Here are the basics: sheefish in the Northwest Arctic are both the largest (over 50 pounds) and oldest (up to 40 years) of their kind in Alaska. Tastier than halibut, heftier than salmon, these prized fish are caught in all seasons wherever they are found in our region.

And where are they found? Our region has two sheefish populations: those that spawn in the upper Kobuk River and those that spawn in the upper Selawik River. These two groups mingle together in Kobuk Lake and Selawik Lake in the winter and spring, but at spawning time mature sheefish move back to the river from where they hatched.

Immature sheefish—up to about nine years old—linger in Kobuk Lake and Selawik Lake during the summer, feeding and growing. They can be found as far west as Anigaaq near Cape Krusenstern, as far south as Arctic Circle landing strip, and as far up the Noatak River as the Aggie River.

Biologists have been studying sheefish here for decades. Elders might remember Ken Alt, an Alaska Department of Fish and Game biologist who spent many hours in the 1970s learning about sheefish from local people. Much of what early researchers knew came from the extensive local knowledge of the Iñupiat. Today researchers continue to fine-tune scientific understanding of local sheefish. Turn to page 2 for more information on the latest projects.
More Secrets of Sheefish

The dazzling and delicious sheefish, or *sii* in Iñupiaq, is one of our region’s most prized resources. In Alaska, sheefish reach their biggest size in the Northwest Arctic region. Smaller sheefish are found in the Yukon and Kuskokwim rivers and tributaries and in Norton Sound.

Based on household surveys, an estimated 25,000 sheefish are harvested each year in our region, mostly by subsistence fishermen in Kotzebue, Selawik, and the Kobuk River villages.

Cold Ocean Water

Our two sheefish populations—one from the Kobuk River, one from the Selawik River—travel seasonally between fresh and salt water. Biologists believe their westward movement into the open ocean in winter is limited by the coldness of marine waters. Since sea water freezes at a lower temperature (28° F) than fresh water (32° F), the ocean is considerably colder in winter than the brackish and fresh water of Kobuk Lake and the Noatak River mouth.

Unlike salmon (which migrate to sea as juveniles), sheefish spend their entire lives in our region. One benefit of this is that sheefish do not pick up contaminants from elsewhere in the world. But it also makes it even more important that we maintain healthy habitats for sheefish here at home.

25,000 Spawners

Biologists from our Fairbanks office camped for six weeks on the upper Selawik River last fall, continuing their study of sheefish on the spawning grounds.

Using sonar for a second year, biologists counted about 25,000 spawning sheefish in the Selawik River. That’s a lot of fish for a river that size! A similar number of spawning sheefish were counted in 2012. Using a different technique, the Selawik River spawning population was estimated at roughly 24,000 sheefish in 2004.

The spawning population in the Kobuk River was last estimated at roughly 33,000 sheefish in 1997 by Alaska Department of Fish & Game.

Because of the late freeze-up last year, biologists for the first time were able to count the entire downriver run of sheefish in the Selawik. Normally, river ice begins running—making it impossible to use the sonar—before all the sheefish have passed by.

Repeating the spawning counts for several years gives biologists a chance to see year-to-year changes.

Quick Turnaround

Biologists already knew, as elders do, that sheefish turn around and head downstream quickly after spawning. Here’s how fast this actually takes place: in only three days last fall (Sep 30-Oct 2) about 65% of the spawning sheefish (about 16,000 fish) passed by the sonar counter on their downstream migration.

Long ago the Iñupiat of the upper Kobuk built temporary brush fences across the river to intercept this downstream migration.

Later in the fall, biologists will use mammalian predators, including sea otters, to further study the Selawik. This is one of the two sheefish spawning areas in our region.

Sandbars, willow thickets, and spruce-birch forests line the upper Selawik River. In fall the river typically has shallow riffles interspersed with deep pools. This is one of the two sheefish spawning areas in our region.

Frank Berry, Jr. of Selawik holds a sheefish caught in the upper Selawik River as part of the study. The harvested sheefish were cut, dried, and distributed to households in Selawik village.
Under Cover of Darkness
Almost all of the sheefish migrating downstream after spawning travel at night. Our fish biologists counted very few fish on the sonar during daylight hours. These "under the cover of darkness" movements are nothing new to Iñupiaq elders. In the upper Kobuk, elders tell wonderful old-time stories about spearing sheefish by lantern-light in late fall at the brush fences built across the river.

Late Fall Spawning
Sheefish in our region spawn in late September to early October. Biologists suspect that the timing of spawning depends on water temperature. This year sheefish started moving heavily a couple of days after ice first started running in the upper Selawik River. Upper Kobuk elders say sheefish spawn anytime after September 20.

