Blue Mountains Paraglacial Margins, Serpentinitic

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: Paraglacial Margins

Paraglacial Margins, Serpentinitic occur around the edges of glacial mountains. These are locally complex landforms that result from more than one origin. Paraglacial Margins are those areas that include remnants of moraines and areas just beyond moraines where topography may have been directly or indirectly influenced by ice, ice borne debris and fans and other sediments that flowed off of

melting glaciers. Catastrophic floods and collapse from abrupt glacial melt events and proto-glacial landforms are in evidence with meltwaters breaching moraines and flowing over the landscape. Paraglacial margins also include the patterned ground which developed from being adjacent to glaciers (frost heave). Patterned ground is the distinct, and often symmetrical geometric shapes formed by ground material in periglacial regions it is associated with frost heaving, which refers to expansion that occurs when wet, fine-grained, and porous soils freeze. Paraglacial margins also include push-up deformational ridges resulting from ice movement.

Serpentinitic is a term attached to the landform association if the base geology is peridotite or serpentine (from geologic maps. The resultant chemical (Mg/Ca) imbalance may or may not dominate the above ground vegetation assemblages. In some areas the chemical imbalance that results from this geology may be obscured by landslide geomorphology which neutralized the affect by mixing multiple parent materials.

This Landform Association is rare 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°)**
Paraglacial Margins, Serpentinitic	**0.0%**	**21**	**1684**	**1930**	**1825**	**88%**	**12%**
Paraglacial Margins, Serpentinitic, Subalpine Fir	100.0%	21	1684	1930	1825	88%	12%

Climate:

Landtype Assocation	Mean Annual Precipitation (mm)	Mean Annual Temperature °C	AET/PET Ratio July, Aug, Sept
Paraglacial Margins, Serpentinitic	**756**	**5**	**0.26**
Paraglacial Margins, Serpentinitic, Subalpine Fir	756	5	0.26

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 1means that the Actual Evapotranspiration is below potential based on this climatic zone (Ringo, et. al. 2016 in draft).