USDA Natural Resources Conservation Service

Ecological site R025XY018ID
MAHOGANY SAVANNA 16-22

Last updated: 4/24/2024
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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.

MLRA notes

Major Land Resource Area (MLRA): 025X–Owyhee High Plateau

MLRA Notes 25—Owyhee High Plateau
This area is in Nevada (56 percent), Idaho (30 percent), Oregon (12 percent), and Utah (2 percent). It makes up about 27,443 square miles. MLRA 25 is characteristically cooler and wetter than the neighboring MLRAs of the Great Basin. The western boundary is marked by a gradual transition to the lower and warmer basins of MLRA 24. The boundary to the south-southeast, with MLRA 28B, is marked by gradual changes in geology marked by an increased dominance of singleleaf pinyon and Utah juniper and a reduced presence of Idaho fescue. The boundary to the north, with MLRA 11, is a rapid transition from the lava plateau topography to the lower elevation Snake River Plain.
Physiography:
All of this area lies within the Intermontane Plateaus. The southern half is in the Great Basin section of the Basin and Range province. This part of the MLRA is characterized by isolated, uplifted fault-block mountain ranges separated by narrow, aggraded desert plains. This geologically older terrain has been dissected by numerous streams draining to the Humboldt River.
The northern half of the area lies within the Columbia Plateaus province. This part of the MLRA forms the southern boundary of the extensive Columbia Plateau basalt flows. Most of the northern half is in the Payette section, but the northeast corner is in the Snake River Plain section. Deep, narrow canyons draining into the Snake River have been incised into this broad basalt plain. Elevation ranges from 3,000 to 7,550 feet on rolling plateaus and in gently sloping basins. It is more than 9,840 feet on some steep mountains. The Humboldt River crosses the southern half of this area
Geology:
The dominant rock types in this MLRA are volcanic. They include andesite, basalt, tuff, and rhyolite. In the north and west parts of the area, Cretaceous granitic rocks are exposed among Miocene volcanic rocks in mountains. A Mesozoic igneous and metamorphic rock complex dominates the south and east parts of the area. Upper and Lower Paleozoic calcareous sediments, including oceanic deposits, are exposed with limited extent in the mountains. Alluvial fan and basin fill sediments occur in the valleys.
Climate:
The average annual precipitation in most of this area is typically 11 to 22 inches. It increases to as much as 49 inches at the higher elevations. Rainfall occurs in spring and sporadically in summer. Precipitation occurs mainly as snow in winter. The precipitation is distributed fairly evenly throughout fall, winter, and spring. The amount of precipitation is lowest from midsummer to early autumn. The average annual temperature is 33 to 51 degrees F. The freeze-free period averages 130 days and ranges from 65 to 190 days, decreasing in length with elevation. It is typically less than 70 days in the mountains.
Water:
The supply of water from precipitation and streamflow is small and unreliable, except along the Owyhee, Bruneau, and Humboldt Rivers. Streamflow depends largely on accumulated snow in the mountains. Surface water from mountain runoff is generally of excellent quality and suitable for all uses. The basin fill sediments in the narrow alluvial valleys between the mountain ranges provide some ground water for irrigation. The alluvial deposits along the large streams have the most ground water. Based on measurements of water quality in similar deposits in

adjacent areas, the basin fill deposits probably contain moderately hard water. The water is suitable for almost all uses. The carbonate rocks in this area are considered aquifers, but they are little used. Springs are common along the edges of the limestone outcrops.
Soils:
The dominant soil orders in this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic or frigid temperature regime and an aridic, aridic bordering on xeric, or xeric moisture regime. Soils with aquic moisture regimes are limited to drainage or spring areas, where moisture originates or runs on and through. These soils are of a very limited extent throughout the MLRA. They generally are well drained, clayey or loamy, and shallow or moderately deep. Most of the soils formed in mixed parent material. Volcanic ash and loess mantle the landscape. Surface soil textures are loam and silt loam with ashy texture modifiers in some areas. Argillic horizons occur on the more stable landforms. They are exposed nearer the soil surface on convex landforms, where ash and loess deposits are more likely to erode. Soils that formed in carbonatic parent material in areas that receive less than 12 inches of precipitation are characterized by calcic horizons throughout the profile, while soils in areas that receive more than 12 inches of precipitation do not have calcic horizons in the upper part of the profile. Soils that formed on stable landforms at the lower elevations are dominated by ochric horizons. Soils that formed at the middle and upper elevations are characterized by mollic epipedons. Soils in drainage areas at all elevations that receive moisture running on or through them are characterized by thicker mollic epipedons.
Biological Resources:
This MLRA supports shrub-grass vegetation. Lower elevations are characterized by Wyoming big sagebrush associated with bluebunch wheatgrass, western wheatgrass, and Thurber’s needlegrass. Other important plants include bluegrass, squirreltail, penstemon, phlox, milkvetch, lupine, Indian paintbrush, aster, and rabbitbrush. Black sagebrush occurs but is less extensive. Singleleaf pinyon and Utah juniper occur in limited areas. With increasing elevation and precipitation, vast areas characterized by mountain big sagebrush or low sagebrush/early sagebrush in association with Idaho fescue, bluebunch wheatgrass, needlegrasses, and bluegrass become common. Snowberry, curl-leaf mountain mahogany, ceanothus, and juniper also occur. Mountains at the highest elevations support whitebark pine, Douglas-fir, limber pine, Engelmann spruce, subalpine fir, aspen, and curl-leaf mountain mahogany.
Major wildlife species include mule deer, bighorn sheep, pronghorn, mountain lion, coyote, bobcat, badger, river otter, mink, weasel, golden eagle, red-tailed hawk, ferruginous hawk, Swainson’s hawk, northern harrier, prairie falcon, kestrel, great horned owl, short-eared owl, long-eared owl, burrowing owl, pheasant, sage grouse, chukar, gray partridge, and California quail. Reptiles and amphibians include western racer, gopher snake, western rattlesnake, side-blotched lizard, western toad, and spotted frog. Fish species include bull, red band, and rainbow trout.

