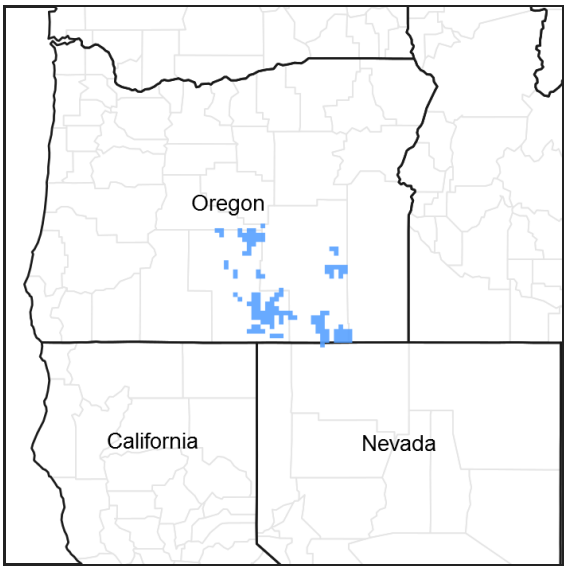


**Figure 1. Mapped extent**

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.

## Associated sites

| | |
|---|---|
| R023XY216OR | **CLAYPAN 12-16 PZ**<br>Claypan 12-16" PZ |
| R023XY218OR | **THIN SURFACE CLAYPAN 10-16 PZ**<br>Thin Surface Claypan 10-16" PZ |
| R023XY310OR | **NORTH SLOPES 12-16 PZ**<br>North Slopes 12-16" PZ |
| R023XY318OR | **LOAMY 12-16 PZ**<br>Loamy 12-16" PZ |

## Similar sites

| | |
|---|---|
| R023XY216OR | **CLAYPAN 12-16 PZ**<br>Claypan 12-16" PZ (lower production) |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | Not specified |
| Shrub | (1) *Artemisia arbuscula* |

| | |
|---|---|
| Herbaceous | (1) *Festuca idahoensis* |

## Physiographic features

This site occurs on the north exposures of high elevation plateaus and mountians side slopes. Slopes range from 20 to 70%. Elevation varies from 5000 to 8000 feet.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Mountain slope |
| Flooding frequency | None |
| Ponding frequency | None |
| Elevation | 1,524–2,438 m |
| Slope | 20–70% |
| Aspect | N |

## Climatic features

The annual precipitation ranges from 12 to 16 inches most of which occurs in the form of snow during the months of December through March. Localized convection stroms occasionally occur during the summer. The soil temperature regime is frigid to cryic with a mean annual air temperature of 42 degrees F. Temperature extremes range from 100 to -30 degrees F. The frost-free period ranges from less then 30 to 60 days. The optimum growthn period for native plants is from mid-May through mid-July.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (average) | 60 days |
| Freeze-free period (average) | 0 days |
| Precipitation total (average) | 406 mm |

## Influencing water features

## Soil features

The soils of this site are very shallow or shallow to a claypan, bedrock, or an extremely gravelly to stony substratum. The surface layer is a loam or clay-loam 5 to 12 inches thick with variable amounts of coarse fragments. The subsoil is typically a silty clay loam to clay 5 to 15 inches thick. Permeability is moderate to the bedrock or claypan and slow or very slow in the claypan. The available water holding capacity (AWC) is about 1 to 4 inche for the profile. The potential for water erosion is moderate to severe.

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Colluvium–basalt<br>(2) Residuum–andesite |
| Surface texture | (1) Very gravelly loam<br>(2) Very stony clay loam |
| Family particle size | (1) Clayey |
| Drainage class | Well drained |
| Permeability class | Very slow to moderate |
| Soil depth | 10–51 cm |
| Surface fragment cover <=3" | 0% |

| | |
|---|---|
| Surface fragment cover >3" | 0–9% |
| Available water capacity (0-101.6cm) | 2.29–10.92 cm |
| Calcium carbonate equivalent (0-101.6cm) | 0% |
| Electrical conductivity (0-101.6cm) | 0 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 0 |
| Soil reaction (1:1 water) (0-101.6cm) | 6.6–7.8 |
| Subsurface fragment volume <=3" (Depth not specified) | 13–30% |
| Subsurface fragment volume >3" (Depth not specified) | 5–35% |

## Ecological dynamics

Range in Characteristics:
The reference native plant community is dominated by Idaho fescue, and low sagebrush. bluebunch wheatgrass and Sandberg bluegrass are prominent. The vegetative composition of the community is approximately 80 percent grasses, 5 percent forbs, and 15 percent shrubs.

