Major Land Resource Area 234X
Interior Brooks Range Mountains

Accessed: 06/18/2026

Description

Geography The Interior Brooks Range mountains area consists of predominantly steep, jagged mountains and narrow valleys that drain the southern side of the Brooks Range. This area is bordered by the Northern Brooks Range Mountains (MLRA 244) to the north, the Western Brooks Range Mountains Foothills and Valleys (MLRA 243) to the west, and the Upper Kobuk and Koyukuk Hills and Valleys (MLRA 233) and the Interior Alaska Highlands (MLRA 231) to the south. The Brooks Range represents a drainage divide that is also the dividing line between MLRA 234 from MLRA 244. Rivers draining to the north wind their way along the North Slope until they reach the Arctic Ocean, while rivers that drain to the south reach the northern Pacific Ocean via the Bering Sea. MLRA 234 covers an area of 22,479 miles and is sparsely populated. Geology The Brooks Range is the northernmost extension of the Rocky Mountains and the highest range within the Arctic Circle, with high peaks in the eastern part of the range reaching elevations of nearly 9,000 feet. This area falls within the zone of discontinuous permafrost, with the continuous permafrost zone primarily occurring north of the Brooks Range. Wide, U-shaped valleys are evidence of extensive glaciation in the Early and Mid-Pleistocene, with most glaciers retreating to their current, high-elevation positions by the Late Pleistocene. The characteristically sharp upper peaks give way to lower mountain slopes comprised of alluvial and colluvial fans before reaching the gently sloping flood plains and terraces of the valley bottoms. While Paleozoic and Jurassic igneous and volcanic rocks can be found in the eastern part of the range, most of the lower slopes of this area are comprised of modified glacial material, alluvial, and colluvial deposits. Many rivers and streams, such as the Koyukuk, have their headwaters in the Brooks Range and drain to the Bering Sea and North Pacific Ocean via the Yukon River. Soils The dominant soils orders in this MLRA are Gelisols, Entisols, and Inceptisols. Soils in the area have a gelic (subgelic) or cryic temperature regime, a udic or aquic moisture regime, and mixed minerology. Gelisols are common on soils that are shallow or moderately deep to permafrost and are somewhat poorly to very poorly drained. Gelisols are more common on cold slopes and stream terraces. In some cases, higher-intensity wildfires lead to loss of insulation when the surface organic layer is burned. This can lead to permafrost loss or active layer expansion and ultimately alter hydrology and taxonomic classification. Entisols and Inceptisols lacking in permafrost range from excessively-well to poorly drained. Entisols and inceptisols are more common on rocky terrain, warm boreal slopes, and flood plains. Miscellaneous areas such as glaciers, riverwash, rock outcrop, and rubble land make up 63 percent of the MLRA. Vegetation The continental subarctic climate of the Brooks Range in conjunction with shallow, rocky soils leads to a sparsely forested landscape in this MLRA. Spruce-hardwood forests and woodlands tend to be relegated to lower elevations where deeper soils form on footslopes and terraces. This is contrasted by the ericaceous dwarf shrub communities that are abundant on shallow, rocky slopes and ridges, while exposed sites are predominantly covered in lichen and sporadic forbs. On high stream terraces and footslopes where permafrost occurs, black spruce woodlands and tussock-forming sedge communities in addition to wet sedge meadows can be found. Floodplains tend to be dominated by low to tall willow scrub communities. Land use Except for areas along the Dalton Highway, access to most of this MLRA is extremely limited, lending itself to intact natural vegetation communities. For this reason, land use primarily takes the form of subsistence hunting, gathering, and fishing by local communities. In additions to subsistence activity, the Brooks Range is also a popular recreation destination, with many users utilizing air taxi and guiding services to access remote parts of the area. As is the case with much of interior Alaska, major resource concerns involve the persistence of permafrost, the degradation of which can lead to various changes in hydrology and nutrient cycling.

Ecological site keys

Life zone key

I. Elevation generally below 2500 feet - Boreal zone

II. Elevation generally above 2500 feet.

- **A. Sparse, stunted trees. Shrubs <3m in height - Subalpine zone**
- **B. Trees no longer persistent. Shrubs <1m in height - Alpine zone**

Boreal Life Zone

I. Occurs on floodplains

II. Occurs on hills, plains and mountains

A. Cold slopes. Permafrost present.

1 Occurs on earth hummocks ... R234XY701AK – Boreal tussock frozen hummocks

2 Other than above. Occurs on mountain slopes. ... F234XY713AK – Boreal forest loamy frozen slopes

B. Warm slopes. Permafrost absent

1 Water table present within 10 inches of the soil surface, poorly drained soils ... F234XY712AK – Boreal forest silty wet slopes

2 Water table absent, well-drained soils

i. Steep slopes, > 40% ... F234XY711AK – Boreal forest gravelly steep slopes

ii. Moderate slopes, < 40% ... F234XY714AK – Boreal forest gravelly slopes

Subalpine life zone

I. Occurs on hills, plains, and mountains ... R234XY702AK – Subalpine scrub gravelly slopes

Alpine life zone

I. Occurs on hills, plains, and mountains

A. Water table present within 10 inches of the soil surface, poorly drained soils ... R234XY702AK – Subalpine scrub gravelly slopes

B. Water table absent, well-drained soils

1 Associated with calcareous parent material. High soil pH, alkaline soils ... R234XY704AK – Alpine scrub gravelly alkaline slopes

2 Associated with non-calcareous parent material. Low to neutral soil pH ... R234XY705AK – Alpine dwarf scrub gravelly slopes