Ecological site concept

This site is on mountain slopes ranging from 5 to 50 percent on all aspects. Elevations range from 5,400 to 8,300 feet (1,645 to 2,530 meters).

The soils supporting this site are moderately deep to deep, well to somewhat excessively drained, with moderately slow to moderately rapid permeability above bedrock. Runoff is low to very high. The erosion hazard is slight to severe by water, and slight to moderate by wind. The available water holding capacity (AWC) is very low to low.

This site is dominated by a curlleaf mountain mahogany and needlegrass community.

Associated sites

R025XY022ID	**LOAMY 16-22** Loamy 16 to 22 usually is deeper to bedrock; typically 40 to 60 inches. Dominant species are ARTRV/FEID.
R025XY030ID	**MOUNTAIN BRUSH 18-22** Mountain Brush 18 to 22 usually has a finer surface texture.
R025XY042ID	**MOUNTAIN RIDGE 14-18** Mountain Ridge 14 to 18 is usually found on Ridges and dip slopes.

Similar sites

R025XY030ID	**MOUNTAIN BRUSH 18-22** Mountain Brush 18 to 22 usually has a finer surface texture.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Cercocarpus ledifolius* (2) *Symphoricarpos oreophilus*
Herbaceous	(1) *Festuca idahoensis* (2) *Achnatherum*

Physiographic features

This site is on slopes that are rolling to very steep ranging from 5 to 50 percent on all aspects. Elevations range from 5,400 to 8,300 feet (1,645 to 2,530 meters). This site is associated with mountain slopes and mountain ridges.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Mountains > Ridge
Runoff class	Medium to very high
Flooding frequency	None
Ponding frequency	None
Elevation	1,646–2,530 m
Slope	5–50%
Water table depth	183 cm
Aspect	Aspect is not a significant factor

Climatic features

In MLRA 25 summers are hot, especially at lower elevations, and winters are cold and snowy. Precipitation is usually lighter at lower elevations throughout the year. At higher elevations precipitation is much greater, and snow accumulates to a considerable depth. The average total precipitation is 14.39 inches (36.5cm) (based on 6 long term climate stations located throughout the MLRA).

The estimated mean annual precipitation of this site is estimated to be 18 inches.

The mean annual temperature of the MLRA is 45.9 degrees F. The average high is 59.7 degrees F and the average low temperature is 32.1 degrees F. The prevailing wind is from the west. Average wind speed is greatest, at about 10 miles per hour, in March.

The frost-free period of this site is estimated to range from 30 to 90 days and the freeze free period ranges from 50 to 140 days.

*The above data is averaged from NASIS and, Western Regional Climate Center.

Table 3. Representative climatic features

Frost-free period (characteristic range)	30-90 days
Freeze-free period (characteristic range)	50-140 days
Precipitation total (characteristic range)	356-711 mm
Frost-free period (actual range)	30-90 days
Freeze-free period (actual range)	
Precipitation total (actual range)	
Frost-free period (average)	70 days
Freeze-free period (average)	123 days
Precipitation total (average)	457 mm