Idaho fescue will increase on deeper soils and at the upper end of the precipitation zone. Low sagebrush will increase on shallower soils. Bluebunch wheatgrass will increase as the aspect varies to the east and northwest.

Four states have been identified for this site: a reference state; a state with the presence of annuals; a state that has juniper and low sagebrush co-dominant on the site, and a state with annual dominance.

Reference State: Stable plant community affected infrequently by fire. Sites are dominated with low sagebrush with some sites exhibiting a small percentage of old growth juniper. Infrequent fire (> 80 to 100 year intervals) maintained site dynamics. Fire reduced shrub cover in a mosaic, patchy pattern. The introduction of invasive annual grasses and forbs transitions into the state 2.

State 2: Compositionally similar to the reference state with a trace of cheatgrass and/or medusahead and other annual weeds. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. Infrequent fire (> 80 to 100 years) reduces shrub cover, removes young juniper and promotes grass production while time since fire allows shrub recovery. Mismanagement of grazing facilitates an increase in Sandberg’s bluegrass, weedy species, young juniper, and low sagebrush. Bunchgrasses decline in production and density. Prescribed grazing can reverse the trend. Loss of deep-rooted perennial bunchgrasses and an increase in young juniper brings the site to State 3.

State 3: Low sagebrush and possibly young juniper dominate the site with minimal perennial, deep-rooted grasses. Cheatgrass and/or medusahead along with other weedy forbs are increased in density and cover. Sandberg’s bluegrass cover and vigor is declining. Water flow paths are evident. Sagebrush and possibly juniper control site resources. Catastrophic wildfire leading to annual dominated plant community will take the site to State 4.

State 4: Cheatgrass and/or medusahead dominated. Few old growth juniper may be present. Rabbitbrush has increased with few to no low sagebrush. Wind and water erosion drive site processes.

Response to Disturbance:
If the condition of the site deteriorates as a result of overgrazing, Idaho fescue will decrease while low sagebrush, bluebunch wheatgrass, and Sandbergs bluegrass will increase. Idaho fescue is the preferred species during all seasons. With further deterioration, bluebunch wheatgrass and Sandberg bluegrass will increase. Idaho fescue is the preferred species during all seasons. With further deterioration, bluebunch wheatgrass will decrease while Sandberg bluegrass and low sagebrush will continue to increase. Annuals invade and bare ground markedly

increases. Excessive erosion in the bare soil interspaces reduces the site productivity and contributes to downstream sedimentation.

