

Ecological site R013XY062ID

Snowpocket

16+ PZ POTR5/SHRUBS

Last updated: 9/23/2020
Accessed: 08/31/2026

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): 013X–Eastern Idaho Plateaus

Land Resource Region: B (Northwestern Wheat and Range) MLRA: 13 (Eastern Idaho Plateaus) EPA EcoRegion: Level III (Middle Rockies)

LRU notes

013X-Eastern Idaho Plateaus Precipitation or Climate Zone: 16+” P.Z. <https://soils.usda.gov/survey/geography/mlra/index.html>

Classification relationships

No data.

Ecological site concept

Site receives additional water. Site occurs in areas where snow drifts retain moisture well into the growing season. Soils are: not saline or saline-sodic. Deep to very deep, not skeletal within 20” of soil surface, subsurface soil may be skeletal below 20” Not strongly or violently effervescent throughout the soil profile. textures usually range from loam to silt loam in surface mineral 4”. Slope is > 30%. Clay content is = 35% in surface mineral 4”. Site does not have an argillic horizon with > 35% clay.

Associated sites

R013XY005ID	Loamy 16-22 PZ ARTRV/FEID-PSSPS
R013XY014ID	Shallow Stony 12-20 PZ ARAR8/PSSPS
R013XY019ID	Stony Loam 16-22 PZ ARTRV/PSSPS
R013XY020ID	Loamy Tall Brush 16-22 PZ ACGL/BRMA4
R013XY022ID	Subalpine Loamy 16-22 PZ ARTRS2/ELTR7-BRMA4

R013XY031ID	Steep Stony North 16-22 PZ ARTRV/FEID
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on mountainsides where snow drifts occur. The site normally occurs on east to north slopes. Slopes range from 15 to 60 percent. Elevations will range from 5500 to 9000 feet (1675-2750 meters).

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Elevation	1,680 – 2,740 m
Slope	20 – 60 %
Water table depth	100 – 150 cm
Aspect	N, E

Climatic features

MLRA 13, the Eastern Idaho Plateaus, is part of the Northwestern Wheat and Range Region. Its elevation ranges from 4209 to 9331 feet above sea level, with an average elevation of 5787 feet. The average annual precipitation is 16.41 inches, with a range of 13.56 to 18.75 inches, based on ten long term climate stations located throughout the MLRA. A spike in precipitation amount often occurs in late spring, usually in May.

Temperatures vary widely in the MLRA throughout the year. A maximum temperature of 103° Fahrenheit occurred at the McCammon climate station (# 105716; elevation 4770 feet), while a minimum of -41° was recorded at the Kilgore station (#104908). At all stations temperatures throughout the year are usually below the national average. Kilgore also recorded the greatest annual snowfall amount of 217 inches. The average temperature is 41.4 degrees F. with an average high of 55.3 degrees and an average low of 27.5 degrees. The frost-free period ranges from 64 to 90 days, while the freeze-free period can be 98 to 123 days.

Table 3 Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	120 days
Precipitation total (average)	480 mm

Influencing water features

This site is influenced by melting snowdrifts and the duration of the snowdrifts.

Soil features

The soil surface is covered by a layer of organic material consisting of undecomposed or partially decomposed leaves, twigs, and grasses. The soils are deep, well-drained loams. The surface horizon is very dark brown. The subsurface soils are medium textured. Fifteen to forty percent coarse fragments may be present below 45 inches. The parent material is fine grained sandstone, loess alluvium, and some colluvium materials. The soils are 40 to over 60 inches deep.

Table 4. Representative soil features

Surface texture	(1) Loam
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	100 – 150 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Subsurface fragment volume <=3" (Depth not specified)	40 – 50 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

The dominant visual aspect of this site is a grove of shrubby quaking aspen with a heavy understory of shrubs and forbs. This site is composed of one to several quaking aspen clones, each with a common genetic makeup and individual phenological and physiological characteristics. Composition by weight for the entire plant community is approximately 5 percent grass, 10 to 20 percent forbs, and 75 to 85 percent shrubs (the aspen usually do not develop into tree form).