Sheefish are "surface spawners," meaning they cast their eggs and milt at the water’s surface. Elders and biologists alike say you can hear them splashing at night during spawning. In contrast, salmon dig "redds," or small hollows, in the gravel to lay their eggs. Sii are also unlike salmon in that they live to spawn again and again. Salmon spawn once, then die. Sheefish need gravel of a certain size and water 4-8 feet deep to create the right conditions for spawning. The water needs to be clean and flow continuously over the eggs to bring them oxygen. Too much sediment in the river can threaten the eggs’ ability to survive.

A Giant Mudslide
The Selawik River thaw slump—a giant mudslide on the upper river—deposited large amounts of silt in the river for several years. One of the important reasons biologists continue to monitor Selawik River sheefish is to look for impacts to these fish since the slump started in 2004. In addition to the spawning counts mentioned above, the crew collected samples from 200 sheefish to measure their ages and determine the survival rate of fish in the years following the slump.

We expect sheefish research in Selawik River to continue for several years. With the recent unusual weather and other changes, this is an ideal time to learn all we can about the resources near us.
Seeing the Coast from the Sky

Would you like to soar along the shore of Kobuk Lake on a sunny July day? Maybe look at places you have camped, or would like to visit?

Now it is possible to "fly" along Alaska's coast without ever leaving your house, thanks to a project called Alaska ShoreZone. In 2012 the ShoreZone team flew the entire coastline in our region, taking photographs and videos. These images are available for free online viewing at http://alaskafisheries.noaa.gov/mapping/szflex/.

Selawik Refuge has put some of these coastal photographs on DVDs for communities near the refuge (Noorvik, Selawik and Buckland) to make viewing easier with a slow internet speed.

Unlike Google Earth (which uses satellite imagery), ShoreZone documents the coastlines of Alaska with aerial photographs taken from a helicopter at low tide in summer. Using these photographs, ShoreZone maps both the biology (plants and animals) and geology (rock and soil types, tide lines, etc.) of the coast and intertidal areas.

ShoreZone is a public mapping program funded by more than 20 partners, including Alaska's Landscape Conservation Cooperatives. The NOAA National Marine Fisheries Service is hosting the data and online mapping site.

Why is ShoreZone useful? Its main purpose is to help us understand and prepare for changes like coastal erosion, increases in shipping, and offshore development. But ShoreZone can be used by anyone! Other ideas include:

- Oil spill and emergency planning, response, and recovery
- Community planning for climate change impacts
- Search and rescue
- Planning outdoor trips
- Coastal clean-up planning

The sheer beauty of the photos are reason enough to browse Alaska ShoreZone, and good reminders of our exquisite summer coastline. There's a certain magic to seeing a place from the air that you know well on the ground. Here are a sample of ShoreZone photos. Take a look at the rest when you get a chance!

(Above) Sipiağruk is located at the east end of Selawik Lake near the mouth of the Selawik River. This sandy point is at the mouth of Sipiağruk River, a humpback whitefish spawning area. The rows of shrubs in the bottom left of the photo indicate old beach ridges, each likely formed by a single storm event.

(Right) At the southern tip of Baldwin Peninsula, Chamisso Island and Choris Peninsula (in far background) are among the few places in Kotzebue Sound with rocky headlands. The vertical rock cliffs, resistant to erosion, are interspersed with beautiful coves of sandy beaches. The Iñupiaq name for Chamisso Island is Iguağvik, meaning "place where you cook something to put away for the winter."
More Alaska ShoreZone Photos!

(Left) This photo shows Puffin Island, a small rocky islet at the southern tip of the Baldwin Peninsula. Choris Peninsula is in the background. This island, along with the nearby larger Chamisso Island (out of view to the right), teems with nesting seabirds in the summer: puffins, murres (crowbills), kittiwakes, and a few cormorants. Gathering eggs in July from Puffin Island is a popular subsistence activity for Kotzebue and Buckland residents. You might not know that this island is part of the Alaska Maritime National Wildlife Refuge, based in Homer, which includes 2,500 scattered islands and cliffs important for seabirds along Alaska’s 6,000-mile coastline. The Inupiaq name for Puffin Island is Aŋviat, meaning "bowhead whales."

The photo to the right was taken just south of Cape Blossom on the Baldwin Peninsula. Eroding bluffs make this area popular with beachcombers; the height of these bluffs makes them visible from miles out at sea.

(Below) Riley Wreck, an extensive shallow lagoon south of Cape Blossom, provides ideal habitat for migratory birds. The outlet current can be strong, making crossings hazardous with 4-wheelers in summer.

(Bottom right) The channels of the Kobuk River delta change over time, with some filling in and others no longer reaching all the way to Kobuk Lake, such as the one pictured here.
Off-Road Vehicles on Refuge Lands

This is a reminder that off-road vehicles, such as Honda 4-wheelers, Argos, and airboats, are not allowed on federal lands in the Selawik National Wildlife Refuge. As most people know, these vehicles can cause substantial damage to tundra, wetlands, and waterways.

