USDA Natural Resources
Conservation Service

Ecological site R010XY003OR
Wet Meadow

Accessed: 05/10/2025

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.

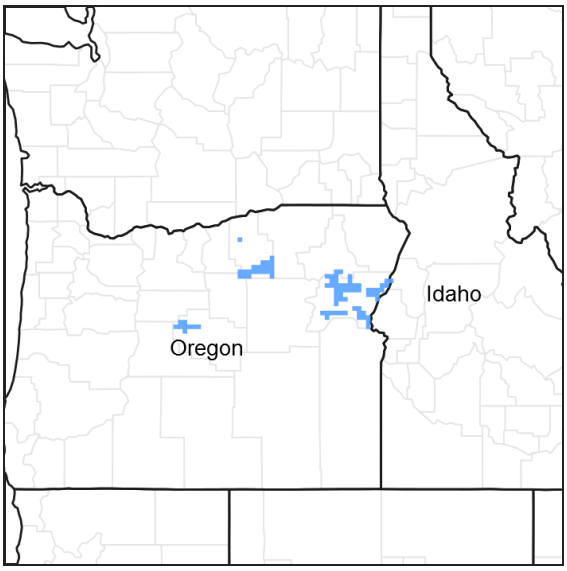


Figure 1. Mapped extent

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

R010XY004OR	**Meadow** Meadow (hydric soil, higher topographic position, shorter duration seasonal water table, anaerobic conditions, different composition - DECE-CAREX-JUNCU association)
R010XY005OR	**Loamy Bottom** Loamy Bottom (greater depth to water table, higher terrace, different composition – basin wildrye strongly dominant)
R010XY010OR	**Coyote Willow Riparian** Willow Riparian Complex (narrowleaf {coyote}Willow) – (stream channel & bank position, early succession state, mesic to frigid near mesic temperature regime, different composition– SAEX/CAREX complex)
R010XY011OR	**Cottonwood-Willow-Riparian** Black Cottonwood-Willow Riparian Complex (gravelly floodplain position, mesic temperature regime, different composition – POBAT-SALIX/LECI4 complex)
R010XY012OR	**Booth-Yellow Willow Riparian** Willow Riparian Complex (Booth-Yellow Willow) - (stream channel & bank position, mesic near frigid temperature regime, different composition– SABO2-SALU2/CAREX complex)
R010XY013OR	**Booth-Geyer-Yellow Willow Riparian** Willow Riparian Complex (Booth-Geyer Willow) - (stream channel & bank position, frigid temperature regime, different composition– SABO2-SAGE2/CAREX complex)

Similar sites

R010XY004OR	**Meadow** Meadow (hydric soil, higher topographic position, shorter duration seasonal water table, anaerobic conditions, different composition - DECE-CAREX-JUNCU association)
R010XY001OR	**Cold Wet Meadow** Cold Wet Meadow (hydric soil, colder temperature, higher elevation, shorter growing season, similar position and water table, anaerobic conditions, similar composition – CAREX-DECE-JUNCU association)

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Carex* (2) *Deschampsia caespitosa*

Physiographic features

This wetland meadow site occurs on low deposition floodplains of streams, rivers and their secondary tributaries. The site occurs in floodplain depression areas, secondary overflow channels, swales, cutoff meanders and small channel remnants. It also occurs on upland spring and seep areas, along marsh edges and up-swelling meadow spring areas. When located near active stream channels it is subject to seasonal flooding and sediment deposition. Surface and subsurface water is at or near the surface throughout the growing season. The soils often have a tendency to slightly move or sub-side over time due to saturation and supersaturated conditions. Historically, the hydrology, soil formation and biotic processes were often influenced by the presence of beaver. Slopes range from 0 to 3 percent. Elevations vary from 500 to 4,700 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Swale (3) Marsh
Flooding duration	Long (7 to 30 days) to brief (2 to 7 days)
Flooding frequency	Frequent to occasional
Elevation	500–4,700 ft
Slope	0–3%
Water table depth	0–18 in
Aspect	Aspect is not a significant factor

Climatic features

The annual precipitation ranges from 9 to 16 inches, most of which occurs in the form of rain and snow during the months of November through March. Ample surface and sub-surface flows from adjacent perennial and seasonal streams and uplands augment the precipitation. The soil temperature regime is mesic to frigid near mesic with a mean air temperature of 47 degrees F. Temperature extremes range from 100 to -10 degrees F. The frost free period ranges from less than 90 to 150 days. The optimum growth period for plant growth is April through mid August.

