

Ecological site R023XY310OR NORTH SLOPES 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.

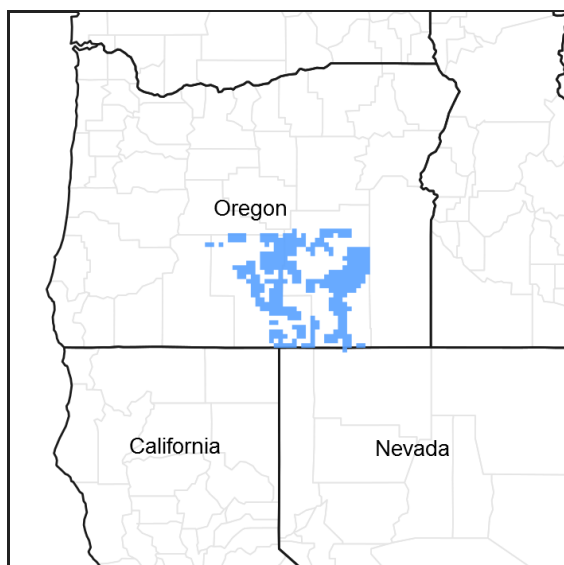


Figure 1. Mapped extent

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 Claypan 12-16" PZ
R023XY321OR	DEEP LOAMY 12-16 PZ Deep Loamy 12-16" PZ
R023XY404OR	DEEP NORTH 12-18 PZ Deep North 12-18" PZ

Similar sites

R023XY321OR	DEEP LOAMY 12-16 PZ Deep Loamy 12-16" PZ (not influenced by aspect)
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
Herbaceous	(1) <i>Festuca idahoensis</i>

Physiographic features

This site occurs on northerly exposures of mountain sideslopes. Slopes range from 15 to 80 percent, but slopes of 20 to 70 percent are most typical. Elevations range from 5000 to 7000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Elevation	1,524–2,134 m
Slope	20–70%
Aspect	N

Climatic features

The annual precipitation is 12 to 16 inches, most of which occurs in the form of snow during November to March. Spring rains are common. The soil temperature regimes are frigid and cryic. Extreme air temperatures range from 90 degrees F to -30 degrees F. The frost-free period is about 30 to 90 days. The optimum period for plant growth is from mid-May through early July.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	0 days
Precipitation total (average)	406 mm

Influencing water features

Soil features

The soils in this site are shallow to deep to bedrock, well-drained, formed in colluvium, and residuum. The soils have a medium textured surface layer 10 to 20 inches thick over a medium or fine textured subsoil. Typically the surface contains 20 to 70 percent rock fragments (primarily stones and cobbles). The subsoil typically contains 35 to 60 percent rock fragments. For the soils which have a clay increase between the surface and subsoil, the boundary is not abrupt. Permeability is moderate to slow. The available water holding capacity is about 1 to 4.5 inches for the profile.

Table 4. Representative soil features

Parent material	(1) Colluvium–basalt (2) Residuum–welded tuff
Surface texture	(1) Very cobbly loam (2) Extremely stony loam (3) Very gravelly loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	51–102 cm
Surface fragment cover ≤3"	13–30%
Surface fragment cover >3"	5–37%
Available water capacity (0–101.6cm)	2.54–11.18 cm

Soil reaction (1:1 water) (0-101.6cm)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	14–30%
Subsurface fragment volume >3" (Depth not specified)	19–40%

Ecological dynamics

Range in Characteristics:

The reference native plant community is dominated by Idaho fescue and mountain big sagebrush. Vegetative composition is about 70 percent grasses, 10 percent forbs, and 20 percent shrubs.

Because of the moderating influence of its northerly aspect, there is little variability in this site.

Five states have been identified for this site: a reference state; a state with the presence of annuals; a state that has Juniper dominating site resources; a state that is Juniper dominant; and a state with annual dominance.

Reference State: Plant community phase change is driven by fire. Mountain and basin big sagebrush declines after fire while Idaho fescue, Thurber's needlegrass and other grasses increase. Rabbitbrush may temporarily increase after fire. Time facilitates the reintroduction of sagebrush. The introduction of invasive annual grasses and forbs transitions into state 2.

State 2: Compositionally similar to the reference state with a trace of cheatgrass and the annual weeds. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. Prescribed grazing maintains state dynamics. Mismanagement of grazing favors sagebrush and Sandberg's bluegrass. Cheatgrass increases. Prescribed grazing can reverse the trend. Reduction in fire frequency facilitates juniper encroachment in both poor and good condition communities. Fire reduces or eliminates juniper and with time sagebrush reestablishes. Further expansion of juniper, which out-competes sagebrush and the herbaceous plant community, brings the site to state 3.

