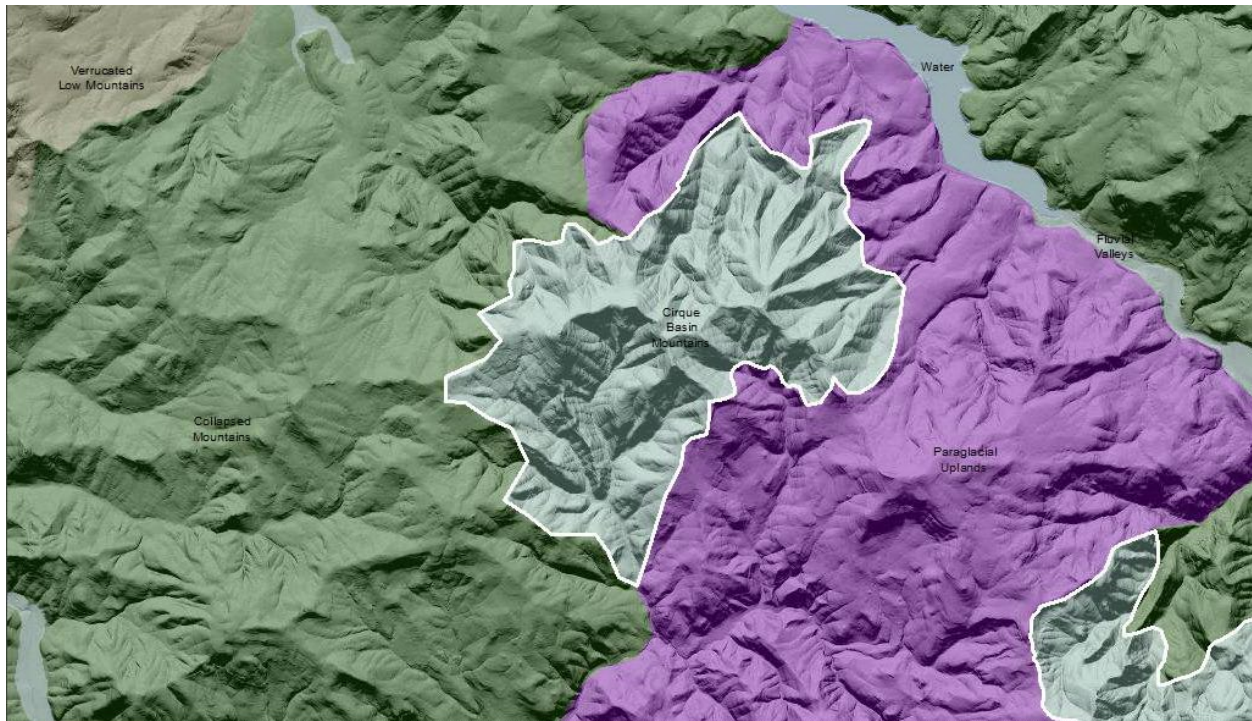


## Cascades Cirque Basin Mountains

**Terrain Class: Mountains** - No one process responsible for construction of mountains. They can be uplifted, tectonic, subduction of plates, folding, uplift, up and down warping of the mantle, inflation of molten lower crustal (batholiths), etc. Erosion of mountain systems occurs over time. The rate of erosion is dependent on the geomorphic process, the underlying rock structure, and the climate, including both freeze thaw and the amount and intensity of precipitation and runoff. Mountains are further defined and distinguished based on morphology, including the pattern and density of drainages, depth of drainages, overall morphology of the area between the drainages, evidence of a strong imprint of a surficial process such as glaciation, and presence of visible underlying rock structure.

Mountains have simple to very complex forms that have arisen due to inherited rock structure, rock history, and are the net result of local to regional spatial scales of competing rates of upbuilding/uplift and downgrading/erosion. Mountains will have an inherited history from weathering and degradation of the underlying stack of earth materials that forms them. Vegetation, habitat, water interception, collection and transport will share a similar history in the same type of uplift and rock.

### Landform Association: Cirque Basin Mountains



**Cirque Basin Mountains** are mountainous landscapes that have obvious imprints of current or past glaciation. Glacial scour and downslope movement of the glaciers have created cirque basins. Cirque basins are semi-circular bowl-like excavation in a hanging valley or at the head of a valley. An aerial view of a cirque shows a horseshoe like shape with the open end of the shoe pointing away from the steep headwall and surrounding side slopes. This open end of the shoe is a raised threshold often

supplemented by a recessional moraine. The closed depression of the cirque frequently hosts a meadow, lake or tarn.

In the Northern Hemisphere cirque basins usually have a north to northeastern aspect. At higher elevations or latitude cirque aspect can be to any point of the compass.

This Landform Association has a limited spatial extent on National Forest System Lands.

**Landtype Associations:** Landtype Associations are formed by intersecting vegetation series or groups of vegetation series with Landform Associations.

