

= Mount Thielsen =

Mount Thielsen , or Big Cowhorn (Klamath : hisc ? akwalee?as) , is an extinct shield volcano in the Oregon High Cascades , near Mount Bailey . Because eruptive activity ceased 250 @, @ 000 years ago , glaciers have heavily eroded the volcano 's structure , creating precipitous slopes and a horn @-@ like peak . The spire @-@ like shape of Thielsen attracts lightning strikes and creates fulgurite , an unusual mineral . The prominent horn forms a centerpiece for the Mount Thielsen Wilderness , a reserve for recreational activities such as skiing and hiking .

Thielsen was produced by subduction of the Juan de Fuca Plate under the North American Plate . Volcanism near the Cascades dates back to 55 million years ago (mya) , and extends from British Columbia to California . Thielsen is part of the High Cascades , a branch of the main Cascades range that includes Oregonian volcanoes less than 3 @. @ 5 million years old ; it is also a member of a group of extinct volcanoes distinguished by their sharp peaks .

The area surrounding the volcano was originally inhabited by Chinook Native Americans , and was later encountered by Polish settlers . One of the visitors was Jon Hurlburt , an early explorer of the area who named the volcano after the engineer Hans Thielsen . Later explorers discovered nearby Crater Lake . The volcano was not analyzed until 1884 , when a team from the United States Geological Survey sampled its fulgurite deposits .

= = History = =

The area was originally inhabited by Chinook Native Americans , who referred to the mountain as " Hischokwolas " ; the Klamath call it " hisc 'akwaleeas " . Jon Hurlburt , a Polish explorer , renamed the volcano after Hans Thielsen , a railroad engineer and builder who played a major role in the construction of the California and Oregon Railroad .

In 1884 a United States Geological Survey team headed by J. S. Diller began studying the mountains of the Cascade Range . Their intended destinations included Thielsen , which was climbed and sampled for its fulgurite variant . Thielsen 's spire @-@ like top is hit by lightning so frequently that some rocks on the summit have melted into a rare mineraloid known as lechatelierite , a variety of fulgurite . The mountain has earned the nickname " the lightning rod of the Cascades " .

Apart from study , Thielsen and the rest of the Crater Lake area features heavily into 19th- and early 20th @-@ century exploration . In 1853 , miners from Yreka first described Crater Lake ; one called it " the bluest water he had ever seen " , another " Deep Blue Lake . " The first published description was written by Chauncy Nye for the Jacksonville Sentinel in 1862 . Nye recalled an expedition of gold prospectors where they passed a lake of a deep blue color . Native Americans lived in the area and grew irritable towards new settlers in the area . In 1865 , Fort Klamath was built as a protective sanctuary . A wagon road was built to connect the Rogue Valley to the building . In late 1865 , two hunters ventured upon the lake ; more explorers followed . By then , the lake became famous for its distinctive color , and crowds flocked to see it . The first non @-@ Native American to stand on the shore of Crater Lake was Sergeant Orsen Stearns , who climbed down into the caldera . A friend , Captain F.B. Sprague , gave it the name " Lake Majesty . " Tourism continued until May 22 , 1902 ; on that day , Theodore Roosevelt designated the lake and surrounding area a national park .

= = Geography = =

= = = Regional = = =

The Cascade Range was produced by convergence of the North American Plate with the subducting Juan de Fuca Plate . Active volcanism has taken place for approximately 36 million years ; the nearby Challis Range features complexes as old as 55 mya . Most geologists believe

that activity in the Cascades has been relatively intermittent , producing up to 3 @, @ 000 volcanic calderas at a time . Frequent volcanism within the last 10 @, @ 000 years created complexes from Mount Garibaldi in British Columbia to north California 's Lassen Peak complex . Remarkably different from state to state , the volcanism ranges from large volcanoes to zones of many smaller geologic features such as lava shields and cinder cones . The Cascade volcanoes are divided into two large sectors , called the High Cascades and the Western Cascades ; Thielsen is part of the High Cascades , which are east of the Western Cascades .

= = = Local = = =

Diamond Lake , formed by one of Thielsen 's eruptions , lies to the west of Mount Thielsen and beyond lies Mount Bailey , a much less eroded and younger stratovolcano . Thielsen 's sharp peak is a prominent feature of the skyline visible from Crater Lake National Park . All three volcanoes are part of the Oregon High Cascades , a range that sections off the stratovolcanoes of Oregon that are younger than 3 @. @ 5 million years . The High Cascades include Mount Jefferson , the Three Sisters , Broken Top , and other stratovolcanoes and remnants .

Rock in the area ages from the Upper Pliocene and Quaternary . Basalt and basaltic andesite comprise newer volcanoes atop the High Cascades : major volcanic centers include Mount Hood , Three Sisters @-@ Broken Top , Mount Mazama (Crater Lake) , and Mount Jefferson . All have produced diverse eruptions , including both lava flows and pyroclastic eruptions , and variability in composition between dacite , basalt , and even rhyolite (except for Mount Hood , which is not known to have produced rhyolite) . Thielsen is part of a series of extinct volcanoes in Oregon termed the Matterhorns for their steep , spire @-@ like summits ; Thielsen is the highest at 9 @, @ 182 feet (2 @, @ 799 m) . Other Matterhorns include Mount Washington , Three Fingered Jack , Mount Bailey , and Diamond Peak . Unlike other mountains in the High Cascades , all these volcanoes became extinct 250 @, @ 000 to 100 @, @ 000 years ago , and their summits endured the last few ice ages , accounting for their distinct shapes .