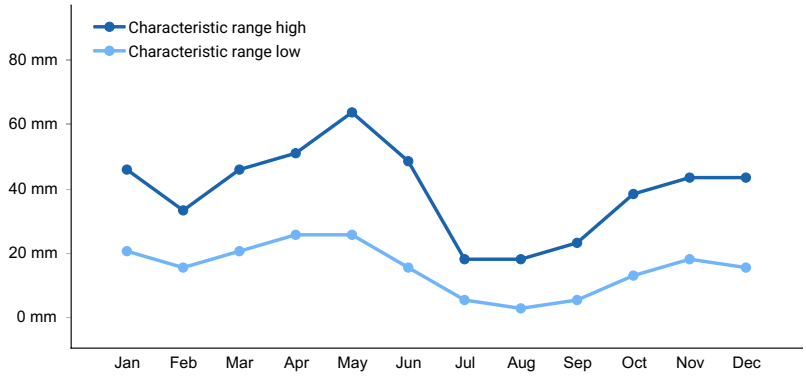

Figure 1. Monthly precipitation range

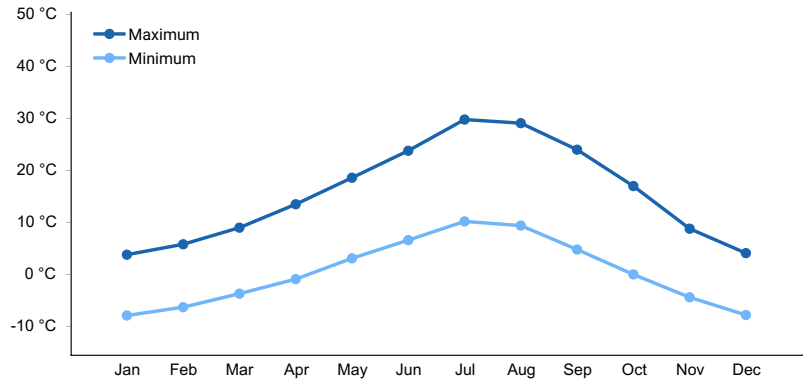

Figure 2. Monthly average minimum and maximum temperature

Influencing water features

This site is not influenced by adjacent wetlands, streams or run on.

Soil features

The soils supporting this site are moderately deep to deep, well to somewhat excessively drained, with moderately slow to moderately rapid permeability above bedrock. Runoff is low to very high. The erosion hazard is slight to severe by water, and slight to moderate by wind. The available water holding capacity (AWC) is very low to low.

These soils are typically 20 to 40 inches (51 to 102cm) deep to bedrock. The soils usually have a bouldery to very gravelly loam surface with a loamy or loamy-skeletal subsoil. The subsoil is usually moderately well to well developed with clay ranging from approximately 11 to 30 percent. Water is available to roots in the bedrock due to fracturing. These soils are characterized by limited AWC, a soil moisture regime of xeric, and cold temperatures. Soil temperature regime is either cryic or frigid.

Soil series associated with this site are: Earcree, Foxmount, Gaib, Hogmalat, Quicksilver, Saturday and Takeuchi

Table 4. Representative soil features

Parent material	(1) Colluvium (2) Residuum
Surface texture	(1) Stony loam (2) Bouldery loamy coarse sand (3) Gravelly
Family particle size	(1) Loamy (2) Loamy-skeletal (3) Coarse-loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately slow to moderately rapid
Depth to restrictive layer	51–152 cm
Soil depth	51–152 cm
Surface fragment cover <=3"	9–35%
Surface fragment cover >3"	3–11%
Available water capacity (0-101.6cm)	2.79–11.68 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)	5.1–7.3
Subsurface fragment volume <=3" (Depth not specified)	0–23%
Subsurface fragment volume >3" (Depth not specified)	0–58%

Table 5. Representative soil features (actual values)

Drainage class	Not specified
Permeability class	Not specified
Depth to restrictive layer	25–152 cm
Soil depth	25–152 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	Not specified
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	Not specified

Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

During the last few thousand years, this site has evolved in an arid climate characterized by dry summers and cold, wet winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include mule deer, Rocky Mountain elk, lagomorphs and small rodents.

Fire has historically occurred on the site at intervals of 250 tp 500 years. Due to the variability of soil depth, from shallow to deep, curlleaf mountain mahogany has a patchy or clumpy appearance on the landscape. For this reason when the site burns, fire moves across the site leaving a mosaic of burned and unburned areas. The plant community of this site is dominated by curlleaf mountain mahogany in the overstory and Idaho fescue, purple oniongrass, mountain brome, Columbia and western needlegrass and mountain snowberry in the understory. Total annual production is 1800 pounds per acre (2000 kilograms per hectare) in a normal year.

Structurally, curlleaf mountain mahogany dominates the overstory. In the understory cool season deep rooted perennial bunchgrasses are dominant, followed by tall shrubs being more dominant than perennial forbs while shallow rooted bunchgrasses are subdominant.

Western juniper sites frequently occur in association with this site. Juniper can invade this site when a seed source is present. Conifers such as juniper have greater growth rates, their shape is more tapered and they reach greater heights. Consequently, conifer species invading curlleaf mountain mahogany sites eventually overtop them. Because mature curlleaf mountain mahogany is shade intolerant its competitive ability is lost, and it becomes senescent. Mortality usually follows.

FUNCTION:

This site is suited for livestock grazing in the summer and fall. Livestock use the site for feeding and loafing. Big game animals use the site in the spring, summer and fall. It is important for both hiding and thermal cover. Birds use the mahogany for nesting. This site is very important as summer habitat for mountain bluebirds. The site has high value for hunting, camping, photography and picnicking. The mountain mahogany provides visual diversity to the landscape.

The understory of this site is easily degraded by livestock and big game due to its attractiveness as shade and cover.

Impacts on the Plant Community:
Influence of fire:

Where there is a juniper seed source in the vicinity and in the absence of normal fire frequency, juniper increases to the point of severely reducing nearly all of the understory and overstory species. Juniper has a greater growth rate, its shape is more tapered and it reaches greater heights. Consequently, juniper invading curlleaf mountain mahogany sites eventually over tops them. Because mature curlleaf mountain mahogany is shade intolerant its competitive ability is lost, and it becomes senescent.

