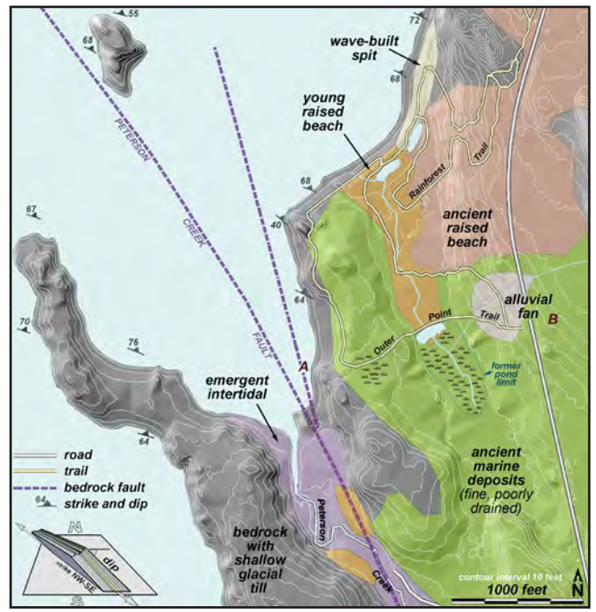
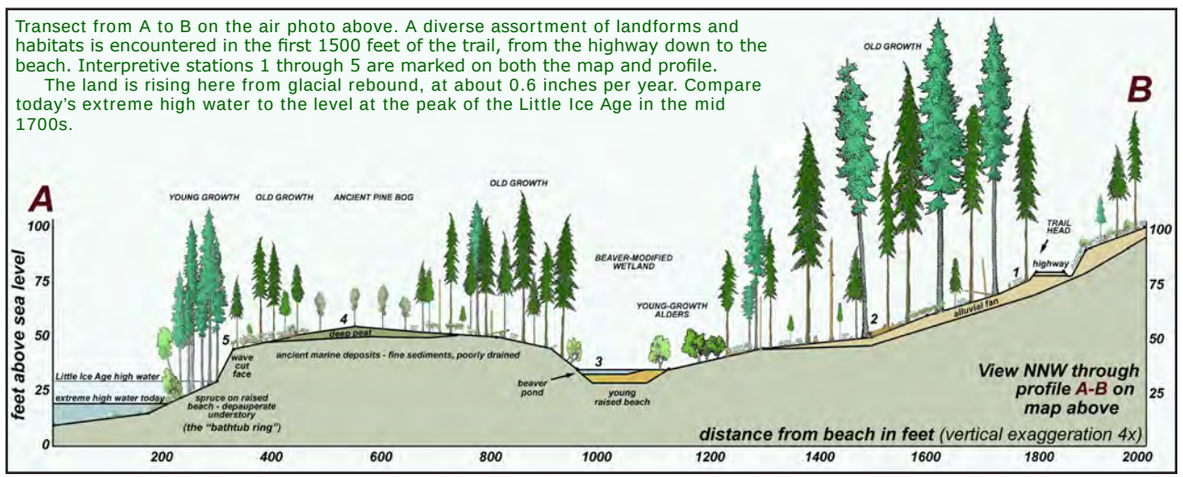


Lay of the land

Peterson Creek runs parallel to the coastline within a NW-striking geologic fault, or fracture zone. Scrubby forest and bog on poorly drained soils is generally underlain by fine marine sediments (green) from a time of higher sea level, about 10,000 years ago. Larger trees at the beginning of the trail occupy a small stream deposit (alluvial fan–see also Profile A-B). Ponds near the junction with the Rainforest Loop formed more recently behind a wave-built spit. Returning southward along the Outer Point Loop, you follow the almost imperceptible slope of a "young raised beach." Forest here is mature but not yet old growth.

Transect from A to B on the air photo above. A diverse assortment of landforms and habitats is encountered in the first 1500 feet of the trail, from the highway down to the beach. Interpretive stations 1 through 5 are marked on both the map and profile.

The land is rising here from glacial rebound, at about 0.6 inches per year. Compare today's extreme high water to the level at the peak of the Little Ice Age in the mid 1700s.



