

## Geologic Setting of the Shasta-Trinity National Forest

The Shasta-Trinity National Forest is geologically quite diverse and complex. It is primarily contained within the Klamath Mountains and Cascade Range **geomorphic provinces**<sup>1</sup>, but also contains small portions of the Coast Range, Great Valley sequence and the Modoc Plateau province, with each having its own distinct characteristic and development.

The Klamath Mountains lie west of Interstate 5 and is the largest and most diverse province within the Forest. It is composed of six major rock belts which range in age from Ordovician (500 **mya**<sup>2</sup>) to Jurassic (135 mya). The province is composed of **accreted terranes**<sup>3</sup> that consist predominantly of marine arc-related volcanic and sedimentary rocks but ultramafic and other **ophiolitic**<sup>4</sup> rocks are also important components. Granitic **plutons**<sup>5</sup> that intruded during the Jurassic can also be found through this province.

The Cascade Province is located to the north of Redding and is composed of large **composite or strato-volcanoes**<sup>6</sup> consisting of lavas and **pyroclastic**<sup>7</sup> deposits. The range itself is only a small portion of a continuous chain of volcanoes that have formed slightly inland due to the upwelling of magma produced by the subduction and remelting of oceanic crust beneath the continent.

Located within the Cascade Province is the active stratovolcano, Mt. Shasta, and Medicine Lake **shield volcano**<sup>8</sup>, with Medicine Lake occupying its collapsed caldera. The area is characterized by a vast volcanic plateau broken by cinder cones, and small stratovolcanoes. Andesite and basalt lava flows are the dominant **lithologies**<sup>9</sup>. Other major lithologies include rhyolite, volcanic mudflows, **tuffaceous**<sup>10</sup> sediments, pyroclastics, ash and pumice deposits. These rocks vary in age from Pliocene (13 mya.) to Holocene (500 **ya**<sup>11</sup>).

### Geologic Time Scale

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<sup>1</sup> A large area that is characterized by similar features (e.g. lithology or rocks) or by a having a history that is significantly different than adjacent areas

<sup>2</sup> Million years ago

<sup>3</sup> Oceanic material that was added to the continent through time due to the collision and subduction of tectonic plates.

<sup>4</sup> A group of ultramafic, mafic rocks that have later been metamorphosed.

<sup>5</sup> The process of a magma body that has intruded into pre-existing rock.

<sup>6</sup> A large, steep sided volcano that is composed of felsic or "sticky" lava. These volcanoes can produce pyroclastic flows and sometimes explosive eruptions due to the characteristic of its lava.

<sup>7</sup> Broken rock fragments that were ejected during a volcanic explosion

<sup>8</sup> A large, shield-like volcano that is composed of viscous or "easy to flow" lava. These volcanoes produce lava flows that can travel great distances on ground. A current example of this type of volcano is Hawaii's most active volcanoes, Mauna Loa and Kilauea.

<sup>9</sup> A description of rocks by characteristics such as color, mineralogy, and grain size

<sup>10</sup> Sediment that contains up to 50% tuff or pyroclastic

<sup>11</sup> Years ago