Because of its topographic position on the landscape, ridgetops and sideslopes, fires started by lightning strikes are fairly common. Because of the variability of soil depth, from shallow to deep, curlleaf mountain mahogany has a patchy or clumpy appearance on the landscape. For this reason when the site burns, fire moves across the site leaving a mosaic of burned and unburned areas. Fires of this nature rarely involve large acreages due to surrounding rimrocks and other features that limit the spread of fire. The site rarely, if ever, burns in its entirety.

On the area that burns, shrubs such as young curlleaf mountain mahogany, mountain big sagebrush and antelope bitterbrush will be killed. Idaho fescue may also suffer mortality. Snowbrush ceanothus may become dominant after fire since it requires heat for seed germination. Recovery after fire is generally rapid due to the proximity of a

desirable seed source and favorable moisture regime.

A frequent fire regime, once every 5 to 10 years, generally does not develop on this site. Soils are too shallow and fuels are not continuous enough for a frequent fire cycle to occur.

Influence of improper grazing management:

Improper grazing management can damage this site moderately. Due to the rough and rocky nature of the site, livestock generally do not prefer to use it. Livestock use the site primarily for loafing and bedding. Forage production is low. When this site is being impacted by improper grazing management, adjacent sites that are more productive and less rocky are usually being much more severely degraded.

Season-long grazing and/or excessive utilization can be detrimental to this site. This type of management leads to reduced vigor of the bunchgrasses and palatable shrubs. With reduced vigor, recruitment of these species declines. Generally, juniper seedlings will replace the desirable grasses and shrubs if improper grazing management continues.

Weather influences:

Above normal precipitation in the spring increases forage production slightly. Only in the areas with deeper soils do plants capitalize on extra spring-time moisture. Below normal precipitation in the spring can reduce production and ultimately cause plant mortality under continued drought conditions.

Juniper is very resistant to drought influences. It has a root system that is capable of removing deep moisture in the fractures of the bedrock that is not available to other plants on the site. In addition, juniper is capable of photosynthesizing (growing) anytime the air temperatures are above freezing. It therefore is removing moisture from the soil for 10 to 11 months of the year. This gives juniper a competitive advantage for moisture over all of the other species on the site.

Influence of Insects and disease:

Outbreaks can affect vegetation health, particularly bitterbrush from western tent caterpillars (Malacosoma fragilis). Two consecutive years of defoliation by the tent caterpillar can cause mortality in bitterbrush. Outbreaks of a curlleaf mountain mahogany defoliating moth Stamnodes animata, occur at infrequent intervals. Two consecutive years of severe defoliation can also cause mortality.

Influence of noxious and invasive plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency. Many of the annual and perennial invasive species with deep root systems compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:

Big game animals use this site in the spring, summer and fall. Their numbers are seldom high enough to adversely affect the plant community. Herbivory can be detrimental to young curlleaf mountain mahogany and bitterbrush when livestock grazing and browsing by big game occurs at the same time and season. This will occur when both kinds of animal are using the plant in the late summer or fall. The adverse impact is excessive use of the current years' leader growth.

Watershed:

Decreased infiltration and increased runoff occur with the invasion of juniper. Juniper invasion can be triggered by lack of fire, improper grazing management and prolonged drought. The increased runoff also causes sheet and rill erosion. The long term effect is a transition to a different state.

Influence of juniper invasion:

In plant communities that are invaded by juniper, the species has a competitive advantage for the following reasons:
• Juniper is very drought tolerant.
• It has the ability to extract soil moisture from a wide range of soil depths.
• Juniper has high evapo-transpiration rates.
• The species intercepts rain and snow before it reaches the soil surface.
• It has the ability to grow as long as there is soil moisture and the temperature is above freezing.
• Juniper has a relatively rapid growth rate and is long-lived. It can readily over-top shade intolerant species which leads to mortality.
• Nutrient cycling is reduced.
• As the canopy closes, juniper gains control of energy capture.

As juniper extracts water, other plants are unable to acquire sufficient water and nutrients to sustain growth and reproduction, thus reducing cover and biomass in the interspaces. After the canopy closes, there is sufficient soil moisture available for shallow-rooted, shade tolerant species to persist directly under the tree.

The following hydrological impacts occur on sites invaded by juniper:
• Infiltration in the interspaces is reduced.
• Run-off increases resulting in increased sheet and rill erosion with elevated sediment loads.
• Soil temperatures increase in the interspaces which results in accelerated drying of the soil surface.
• Increased bare ground in the interspaces.
• Soil moisture storage is reduced.

As bare ground and interconnectiveness of patches of bare ground increases, flow rates are accelerated (reduction of flow sinuosity) and run-off out of the area increases.

Degradation of these systems can result in the formation of a feedback cycle in which greater juniper cover and density results in greater plant and soil disturbance between the canopies.

In summary, a closed juniper community takes control of the following ecological processes: hydrology, energy capture and nutrient cycling. The changes are primarily driven by the hydrological processes. The development of a closed juniper canopy always results in a transition across the threshold to a different state. Generally, when juniper canopy cover nears 20%, the plant community is approaching the threshold.