Table 3. Representative climatic features

Frost-free period (average)	150 days
Freeze-free period (average)	0 days
Precipitation total (average)	16 in

Influencing water features

Soil features

The soils of this site are recent, deep to very deep and poorly drained. Depth to alluvial sediments averages 30 to over 40 inches. The surface layer is typically a silt loam to silty clay loam 20 inches thick. The subsoil is a silty clay loam over 20 inches thick. Permeability is moderate. The available water holding capacity (AWC) is about 6 to 8 inches for the profile. Perennial to late season surface and subsurface flows augment the available water. Spring flooding is common. The high water table typically fluctuates between the surface and 18 inches from March through July. Soils are inheritably unstable and subject to natural slumping and subsidence due to prolonged supersaturated conditions. The erosion potential is moderate to severe.

Table 4. Representative soil features

Parent material	(1) Alluvium–rhyolite (2) Overbank deposits–basalt (3) Volcanic ash–granodiorite
Surface texture	(1) Silt loam (2) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Poorly drained to very poorly drained
Permeability class	Moderate to moderately slow
Soil depth	40–60 in

Ecological dynamics

The potential native plant community is strongly dominated by sedges. Tufted hairgrass is prominent. Rushes and other emergent vegetation are common. Nebraska, Northwest Territory (beaked), bigleaf, water, lakeshore, awlfruit (sawbeak) and slenderbeak are some of the common sedges. Long duration anaerobic and saturated conditions preclude the establishment of willows. Even though willows tolerate periods of inundation they require aeration in the upper root zone and cannot survive on the poorly drained soils of this site. Vegetative composition of the community is approximately 98 percent grasses and grass-like plants and two percent forbs. Approximate ground cover is 90 to 120 percent (basal and crown). The site typically occurs in association with meadow, willow riparian and loamy bottom sites. In the Cowardian system the potential native plant community is classified as a palustrine emergent wetland.

Range in Characteristics:
The extent and duration of surface and subsurface flows have a major affect on site composition and production. Sedge production and composition increases when surface flows and subsurface flows are at or near the surface well into the growing season. Tufted hairgrass increases where surface and subsurface flows are of shorter duration. Just slight differences in subsurface water elevations of one foot or less early in the growing season produce these effects. This is most apparent on active floodplains where slight elevation differences in secondary channels, sloughs, terraces and distance from streams produce this affect. At the meadow channel outlet and along the drainage network willows sporadically increase where there is adequate aeration. Initially narrowleaf (coyote) willow a rhizomatous species increases. The scattered presence of willows along with massive deep rooted sedges are critical in maintaining soil stability and controlling head cutting in the meadow drainage system. In a high seral state the sedge dominated wet meadow sites are intermixed with tufted hairgrass meadow sites and discontinuous groupings of willow riparian sites.

Response to Disturbance - States:
The soils of the site are easily disturbed by hoof action under super-saturated conditions. When the sod is broken and the site deteriorates sedges and tufted hairgrass decrease. Rushes increase. Reed canarygrass rapidly invades along with meadow foxtail. As the soil stabilization function of dense sedge roots is broken the natural drainage pattern of meadows is subject to down-cutting. This incision is accentuated on meadows with higher gradients and where a primary incised channel provides a lower elevation outlet. Subsurface flows are affected. The water table drops and storage of water for late season flows is reduced. Plants well adapted to a drier climatic regime invade

and production drops. Quackgrass and sod bluegrasses invade as the site becomes drier. With continued drying and lowering of the water table annuals, forbs, basin big sagebrush and other drought tolerant plants invade.

Extensive hydrologic alteration impacts can also occur from a variety of on-site and off-site activities. On lower elevation bottomlands channel straightening, deepening and drainage practices are often implemented to use the excellent meadow soils for intense agriculture activities, transportation corridors and urban development. Upstream water storage and withdrawals for irrigation on the floodplain and adjoining terraces are often a part of these activities. Floodplains are isolated and the wet meadows are drained.