The map on the back page of this newsletter can help you become familiar with the location of federal lands in Selawik Refuge where off-road vehicles are not allowed.

Snowmachines are NOT considered off-road vehicles and can be used anywhere in the Selawik Refuge when there is adequate snow cover.

The Alaska National Interest Lands Conservation Act, which established Selawik Refuge in 1980, has provisions for traditional surface transportation for subsistence. For this reason, refuge employee Susan Georgette has been studying the pre-1980 history of off-road vehicles as transportation on the refuge.

Last year she interviewed more than 40 Selawik and Kobuk River residents, mostly elders. Although Honda 3-wheelers first arrived in the late 1970s, elders said these vehicles were not suitable for rough terrain and were not used for subsistence activities on refuge lands. The complete results of this research should be available later this spring. Many thanks to all who shared their knowledge and memories!

The Highs and Lows of Caribou

Caribou have been abundant in our region in recent decades, but this has not always been the case. Elders in the northwest Arctic tell stories of long travels by foot in summer and dog team in winter to reach caribou in the upper Noatak and on the North Slope. That was in the 1880s to 1940s. It wasn’t until the 1950s that caribou started being seen again as far south as the Selawik valley.

From 1970 to 1976, the caribou herd in our region—the Western Arctic herd—declined again dramatically, leading to contentious hunting restrictions. From 1976 to 2003, the caribou herd grew again, at first rapidly and then more slowly, reaching a peak of 490,000 animals in 2003, according to the Alaska Department of Fish & Game.

But changes are coming once more to the Western Arctic herd. Since 2003 the number of caribou has been decreasing slowly but steadily, about 5% per year. Caribou populations naturally go up and down, so this is not surprising. But a continuing drop could mean changes for hunters.

Alaska Department of Fish & Game biologists are predicting that the herd will continue to decrease, based on high mortality rates for caribou cows and low survival rates for calves. Decreases in lichen—important winter food for caribou—and high numbers of wolves and bears also point to tough times ahead for caribou. Mid-winter rain and thaws can create icy layers in the snow that may further impact caribou survival.

If the herd drops to less than 265,000 animals, management will become more conservative. This could mean changes such as: no harvest of calves, no cow harvest by nonresidents, and limits on bull harvest by nonresidents. If the herd drops below 200,000 animals, more challenging restrictions for subsistence hunters are likely to follow.

Caribou are a vital food source for the people of this region. As always, we must all be respectful in our caribou hunting, taking only what we need. Hunters are encouraged to voluntarily reduce their cow harvests, as cows are needed to produce calves for the herd to stabilize or increase.

This spring the Alaska Department of Fish & Game expects to release the results of the 2013 caribou count, at which time everyone can evaluate what, if any, actions are needed.
Our Refuge Manager Retires...

Our widely admired refuge manager, Lee Anne Ayres, retired this winter after 30 years of resource work in northwest Alaska. She came to Kotzebue in 1983 to study the ecology of Dall sheep for her master's project and never left.

Lee Anne was the first wildlife biologist for the National Park Service’s Western Arctic Parklands, and then worked as the assistant area biologist for the Alaska Department of Fish & Game in Kotzebue. Her career with the Selawik Refuge began in 2000 when she added flying to her job description and became our biologist/pilot. Lee Anne took the helm as refuge manager in 2003. We will miss her leadership and laughter!

...and a New Refuge Manager is Hired

Welcome to Shawn Bayless, the next manager at the Selawik National Wildlife Refuge! Shawn was previously manager at Innoko Refuge in McGrath, and spent most of his working life in Montana, Wyoming, and North Dakota, engaged in many aspects of wildlife and bird conservation. He is also an experienced pilot. We are looking forward to introducing Shawn to our many partners in the region!

Congratulations to Other Staff!

Other changes also took place in our staff in 2013:

- Pilot Eric Sieh left to start his own aviation charter business in Kotzebue. Congratulations to Eric and his family on reaching this long-term goal!
- Biologist Brandon Saito transferred across town to become the new area biologist at the Alaska Department of Fish and Game. We’re glad to still be working with him on a variety of resource issues.
- Biologist Anne Orlando returned to California to pursue her interests in "big cat" conservation. She will undoubtedly return at times to visit the Arctic.

We wish them all good luck and many thanks for their service!
Know the Land

It's not easy to know where federal lands are when you're out on the land. The black line on this map shows the outer boundary of Selawik National Wildlife Refuge. The brown areas within this boundary are private (mostly Native Corporation) lands. All green and gray areas within this boundary are federal lands managed by the U.S. Fish & Wildlife Service. Please contact us if you have questions or need more detailed information.