Practice limitations:

There are few limitations for vegetation management practices on this site. This site is commonly a loafing area for livestock and they tend to overuse it. Moderate limitations exist for facilitating practices due to shallow, stony soils. Any brush control practices should be carefully evaluated because maintaining curlleaf mountain mahogany on the site has high value to the entire ecosystem.

State and transition model

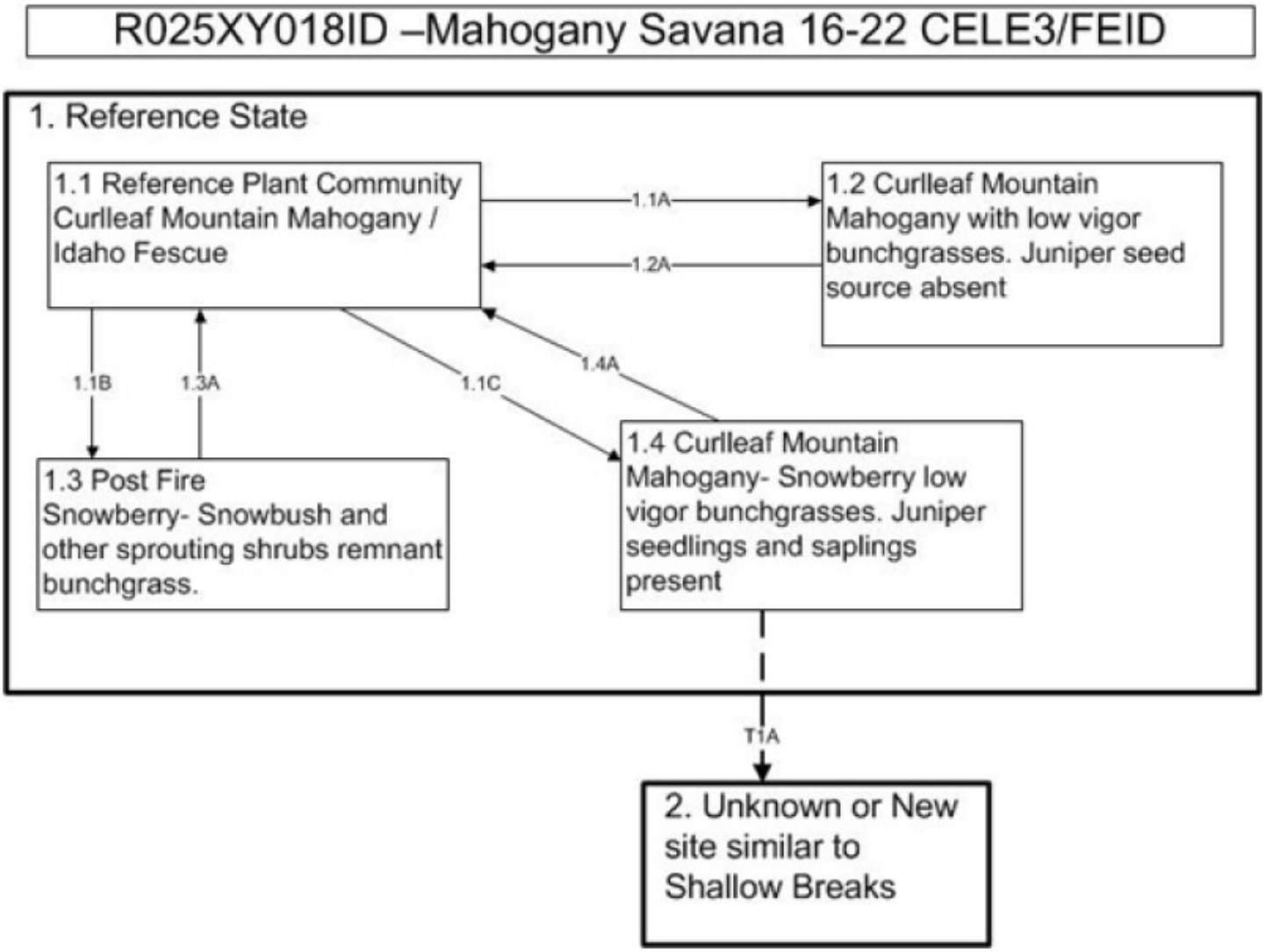

Figure 3. 25x-18

State 1
Reference State

The Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase 1.1. The plant species composition of Phase 1.1 is listed later under “Reference Plant Community Phase Plant Species Composition”.

Community 1.1
Reference Plant Community

This plant community has a curlleaf mountain mahogany overstory with a wide variety of grasses in the understory. Mountain snowberry, mountain big sagebrush and seedlings and saplings of curlleaf mountain mahogany are the shrubs in the understory. Soils vary from moderately deep to to deep, therefore the site has a patchy, clumpy appearance on the landscape. The historic natural fire frequency is approximately every 250 to 500 years. When the site burns, it burns in a mosaic pattern across the site. The site never burns in its entirety. Idaho fescue, bulbous oniongrass, mountain brome, Columbia needlegrass and western needlegrass are the most prevalent understory grasses. Composition by weight is approximately 40 percent grass, 10 percent forbs and 50 percent shrubs and tree-like shrubs. These percentages are for current annual growth for all plants, irrespective of height.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	729	1009	1233
Grass/Grasslike	583	807	986
Forb	146	202	247
Total	**1458**	**2018**	**2466**

