

*This trail is dedicated in loving memory of
Ranger Margaret (Maggie) Mary Yurick
1954-1990*



*May all who walk here share her love for the
beauty and wonder of the earth.*

Photo courtesy of Loretta Yurick

Welcome to



Captain Cook

State Recreation Area

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This Land Through Time

An interpretive nature trail

Revised 2016



1. Welcome.

This 1 mile-long trail starts in a northern boreal forest, also called taiga, that is a mixture of old cottonwoods, younger white spruce, and very young birch and alder, with an undergrowth of highbush cranberry and other shrubs.

These rocks and this water have been here, in various arrangements, for millions of years, but let's begin with the glaciers of the last ice age that covered most of this area. Their melting water flowed into Cook Inlet and as they retreated they left sand, silt, bare rocks, and gravel. Over time, plants began to grow and animals followed. Finally, people came to this land.

The Dena'ína (pronounced De nine'a) arrived about 1,000 years ago on the Kenai Peninsula. Finding the area rich in resources with a moderate climate, they settled along the rivers and sea coast. They are one of eleven Athabascan groups in Alaska.

There are about 800 members of the Kenaitze group of the Dena'ína now living in this area. They have a rich heritage that connects them to the land. As you follow this trail, you will find many references to the ways the Dena'ína use plants in their daily lives. These customs are being passed down to today's generation.



Wild Rose, *Rosa* sp.

Please leave this guide for our next guests in the box provided at the end of this nature trail.

Thank you.

Illustrations of white spruce, cottonwood and paper birch courtesy of "Guide to Alaska Trees" by the U.S. Department of Agriculture, US Forest Service

Illustrations of wild rose, club moss, dwarf dogwood, horsetail, fireweed, and devil's club courtesy of the Alaska Department of Fish & Game

Illustration of ninchil from "Shem Pete's Alaska" courtesy of University of Alaska Press

Photos on front cover and posts 6,7 and 11 courtesy of Edward Brewer.

*Resources: "Tanaina Plantlore, Dena'ína Kétúna"
An Ethnobotany of the Dena'ína Indians of Southcentral Alaska.
By Priscilla Russell Kari, Alaska Native Language Center, Fairbanks, Alaska*

14. The Aleutian Mountains mark a geological event.

You can see the Aleutian Mountains across Cook Inlet. This range marks the border of a fantastic geological event.

Due to tectonic motion, the Pacific Plate is pushing against the lighter Continental Plate. The old sedimentary deposits on the top of the Pacific Plate are crumpled over the Continental Plate, forming the Kenai Mountains. The heavier part of the Pacific Plate is subducted, or pushed, deeper and deeper under the Continental Plate and is heated until it eventually breaks through in volcanic action.

To your left, beyond the point of land, is Mt. Redoubt which erupted in 1989, 1990, and 2009. In front of you is Mt. Spurr which erupted in 1952 and 1992. In 1994 NASA tested a robot on Mt. Spurr; it fell into a crater and had to be rescued by a climber. Mt Spurr is the start of this range which goes to the tip of the Aleutian Peninsula.

This landscape is dynamic, changing slowly over time. Many people have passed through. They too change and move on. Perhaps you have been changed in some way because you came here.