State 3: Juniper dominates site resources. Sagebrush is dead or dying and bitterbrush lacks vigor. Sandberg's bluegrass is the dominant species in the interspace and bare ground is significant. The perennial grass component is significantly reduced in both density and productivity. Idaho fescue may be present under the canopy of trees (north slope typically). Spatial and temporal energy capture and nutrient cycling has been truncated. Infiltration may be reduced due to lack of ground cover. As juniper woodland development becomes complete and soil loss and erosion drive site processes, the site goes into state 4.

State 4: Juniper dominated state. Soil loss is evident and erosion is active. All ecological processes, hydrologic cycle, nutrient cycle and energy capture have been significantly changed preventing the establishment of perennial plants. An abiotic threshold has been crossed. With catastrophic wildfire, state 5 is achieved.

State 5: Cheatgrass dominated plant community with limited to no shrub or perennial grass component. Soil erosion and redistribution along with changes in dynamic soil properties affect the hydrologic cycle and thus the nutrient cycle. Harsh environmental factors increase state resiliency to change.

Response to Disturbance:

Mountain big sagebrush will increase with the decline in condition. The lack of occasional fire favors juniper invasion. Establishment and persistence of annual grasses and forbs is less likely on this site than on warmer/drier sites. This is due to the colder soil temperatures (frigid and cryic) and higher precipitation (12-16").