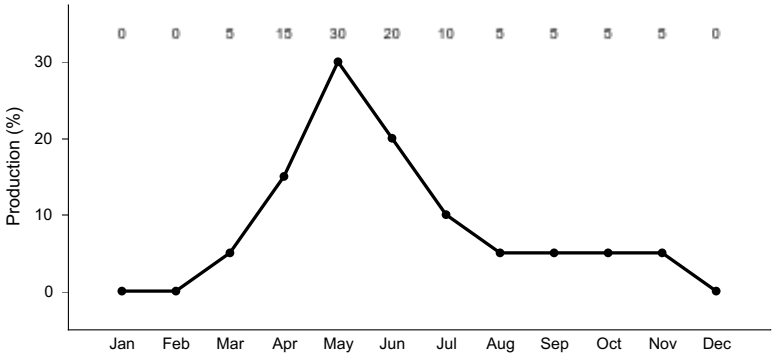

Figure 5. Plant community growth curve (percent production by month). ID0903, D25 JUOC/POSE/ANNUALS.

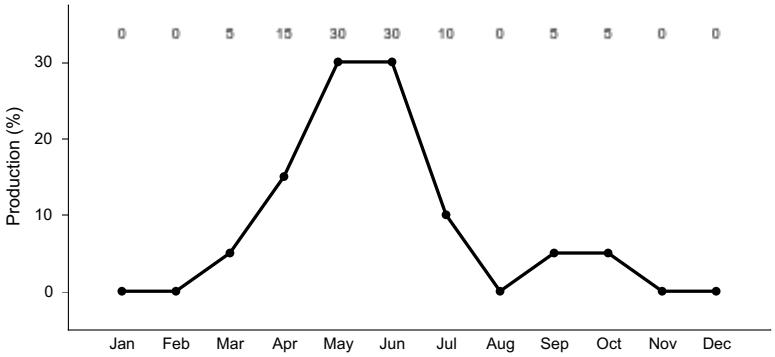

Figure 6. Plant community growth curve (percent production by month). ID0912, ARTRV-PSSP6 high elevation.

Community 1.2
Low Vigor Bunchgrasses - No Juniper

This phase has developed through improper grazing management and no fire. Juniper encroachment is not a problem since there is no seed source in the vicinity. Palatable shrubs such as young curlleaf mountain mahogany and bitterbrush are typically hedged. Idaho fescue and the needlegrasses are in low vigor. Less desirable grasses such as Sandberg bluegrass and bottlebrush squirreltail have increased.

Community 1.3
Post Fire - Sprouting Shrubs

This phase has developed from wildfire. Improper grazing management accelerates the movement of this plant community toward Phase 1.3. Mountain snowberry has sprouted from the roots after burning. Snowbrush ceanothus has become established since its seed requires heat for germination. Sandberg bluegrass and cheatgrass have increased after fire and with improper grazing management. Remnants of Idaho fescue, needlegrasses and curlleaf mountain mahogany are present on the site.

Community 1.4
Low Vigor bunchgrasses - Juniper seedlings

This phase has developed with no fire and where a juniper seed source is present. Juniper seedlings and saplings are beginning to impact understory production. Competition for moisture and shading are causing the desirable

grasses and shrubs to decline. Because mature curlleaf mountain mahogany is shade intolerant its competitive ability is lost, and it becomes senescent. Mortality usually follows.

Pathway 1.1a
Community 1.1 to 1.2

Develops with improper grazing management and no fire.

Pathway 1.1b
Community 1.1 to 1.3

Develops after wildfire. Improper grazing management may accelerate the transition from Phase 1.1 to Phase 1.3.

Pathway 1.1c
Community 1.1 to 1.4

Develops with no fire.

Pathway 1.2a
Community 1.2 to 1.1

Develops through prescribed grazing and no fire.

Pathway 1.3a
Community 1.3 to 1.1

Moves towards the HCPC with no fire and prescribed grazing.

Pathway 1.4a
Community 1.4 to 1.1

Removal of juniper with brush management (mechanical or prescribed fire) affects this move.

State 2
Unknown new site

Undocumented site that may occur with degradation to the site.

Community 2.1
Unknown new site

Juniper in Phase 1.4 has become so dominant that the plant community has moved across the threshold to a new site. This new site has developed due to continued improper grazing management and no fire. Soil erosion has increased dramatically and production potential has been lost. It is not economically feasible to move this plant community back across the threshold to the Reference State. This site may resemble Shallow breaks 14-18” JUOC/ARTRV/FEID.

Transition T1A
State 1 to 2

This develops with continued improper grazing management and no fire. This site has crossed the threshold. It is not economically practical to move the site back to State 1.

