USDA Natural Resources
Conservation Service

Ecological site R010XC082OR
SR Dry Pine 14-16 PZ

Accessed: 05/11/2025

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

R010XC032OR	**SR Mountain 12-16 PZ** SR Mountain 12-16 PZ
R010XC033OR	**SR Cool 12-16 PZ** SR Cool 12-16 PZ
R010XC037OR	**SR Mountain Shallow 12-16 PZ** SR Mountain Shallow 12-16 PZ
R010XC039OR	**SR Very Shallow 12-16 PZ** SR Very Shallow 12-16 PZ
R010XC047OR	**SR Mountain South 12-16 PZ** SR South 12-16 PZ
R010XC066OR	**SR Mountain North 12-16 PZ** SR Mountain North 12-16 PZ
R010XC080OR	**SR Mahogany Mountain Loam 14-18 PZ** SR Mahogany Mountain Loam 14-18 PZ

Similar sites

R010XC037OR	**SR Mountain Shallow 12-16 PZ** SR Mountain Shallow 12-16 PZ (stony loam surface texture, shallow to bedrock, lower production)
R010XC032OR	**SR Mountain 12-16 PZ** SR Mountain 12-16 PZ (higher production, different composition- no PIPO)
R010XC033OR	**SR Cool 12-16 PZ** SR Cool 12-16 PZ (higher production, different composition- no PIPO, greater amounts of ARTRT-X)
R010XC080OR	**SR Mahogany Mountain Loam 14-18 PZ** Mahogany Mountain Loam 14-18" PZ (substratum more highly fractured, different composition - CELE3 dominant)

Table 1. Dominant plant species

Tree	(1) *Pinus ponderosa*
Shrub	(1) *Artemisia tridentata var. vaseyana* (2) *Purshia tridentata*
Herbaceous	(1) *Festuca idahoensis* (2) *Pseudoroegneria spicata ssp. spicata*

Physiographic features

This site occurs adjacent to woodlands on tablelands and mountain plateaus. Slopes typically range from 2 to 20%. Elevations typically range from 4,000 to 5,700 feet.

Table 2. Representative physiographic features

Landforms	(1) Plateau (2) Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	1,219–1,737 m
Slope	2–12%
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 14 to 16 inches plus, most of which occurs in the form of snow during the months of December through March. Localized convection storms occasionally occur during the summer. The soil temperature regime is frigid with a mean air temperature of 43 degrees F. Temperature extremes range from 90 to -30 degrees F. The frost free period ranges from less than 30 to 60 days. The optimum growth period for plant growth is May through June.

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 typically moderately deep and well drained. Typically, the surface layer is a stony loam to clay loam about 8 inches thick. Variable amounts of coarse fragments are present. The subsoil is a stony clay loam about 20 inches thick. Depth to bedrock ranges from 20 to 40 inches. Permeability is moderate. The available water holding capacity (AWC) is about 4 to 8 inches for the profile. The erosion potential is moderate to severe.

Table 4. Representative soil features

Surface texture	(1) Stony loam (2) Cobbly clay loam
Family particle size	(1) Loamy
Drainage class	Well drained to moderately well drained
Permeability class	Moderate to moderately slow
Soil depth	51–102 cm
Available water capacity (0-101.6cm)	10.16–20.32 cm

Ecological dynamics

The potential native plant community is dominated by ponderosa pine, mountain big sagebrush, antelope bitterbrush and Idaho fescue. Wax currant and bluebunch wheatgrass are common. Mountain mahogany and a variety of forbs are present. Canopy cover of scattered 80 year old and older ponderosa pine ranges up to 10 percent. Mountain mahogany canopy cover is less than 5 percent. Vegetative composition of the community by air dry weight to 4.5 feet is approximately 75 percent grasses, 10 percent forbs and 15 percent shrubs. Approximate ground cover is 70 to 80 percent (basal and crown).

Range in Characteristics:
The scattered overstory of mature 80 year old and older ponderosa pine approaches 10% canopy coverage near adjacent woodland. Idaho fescue increases on northerly exposures. Bluebunch wheatgrass increases on slight south and west exposures. Production, antelope bitterbrush, serviceberry, snowberry and pine increase over fractured bedrock and at the upper end of the precipitation zone. The original open scattered pine stand is maintained by a fire frequency of 10 to 25 years.