= = Geology = =

Thielsen has been so deeply eroded by glaciers that there is no summit crater and the upper part of the mountain is more or less a horn . Thielsen is a relatively old Cascade volcano , and cone @-@ building eruptions stopped relatively early . Erosion caused during the last two or three ice ages remains visible . Subsidence of the last material in Thielsen 's crater moved its youngest lava more than 1 @, @ 000 feet (305 m) above the active crater .

On the mountain past lava flows are diverse , some as thick as 33 feet (10 m) , others as thin as 1 foot (30 cm) . Stack @-@ like figures composed of breccia and past flow deposits are as thick as 328 feet (100 m) . The placement of these flows suggest that they were generated by splatter emitted by fountains in the cone . On the sides of the mountain are bands of palagonite , a clay formed from iron @-@ rich tephra making up the body of the volcano . Basalt taken from the volcano contained pyroxene , hypersthene material , and feldspars .

Other notable formations in the vicinity include Howlock Mountain , Windigo Butte , and Tolo Mountain . Other than Crater Lake , little water flows on the surface . In canyons excavated by glaciers , small streams have formed .

= = = Composition = = =

The volcanic cone of Mount Thielsen sits atop prior shield volcanoes , and has a volume of 2 cubic miles (8 @. @ 3 km³) . The cone was built from basaltic andesite , a common component of other shield volcanoes in the Oregon Cascades , breccia , and tuff , and it is intruded by dikes . A coalesced volcanic cone , it formed as pyroclastics erupted and fountains spewed lava . Glaciers cut and deformed the cone , eroding its upper sector . This erosion opened the interior of Thielsen for observation . Within the cone , lava flows , pyroclastic flow deposits , and strata of tephra , and

volcanic ash , are easily visible . Potassium @-@ argon dating of deposits in the cone suggests that Thielsen is at least 290 @,@ 000 years old . Since its eruption stopped about 250 @,@ 000 to 100 @,@ 000 years ago , the period of eruptive activity was short in time . The eruptions of the cone came in three phases : a period where lava flows built up its cone , one where more explosive pyroclastic eruptions took place , and the final period , in which pyroclastic and material of lava @-@ based origin were erupted together forming a weak cone encircled by long deposits .

= = = Glaciation = = =

Glaciers were present on the volcano until the conclusion of the Little Ice Age , at the beginning of the 20th century . Pleistocene glaciers have largely eroded Thielsen 's caldera ? leading to exposure of its contents . The small Lathrop Glacier in the northern cirque of the volcano is the only extant glacier on Mount Thielsen . While the glaciation was extensive , volcanic ash from eruptive activity at Mount Mazama has almost certainly masked contents .

= = = Fulgurites = = =

Fulgurites (substances that form when lightning melts rock) on the volcano are restricted to the very pinnacle of the mountain , and are only found between the top 5 feet (2 m) and 10 feet (3 m) of its summit . Lightning strikes the summit regularly , creating patches of " brownish black to olive @-@ black glass " that resemble " greasy splotches of enamel paint " . These range from a few centimeters in diameter to long , narrow lines up to 30 centimeters (12 in) long . Their appearance also varies : while some patches are rough and spongy , others are flat . Inspection of the fulgurite reveals a homogenous glass over a layer of basalt ; in between , a stratum made of materials such as feldspar , pyroxene , and olivine exists .

= = Ecology = =

A grove of enormous incense cedars exists near Diamond Lake , and there is a forest of ponderosa pine at the nearby Emile Big Tree Trail . The Umpqua National Forest features swordferns and Douglas firs . Rocky Mountain elks , pronghorns , and mule deer , bobcats , black bears , and mountain lions live in the Fremont ? Winema National Forest . The forest 's rivers support populations of trout , and the lakes contain fish such as the largemouth bass . The forest is inhabited by avian species such as mallards , American bald eagles , Canada geese , and whistling swans . Peregrine falcons and Warner suckers also infrequently enter its boundaries .

The lower slopes of Mount Thielsen are heavily forested , with low diversity of plant species . A forest of mountain hemlock and fir grows up to the timberline at about 7 @,@ 200 feet (2 @,@ 200 m) . Near the peak of the volcano , whitebark pine prevails .

= = Recreation = =

Mount Thielsen lies in the southern section of the Mount Thielsen Wilderness , which is part of the Deschutes , Umpqua and Fremont ? Winema national forests . On the west , the wilderness borders the Oregon Cascades Recreation Area , a 157 @,@ 000 @-@ square @-@ mile (406 @,@ 628 km²) area set aside by Congress in 1984 . The wilderness and forests offer several activities related to the mountain , such as hiking and skiing . The wilderness covers 55 @,@ 100 acres (86 @.@ 1 sq mi) around the volcano , featuring lakes and alpine parks . It also contains 26 miles (42 km) of the Pacific Crest National Scenic Trail , accessible from a trailhead along Oregon Highway 138 . In 2009 the trail was selected as Oregon 's best hike . Three skiing trails exist on the mountain , all of black diamond rating . They follow several trails through the wilderness from the bowl of the mountain .