State and transition model

State 1 – Reference State, Shrub - Steppe

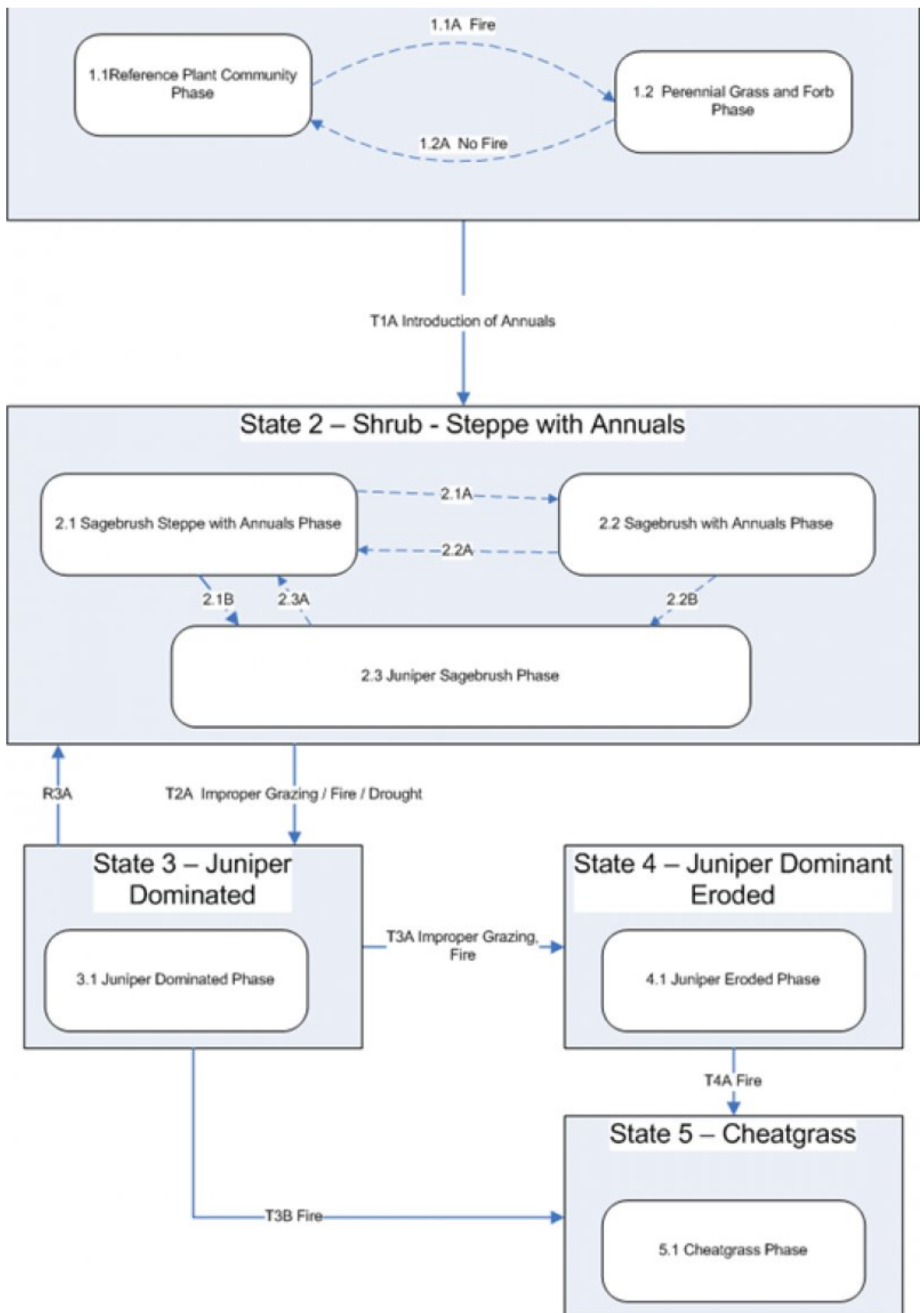


Figure 3. Group 8, STM

State 1 Reference State

Community 1.1 Reference Plant Community

The potential native plant community is dominated by Idaho fescue and mountain big sagebrush. Vegetative composition is about 70 percent grasses, 10 percent forbs, and 20 percent shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	628	942	1177
Shrub/Vine	179	269	336
Forb	90	135	168
Total	897	1346	1681

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			538–673	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	538–673	–
2	Perennial, moderately-deep rooted, bunchgrass			67–202	
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>	67–202	–
3	Perennial, deep rooted, bunchgrass			67–202	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	67–202	–
4	Perennial, moderately-deep rooted, bunchgrass			27–54	
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	13–27	–
	California brome	BRCA5	<i>Bromus carinatus</i>	13–27	–
5	Perennial, shallow-rooted, bunchgrass			27–67	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	27–67	–
6	Other perennial grasses			13–67	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0–13	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–13	–
Forb					
7	Perennial Forbs			40–81	
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	13–27	–
	western stoneseed	LIRU4	<i>Lithospermum ruderales</i>	13–27	–
	lupine	LUPIN	<i>Lupinus</i>	13–27	–
9	Other perennial forbs			27–67	
	milkvetch	ASTRA	<i>Astragalus</i>	0–27	–
	balsamroot	BALSA	<i>Balsamorhiza</i>	0–27	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0–27	–

	buckwheat	ERIOG	<i>Eriogonum</i>	0–27	–
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	0–27	–
	desertparsley	LOMAT	<i>Lomatium</i>	0–27	–
	ragwort	SENEC	<i>Senecio</i>	0–27	–
Shrub/Vine					
11	Evergreen			135–202	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	135–202	–
12	Deciduous			27–135	
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	27–135	–
14	Deciduous			27–67	
	mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>	27–67	–
15	Other shrubs			27–67	
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	0–27	–
	curl-leaf mountain mahogany	CELE3	<i>Cercocarpus ledifolius</i>	0–27	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0–27	–
	slender buckwheat	ERMI4	<i>Eriogonum microthecum</i>	0–27	–
	currant	RIBES	<i>Ribes</i>	0–27	–
	rose	ROSA5	<i>Rosa</i>	0–27	–

Animal community

Livestock Grazing:

This site is suitable for livestock grazing use in spring, summer, and fall. Deferred grazing is recommended at least once every three years. On slopes greater than 50 percent, cattle use will be reduced significantly.

Native Wildlife Associated with the Climax Community:

Mule deer

Pronghorn antelope

This site is commonly used by many species of wildlife. Big game such as mule deer and pronghorn antelope will use this site during the late spring and summer. Small mammals and several species of rodents will use this site throughout the summer months.

Hydrological functions

The soils of this site have medium infiltration rates and rapid to very rapid runoff potential. The hydrologic soil group is B or C.

Other information

This site has low potential for range seeding because of steepness of slope.

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	State Rangeland Management Specialist for NRCS - OR
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 to some, 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 some terracettes

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10-35%

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** None, Slight 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 to deep well drained gravelly sandy loams, stony loams, or extremely stony loam soils (with 20-70% rock fragments; weak fine granular to weak medium platy structure, 7-20 inches thick; dry color value 3-5 : Moderate OM (1-4%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Low ground cover (30-35%) and gentle to very steep slopes (15-80%) slightly limit rainfall impact and overland flow
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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):** 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 > Bluebunch wheatgrass = Basin wildrye = Mountain big sagebrush > Antelope bitterbrush > other grasses > forbs > 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: 1500, Normal: 1200, Unfavorable: 800 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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