Response to Disturbance:
If the condition of the site deteriorates as a result of overgrazing, Idaho fescue decreases. Mountain big sagebrush and ponderosa pine increase. Western juniper strongly invades and bare ground increases. Sandberg bluegrass, cheatgrass and other annuals dominate the understory. With further deterioration and lack of fire invading juniper outcompetes big sagebrush and dominates the site. With fire and heavy use annuals invade and bare ground increases. Excessive erosion reduces the site productivity and contributes to downstream sedimentation.

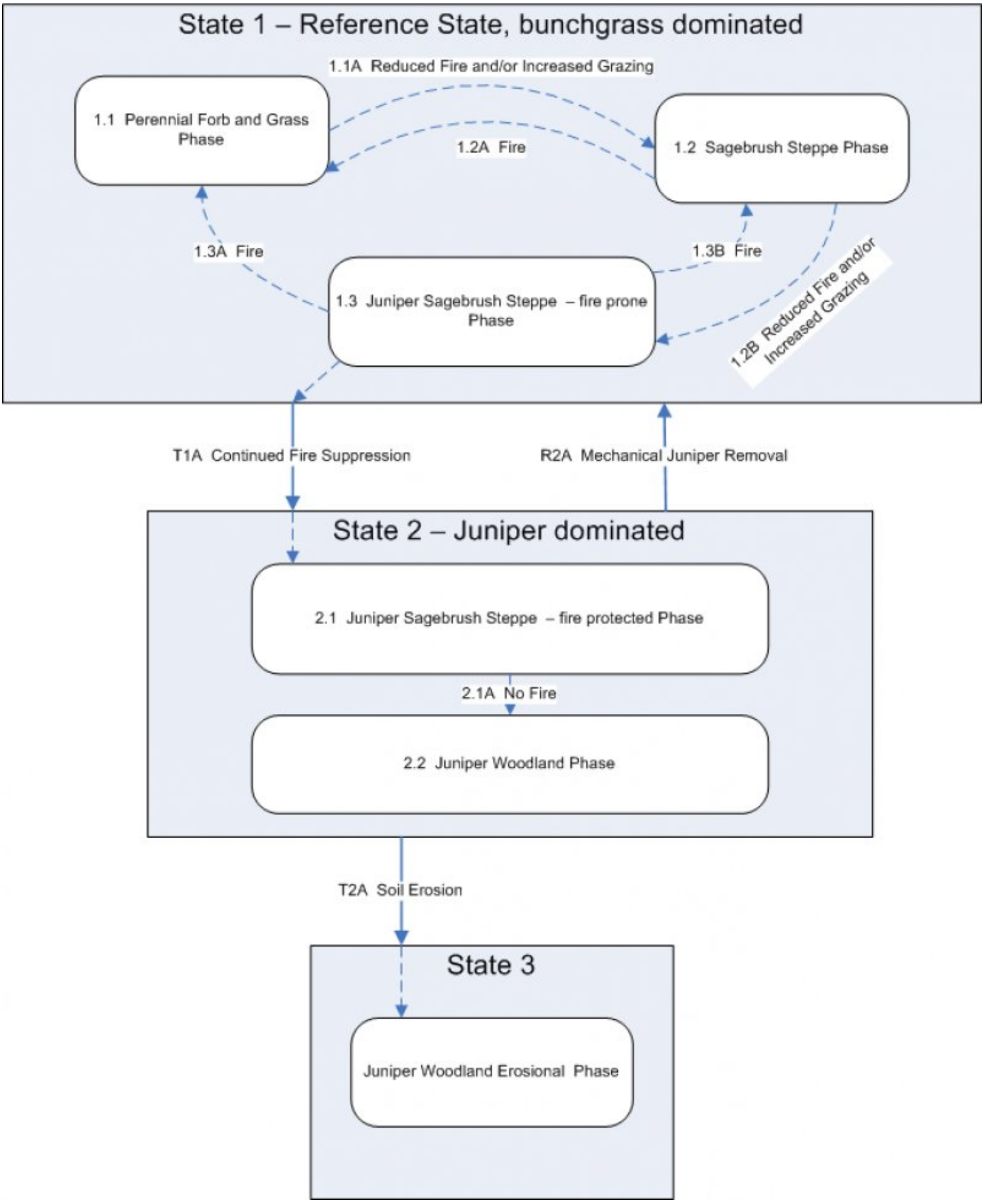
States: PIPO-JUOC/ARTRV-T/POSE-Bare Ground; JUOC-PIPO/POSE-Bare Ground; POSE–BRTE (TACA8)/Biennial Forbs-Bare Ground (following fire on degraded range)