During the last few thousand years, this site has evolved in a climate characterized by cool, moist summers and cold, wet winters. The site has evolved in pockets that accumulate snow. Snow may be present on the site from mid October to late June. This site is typically multi-layered. Sufficient light is able to penetrate the canopy to support abundant understory growth. The aspen stands are un-even in age due to the loss of top growth from disease, insects, age, or breakage from snow loads. As these conditions occur the individual aspen shrubs are then able to replace themselves through rhizomatous reproduction. Understory species that occur near the periphery of an aspen clone are generally shade intolerant. They include basin wildrye, bluebunch wheatgrass, bottlebrush squirreltail, mountain brome, slender wheatgrass, bittercherry, mountain big sagebrush, and common chokecherry.

Herbivory has historically occurred on this site at low levels of utilization. Herbivores include mule deer, Rocky Mountain elk, and Shiras moose.

Fire stimulates suckering or root sprouting from the root system. The fire frequency on the site is dependent on the frequency of fire on

adjacent range sites and the level of moisture in the fuels on the site. Fire conditions generally need to be severe to carry a fire through this plant community. Often due to higher humidity and fuel moisture within the aspen grove, fire is knocked down once it enters the site. Therefore fire frequency is generally less frequent than on adjacent upland range sites. The normal fire frequency is 75-120 years.

The total annual production is 4000 pounds per acre (4480 kilograms per hectare) in a normal year. In a below normal year production is 3000 pounds per acre (3360 kilograms per hectare). In an above normal year production is 4500 pounds per acre (5040 kilograms per hectare).

Structurally, shrubs are very dominant followed by cool season deep-rooted perennial forbs, followed by perennial grasses being sub-dominant.

The Historic Climax Plant Community (HCPC), 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 Reference Plant Community varies dependent on the normal or average snow depth and its' duration. With lesser snow depths and shorter durations, shrubs such as mountain snowberry, serviceberry, and Woods' rose may be more prevalent than Scoulers willow. Sites with deeper snow levels resulting in longer durations will have fewer understory shrubs and have a dominance of aspen. A typical composition for the plant community of Phase 1.1 with a moderate snow depths and durations is listed later under "Reference Plant Community Phase Plant Species Composition".

Additional data needs to be collected to obtain the species in the Reference Plant Community for snowpockets that have snow depths and durations that differ from this typical situation.

The plant community can go through an herbaceous stage where vegetation is dominated by grasses and forbs under full sunlight. Dominant grasses found in this stage include a mix of shade tolerant and shade intolerant plants. This stage is experienced after a major disturbance such as root-rot, insect damage, or ground fire. Following a major disturbance, the aspen root system gives rise to many root suckers, assuming the root system has remained intact and is still healthy. Most other shrubs in the understory will also sprout from their crowns or root systems following a fire. This stage is shown as Phase 1.2 in the state and transition model. This stage occurs for a short period of time.

FUNCTION:

This site is not well suited for livestock grazing because the plant community is so dense that it is hard for livestock to physically enter it. Typically, they will use the outer edges of the community only. Snowpockets that form with a lower average snow depth and duration may be grazed. This type of snowpocket site is an important area for wildlife. They provide cover, nesting, and food, although it is still often so dense that larger animals find it difficult to enter them. Hunting opportunities are good where the site is isolated from human activity. Severe degradation of adjacent sites will occur prior to this site being degraded.

Impacts on the Plant Community.

Influence of fire:

This site can burn from wildfire. Burning usually occurs from fire spreading from an adjacent range site when the fuel moisture levels are low in these. Since the plant community in this site is dependent on moist soils which allow deep-rooted plants to grow throughout most of the summer, the fuels often are not dry enough to burn. The fire frequency is usually longer than adjacent range sites. Most of this site is associated with the sagebrush steppe where the normal fire frequency is estimated at 20-50 years. A wildfire can damage or kill most of the above ground plant material. Aspen and most of shrubs adapted to the site are root-sprouting plants and regenerate rapidly. In order for this site to remain intact, fire needs to be a component of plant community development since aspen and willows require bare soil conditions to establish seedlings. Conifer invasion is usually not a problem, but if it occurs, fire is needed to maintain the aspen community.

