

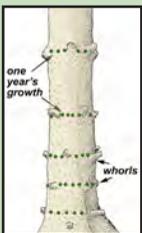


H A spur leads west from the High Trail up into a unique century-old spruce forest—the oldest of the stations in our successional tour. By the early 1900s, hillsides above Douglas and Treadwell were completely clearcut. The 1979 color infrared NASA air photo above shows the extent of the resulting 4-mile-long, 550-acre conifer forest. Few trees here are much older than 120 years. At station H, most of the cut stumps from the previous forest have rotted away.

Unlike the more developed portions of Treadwell, the duff and understory plants in this hillside conifer forest remained intact after logging. Insufficient soil was exposed for alder, willow or cottonwood to germinate, as they did throughout the more trampled town- and mill sites.

This second-growth forest has a thicker shrub layer than most century-old clearcuts, where typically very little grows in the understory. There's plentiful devil's club (*Oplopanax horridum*) and false lily-of-the-valley (*Maianthemum dilatatum*). Let's ask a series of questions that may shed some light on the Treadwell clearcut's unusual disturbance history.

First, what is the ratio of spruce to hemlock? You can tell spruce trunks by their shallow "potato-chip" bark, and—in this forest—by the whorled pattern of branch stubs. Hemlocks—lacking that pattern—comprise less than 5% of this stand. The whorled-branches tell us that as saplings, spruces grew up far apart, with plentiful sun. For some reason these trees did not come in thickly, as in most post-logging stands.



Now, look up. How would you describe



the canopy of today's forest? Green crowns are mostly limited to the top 20% of the trees, and branches are short. Few of the crowns intersect. More light gets through this canopy to the understory shrubs than in most post-logging forest.

But why is this forest atypical?

Consider its early growth. Many have commented on the abundance of dead trees in the early photos of Treadwell, taken before the forest was completely clearcut. The cyanide plant was probably not the sole culprit, as trees were dying long before it went into operation. Perhaps its predecessor—the chlorination works near the 300-stamp mill—was a factor in tree mortality.

Spruce is generally more tolerant of air pollution than is hemlock. Those we have cored in this forest germinated around the year 1900. They had wide rings until mid-century, then steadily slowed to about 15 rings per inch. The result today is a slow-growing, sparse-crowned, spruce-dominated forest with unusually rich shrub layer for its age.

I The bench above the famous cave-in site has become the launch-pad from which 105 mm howitzer shells are fired across the channel into avalanche slide paths along Thane Road. Although Treadwell is relatively free of snow avalanche hazard, that's not the case on the mainland, where higher, steeper mountains tower directly over homes and thoroughfares. How many of the 19 avalanche paths crossing Thane Road can you count from here?



J Return along the high road for 1200 feet and take the spur up (south) to the Glory Hole overlook. On the left, below, is the foundation of the original 240-stamp mill. For some reason, huge redwood timbers—rather than native spruce—were used in this building, perhaps because of their rot resistance.

Paris Creek, which forms the nearly vertical waterfall



Treadwell Glory Hole, prior to complete clear-cutting of the slopes above. Note that many of the standing trees were already dead, killed by air pollution. Also, notice the pale color of the freshly exposed Treadwell diorite—91 million years old—since weathered to a much darker grey. Tenacious spruce and alder now cling to the cliffs. *Alaska State Library, P226-342.*

cascading down the south wall of the Glory Hole, was the site of Treadwell's original gold discovery by Pierre Erussard in 1881. At that time it was probably a nice little pink salmon stream. Today, its final, under-ground run to Cave-in Cove makes a good contender for the most altered stream in Alaska.

In the photo above, the Glory Hole is much paler than today; the rock has weathered darker. Here, miners exposed the Treadwell diorite, a narrow dike intruding the matrix of black slate we saw earlier down at the cave-in.

K Return down the Glory Hole spur and turn homeward (northeast) on the "high trail." Station K is just upslope from the old power plant and the small transformer room—the most intact of the Treadwell structures. From this higher vantage you can admire both the solidity of human architecture and the "resourcefulness" of the roof-top forest. For more information on post-human succession, read *The World Without Us*, Alan Weisman, 2007, Thomas Dunne Books, NYC.

This trail guide is part of a series of interpretive products created in 2010 by Discovery Southeast for trails on CBJ land. Other creations include natural history signs, a summary guide to CBJ trails, and free web products. See also the King-Geraghty guide to Treadwell mining history, available at the Juneau-Douglas City Museum.

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Natural History of Treadwell Mine Historic Trail

Guide to
interpretive
stations

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Lettered stations

There are 2 interpretive guides to this trail. One, by Mary Lou King and Jim Geraghty, focuses on *mining* history. Its stations are identified by *numbered* sign posts.

This brochure focuses on *natural* history, particularly the ways in which nature has responded to the abandonment of Treadwell. The theme of our walk is *succession*—the change in plant communities over time. To distinguish our stations from those of the King-Geraghty guide, we use *lettered* posts (A through K). Our interpretive loop heads out along the “low trail” and returns along the “high trail.”