This trail guide is part of a series of interpretive products created in 2010 for trails on CBJ lands by Discovery Southeast. Other creations include natural history signs, a summary guide to CBJ trails and free web products.

Discovery Southeast

Founded in 1989, DSE is a nonprofit organization promoting direct, hands-on learning from nature through natural science and outdoor education for youth, adults, and teachers. Discovery naturalists deepen the bonds between people & nature.

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The City and Borough of Juneau/Parks & Recreation welcomes you. Parks & Recreation manages 50 miles of trails and fosters innovative stewardship of its diverse resources. Collectively, along with our partners Alaska State Parks, the U.S. Forest Service, Trail Mix and SAGA, 135 miles of trails are managed--connecting our community with Juneau's magnificent landscape.

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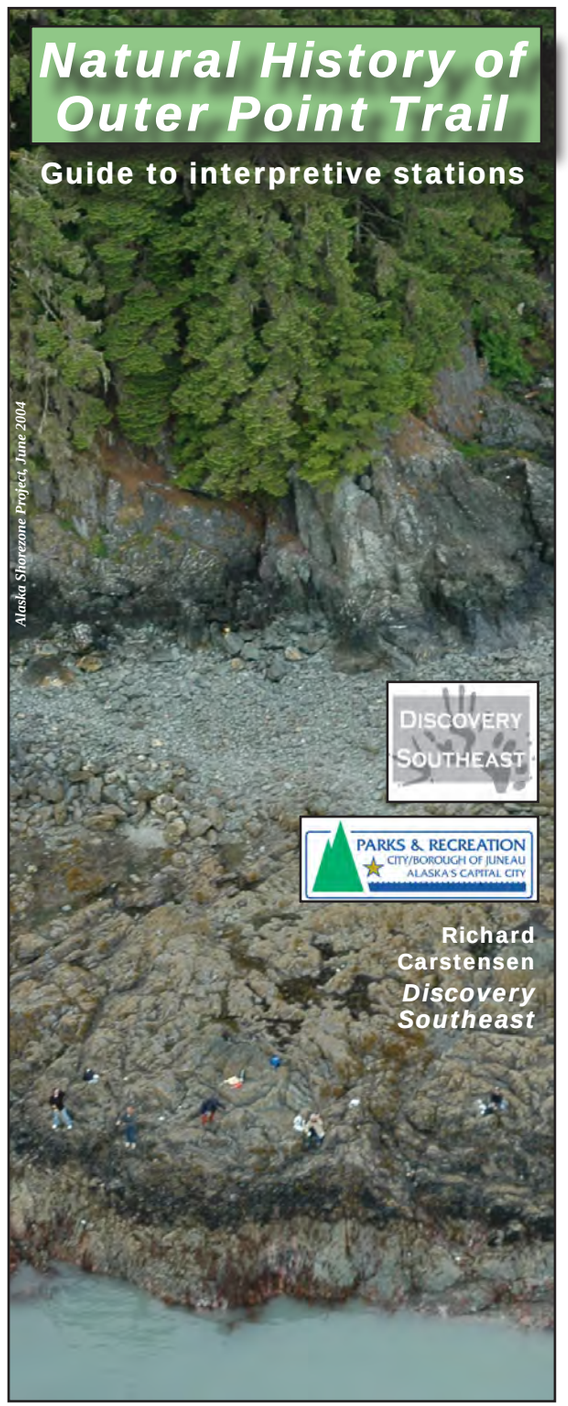
Natural History of Outer Point Trail

Guide to interpretive stations



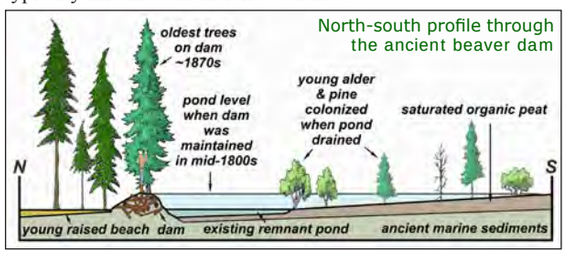
Numbered stations

Interpretive stations are marked by numbered posts along the Outer Point Loop Trail and show on the aerial photo (flip side).