Influence of improper grazing management.

Typically, this site is not well suited to grazing due to the density of the plant community. The outer edges of the plant community are often grazed and can be adversely impacted. Usually, adjacent sites will be severely impacted before this site is degraded.

Proper grazing management that addresses frequency, duration, and intensity of grazing applied to adjacent sites can maintain the integrity of the plant community and the moist soils on which it is dependent. Properly managed ungulate grazing and browsing does not have a detrimental affect on stand development.

Weather influences:

Because of the deep moist soils, the production of this site changes little during wet or dry precipitation years. The overall production can be adversely influenced with prolonged drought. Prolonged drought can lead to more frequent fires. Overall plant composition is normally not affected when perennials have good vigor.

Below normal temperatures in the spring can have an adverse impact on total production regardless of the run-off and flooding. An early, hard freeze can occasionally kill some plants and stop the growth of trees and shrubs.

Influence of insects and disease:

Periodic disease and insect outbreaks can affect vegetation health. Aspen is susceptible to injury or mortality from a variety of borers and fungus. It is most susceptible following fire or when the clone becomes older than 60-70 years. An outbreak of a particular insect is usually influenced by weather but no specific data for this site is available.

Influence of noxious and invasive plants:

Annual and perennial invasive species can compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory. There are several noxious or invasive plant species that are adapted to this site, particularly following fire. As the canopy closes most of the shade intolerant species decline.

Influence of wildlife:

This site is important for many species of mammals and birds for food and life cycles. Total numbers are seldom high enough to adversely affect the plant community. The site is primarily used in the late spring, summer, and fall by big game. Many birds use the site for food, nesting, or brood rearing in the late spring and summer.

Watershed:

When ground cover is at or near potential, the erosion hazard is slight. The largest threat to degradation of this site is improper grazing management on adjacent sites resulting in degradation of the periphery of the site. This plant community, over time, will get smaller and smaller. If improper grazing management continues to remove the aspen suckers, the entire aspen clone can be lost.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.

1.1. Aspen-Scouler willow-shrubs

Plant Community Phase 1.1 to 1.2 (1.1A). Results from fire.

Plant Community Phase 1.1 to 1.4 (1.1B). Results from improper grazing management.

Plant Community Phase 1.1 to 1.3 (1.1C). Results from old age, insects, and disease.

Plant Community Phase 1.2 to 1.1 (1.2A). Results from no fire.

Plant Community Phase 1.3 to 1.2 (1.3A). Results from fire.

Plant Community Phase 1.4 to 1.1 (1.4A). Results from prescribed grazing, particularly on adjacent sites.

State 1, Phase 1.4 to State 2 (T1A). Results from continued improper grazing management, particularly on adjacent sites. This site has crossed the threshold. It is not economically feasible to move this state back to the State 1.

State 2 to State 3, unknown new site (T2.1A). Results from continued improper grazing management, particularly on adjacent sites.

Practice Limitations.

Only slight limitations exist for implementing vegetative management practices and facilitating practices. However, it may be desirable to locate salt and water away from this site to help improve animal distribution and reduce concentration on this site. Severe limitations exist for seeding after a fire due to sprouting shrubs. Prescribed burning may be needed to revitalize decadent stands of aspen. Potential for sheet and rill erosion is moderate to severe if the shrub canopy is removed by a severe, hot fire and where slopes are greater than 15 percent.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 6.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Animal community

