

Ecological site F043BP702WY

Shallow Cool Woodland Group

Last updated: 4/09/2025

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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): 043B–Central Rocky Mountains

Major Land Resource Area (MLRA): 043B–Central Rocky Mountains 043B – Central Rocky Mountains – This MLRA is extensive including Montana, Idaho, Wyoming and a small portion in Utah. This MLRA consists of the major chains of Mountain Ranges with the corresponding valleys. Cartographic standards limited the ability to capture the foothills as a separate MLRA, so revisions of the MLRA boundaries in 2006 led to the inclusion of the foothills with the mountains for much of Wyoming. Further information regarding MLRAs, refer to: United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Available electronically at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053624#handbook.

LRU notes

LRU P: PES (Provisional Ecological Site or Group - PEG) A PROVISIONAL ECOLOGICAL SITE is a conceptual grouping of soil map unit components within a Major Land Resource Area (MLRA) based on the similarities in response to management. Although there may be wide variability in the productivity of the soils grouped into a Provisional Site, the soil vegetation interactions as expressed in the State and Transition Model are similar and the management actions required to achieve objectives, whether maintaining the existing ecological state or managing for an alternative state, are similar. Provisional Sites are likely to be refined into more precise concept during the process of meeting the APPROVED ECOLOGICAL SITE DESCRIPTION criteria. This PROVISIONAL ECOLOGICAL SITE has been developed to meet the standards established in the National Ecological Site Handbook. The information associated with this ecological site does not meet the Approved Ecological Site Description Standard, but it has been through a Quality Control and Quality Assurance processes to assure consistency and completeness. Further investigations, reviews and correlations are necessary before it becomes an Approved Ecological Site Description.

Classification relationships

Other Classifications: PSME/PHMA habitat type (Steele Et.Al. 1983) PSME/ACGL habitat type (Steele Et.Al. 1983) PSME/SYAL habitat type (Steele Et.Al. 1983) PSME/CARU habitat type (Steele Et.Al. 1983) PSME/BERE habitat type (Steele Et.Al. 1983) PSME/SPBE habitat type (Steele Et.Al. 1983) PSME/JUCOD habitat type (Steele Et.Al. 1983) PSME/ARCO habitat type (Steele Et.Al. 1983) PIFL2/JUCOD habitat type (Steele Et.Al. 1983)

Ecological site concept

• Site does not receive any additional water • Soils are o Generally not saline or saline-sodic o Shallow o Typically less than 5% stone and boulder on surface (15%) o Soil surface texture ranges from sandy loam to clay loam in surface mineral 4"

Associated sites

F043BP707WY	Subirrigated Cool Woodland Group Subirrigated Cool Woodlands will occur below or at the foot of the Shallow Cool Woodlands, generally associated with the valley floor or low-lying flatter positions with the slopes coming up from the floor being the Shallow Cool Woodlands.
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F043BP708WY	Upland Aspen Woodland Group Upland Aspen Woodland can be intermixed with the Shallow Cool Woodland, especially in snow melt pockets or seeps occurring near or below rock outcrops, with the Shallow Cool woodlands occurring on the upper edges or sides associated with the rock outcrops.
F043BP710WY	Upland Cool Woodland Group Upland Cool Woodland can be found in slightly concave or deeper soils below or around the Shallow Cool Woodlands.

Similar sites

F043BP704WY	Shallow Warm Woodland Group Shallow Warm Woodlands have the same general site concept, except occurs on lower elevations or western aspect slopes across the Mountains. The warmer temperature affects both the tree species as well as the understory species.
R043BY260WY	Shallow Igneous Foothills and Mountains West Shallow Igneous 15-19
R043BY360WY	Shallow Igneous (Swlg) 15-19" Foothills and Mountains East Precipitation Zone Shallow Igneous 15-19
R043BY262WY	Shallow Loamy Foothills and Mountains West Shallow Loamy 15-19
R043BY362WY	Shallow Loamy (SwLy) 15-19" Foothills and Mountains East Precipitation Zone Shallow Loamy 15-19

Table 1. Dominant plant species

Tree	(1) <i>Pseudotsuga menziesii</i> (2) <i>Pinus contorta</i>
Shrub	(1) <i>Symphoricarpos occidentalis</i> (2) <i>Spiraea betulifolia</i>
Herbaceous	(1) <i>Calamagrostis rubescens</i> (2) <i>Carex geyeri</i>

Physiographic features

This site occurs on most slopes and along ridge tops. Rock outcrops are common in association with this ecological site.

Table 2. Representative physiographic features

Geomorphic position, mountains	(1) Mountainflank (2) Free face (3) Mountaintop
Landforms	(1) Mountains > Mountain slope (2) Mountains > Moraine (3) Mountains > Ridge
Runoff class	Low to very high
Elevation	1,830 – 3,050 m
Slope	20 – 80 %
Aspect	Aspect is not a significant factor

Climatic features

Annual precipitation ranges from 15-19 inches per year. June is generally the wettest month. July, August, and September are somewhat less with daily amounts rarely exceeding one inch. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation.

Temperatures show a wide range between summer and winter and between daily maximums and minimums. This is predominantly due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks in winter move rapidly from northwest to southeast and account for extreme minimum temperatures.