## State and transition model

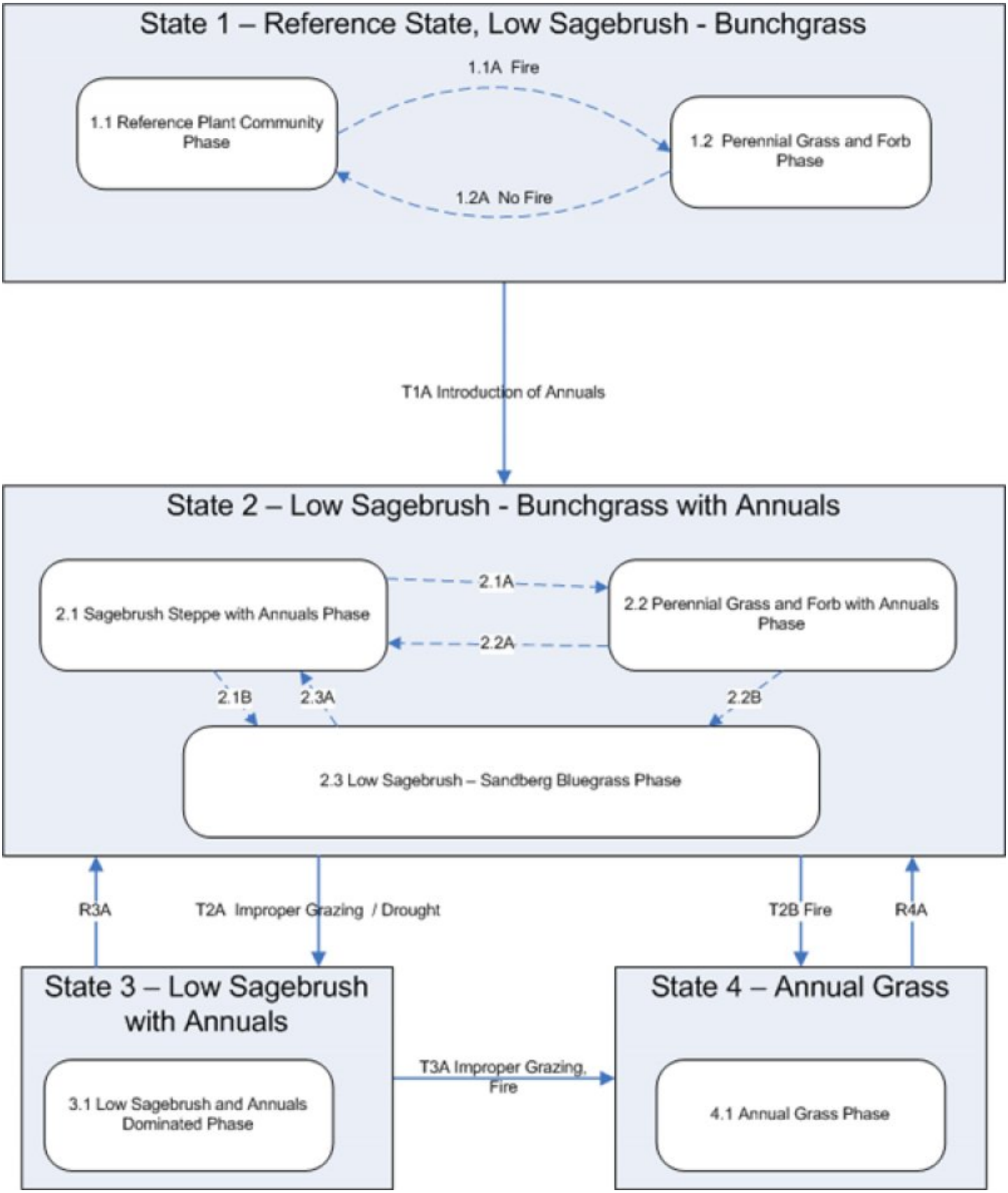


**Figure 3. Group 10, STM**

## State 1
## Reference State

## Community 1.1
## Reference Plant Community

The potential native plant community is dominated by Idaho fescue and low sagebrush. Bluebunch wheatgrass and Sandberg bluegrass are prominent. The vegetative composition of the community is approximatley 80% grass, 5% forbs and 15% shrubs.

**Table 5. Annual production by plant type**

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|---|---|---|---|
| Grass/Grasslike | 448 | 628 | 897 |
| Shrub/Vine | 84 | 118 | 168 |
| Forb | 28 | 39 | 56 |
| **Total** | **560** | **785** | **1121** |

## Additional community tables

**Table 6. Community 1.1 plant community composition**

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|---|---|---|---|---|---|
| **Grass/Grasslike** | | | | | |
| 1 | **Perennial, moderately-deep rooted, bunchgrass** | | | 392–549 | |
| | Idaho fescue | FEID | *Festuca idahoensis* | 392–549 | – |
| 2 | **Perennial, moderately-deep rooted, bunchgrass** | | | 39–118 | |
| | bluebunch wheatgrass | PSSPS | *Pseudoroegneria spicata ssp. spicata* | 39–118 | – |
| 5 | **Perennial, shallow-rooted, bunchgrass** | | | 16–39 | |
| | Sandberg bluegrass | POSE | *Poa secunda* | 16–39 | – |
| 6 | **Other perennial grasses, all** | | | 16–63 | |
| | Thurber's needlegrass | ACTH7 | *Achnatherum thurberianum* | 0–16 | – |
| | squirreltail | ELEL5 | *Elymus elymoides* | 0–16 | – |
| | prairie Junegrass | KOMA | *Koeleria macrantha* | 0–16 | – |
| | basin wildrye | LECI4 | *Leymus cinereus* | 0–16 | – |
| | Cusick's bluegrass | POCU3 | *Poa cusickii* | 0–16 | – |
| **Forb** | | | | | |
| 7 | **Perennial Forbs** | | | 31–94 | |
| | aster | ASTER | *Aster* | 8–24 | – |
| | tapertip hawksbeard | CRAC2 | *Crepis acuminata* | 8–24 | – |
| | lupine | LUPIN | *Lupinus* | 8–24 | – |
| | phlox | PHLOX | *Phlox* | 8–24 | – |
| 9 | **Other Perennial Forbs** | | | 8–39 | |
| | common yarrow | ACMI2 | *Achillea millefolium* | 0–8 | – |
| | agoseris | AGOSE | *Agoseris* | 0–8 | – |
| | sandwort | ARENA | *Arenaria* | 0–8 | – |
| | balsamroot | BALSA | *Balsamorhiza* | 0–8 | – |
| | Indian paintbrush | CASTI2 | *Castilleja* | 0–8 | – |
| | maiden blue eyed Mary | COPA3 | *Collinsia parviflora* | 0–8 | – |
| | fleabane | ERIGE2 | *Erigeron* | 0–8 | – |