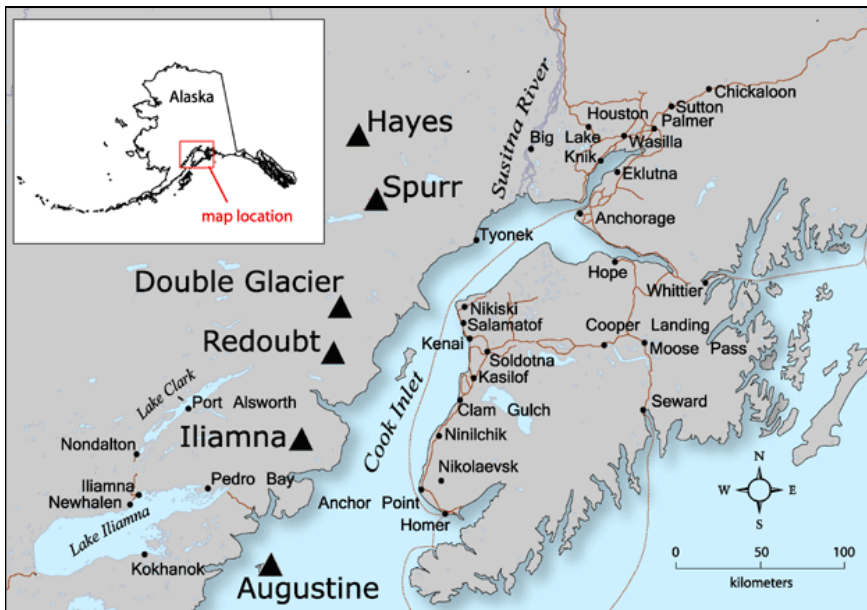


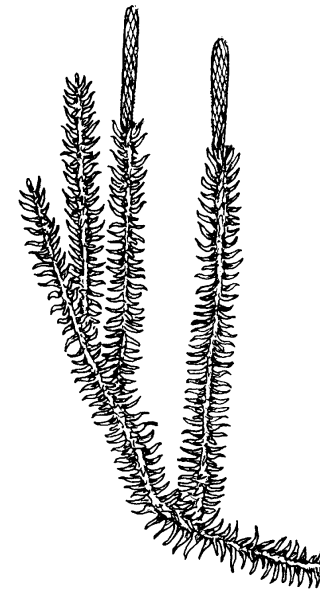
Illustration courtesy, Alaska Volcano Observatory

2. Glaciers were here first.

Have you seen the huge boulders in Cook Inlet? How do you suppose they got here? How do you suppose this boulder got here?

Many thousands of years ago, glaciers carried material as they moved. Glacial soils lack uniformity in their composition, unlike rocks in stream beds. Large boulders, called erratics, were left behind. As you walk along this trail, see how many more erratics you can spot.

Notice that this boulder contains an entire community of life, including a tree! Please do not climb on it! Let this little world live so it can grow and be enjoyed by others who walk here.



Club moss, *Lycopodium sp.*

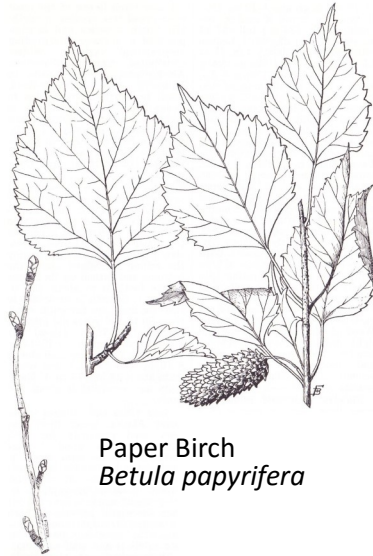


Dwarf dogwood,
Cornus canadensis

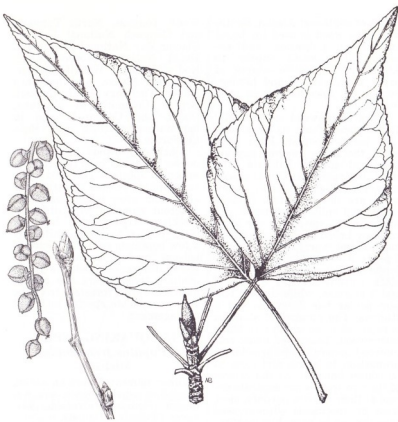
3. The forest came next.

A shallow layer of top soil eventually established and plants and trees began growing. Soils in Alaska tend to be shallow, because decomposition occurs slowly here due to our cold climate. As a result of shallow soils, plants have shallow root systems and as you walk along you may have to navigate over those that are in the path.

Cottonwood and birch seedlings are the first trees to become established on this young, shallow soil because they need lots of sun. They grow quickly but do not live long. They provide shade for the white spruce seedlings, which reach full growth after the cottonwood and birch die. The mature forests in this area are composed mainly of spruce trees, and as they die the cycle will continue. There are many reasons mature forests can change over time, including fire, disease, wind, old age or insect attacks.



Paper Birch
Betula papyrifera



Black Cottonwood, *Populus trichocarpa*

The Dena'ina favored cottonwood for smoking fish. They also used the resin from its buds, mixed with lard, to make a salve that was especially effective for babies' diaper rash.

13. Cook Inlet molds the landscape.

The Kenai Peninsula was formed from materials left by retreating glaciers, and, in some places, glacial till—gravel and small stones—up to 2,000 feet thick. These bluffs are composed of glacial till and erratics standing on a base of very old sedimentary rock. There are also at least six visible ash layers, deposited here from historic eruptions volcanoes across Cook Inlet.

The bluffs are being eroded by tides, storms, wind and bank seepage. Humans also contribute by climbing on them. Please help protect these bluffs by using only designated trails to get down to the beach. Trees and plants growing on the bluffs help to stabilize them, and as you walk along you will see what has happened to many of these as the bluffs continue to erode.

As you look across Cook Inlet you will see many erratics that have been dropped by retreating glaciers and fallen from the eroding bluffs. Does this give you some idea of where the bluffs might have stood at one time?