Additional community tables

Table 7. Community 1.1 plant community composition

				Annual Production	Foliar Cover

Group	Common Name	Symbol	Scientific Name	(Kg/Hectare)	(%)
Grass/Grasslike					
1				583–986	
	Idaho fescue	FEID	*Festuca idahoensis*	146–493	–
	oniongrass	MEBU	*Melica bulbosa*	112–185	–
	Columbia needlegrass	ACNE9	*Achnatherum nelsonii*	112–185	–
	western needlegrass	ACOC3	*Achnatherum occidentale*	112–185	–
	mountain brome	BRMA4	*Bromus marginatus*	112–185	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	45–73	–
	Sandberg bluegrass	POSE	*Poa secunda*	45–67	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	45–67	–
	sedge	CAREX	*Carex*	45–67	–
	squirreltail	ELEL5	*Elymus elymoides*	45–67	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	45–67	–
	Letterman's needlegrass	ACLE9	*Achnatherum lettermanii*	1–50	–
Forb					
2				146–247	
	arrowleaf balsamroot	BASA3	*Balsamorhiza sagittata*	78–135	–
	tapertip hawksbeard	CRAC2	*Crepis acuminata*	50–84	–
	lupine	LUPIN	*Lupinus*	50–84	–
	desertparsley	LOMAT	*Lomatium*	28–50	–
	aster	ASTER	*Aster*	28–50	–
	beardtongue	PENST	*Penstemon*	28–50	–
	phlox	PHLOX	*Phlox*	28–50	–
	common yarrow	ACMI2	*Achillea millefolium*	28–50	–
	Indian paintbrush	CASTI2	*Castilleja*	1–34	–
	maiden blue eyed Mary	COPA3	*Collinsia parviflora*	0–11	–
	agoseris	AGOSE	*Agoseris*	0–11	–
	little larkspur	DEBI	*Delphinium bicolor*	0–11	–
	Douglas' buckwheat	ERDO	*Eriogonum douglasii*	0–11	–
	blue flax	LIPE2	*Linum perenne*	0–11	–
	ragwort	SENEC	*Senecio*	0–11	–
	nineleaf biscuitroot	LOTR2	*Lomatium triternatum*	0–11	–
	oblongleaf bluebells	MEOB	*Mertensia oblongifolia*	0–11	–
Shrub/Vine					
3				729–1233	
	curl-leaf mountain mahogany	CELE3	*Cercocarpus ledifolius*	504–863	–
	mountain snowberry	SYOR2	*Symphoricarpos oreophilus*	90–146	–
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	50–90	–
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	1–73	–
	snowbrush ceanothus	CEVE	*Ceanothus velutinus*	1–73	–
	creeping barberry	MARE11	*Mahonia repens*	1–73	–
	bitter cherry	PREM	*Prunus emarginata*	1–73	–

	chokecherry	PRVI	*Prunus virginiana*	1–73	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	1–73	–

Animal community

Animal Community – Wildlife Interpretations

Mule deer and elk are large herbivores using the site. The rangeland habitat provides seasonal habitat for resident and migratory animals including western toad, sagebrush lizard, shrews, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon and mountain bluebirds. Encroachment of noxious and invasive plant species (cheatgrass and bulbous bluegrass) in isolated areas have replaced native plant species which provided critical feed, brood-rearing and nesting cover for a variety of native wildlife. Water features are sparse provided by seasonal runoff, artificial water catchments and springs.

State 1 Phase 1.1 –Curlleaf Mountain Mahogany/ Mountain Snowberry/ Idaho Fescue/ Needlegrass Reference Plant Community (RPC) This plant community provides a diversity of grasses, forbs and shrubs, used throughout the growing season by native insect communities that assist in pollination. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, western toad and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Development of spring sites that collect all available water would exclude amphibian use on these sites. The diverse vertical structure offers habitat for many bird species including mountain bluebird, rock wren, grouse and flycatchers. The plant community provides important forage for mule deer and elk in the spring, fall and winter. Mahogany and mountain snowberry is desirable forage for mule deer and elk. The site provides thermal cover and young of year cover for mule deer and elk. A small mammal population including golden-mantled ground squirrels, jackrabbits, deer mice and Great Basin pocket mice utilize this plant community.

State 1 Phase 1.2 – Curlleaf Mountain Mahogany/ Mountain Snowberry/ Bottlebrush Squirreltail/ Sandberg Bluegrass Plant Community: This plant community is the result of improper grazing management and no fire. Reduced forbs diversity may reduce insect diversity. Reptile community would be similar to State 1 Phase 1.1. Amphibian habitat would be tied to permanent spring sites in the area. Bird species utilizing the site would be similar to State 1 Phase 1.1. The poor vigor of mahogany and bitterbrush would reduce the quality of winter habitat for mule deer and elk. The site would still provide thermal cover and young of year cover for large herbivores. A small mammal population including golden-mantled ground squirrels, jackrabbits, deer mice and Great Basin pocket mice utilize this plant community.

State 1 Phase 1.3- Mountain Snowberry/ Snowbrush Ceanothus / Sandberg Bluegrass/ Cheatgrass Plant Community: This phase has developed due to fire. Vertical structure would change with the loss of mahogany reducing the quality of habitat for resident and migratory birds. Encroachment of mountain snowberry would add spring and summer pollinator habitat to the site. Until mountain snowberry is established diversity and populations of reptiles would be limited or excluded. The change in understory vegetation reduces quality of habitat for ground nesting birds. Mountain snowberry would provide good forage habitat for mule deer and elk. Winter habitat for mule deer and elk would be reduced with the loss of mahogany and bitterbrush. Small mammal diversity and populations would be similar to State 1 Phase 1.1 and 1.2. The fruit of mountain snowberry provides good food for ruffed grouse, magpies and small mammals.