Juniper Response:
Fine fuel reduction from improper grazing and fire suppression has led to an increase in the historical fire return interval on many western rangelands. A reduction in fire frequency on these sites leads to an increase in juniper cover, a decrease in sagebrush cover followed by a decrease in herbaceous cover and understory diversity. As juniper encroaches on north facing aspects sagebrush declines with a subsequent decrease in forbs, bluebunch wheatgrass and needlegrass. Idaho fescue becomes the primary herbaceous species occurring under the canopy of the juniper trees. Sandberg’s bluegrass increases in the plant community on lower elevation north slopes and warmer non-aspect sites while bare ground increases in the interspaces between trees. Bitterbrush is more resistant to juniper encroachment than sagebrush and maintains its presence in the community, however vigor and fitness (seed production) may be thwarted. The potential for soil erosion increases as the juniper woodland matures and the understory plant community cover declines. The combined effect of overgrazing and juniper invasion increases the rate of decline in ecological function and the probability of crossing a threshold is high.

Treatment Response:

This site responds positively to juniper removal if soil erosion is not significant.
Seeding may be necessary if there are less than 1-2 bunchgrass plants per meter square in the understory. Forbs may also need to be seeded if adult plants are no longer present in the understory.

State and transition model



State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The potential native plant community is dominated by ponderosa pine, mountain big sagebrush, antelope bitterbrush and Idaho fescue. Wax currant and bluebunch wheatgrass are common. Mountain mahogany and a variety of forbs are present. Canopy cover of scattered 80 year old and older ponderosa pine ranges up to 10 percent. Mountain mahogany canopy cover is less than 5 percent. Vegetative composition of the community by air dry weight to 4.5 feet is approximately 75 percent grasses, 10 percent forbs and 15 percent shrubs. Approximate ground cover is 70 to 80 percent (basal and crown).

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	841	1093	1345
Shrub/Vine	135	175	215
Forb	112	146	179
Tree	34	44	54
Total	**1122**	**1458**	**1793**

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	**Dominant, perennial deep rooted grasses**			583–874	
	Idaho fescue	FEID	*Festuca idahoensis*	583–874	–
2	**Sub-dominant, perennial deep rooted grass**			291–729	
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	291–729	–
4	**Sub-dominant, perennial, shallow-rooted grass**			15–44	
	Sandberg bluegrass	POSE	*Poa secunda*	15–44	–
5	**Other perennial grasses**			17–142	
	Thurber's needlegrass	ACTH7	*Achnatherum thurberianum*	6–29	–
	basin wildrye	LECI4	*Leymus cinereus*	0–29	–
	bluegrass	POA	*Poa*	0–17	–
	mountain brome	BRMA4	*Bromus marginatus*	0–17	–
	sedge	CAREX	*Carex*	0–17	–
	squirreltail	ELEL5	*Elymus elymoides*	6–17	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	6–17	–
Forb					
7	**Dominant, perennial forbs**			36–72	
	buckwheat	ERIOG	*Eriogonum*	15–29	–
	lupine	LUPIN	*Lupinus*	15–29	–
	phlox	PHLOX	*Phlox*	7–13	–
9	**Other perennial forbs**			31–149	