Cook Inlet has one of the greatest tidal fluxes in the world, almost 30 feet at the upper end. The waters are in continuous motion as the incoming tide moves up the east side of the inlet and the outgoing tide flows south down the west side.

The inlet waters are loaded with silt from the eroding bluffs. Silt or "rock flour," rock powdered by the glaciers, flows into the inlet from the rivers and streams that drain the glaciers. This silt moves back and forth with the tides, and slowly the minute particles settle onto the mud flats along the shore. Some silt eventually flows into the ocean, but most stays in the inlet. What do you think the inlet will look like in 500 years? Will it be larger or smaller than it is now?

12. Wetlands have important functions.

This wetland was formed as water from the surrounding area drained into it, making it boggy for part of the year. Wetlands have many important functions in nature. They support a variety of wildlife who use them for breeding, feeding and shelter. They provide natural flood control by holding water and releasing it more slowly into river systems. Wetlands also act as natural purification systems by removing silt, and filtering out and absorbing many pollutants.

The most common plant found here is fireweed. Local people say that when all the blooming flowers disappear from the flower head that summer is over.

This wetland is wet when the snow melts, but dries during the summer. It is likely transforming into a meadow, a drier place that supports plants like you see here. This would be a natural succession as drainage patterns change, debris from plant life builds up and absorbs water, and different plants move in.



Fireweed, *Chamerion angustifolium*



4. White spruce dominate a mature forest.

White spruce trees have short, sharp needles. Each horizontal layered tier of branches represents one year of growth; you can estimate its age by counting its tiers!

Many of the spruce here have blown down, usually as a result of a spruce bark beetle attack, an insect about 1/4-inch long. Most larvae turn into pupae in 10-15 days, during the first winter, then grow into beetles. The second winter they hibernate in the litter at the base of the tree; when the temperature rises enough the following summer, adult beetles emerge and attack another tree. During heavy infestation, many beetles can attack a tree and the galleries may circle the trunk and it dies by effectively being “girdled.” It generally takes 3 years for a bark beetle attack to turn a healthy tree into a skeleton, with no needles left. As you walk to marker #5 you will see lots of white spruce that have been blown down as a result of beetle infestations.

White spruce provide food for animals. Red squirrels eat the seeds in the cones, leaving large piles of bits and pieces called middens; they also store large numbers of cones in tunnels or caches that can be three feet deep and 15 to 18 feet in diameter. Porcupines and bear eat the sapwood.

The Dena’ína used all parts of the spruce tree: logs were used for building, rotten logs for tanning moose skin; the sap, to heal burns or cuts. Some say it was an effective medicine for tuberculosis. Dena’ína sealed their birch bark canoes and baskets with spruce pitch, and chewed it like gum. The roots, used as rope or string, lasted longer than sinew.

5. Plant succession happens over time.

At one time this glacial erratic was completely bare. Then lichens, which can be seen around the bottom, attached themselves. These primitive plants can live on stone, as they have a mutually beneficial relationship between a fungus and an algae. The fungus provides physical structure and the algae provides food by photosynthesis. The chemicals which result from their growth begin to break down the rock creating soil for mosses to grow.

Moss is another primitive plant. Its roots creep into weak spots of rock, producing small cracks where other seeds can germinate and take hold. Over time a small layer of soil accumulates and plants, shrubs, and even trees can grow on these rocks! This is called plant succession. Many thousands of years from now this boulder may be totally broken down and become part of the soil.

See how many different plants you can count on just this one boulder. Notice the thick “bed” that rests on top. This is soil developing before your eyes. This is a fragile world, so please help protect it by not climbing on the rock.



White Spruce, *Picea glauca*

11. Birch trees feed moose.

These odd looking “bushes” are birches that moose have chewed. The trees respond by growing many branches, and the tops of these birches often look like clumps. These trees are an important source of food for moose, and they will continue to chew off the tops until they can no longer reach them. Once out of danger, the tree can mature.

There are resident cow moose at Captain Cook SRA and they often travel this trail as a way of conserving energy. Look for moose droppings or pellets as you walk and keep in mind that cow moose, like most mothers, are very protective of their young.

The Dena’ína used the hard wood of the birch for spoons, dishes, snowshoes, and boat frames and ribs. The wood makes good long-lasting fires. Cups, baskets and baby cradles were made from the birch bark, which was also used to line cache pits.



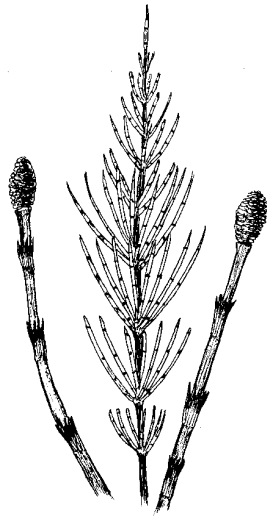
10. Name that plant!