Wildlife Interpretations. Animal Community – Wildlife Interpretations This plant community is dominated by quaking aspen and a variety of understory brush including chokecherry and mountain snowberry offering excellent food and cover habitat for birds and small to large mammals. Mule deer, elk, and moose are the large herbivores using the site. The plant community provides seasonal habitat for resident and migratory animals including western toad, shrews, ground squirrels, mice, coyote, red fox, and badger. Wyoming ground squirrel, Virginia's warbler, Idaho pocket gopher, ring-necked snake, and Merriam's shrew are area sensitive species that may be associated with this site. Encroachment of noxious and invasive plant species (leafy spurge, Canada thistle, and Kentucky bluegrass) in isolated areas can replace native plant species which provide critical feed, brood-rearing, and nesting cover for a variety of native wildlife. Water features are sparse provided by runoff, artificial water catchments, and springs. State 1 Phase 1.1 – Quaking Aspen/ Scouler's Willow/ Basin Wildrye/ Slender Wheatgrass/ Bottlebrush Squirreltail Reference Plant Community (RPC): This plant community is dominated by aspen and a variety of fruit bearing shrubs offering diverse pollinator habitat. Several varieties of moths feed exclusively on aspen. The reptile and amphibian community is represented by common sagebrush lizard, Great Basin spadefoot toad, western toad, and northern leopard frog. Amphibians may be 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, ruffed grouse, and flycatchers. Birds and small mammals eat aspen, chokecherry, serviceberry, and mountain snowberry seeds and fruit. The variety of shrubs is used by birds for nesting and escape cover. Aspen sites are used extensively by ruffed grouse for breeding, brooding, nesting, and winter habitat. The plant community provides desirable forage for large mammals including mule deer, elk, and moose in the spring, summer, and fall. Aspen, Scouler's willow, and mountain snowberry are favorable browse for mule deer, moose, and elk. The site provides thermal cover, escape cover, and young of year cover for mule deer, moose, and elk. A small mammal population including deer mouse, woodrat, golden-mantled ground squirrels, Wyoming ground squirrel, and Merriam's shrew may utilize this site and the adjacent open areas. State 1 Phase 1.2 –Sedge Species/ Forbs/ Quaking Aspen Plant Community: This plant community is the result of fire. Insect diversity may be lowered due to the reduction of shrubs. Reptile habitat quality may decrease due to a loss of shrub cover. Amphibians using the site would be similar to species identified in State 1 Phase 1.1. Bird habitat quality would decline due to the loss of vertical structure and reduced fruit and seed production from shrubs. The site would favor bird species not reliant on shrubs. As shrubs recolonize, habitat for bird species identified in State 1 Phase 1.1 would increase. Elk would utilize the sedges throughout the year and mule deer would utilize them in the spring. The site would not provide suitable thermal cover and young of year cover for large mammals. A small mammal population including deer mouse, golden-mantled ground squirrels, Wyoming ground squirrel, and Merriam's shrew may utilize this community. State 1 Phase 1.3- Quaking Aspen/ Kentucky Bluegrass Plant Community: This plant community is the result of decadent shrubs, insects, disease, and a lack of fire. The plant community would support a similar invertebrate community as described in State 1 Phase 1.1. Habitat quality would decline for bird species including mountain bluebird, rock wren, ruffed grouse, and flycatchers due to the decadent plant conditions. The plant community provides fair forage for mule deer, elk, and moose in the spring, summer, and fall. The site provides thermal cover and young of year cover for mule deer and elk. A small mammal population including deer mouse, golden-mantled ground squirrels, Wyoming ground squirrel, and Merriam's shrew would utilize this site and the adjacent open areas. State 1 Phase 1.4 – Quaking Aspen/ Scouler's Willow/ Basin Wildrye/ Slender Wheatgrass/ Bottlebrush Squirreltail Plant Community: This plant community is the result of improper grazing management on adjacent sites. The plant community would provide habitat for similar animal species as described in State 1 Phase 1.1. The reduced size of the snow pocket site provides additional forage on the edges of the aspen and willow community. The reduced size of the site increases the browsing pressure on the remaining trees and shrubs, and over time may reduce quality of habitat for all animal species State 2 – Annuals Plant Community: This state has developed due to improper grazing management. The loss of all shrubs and significant reductions of native forbs and grasses will reduce insect diversity on the site. The lack of flowering plants reduces pollinator use by butterflies and moths. Quality of cover and forage habitat for reptiles would decline with the loss of understory vegetation and shrubs. Hunting success by raptors may increase due to the poor cover for prey. Mule deer and elk may utilize the herbaceous vegetation in the early part of the year when the invasive annuals (cheatgrass) are more palatable. At other times of the year large mammals would not regularly utilize these areas due to poor food and cover conditions. Grazing Interpretations. This site provides limited grazing unless