Restoration of floodplain meadow function and production is an excellent alternative in upland areas where intense agriculture practices are not feasible or desired. With good management and proper grazing use meadow function can slowly be restored. Initially the system goal is to develop a well vegetated stabile entrenched floodplain within the primary channel followed by slow aggregation and channel narrowing. Willows and a narrow meadow re-establish on the incised floodplain and with the maintenance of adequate fall vegetative cover sediment is retained during spring run-off. Banks are protected and in time with adequate upstream sediment delivery the initial wide floodplain is reconnected. With restoration of hydrology the reintroduction of sedges and tufted hairgrass and the control of reed canarygrass is often required.

States:
PHAR3-ALPR3-JUNCUS (loss of sedges and tufted hairgrass, channels unstable, floodplain becoming disconnected; water table present naturally or from irrigation)

ELRE4-POPR (lower water table often maintained by irrigation, primary and meadow channels becoming incised)

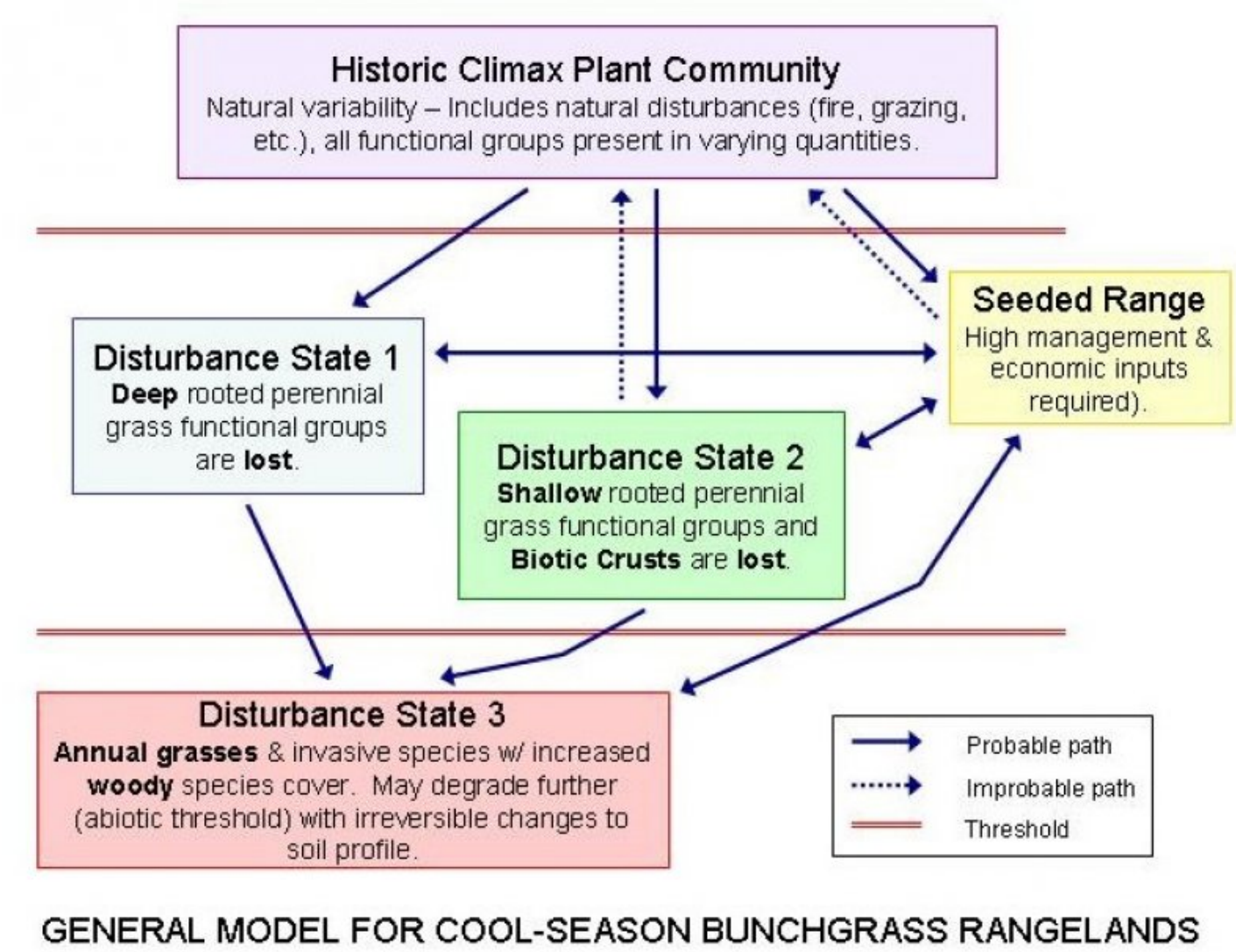
ARTRT/POPR-Annuals (primary channel incised, water table lowered, loss of floodplain connectivity and overland flows)

