

The furry ecosystem engineers of the Copper River Delta

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Swimming beaver towing an alder branch in a pond on the Copper River Delta. Photo courtesy of Mike Truex

By James Ianni

For The Cordova Times

In a breath, the height of the Alaskan summer has passed. The green, tender buds of willows on the Delta have withered, replaced by frozen stalks and stiff branches poking out of the snow. Migrating birds, once abundant, have fled to warmer and sunnier places in the south. Wandering brown and black bears have finished their last salmon and berries, curling up to sleep until spring. Moose remain on the windswept delta, standing belly-deep in the snow, motionless like statues. Land-locked freshwater ponds have frozen solid. The delta's web of meandering rivers, once bursting with life, have slowed. The once-busy beavers have now retreated to their well-insulated huts. Indifferent, the snow falls outside. Grey clouds coat the tips of the otherwise glowing Heney Range. Winter on the delta

The Copper River Delta is dominated by a coastal marine climate, making both the summer a mild and wet. The climate is maintained by the Alaska Current, which delivers warm ocean air and low pressure systems to Alaska's Gulf. Wet, coastal air masses from the Alaska Current must either climb over the Chugach Mountain Range or remain trapped on the coast, increasing humidity. The climate of the delta is also influenced by Alaska's interior which has much colder winters.

summers. One of the main routes for this interior-air to reach the delta is through the Coppe This corridor provides a funnel for the interior air to rush to the coast, causing strong sustain delta thus acts as a mixing zone of steady winds, cold to moderate ambient temperatures, an rain. All of this means, humidity is very high, ground water is flowing like veins through the : remain saturated year-round, and we are left with a landscape sprinkled in jewels, known as v

The climate, mixed with the natural history of the Copper River Delta, provides an ecosystem and thriving. Whether it is summer, or winter, you will be sure to find a furry animal, scurryin mission. One of these furry animals, has picked a luxurious career as a *landscape architect*. D to cut large trees and turn streams into ponds, they have rightfully received the title of *ecosy*: the Copper River Delta alone, they have left a noticeable signature that can be seen when dri River Highway. Since the 1964 earthquake and geologic uplift, they have expanded their rang new areas of uplifted marsh on the delta. After many years, the dams created by these furry e created new habitats for other plants and animals. This animal has a variety of adaptations to survive the winter season on the delta.



Late winter on the Copper River Delta, taken from Alaganik Boat Launch. Photo courtesy of James Ianni/U.S. F

This furry, winter resident is the North American Beaver (*Castor canadensis*). The North Ame largest rodent in North America. Most adult beavers weigh around 35-70 pounds and can rea almost 4 feet With heavily muscled bodies supported by large bones, beavers are short and th noticeable feature is their flattened, paddle-like tail, which is covered in black, leathery scale can walk upright on their hind legs, partially supported by their tail, while carrying mud or st front legs. In the water, beavers will alternate kicking with their hind legs. Their back feet ha

that allow for graceful and efficient swimming. Interestingly, beavers have closeable nostrils, second pair of transparent eyelids (i.e., goggles), and lips that close behind their large incisors to feed underwater. These intriguing animals spend the winter living in a snow-covered house. Like most small mammals, the North American Beaver does not hibernate. Beavers will stay awake all winter as a feat that takes ingenuity. Beavers start planning for winter as soon as spring arrives. When winter melts, the search for the perfect “home” is on. Beavers will examine the landscape, honing in on areas of water and mapping out potential areas to construct a dam. The dams they build are strong enough to back the force of a stream that will flood to become a pond. Once the area is flooded, they begin to build branches to the construction site. Once the dam is satisfactory, the beavers switch their attention to their huts.

A hut is an essential part of a beaver’s life, like a house for us humans. Their huts provide shelter from predators and severe weather (e.g., the wintry delta). When building a hut, beavers must gather sticks, branches, debris, and aquatic vegetation. Once the materials are gathered, they form them into a dome. Most of the structure is then coated with mud, leaving the “peak” open for ventilation. This is the equivalent of a chimney. Within the hut is a chamber that has been dug out. This chamber typically has underwater tunnels with openings above the water level. These openings are the entrance and exit. The main chamber is divided into two levels. The first level is a platform just above water level used for feeding and drying off. The second is a higher, drier platform cushioned with shredded wood used for sleeping. The chamber walls are thick (2-3 feet at the bottom) keeping the beavers warm. The snow that covers the hut in the winter also acts as insulation, keeping the temperature inside the hut stable. This makes for a rather warm and cozy living area, compared to the cold, stark, windy outdoors. Mother Nature, just outside the hut.