What do the plants covering the ground in this area look like? What name would you give them?

For example, horsetail LOOKS like a horse tail! It is a very primitive plant. Fossil remains have been found in Devonian age rocks 400 million years old. They reproduce with spores, and can be dormant for up to 20 years when climate conditions are unfavorable.

They have a partial coating of silicon dioxide making them harsh to touch, but excellent for scouring pots and pans or used as sandpaper.

The Dena'ína used the tubers for food. They burned the stem and leaves of the plant and placed the ashes on sores. The root was heated and placed on aching teeth.



Horsetail, *Equisetum* sp.

The plant with white flowers in the spring later forms red berries.

Thorns line the entire plant. What name would you give this plant? The common term is Devil's Club. You can see why!

The Dena'ína baked, then shredded, the inner bark of the root until it was soft. Then it was placed on swollen glands, boils, and sores and banded to draw out infection.



Devil's Club, *Oplopanax horridus*

6. Dead trees are important.

Dead birch trees play an important role in the forest. Notice the hole at the top of the dead tree behind the marker. Squirrels and birds make their homes in such holes. Perhaps a woodpecker lives here! Smaller holes found in dead trees are often the result of birds pecking in search of insects such as carpenter ants and spruce bark beetles that live in dead wood.

When dead trees fall to the ground, their rotting wood makes safe hiding places for mammals such as voles and porcupines. Larger animals will break apart the soft wood to find food. Colonies of lichen, moss and fungi grow on the bark of the dead trees. Shelf fungus is growing on a nearby fallen birch. They help rot the tree and release the nutrients into the soil.



7. Burls grow on tree trunks.

Some of the cottonwood trees in front of you have large growths, called burls, on their trunks. Some scientists think that a burl is made when the tree surrounds invading insects to keep them from doing further damage. Others believe it is a result of a genetic defect in the tree.

Dena'ína found that birch burls were good fire starters. They would light one and bring it to the next place they wanted to make a fire.

As you walk past the marker, watch for a nest hole in a tree snag.



8. The Swanson River flows here.

The Swanson River flows from its headwaters and empties into Cook Inlet below you. It is affected by the extreme tides of Cook Inlet that influence the depth and clarity of the water. The grey mud that you see has been washed in by the tide.

The river water is brackish, a mixture of salt and fresh water. The plants that grow next to the river are specially adapted to tolerate high levels of salt. Rainbow trout can be found in the river; a few sockeye (red) salmon enter the river in July and a large number of coho (silver) salmon enter in August.

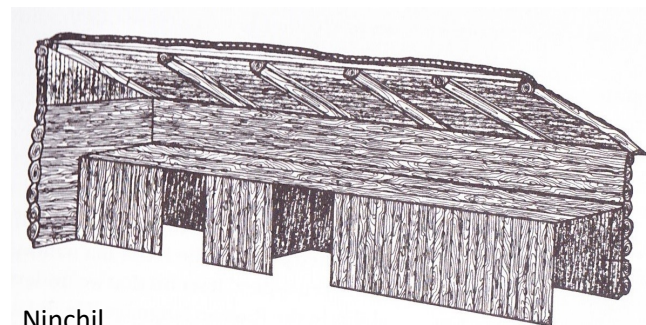
9. The Dena'ína people left caches and ninchils.

Here is a place where Dena'ína people lived. We know this because they dug cache pits near their homes, and used them to store fish.

Barely visible next to the cache pit is a depression left by a ninchil, a Dena'ína house that was built half above ground and half below ground, with dirt covering all sides. You can see the outline of a large main room which would have had a central fire pit and a smoke hole in the roof. The entrance faced the water, and the small room at the rear was used as a sauna or retreat for menstruating women. The Russians called these barabaras (pronounced Ba-rab'-aras). Semi-underground homes are very efficient in this climate and are being re-discovered in areas that experience intense heat or cold.

A Dena'ína village could be very small, with a simple ninchil, or have numerous ninchils spread out along a river terrace or bluff. A large ninchil might have 25 inhabitants. The Dena'ína developed a complex system of beliefs and traditions that connect them to the earth and all living things. To show respect for the fish and animals they killed, they returned fish remains and clam shells to the water, and burned refuse from animals. By showing this respect, they were sure there would be fish and animals for the people in the future.

Since tools were made from bark, skin and wood, and everything they owned was carried with them when they moved, there are no artifacts in these ninchils and caches. Please do not enter or disturb them.



Ninchil

Courtesy "Shem Pete's Alaska"

University of Alaska Press