Each season shows you different sides of Treadwell. Summer is most verdant, but in winter, when ferns and salmonberries lie down and alder leaves fall, it’s easier to locate the old building foundations. The diverse architecture of tree branches is also more apparent after leaf-fall.

A Trailhead sign—a good place to get an overview of bedrock geology and plant succession as they relate to mining history.



B For more than 200 yards, the Treadwell trail is fringed by Sitka willows (*Salix sitchensis*), quite large and old for their species. Turn over the leaves and look for fine silky hairs; Barclay willows (*S. barclayi*) have hairless, “waxy” undersides. Try counting rings in fresh stumps; some are more than 60 years old. Notice also the *stump sprouts*; cutting doesn’t necessarily kill these resilient little trees.

C This station is below the Vanner Room of the old 300-stamp Mill. The largest deciduous trees are black cottonwoods (*Populus trichocarpa*). Like willows, they have

tiny, plumed seeds that need bare mineral soil to germinate—in this case on the deposits of silty streams running through the abandoned mining town. Beneath the cottonwoods is a lush thicket of goatsbeard (*Aruncus sylvestris*) salmonberry (*Rubus spectabilis*), and cow parsnip (*Heracleum lanatum*)—good summer habitat for songbirds and small mammals.

Alaskan deciduous trees are short-lived compared to conifers. As you continue, look for spruce saplings in the understory of this cottonwood stand. Once they gain some height, spruce can grow about one foot per year. What will this forest look like in 100 years?

Here’s some history to bear in mind as you think about the ages of trees and shrubs. Industrial activity dropped sharply after the great cave-in of 1917. In 1926, a fire burned most of Treadwell and Douglas. A foundry southeast of the old Mexican Mine (southeast of this map) continued operations until 1944, but throughout most of Treadwell, succession was already well underway on the ash from the great fire.

D Red alders (*Alnus rubra*) line the trail below the old power plant ruins. These



are the most successful trees at Treadwell. Unlike their shrubby, multi-trunk cousins the Sitka alders (*A. crispa*), reds ultimately grow to majestic size, with moss-covered trunks and large-diameter branches. Alaskan red alders can live much longer than those in Washington or Oregon—up to 2 centuries. So far, few spruces grow beneath them; these alders will endure for many more decades.

E Take the spur trail out to the beach by the Bradley memorial plaque. Try to picture the elaborate wharf system—outlined in white on the map below—that extended from here out to the cement shell of the salt-water pumping station. Only this ruin and the stubs of pilings remain.

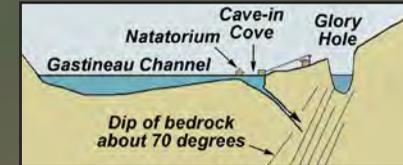
We have the mines to thank for Sandy Beach; natural sand beaches such as those at Eagle River are rare on the CBJ. The Treadwell beach is composed of “tailings,” rock brought up from the mines, crushed, separated, then dumped as sand slurry on the tidal flats.

Meadow herbs now grow on sandy tailings raised above extreme high tide by glacial rebound. Species include ryegrass (*Elymus mollis*), angelica (*Angelica lucida*), beach pea (*Lathyrus maritima*) and black lily (*Fritillaria camschatcensis*).

F Most of these spruces (*Picea sitchensis*) germinated just after the fire of 1926, out-competing the deciduous trees prevalent in most of lower Treadwell. Compare the understory of this conifer patch to that of the richer surrounding alder and cottonwood forest; very little grows in the dense shade and acidic needle litter. For birds and small mammals, this is inferior habitat. (Station I is in an older spruce forest with richer understory.)



G Look across Cave-in Cove to the exposed, steeply dipping slate beds, and the fine, marine sediments piled on top of them. The mines penetrated 2800 feet down into the black slate beneath the Glory Hole. In 1917, the shoreline beneath the Natatorium (an indoor pool on pilings) gave way, and a roaring waterfall disappeared into the earth. In a few hours, the entire subterranean labyrinth of the Treadwell, 700-ft, and Mexican Mines was flooded.



This bouldery beach is a good place to examine the local diversity of rock types. “Black slate” (a mix of slate and phyllite) outcrops near the cove. The large, rounded granitic boulders do not derive from local bedrock but were delivered here by glaciers thousands of years ago.



- existing trails
- stream
- historic features**
- road
- raised track
- pipe
- powerline
- structures**
- industrial
- facilities
- lodging
- storage

- 1 Vanner Room
- 2 300-stamp mill
- 3 power plant
- 4 oil tanks
- 5 superintendent's mansion
- 6 wharf
- 7 M&M
- 8 boarding house
- 9 “new” office building
- 10 oil tank
- 11 hoist
- 12 shaft house
- 13 oil tank
- 14 240-stamp mill
- 15 Treadwell Club
- 16 Natatorium
- 17 oil tank
- 18 700-foot mill
- 19 ore bin
- 20 hoist