1 Trailhead sign This brochure describes the Outer Point Loop Trail and immediate vicinity. For a broader, watershed perspective, check out the 3-panel Discovery Sign at the trailhead. The sign covers bedrock geology, glacial history, Tlingit land use, and the outstanding fish and wildlife values of the greater Peterson Creek watershed that empties into the protected estuary framed by Outer Point.

2 Large-tree old growth The tallest trees on the loop trail occupy the gently sloping alluvial fan of an ephemeral tributary to Beaver Creek (geology map and profile, flip side). In the creek bed, look for flat chips of slate. This lime-rich, easily disintegrated rock underlies many of Juneau's finest large-tree forests, especially where it composes stream fans and flood plains, relatively free of impermeable layers that elsewhere result in high water tables and stunted tree growth. During winter storms, the multi-canopied forest intercepts more snow than other habitats. Deer find food here when the snow is up to their bellies in neighboring peatlands and scrub forests.

3 Beaver legacies Walk down to the platform just west of Beaver Creek. Look south over the small pond and long wet meadow. You're standing on a beaver dam, abandoned in the 1870s, to judge from tree ages. Imagine water level at the top of this dam; probable pond extent is shown on the flip-side geology map. Beaver have come and gone in this valley for millennia, each generation adding to the foundation of their predecessors, resulting in an unusual combination of deep peat, and–since the last flooding–young alders that you don't typically find in such ancient wetlands.



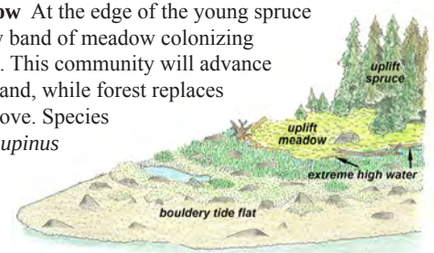
4 Dome bog Unlike the beaver wetland at station 3–which occupies a valley–this habitat takes its name from the gently domed surface; sphagnum peat is deepest in the center. Only scattered lodgepole pines (*Pinus contorta*) tolerate the saturated, acidic soil. They're small but ancient, growing at about 100 rings per inch of radius! The pines appear to have

colonized as a cohort in the mid 1700s, perhaps after fire, or drought that promoted seed germination.

5 The "bathtub ring" Pause at the top of the stairs leading down to a smooth, gently sloping surface. Notice the almost complete tree species turnover, with western hemlocks (*Tsuga heterophylla*) on top and Sitka spruce (*Picea sitchensis*) below. At the peak of the Little Ice age in the mid 1700s, high tides reached to the base of the escarpment (profile, flip side). Although taller than the hemlocks, the spruces are much younger; all colonized a former beach, revealed as relative sea-level declined (the bathtub ring"). The largest spruce at the base of the stairs germinated in about 1870.

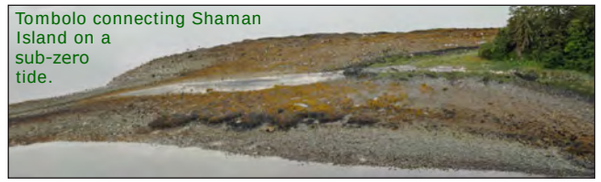
One branch of the Outer Point Loop Trail remains in the forest at the top of the escarpment. But let's go out onto the beach, following the dotted line on the flip-side map.

6 Uplift meadow At the edge of the young spruce forest is a narrow band of meadow colonizing uplifted tide flats. This community will advance onto former tideland, while forest replaces meadow from above. Species include lupine (*Lupinus nootkatensis*), silverweed (*Potentilla anserina*) and invasive dandelion (*Taraxacum officinale*). This forest-fringe belt is a magnet for the eaters of leaves, roots and berries, and those who prey on them.



7 Bedrock "Strike and dip" symbols mark beach exposures on the flip-side geology map. Imagine a tipped-up book, with its spine pointing northwest (the strike) and the pages dipping at an angle of 64° below the horizontal. That's the orientation of most of the layered, metamorphic rocks at Outer Point, displayed so clearly along this fascinating beach. Strike and dip explains much about the basic "grain" of the country, from these fine-scale outcrops to broad-scale alignment of major shear zones such as Gastineau Channel.