Late spring on the Copper River Delta of a beaver and dusky Canada goose, captured on a game camera. Photo by Forest Service, Cordova District Office Wildlife Program

In the fall, beavers also pack on their own form of insulation — fat! Beavers have a ravenous appetite for months approaching winter. The fat layers they pack on act like a down jacket that we might wear when heading outside in the cold. To make sure they have enough food to last through the winter, they store sticks, branches, twigs, and any other vegetation that they can find. These winter snacks are stashed underwater near their huts. Acting as a refrigerator, the cold water keeps their food cold, crisp. In winter under the frozen surface, beavers swim back and forth, from their food cache to their huts. For insulation, their fat is also very high in energy. This means they have a portable energy source that can be burned at a moment’s notice. Did you know that one of the best fat reserves on a beaver is in its tail? This means that their tails are continuously changing size! In the spring and summer, they are increasing the size of their tail. In the winter, their tails shrink as the fat stores are used. Another interesting fact about a beaver’s tail is that it is lined with a web of blood vessels, called *rete mirabile* (Latin for “wonderful net”). These blood vessels exchange heat and help regulate the beaver’s body temperature.

To make the icy water more comfortable, beavers have thick fur. Beaver fur is so thick that a square inch of skin is carpeted with over 125,000 individual hairs — this is more than the average human has on their entire head! This thick, fuzzy coat helps insulate them from the cold. To give their coat extra

beavers will groom themselves with natural oil. The oil is produced from glands beneath their skin. During grooming, a beaver will use a modified toenail on each hind foot, to coat themselves in the oil. Once coated, they can comfortably swim beneath the frozen surface. Grooming also creates a pocket of air near the skin. This air pocket acts as another insulating layer while underwater. Historically, this beautiful, thick fur coat was not always very advantageous. When Europeans arrived in North America, many as 400 million beavers swam the continent's rivers and ponds. Between the 1700s and 1800s, beaver populations were decimated by fur trappers, primarily to support the European fashion for beaver hats. In this, beaver populations in the eastern United States were largely removed and the continent's population estimated at only about 100,000. Fortunately, these declines caught public attention. Conservation efforts eventually led to regulations that controlled harvest and methods of take, generating a steady recovery of beaver populations. Although pristine beaver habitat has been heavily reduced in many states via human land-use practices, beavers have proven to be a highly adaptable animal, able to survive in a variety of human-made habitats.



Aerial photograph of remnant beaver dams on the west Copper River Delta. Photograph courtesy of Wildlife Biologist Gabrielson/U.S. Forest Service

Beavers now occupy much of their former range in North America, although habitat loss has limited their population growth. Since the 1830s, about 195,000-260,000 square kilometers of wetlands have been converted to agricultural or other use areas in the United States. Many of these wetlands were most like those that beavers create. Beavers are adaptable, being marginally able to subsist above timberlines in mountainous areas and in cold regions. Beavers have yet to colonize Alaskan or Canadian arctic tundra, possibly due to the lack of essential woody plants for winter food and lodge construction, or because thick ice limits survival in winter. However, in milder areas of Alaska, beavers thrive. The Copper River Delta supports a large population of beavers due to their low natural mortality and an abundance of suitable habitat.

large size and limited amount of time away from the protection of water, adult beavers have many natural predators! Young beavers, also known as *kits* or *yearlings*, on the other hand may be eaten by bears, coyotes, bobcats, and even great horned owls.

Next time you are out on the Delta, look for signs of beaver including newly cut alders or a ha pond or slough. Take note of the area, see if you can find aquatic plants and insects in the wa waterfowl and fish. Take a minute to count how many different species you find and think ab relationships that might be happening. You might not have to ask scientific questions or con: ecological richness that beavers create in order to enjoy them! Maybe sitting and soaking in t while beavers motor across the pond is enough. But while enjoying the vast, lush landscape, | the furry ecological engineer that is the North American Beaver.

If you would like to know more about the world of beavers out on the Copper River Delta or their n please feel free to contact Erin Cooper, Terrestrial Program Manager (Wildlife/Ecology/Vegetation Service, Cordova District Office at 907-424-4757 or erin.cooper@usda.gov

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