ARTRT(JUOC)/Annuals (water table lowered, primary channel deeply incised, floodplain disconnected)

Annuals-Deep rooted biennial & perennial forbs (water table lowered, primary channel deeply incised, floodplain disconnected)

Altered land use changes

State and transition model



GENERAL MODEL FOR COOL-SEASON BUNCHGRASS RANGELANDS

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference native plant community is strongly dominated by sedges. Tufted hairgrass is prominent. Rushes and other emergent vegetation are common. Nebraska, Northwest Territory (beaked), bigleaf, water, lakeshore, awlfruit (sawbeak) and slenderbeak are some of the common sedges. Long duration anaerobic and saturated conditions preclude the establishment of willows. Even though willows tolerate periods of inundation they require aeration in the upper root zone and cannot survive on the poorly drained soils of this site. Vegetative composition of the community is approximately 98 percent grasses and grass-like plants and two percent forbs. Approximate ground cover is 90 to 120 percent (basal and crown). The site typically occurs in association with meadow, willow riparian and loamy bottom sites. In the Cowardian system the potential native plant community is classified as a palustrine emergent wetland.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2400	2880	3360
Shrub/Vine	50	60	70
Forb	50	60	70
Total	**2500**	**3000**	**3500**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant, deep rooted sedges**			2100–2400	
	Nebraska sedge	CANE2	*Carex nebrascensis*	300–750	–
	Sheldon's sedge	CASH	*Carex sheldonii*	0–750	–
	Northwest Territory sedge	CAUT	*Carex utriculata*	300–750	–
	awlfruit sedge	CAST5	*Carex stipata*	150–450	–
	bigleaf sedge	CAAM10	*Carex amplifolia*	150–450	–
	water sedge	CAAQ	*Carex aquatilis*	60–240	–
	slenderbeak sedge	CAAT3	*Carex athrostachya*	60–240	–
	woollyfruit sedge	CALA11	*Carex lasiocarpa*	60–240	–
	lakeshore sedge	CALE8	*Carex lenticularis*	60–240	–
	woolly sedge	CAPE42	*Carex pellita*	60–240	–
2	**Sub-dominant, moderate rooted bunchgrass**			450–750	
	tufted hairgrass	DECE	*Deschampsia cespitosa*	450–750	–
3	**Common, moderate rooted, rhizomatous rush**			90–240	
	mountain rush	JUARL	*Juncus arcticus ssp. littoralis*	90–240	–
4	**Other perennial grasses and grasslike**			30–150	
	American mannagrass	GLGR	*Glyceria grandis*	0–30	–
	fowl mannagrass	GLST	*Glyceria striata*	0–30	–
	tapertip rush	JUAC	*Juncus acuminatus*	0–30	–
	swordleaf rush	JUEN	*Juncus ensifolius*	0–30	–
	bluegrass	POA	*Poa*	10–30	–
	panicled bulrush	SCMI2	*Scirpus microcarpus*	0–30	–
	common spikerush	ELPA3	*Eleocharis palustris*	0–20	–
	toad rush	JUBU	*Juncus bufonius*	0–10	–
	Carolina foxtail	ALCA4	*Alopecurus carolinianus*	0–10	–
	American sloughgrass	BESY	*Beckmannia syzigachne*	5–10	–
	water whorlgrass	CAAQ3	*Catabrosa aquatica*	5–10	–
	ovate spikerush	ELOV	*Eleocharis ovata*	0–10	–
Forb					
9	**Forbs**			30–90	
	cinquefoil	POTEN	*Potentilla*	10–30	–
	ragwort	SENEC	*Senecio*	0–30	–
	buttercup	RANUN	*Ranunculus*	0–20	–
	false hellebore	VERAT	*Veratrum*	5–20	–
	nodding beggartick	BICE	*Bidens cernua*	0–15	–
	small camas	CAQU2	*Camassia quamash*	5–15	–
	cowparsnip	HERAC	*Heracleum*	0–15	–
	ballhead waterleaf	HYCA4	*Hydrophyllum capitatum*	2–5	–
	seep monkeyflower	MIGU	*Mimulus guttatus*	0–5	–