	common yarrow	ACMI2	*Achillea millefolium*	4–15	–
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	7–15	–
	fleabane	ERIGE2	*Erigeron*	7–15	–
	desertparsley	LOMAT	*Lomatium*	7–15	–
	ragwort	SENEC	*Senecio*	0–15	–
	tapertip hawksbeard	CRAC2	*Crepis acuminata*	0–9	–
	largehead clover	TRMA3	*Trifolium macrocephalum*	0–7	–
	stonecrop	SEDUM	*Sedum*	0–7	–
	waterleaf	HYDRO4	*Hydrophyllum*	0–7	–
	woodland-star	LITHO2	*Lithophragma*	3–7	–
	stoneseed	LITHO3	*Lithospermum*	0–7	–
	brodiaea	BRODI	*Brodiaea*	0–7	–
	mariposa lily	CALOC	*Calochortus*	0–7	–
	Indian paintbrush	CASTI2	*Castilleja*	0–7	–
	bushy bird's beak	CORA5	*Cordylanthus ramosus*	0–7	–
	pussytoes	ANTEN	*Antennaria*	3–7	–
Shrub/Vine					
11	**Dominant, evergreen shrub**			44–117	
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	44–117	–
12	**Dominant, deciduous shrub**			44–117	
	antelope bitterbrush	PUTR2	*Purshia tridentata*	44–117	–
15	**Other shrubs**			28–109	
	wax currant	RICE	*Ribes cereum*	15–29	–
	basin big sagebrush	ARTRT	*Artemisia tridentata ssp. tridentata*	7–15	–
	big sagebrush	ARTRX	*Artemisia tridentata ssp. xericensis*	0–15	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	7–15	–
	Woods' rose	ROWO	*Rosa woodsii*	0–9	–
	common snowberry	SYAL	*Symphoricarpos albus*	0–9	–
	horsebrush	TETRA3	*Tetradymia*	0–9	–
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	0–9	–
Tree					
16	**Evergreen trees**			29–87	
	ponderosa pine	PIPO	*Pinus ponderosa*	29–73	–
	western juniper	JUOC	*Juniperus occidentalis*	0–15	–

Animal community

Livestock Grazing:
This site is suitable for livestock grazing use in the late spring, summer, and fall under a planned grazing system. Use should be postponed until the soils are firm enough to prevent trampling damage and soil compaction. Grazing management should be keyed to Idaho fescue. Deferred grazing or rest is recommended at least once every three years.

Native Wildlife Associated with the Potential Climax Community:
This site is commonly used by mule deer, elk, antelope, rabbits, rodents, upland birds and various predators. It is a

preferred site for upland bird nesting and rearing areas. Mule deer and elk make excellent use of the site for spring, summer and fall forage.

Hydrological functions

The soils of this site are typically in an upland topographic position. They have moderate high runoff potential and medium infiltration rates when the hydrologic cover is high. Under frozen ground conditions runoff potential is significantly increased. This occurs for extended periods when deep rooted perennial bunchgrass cover is negligible. Hydrologic cover is good when the Idaho fescue and bluebunch wheatgrass deep rooted bunchgrass component is greater than 70 percent of potential. The soils are in hydrologic group C.

Other information

Juniper invasion is a major risk on this site. Increases in western juniper and the subsequent competition for moisture will lead to a reduction of available forage. Overgrazing can easily reduce ground cover and accelerate soil loss. Improving infiltration, permeability and reducing runoff should be the immediate goal of juniper control. Juniper control measures include prescribed burning and/or cutting followed by rest to improve vigor, density and seed production of existing deep rooted perennial bunchgrasses. Consider seeding following control measures if an inadequate stand of bunchgrass is present.

When incised channels are present, rehabilitation will markedly improve production, reduce downstream sedimentation, and restore good hydrologic characteristics. On altered sites, the reintroduction of basin wildrye may be needed to fully restore the site 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 Frannsen
Contact for lead author	NRCS Oregon State Rangeland Management Specialist
Date	04/04/2003
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

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

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 0-10%

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

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

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):** Significantly resistant to erosion: aggregate stability = 4-6

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** weak fine to moderate medium granular structure, dry color value 4-5, 3-8 inches thick; moderate (2-4%) OM

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Significant ground cover (70-80%), up to 15% canopy cover with ponderosa pine and mountain mahogany, and gentle slopes (2-12%) effectively 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

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: Deep-rooted, cool seasson, bunchgrasses

    Sub-dominant: Evergreen trees > evergreen shrubs = deciduous shrubs

    Other: Shallow-rooted bunchgrasses = perennial forbs

    Additional:

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

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: 1200, Normal: 900, Unfavorable: 600 lbs/acre/year at high RSI

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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:** 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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