the overstory has been thinned. Livestock use the site extensively for shade. 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. Calculations used to determine estimated initial stocking rate will be based on forage preference ratings.

Hydrological functions

No data.

Recreational uses

Aesthetic value is derived from the rich hues and textures of the aspen trees, particularly in the fall. The diverse flora and fauna enhance the beauty of this site. The site offers rewarding opportunities for nature study and for photographers. It has some value for hunting.

Wood products

Firewood gathering is limited on this site.

Other products

None.

Other information

Field Offices American Falls, ID Blackfoot, ID Burley, ID Driggs, ID Ft. Hall, ID Idaho Falls, ID Malad, ID Pocatello, ID Rexburg, ID Soda Springs, ID St. Anthony, ID

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 Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho Jim Cornwell, Range Management Specialist, IASCD Lee Brooks, Range Management Specialist, IASCD Kristen May, Resource Soil Scientist, NRCS, Idaho

Type locality

Location 1: Bingham County, ID

Other references

USDA Forest Service, Rocky Mountain Research Station. 2004. Restoring Western Ranges and Wildlands. General Technical Report RMRS-GTR-136-vols. 1-3.

USDA, NRCS.2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, Forest Service, Fire Effects Information Database. 2004. www.fs.fed.us/database.

USDA, NRCS. 1992. Major Land Resource Area 25, Owyhee High Plateau, Nevada Site Descriptions, Reno, Nevada.

USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland Health. Technical Reference 1734-6; Version 4-2005.

Approval

Kendra Moseley, 9/23/2020

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)	Dave Franzen and Jacy Gibbs Intermountain Range Consultants 17700 Fargo Rd. Wilder, ID 83676
Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	06/25/2009
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** rills do not occur on this site.

2. **Presence of water flow patterns:** water-flow patterns are rare on the site.

3. **Number and height of erosional pedestals or terracettes:** neither occurs on the site.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** data is not available.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** does not occur on the site.

7. **Amount of litter movement (describe size and distance expected to travel):** litter moves very little on the site.

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 to 6 but needs to be tested.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Structure ranges from weak fine granular to moderate fine granular. Soil organic matter (SOM) needs to be determined. Surface color is generally very dark brown.

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: the shrub overstory intercepts raindrops. Deep rooted perennial grasses, forbs, and shrubs slow run-off and increase infiltration.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): 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: shrubs
 - Sub-dominant: forbs
 - Other: perennial grasses
 - Additional:
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13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): some mortality can occur in the shrub and herbaceous layers as different shrub species overtop other shrubs and forbs. Decadence and mortality of aspen can occur with age, insects, and disease.

14. Average percent litter cover (%) and depth (in): additional litter cover data is needed but is expected to be 100 percent to a depth of 0.5-1.5 inches at the end of the growing season.

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): is 4000 pounds per acre (4480 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses and sedges produce 5 percent of the total production, forbs 10-20 percent and shrubs 75-85 percent.

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: includes whitetop, leafy spurge, dock, Canadian thistle, scotch thistle, toadflax, knapweed, and teasel. Other invasive species may include meadow foxtail, redtop, and Kentucky bluegrass. Most invasive species are present on the site following a fire. Since many of them are shade intolerant, they decline as the canopy closes.

17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in most years. Shrub reproduction is primarily vegetative. If regeneration is to occur from seedlings, bare mineral soil must be present. This usually exists following a fire.
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