	bay forget-me-not	MYLA	*Myosotis laxa*	0–5	–
	watercress	NAOF	*Nasturtium officinale*	2–5	–
	fringed willowherb	EPCI	*Epilobium ciliatum*	0–5	–
	marsh willowherb	EPPA	*Epilobium palustre*	0–5	–
Shrub/Vine					
15	**Shrubs**			30–60	
	Booth's willow	SABO2	*Salix boothii*	0–30	–
	narrowleaf willow	SAEX	*Salix exigua*	15–30	–
	yellow willow	SALU2	*Salix lutea*	0–30	–
	Woods' rose	ROWO	*Rosa woodsii*	5–15	–

Animal community

Livestock Grazing:
This site is suitable for livestock grazing use in the late summer and fall under a planned grazing system. Use should be postponed until the soils are firm enough to prevent trampling damage and sod break-up. Grazing management should be keyed to sedges and tufted hairgrass. If grazed in the summer use the associated drier meadow site as the key area with a grazing stubble height of 3 to 4 inches. This minimizes trampling damage and sod break up as livestock prefer to utilize the drier soils and vegetation of the meadow site over the wet meadow site. In the fall, grass and grass-like stubble height should be adequate to prevent erosion and retain sediments during spring high flow events, 6 to 10 inches. Deferred grazing or rest is recommended at least once every three years.

Wildlife:
This site is commonly used by beaver, muskrats, mule deer, rodents, wading birds, waterfowl, neo-tropical birds, amphibians and various predators. Waterfowl and wading birds make excellent use of this site for nesting, food and cover. Beaver presence assists in maintaining the hydrology, soil formation and biotic processes of the site.

Hydrological functions

The soils of this site are typically in a wet bottomland position. A high water table is present and overland flow occurs periodically during spring flow events when the hydrologic cover is high. They have uniform moderate to high runoff potential and moderate infiltration rates. Hydrologic cover is high when the shallow pattern wetland drainage system is intact and the grass-like and grass components are greater than 80 percent of potential. In an undrained state the soils are in hydrologic group D.

Other information

Threatened And Endangered Plants And Animals:
This site contains limited unique and rare plant communities. On site investigation is required for the determination of sensitive and T&E species.

Other Interpretations:
The soils of this site exhibit hydric soil characteristics. When incised channels are present and the wet meadow soil is drained, rehabilitation where feasible will markedly improve production and restore good hydrologic characteristics. On altered sites the reintroduction of sedges and tufted hairgrass is needed to restore the site potential. With restoration of hydrology the control of reed canarygrass an aggressive invader is often required.

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
Contact for lead author	Oregon NRCS State Rangeland Management Specialist
Date	08/07/2012
Approved by	Bob Gillaspy
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

2. **Presence of water flow patterns:** Very frequent flooding with seasonal high water table

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):** 0-5%

5. **Number of gullies and erosion associated with gullies:** Very poor resistance to erosion when cover is lacking. Subject to incision and downcutting

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 to moderately coarse - limited movement

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Moderately to significantly resistant to erosion with adequate cover: aggregate stability = 3-6

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Deep, very deep, poorly drained with a silt loam to silty clay loam surface about 20" thick: Moderate to high OM (3-6%)

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Significant ground cover (90-100%) and very gentle slopes (0-3%) 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: Sedges > Tufted hairgrass > rush > forbs > shrubs = other grasses

    Sub-dominant:

    Other:

    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):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Favorable: 3500, Normal: 3000, Unfavorable: 2500 lbs/acre/year at high RSI (HCPC)

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:** Perennial forb and brush species will increase with deterioration of plant community. Reed canarygrass and meadow foxtail invade sites that have lost deep rooted native perennial grass functional groups.

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