Snowfall is quite heavy in the area. Annual snowfall averages about 150 inches. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.

Prevailing winds are from the southwest, because of the varied topography, the wind will vary considerably for different parts of the area. The wind is usually much lighter at the lower elevations and in the valleys as compared with the higher terrain. Occasional storms, however, can bring brief periods of high winds with gusts exceeding 50 mph. Growth of native cool season plants begins about May 15 and continues to about September 15.

The following information is from the "Jackson", "Cooke City 2W", and "Burgess Junction" climate stations, at the lower end of this precipitation zone. Climate Data is limited and is being extrapolated from the nearest stations.

Table 3 Representative climatic features

Frost-free period (characteristic range)	0-10 days
Freeze-free period (characteristic range)	40-50 days
Precipitation total (characteristic range)	460-580 mm

Frost-free period (actual range)	0-10 days
Freeze-free period (actual range)	40-50 days
Precipitation total (actual range)	430-610 mm
Frost-free period (average)	10 days
Freeze-free period (average)	50 days
Precipitation total (average)	530 mm

- (1) COOKE CITY 2 W [USC00241995], Gardiner, MT
- (2) JACKSON [USC00484910], Jackson, WY
- (3) BURGESS JUNCTION [USC00481220], Dayton, WY

Influencing water features

This site is not associated with any type of surface water feature. Snow drift impact is moderate.

Soil features

The soils associated with this site were derived from calcareous sandstone, limestone, quartzite-sandstone mixes, or granitics. These soils are generally less than 20" in depth and virtually impermeable to plant roots. Pockets of deep soil may occur in this site and are moderately acidic. The bedrock will include igneous, metamorphic and sedimentary material. The soil characteristic having the most influence on the plant community is the shallow depth and slope. Soil temperature regime is found on the upper extent of frigid and the lower extent of cryic; while, soil moisture regime is typic ustic to typic udic.

Figure 7. Hand excavated pit in the Shallow Cool Woodland ecological site.

Table 4. Representative soil features

Parent material	(1) Colluvium – limestone and dolomite (2) Residuum – granite and gneiss (3) Slope alluvium – sedimentary rock (4) Quartzite
Surface texture	(1) Stony, bouldery sandy loam (2) Clay loam (3) Loam (4) Silty clay loam

Drainage class	Well drained
Permeability class	Slow to rapid
Depth to restrictive layer	30 – 50 cm
Soil depth	30 – 50 cm
Surface fragment cover <=3"	0 – 20 %
Surface fragment cover >3"	10 – 20 %
Calcium carbonate equivalent (Depth not specified)	0 – 10 %
Electrical conductivity (Depth not specified)	Not specified
Soil reaction (1:1 water) (Depth not specified)	5.4 – 10
Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 20 %

Ecological dynamics

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 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 2.2 plant community composition

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

This site and plant community complex has minimal livestock grazing capacity in the old stand forests. In new growth or following logging or fire, this site may offer some livestock forage. This site is common habitat for elk, mule deer, bear, wolf, mountain lion, and a variety of other wildlife.

Hydrological functions

Water is the principal factor limiting forage production on this site. This site is highly variable and is dominated by soils in hydrologic group B and C, with localized areas in hydrologic group D. Infiltration ranges from slow to very rapid. Runoff potential for this site varies from moderate to high depending on soil hydrologic group, depth and degree of bedrock fracturing, slope, and ground cover (refer to Part 630, NRCS National Engineering Handbook for detailed hydrology information.) Rills and gullies may be present, but should be small. Water flow patterns should be barely distinguishable. Pedestals are only slightly present in association with bunchgrasses such as bluebunch wheatgrass. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogamic crusts are present, but only cover 1-2% of the soil surface.

Recreational uses

This site provides hunting opportunities for large ungulates and fur bearing species. Limited for upland game bird species. Hiking is limited by density of tree stands and slope of site.

Wood products

Timber harvest for lumber and firewood, as well as post and pole cuttings are common on this forest type. Christmas tree harvest occurs on lower extents of this forest type.

Other products

Berry harvest from understory species as well as medicinal plants can be found within this ecological site. Fungi (mushroom) harvest can also occur in specific locations.

Inventory data references

Information presented here has been derived from NRCS data and other inventory data. Field observations from range trained personnel were also used. Those involved in developing this site include: Bill Christensen, Range Management Specialist, NRCS; Karen Clause, Range Management Specialist, NRCS; and Everet Bainter, Range Management Specialist, NRCS. Other sources used as references include: USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

Other references

Steele, Robert; Cooper, Stephen V.; Ondov, David M.; Roberts, David W.; Pfister, Robert D. 1983. Forest Habitat Types of Eastern Idaho-Western Wyoming. General Technical Report INT-144. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 122 p.

Contributors

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Approval

Kirt Walstad, 4/09/2025

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)	
Contact for lead author	
Date	03/05/2025
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills:

2. Presence of water flow patterns:

3. Number and height of erosional pedestals or terracettes:

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

5. Number of gullies and erosion associated with gullies:

6. Extent of wind scoured, blowouts and/or depositional areas:

7. Amount of litter movement (describe size and distance expected to travel):

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

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):

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:

Sub-dominant:

Other:

Additional:

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

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):

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:

17. Perennial plant reproductive capability:
