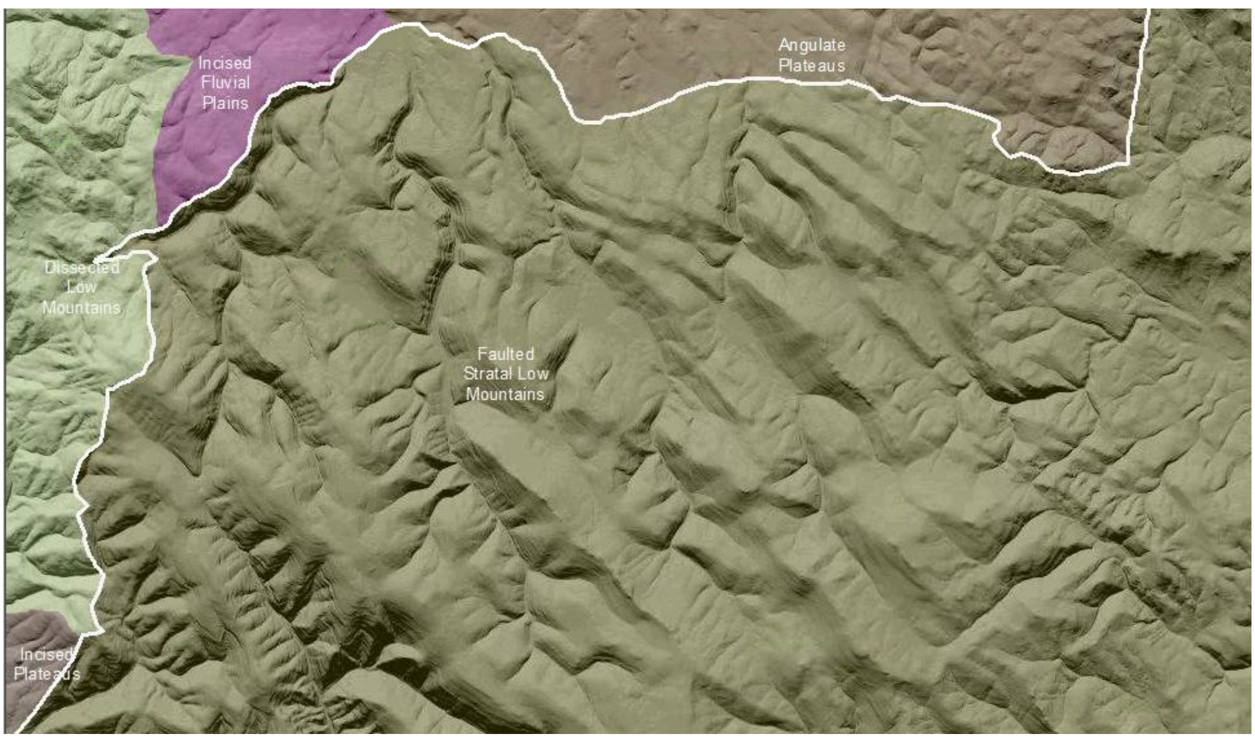
Blue Mountains Faulted Stratal Low Mountains

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: Faulted Stratal Low Mountains



Faulted Stratal Low Mountains are mountains with morphologies which reflect both the underlying rock structure and faulting which exposes the bedrock stratigraphy. Low mountains refer to the fact that the land surface is relatively lower in relief than neighboring area or other similar landform group.

The Faulted Stratal Low Mountains are cut by parallel and sub-parallel faults. Typically these are normal faults with small amounts of lateral displacement. The faulting has created positive (uplands) and negative (drainages) patterns with repeating topographic elements. These Faulted Stratal Low Mountains are characterized by numerous parallel faults over a broad area up to several kilometers in extent. The stratigraphy is a consequence of degradation or denudation of an upland area by hillslope and fluvial processes. Stratigraphy is present and visible, as well as lineations such as unusually straight drainage reaches, indicative of faults in bedrock. Erosional exhumation reveals obvious layering of the underlying rock structure, including dip and anti-dip slopes. Synonymous terms used for these features are cuesta and cuestaform. Anti-dip slopes are benchy, rocky and relatively steep slopes. Following the colluvium downhill on an anti-dip slope you find a repeating pattern of bedrock outcrops with intervening areas of accumulated sediment. Habitat and vegetation distribution corresponds to this pattern. Dip slopes, on the other hand, are broad plains with shallow slopes underlain by relatively deep soils over rock. The dip slope is an almost featureless terrain with few features to orient by. Potential vegetation and habitat are largely invariable across these sloping plains. In this map unit, drainages patterns are more influenced by the faults or fault zones, leading to rectilinear or angulate drainage patterns and consequently diverse routing of surface water through this type of landscape.

The drainages in the Faulted Stratal Low Mountains are captured and redirected by displacement of the faults blocks. The rearrangement and redirection of precipitation runoff by the fault blocks gives a zig-zag appearance to catchment channels. The faults are zones of weakness and set up water flows along these zones. Sediment is impounded by fault scarps, in closed depressions, and at locations with lower slope angle. In these pockets of sediment accumulation there is increased soil development.

There are bedrock slopes that have appeared because of tectonic activity not erosion. These slopes have little if any soil mantle developed. The tectonic created slopes are steeper than the angle of repose of slopes created by erosion. The slopes in this landform are a mix of steep (tectonic) and not so steep (erosion processes) slope. There are valleys with flows that have been diverted or captured flow by other drainages. These captured or diverted drainages are essentially “hanging valleys”. These hanging valleys have sheet flow at a reduced rate and sediment transport is reduced.

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°)**
Faulted Stratal Low Mountains	**2.4%**	**26**	**1125**	**1515**	**1307**	**68%**	**32%**
Faulted Stratal Low Mountains, Douglas-Fir	22.7%	20	1193	1526	1350	81%	19%
Faulted Stratal Low Mountains, Douglas-Fir - Ponderosa Pine	2.3%	34	977	1410	1188	68%	32%
Faulted Stratal Low Mountains, Grand Fir-White Fir	49.0%	26	1156	1742	1429	75%	25%
Faulted Stratal Low Mountains, Grand Fir-White Fir - Douglas-Fir	0.5%	14	1312	1460	1374	72%	28%
Faulted Stratal Low Mountains, Ponderosa Pine	6.5%	21	1123	1412	1249	61%	39%
Faulted Stratal Low Mountains, Ponderosa Pine - Douglas-Fir	1.9%	33	1008	1421	1207	63%	37%
Faulted Stratal Low Mountains, Ponderosa Pine - Shrub-Steppe	0.4%	42	1020	1411	1189	55%	45%
Faulted Stratal Low Mountains, Shrub-Steppe	13.2%	33	728	1275	986	62%	38%
Faulted Stratal Low Mountains, Subalpine Fir	2.6%	23	1659	2119	1906	96%	4%
Faulted Stratal Low Mountains, Western Juniper	0.9%	24	1175	1468	1297	32%	68%

Climate:

Landform Association/Landtype Association	**Mean Annual Precipitation (mm)**	**Mean Annual Temperature °C**	**AET/PET Ratio July, Aug, Sept**
Faulted Stratal Low Mountains	**658**	**7**	**0.19**
Faulted Stratal Low Mountains, Douglas-Fir	601	7	0.20
Faulted Stratal Low Mountains, Douglas-Fir - Ponderosa Pine	670	8	0.18
Faulted Stratal Low Mountains, Grand Fir-White Fir	715	6	0.25
Faulted Stratal Low Mountains, Grand Fir-White Fir - Douglas-Fir	519	6	0.19
Faulted Stratal Low Mountains, Ponderosa Pine	646	7	0.17
Faulted Stratal Low Mountains, Ponderosa Pine - Douglas-Fir	803	8	0.22
Faulted Stratal Low Mountains, Ponderosa Pine - Shrub-Steppe	826	8	0.25
Faulted Stratal Low Mountains, Shrub-Steppe	603	9	0.12
Faulted Stratal Low Mountains, Subalpine Fir	847	5	0.26
Faulted Stratal Low Mountains, Western Juniper	366	7	0.12

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).