**Topography:**

The following tables represent the average conditions for the Landform Association. Only lands within and adjacent to National Forest System Lands were mapped by this project. The entire EPA Level III Ecoregion is not covered by this mapping.

The percent of Landform Association (% of LfA) in bold in the table below refers to the percent of the Ecoregion represented by that Landform Association. The (% of LfA) numbers not in bold in the table below refer to the percent of each Landtype Association within the Landform Association.

Landform Association/Landtype Association	% of LfA	Mean % Slope	Minimum Elevation (m)	Maximum Elevation (m)	Mean Elevation (m)	% Northerly Aspect (226° - 134°)	% Southerly Aspect (135° - 225°)
<b>Cirque Basin Mountains</b>	<b>3.6%</b>	<b>48</b>	<b>931</b>	<b>1583</b>	<b>1259</b>	<b>79%</b>	<b>21%</b>
Cirque Basin Mountains, Grand Fir-White Fir	0.3%	51	922	1653	1218	71%	29%
Cirque Basin Mountains, Grand Fir-White Fir - Mountain Hemlock	0.2%	61	1131	1731	1441	62%	38%
Cirque Basin Mountains, Grand Fir-White Fir - Pacific Silver Fir	1.2%	53	1017	1638	1334	64%	36%
Cirque Basin Mountains, Grand Fir-White Fir - Western Hemlock	0.1%	50	1035	1636	1326	55%	45%
Cirque Basin Mountains, Mountain Hemlock	1.4%	38	1251	1783	1544	74%	26%
Cirque Basin Mountains, Mountain Hemlock - Pacific Silver Fir	0.8%	50	1226	1777	1506	83%	17%
Cirque Basin Mountains, Mountain Hemlock - Western Hemlock	0.1%	39	1105	1578	1387	54%	46%
Cirque Basin Mountains, Pacific Silver Fir	8.5%	49	932	1535	1263	86%	14%
Cirque Basin Mountains, Pacific Silver Fir - Grand Fir-White Fir	2.4%	51	975	1637	1312	83%	17%
Cirque Basin Mountains, Pacific Silver Fir - Grand Fir-White Fir mix	0.4%	59	1054	1713	1421	74%	26%
Cirque Basin Mountains, Pacific Silver Fir - Mountain Hemlock	2.5%	38	1033	1585	1338	82%	18%
Cirque Basin Mountains, Pacific Silver Fir - Western Hemlock	2.7%	46	1011	1620	1299	86%	14%
Cirque Basin Mountains, Western Hemlock	79.2%	48	485	1367	876	74%	26%
Cirque Basin Mountains, Western Hemlock - Grand Fir-White	0.2%	61	899	1681	1254	49%	51%

**Climate:**

Landtype Association	Mean Annual Precipitation (mm)	Mean Annual Temperature °C	AET/PET Ratio July, Aug, Sept
<b>Cirque Basin Mountains</b>	<b>2026</b>	<b>8</b>	<b>0.53</b>
Cirque Basin Mountains, Grand Fir-White Fir	2080	8	0.53
Cirque Basin Mountains, Grand Fir-White Fir - Mountain Hemlock	1787	7	0.56
Cirque Basin Mountains, Grand Fir-White Fir - Pacific Silver Fir	1941	7	0.51
Cirque Basin Mountains, Grand Fir-White Fir - Western Hemlock	1704	8	0.58
Cirque Basin Mountains, Mountain Hemlock	1824	7	0.49
Cirque Basin Mountains, Mountain Hemlock - Pacific Silver Fir	1854	7	0.54
Cirque Basin Mountains, Mountain Hemlock - Western Hemlock	2109	8	0.55
Cirque Basin Mountains, Pacific Silver Fir	2359	8	0.52
Cirque Basin Mountains, Pacific Silver Fir - Grand Fir-White Fir	1961	8	0.54
Cirque Basin Mountains, Pacific Silver Fir - Grand Fir-White Fir - mix	1925	8	0.38
Cirque Basin Mountains, Pacific Silver Fir - Mountain Hemlock	2034	8	0.57
Cirque Basin Mountains, Pacific Silver Fir - Western Hemlock	1826	8	0.54
Cirque Basin Mountains, Western Hemlock	1907	9	0.51
Cirque Basin Mountains, Western Hemlock - Grand Fir-White Fir	1786	8	0.61

The ratio of Actual Evapotranspiration to Potential Evapotranspiration (AET/PET) is used as a broad-scale indicator of potential drought stress. We obtained modeled actual and potential evapotranspiration datasets from the Numerical Terradynamic Simulation Group at the University of Montana (<http://www.ntsg.umt.edu/project/mod16>) for a 30 year climate average. AET/PET ratio in the table above is based on a scale of zero to one. A value closer to 1 means the vegetation is transpiring close to its potential. A value farther from 1 means that the Actual Evapotranspiration is below potential based on this climatic zone (Ringo, et. al. 2016 in draft).