The mid-Cretaceous bedrock (~120 million years old) alternates between relatively solid schists and metafelsite dikes, to softer slate, phyllite and greywacke. The photo above shows a contact between these 2 rock types. Continuing along the beach, you'll find cliffy headlands composed of the *competent* schist. Gentler, inward-curving shorelines were eroded into more *friable* (easily crumbled) rocks.



8 Disappearing spit A tombolo is a spit connecting an "island" that's not really an island at low tide. The Shaman Island tombolo is only exposed very briefly at the lowest tides of the month. ***Beware!*** It's easy to be distracted by Shaman's rich intertidal display, and get stranded out there as the tide creeps back in!

9 Infestation Because it so aggressively invades beach fringe communities critical to people and wildlife, perennial sow-thistle (*Sonchus asper*) is one of the most threatening non-native species in Southeast Alaska. In bloom, sow-thistle is quite obvious, but when flowers are lacking, even large patches may be overlooked. Study the leaves, and see if you can locate more sow-thistle as you follow the edge of vegetation.

10 Crescent beach At station 7, we noted that beach type varies with resistance of bedrock to erosion. Imagine yourself exploring "Back Douglas" 1000 years ago with 20 companions in a 30-foot redcedar canoe, acquired in trade from the Haida. Where would you have camped? Studying the flip-side air photo, consider proximity to food and water, visibility of approaching enemies, and ease of beaching or launching your fragile-hulled craft at any stage of tide. No one site is optimum, but where is the best compromise?

11 Spit forest None of the crowded spruce trees on this elongated berm were present when Joseph Whidbey's survey boats rowed by in 1794. When high tides coincided with northerly gales, waves washed nearly to the top of this storm-built spit. It

was probably covered with meadow vegetation similar to the outer ridges at today's Eagle Beach.

What clues tell you this forest is young? Consider: tree species; size distribution; canopy closure; understory (or lack of it); and depth of organic material. How could you prove this landform was created by waves? One good test is to dig a hole. Beneath only 5 inches of organic material lie wave-tossed pebbles, very similar to those exposed on the beach downslope.

12 Back berm pond Check out the 10-foot contours on the flip-side geology map. Runoff from slopes now traversed by the Rainforest Trail encountered the barrier of the Little-Ice-Age spit, collecting in these back-berm ponds. At higher sea level, they were probably tidal lagoons, filled through breaches in the spit. Today, these are isolated, blackwater ponds, so overhung by young spruces that they're hard to spot on the air photo. The ponds are rimmed with skunk cabbage (*Lysichiton americanum*), pond lily (*Nuphar polysepalum*), and swamp horsetail (*Equisetum fluviatile*).

13 Young raised beach South of the ponds, the Outer Point Loop Trail slowly converges with tiny Beaver Creek. The flip-side geology map calls this surface a "young raised beach" extending nearly a quarter mile inland. Forests here are pre-Little Ice Age, but developed within the Neoglacial, a period of generally cooler temperatures extending back about 3000 years. Glaciers came and went throughout that time, with corresponding sea-level incursions along Beaver Creek. Although soils are somewhat deeper than those beneath the spit forest (station 11), they likewise overlie beach deposits of sand, gravel and cobbles.

Look for mossy, cut stumps here. Loggers yarded out these trees with cables, about 500 feet north to Crescent Beach.

14 Winter deer foods We've looped back onto the small alluvial fan that we first encountered at station 2. Some of the spruces here are quite large, but many trees have fallen in recent decades, opening gaps in the canopy. In some places near the trail, increased sunlight fosters an almost complete carpet of winter deer forage, especially ground dogwood (*Cornus canadensis*) and five-leaved bramble (*Rubus pedatus*). Leaves of these plants remain green even under snow, long after the more tender summer leaves such as twisted stalk (*Streptopus*) have yellowed and wilted. Optimal winter habitat is a mix of large- and small-tree forests, some gappy, some closed, offering deer a choice of food and cover for any weather condition.