State 1 Phase 1.4 – Curlleaf Mountain Mahogany/ Mountain Snowberry/ Western Juniper Plant Community: This plant community is the result of no fire. An increase in canopy of junipers contributes to a sparse herbaceous understory and a reduction of mahogany. A reduced herbaceous understory results in less diversity and numbers of insects. The reptile community will be similar to State 1 Phase 1.1, and includes sagebrush lizard and western rattlesnake. As juniper increases, habitat cover for Brewer’s sparrow, sage thrasher and sage sparrow may increase slightly. Old growth juniper may provide cavity habitat for mountain bluebirds. The plant community provides food and cover habitat for mule deer and elk. Quality of winter forage for elk is reduced due to the loss of vigor and production of mahogany and antelope bitterbrush. Juniper is desirable forage for mule deer throughout the year. As juniper encroachment occurs, the site will continue to provide thermal cover and young of year cover for large herbivores. A small mammal population including golden-mantled ground squirrels, jackrabbits, deer mice and Great Basin pocket mice utilize this plant community.

Grazing Interpretations.

This site is suited for summer and fall grazing. Livestock use the site for shade as well as foraging.
Estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory which includes species, composition, similarity index, production, past use history, season of use and seasonal preference.

Hydrological functions

The soils on this site are in hydrologic group C. They have moderately high runoff potential.

Recreational uses

This site has high value for hunting, camping, photography and picnicking. The mahogany shrubs provide visual diversity to the landscape.

Wood products

This site provides a source of fuel wood for camping, picnics and barbecues. The wood is also used to make small specialty products.

Other products

None.

Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used.

Those involved in developing this site description include:
Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC
Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC
Jim Cornwell, State Rangeland Management Specialist, NRCS, Idaho (retired)
Joe May, State Rangeland Management Specialist, NRCS, Idaho
Leah Juarros, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Assistant State Conservationist, NRCS, Idaho (Retired)

Soils and Physiographic Features were gathered from NASIS database.

Type locality

Location 1: Ada County, ID	
Township/Range/Section	T5 S R3 W S15
Latitude	43° 0′ 28″
Longitude	116° 41′ 35″
General legal description	SW ¼, NW ¼, SEC. 15
Location 2: Ada County, ID	
Township/Range/Section	T5 S R3 W S8
Latitude	42° 59′ 26″
Longitude	116° 41′ 46″
General legal description	SW ¼, NW ¼, SEC. 8

Other references

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Contributors

Dave Franzen And Jacy Gibbs

Approval

Kendra Moseley, 4/24/2024

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)	
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Date	06/25/2007
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are rare on this site due to the coarse surface fragments. If they are present, they are likely to occur on slopes greater than 20% or immediately following a wildfire.

2. **Presence of water flow patterns:** Water-Flow Patterns are rare on this site due to short slope lengths. When they occur, they are short and disrupted by cool season grasses, tall shrubs and surface stones. They are not extensive.

3. **Number and height of erosional pedestals or terracettes:** Pedestals and/or Terracettes are rare on this site. In areas where slopes approach 20 percent and where flow patterns and/or rills are present, a few pedestals may be expected.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground ranges from 15-30% .

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind-Scoured, blowouts and/or deposition areas do not occur on this site.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter in the interspaces may move up to 3 feet following a significant run-off event. Coarse litter generally does not move.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Values should range from 4-6 .

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface horizon is typically 3 to 12 inches thick. Structure typically includes weak thin and platy, and weak or moderate fine or moderate medium granular, and moderate fine to medium subangular blocky. Soil organic matter (SOM) ranges from 1 to 10 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The tree-like canopy of curlleaf mountain mahogany intercepts raindrops and therefore reduces that impact on the soil surface. Bunchgrasses, especially deep-rooted perennials, and surface stones slow run-off and increase infiltration. Tall shrubs accumulate snow in the interspaces.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Compaction layer is not present.

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: Tree-like shrubs >>>cool season deep-rooted bunchgrasses

Sub-dominant: Tall shrubs>perennial forbs >shallow rooted bunchgrasses

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Mortality of curlleaf mountain mahogany is usually the result of insect infestations or fire. Outbreaks of a curlleaf mountain mahogany defoliating moth, Stamnodes animata, occur at infrequent intervals. Two consecutive years of severe defoliation can cause curlleaf mountain mahogany mortality.

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14. **Average percent litter cover (%) and depth (in):** Ranges from 10-20% but additional data is needed.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production is 1800 pounds per acre (2000kg/ha) in a year with normal precipitation and temperatures.

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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:** Invasive plants include shade intolerant species such as cheatgrass, bulbous bluegrass, rush skeletonweed, whitetop, musk and scotch thistle and diffuse and spotted knapweed when the canopy has been altered or removed. In addition, western juniper can invade the site.

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17. **Perennial plant reproductive capability:** All functional groups have the potential to reproduce most years.