| | | | | | |
|---|---|---|---|---|---|
| | fleabane | ERIGE2 | *Erigeron* | 0–8 | |
| | buckwheat | ERIOG | *Eriogonum* | 0–8 | – |
| | stoneseed | LITHO3 | *Lithospermum* | 0–8 | – |
| | desertparsley | LOMAT | *Lomatium* | 0–8 | – |
| **Shrub/Vine** | | | | | |
| 11 | **Evergreen** | | | 78–157 | |
| | little sagebrush | ARAR8 | *Artemisia arbuscula* | 78–157 | – |
| 14 | **Other, Deciduous** | | | 0–24 | |
| | yellow rabbitbrush | CHVI8 | *Chrysothamnus viscidiflorus* | 0–8 | – |
| | antelope bitterbrush | PUTR2 | *Purshia tridentata* | 0–8 | – |
| | spineless horsebrush | TECA2 | *Tetradymia canescens* | 0–8 | – |
| **Tree** | | | | | |
| 15 | **Evergreen** | | | 0–8 | |
| | Saskatoon serviceberry | AMAL2 | *Amelanchier alnifolia* | 0–27 | – |
| | curl-leaf mountain mahogany | CELE3 | *Cercocarpus ledifolius* | 0–27 | – |
| | yellow rabbitbrush | CHVI8 | *Chrysothamnus viscidiflorus* | 0–27 | – |
| | slender buckwheat | ERMI4 | *Eriogonum microthecum* | 0–27 | – |
| | currant | RIBES | *Ribes* | 0–27 | – |
| | rose | ROSA5 | *Rosa* | 0–27 | – |
| | western juniper | JUOC | *Juniperus occidentalis* | 0–8 | – |

## Animal community

Livestock Grazing:
This stie is suited to use by cattle, sheep and horses in late spring, summer and fall under a planned grazing system. Use should be postponed until the soils are firm enough to avoid trampling damage and soil compaction.
Wildlife:
Thiss tie will offer food and cover fro antelope, mule deer, rodents and a variety of birds. It is an importantsummer and fall use area for antelope and mule deer.
Native Wildlife Associtied With the Potential Climax Community:
Mule deer, pronghorn antelope, hawks, songbirds, and rodents.

## Hydrological functions

The soils are in hydrologic group D. The soils of this site have high runoff potential.

## 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) | Jeff Repp and Bruce Franssen |
| Contact for lead author | State Rangeland Management Specialist for NRCS in Oregon |
| Date | 08/17/2012 |
| Approved by | Bob Gillaspy |
| Approval date | |
| Composition (Indicators 10 and 12) based on | Annual Production |

## Indicators

1. **Number and extent of rills:** None, Moderate to severe sheet & rill erosion hazard

2. **Presence of water flow patterns:** None

3. **Number and height of erosional pedestals or terracettes:** None to very few terracettes

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 8-30%

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

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

7. **Amount of litter movement (describe size and distance expected to travel):** Fine - limited movement

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Moderately resistant to erosion: aggregate stability = 3-5

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Shallow t very shallow loam soils (5-20 inches thick)with weak fine granular to moderate platy structure, dry color value 4-6 and 3-8 inches thick; Low to Moderate OM (1-5%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Moderate ground cover (50-60%) and gentle to very steep slopes (20-70%) moderately limit rainfall impact and overland flow

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be**

**mistaken for compaction on this site):** None

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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: Idaho fescue > Low sagebrush > Bluebunch wheatgrass > forbs > other grasses > other shrubs

    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):** Normal decadence and mortality expected

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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):** Favorable: 1000, Normal: 700, Unfavorable: 500 lbs/acre/year at high RSI (HCPC)

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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:** Western Juniper readily invades the site. Cheatgrass and Medusahead invade sites that have lost deep rooted perennial grass functional groups.

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17. **Perennial plant reproductive capability:** All species should be capable of reproducing annually

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