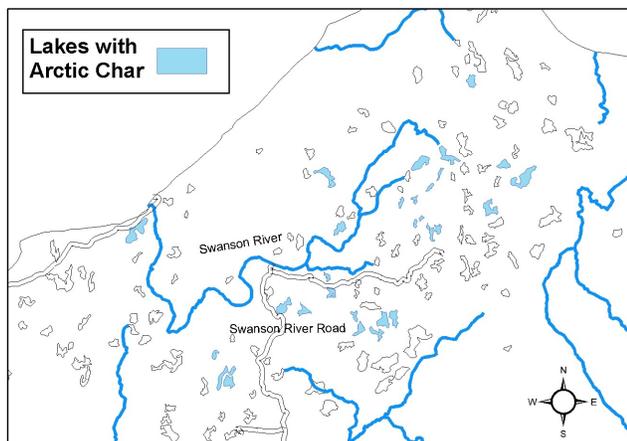


Arctic char on the Kenai Peninsula

by Jack Dean



Arctic char distribution in approximately 50 lakes in the Swanson River watershed.

The lakes along the Swanson River drainage have some special fish. Let's say that you've just caught a fish in one of these lakes. Your fish does not have the typical black spots found on a rainbow trout. Instead it has light pink or red spots, and white-edged ventral fins. If you look closely, a few spots are larger than the pupil of the eye. You might be inclined to call this fish a Dolly Varden, even though few Dollies have ever been found in these lakes. Most likely, your fish is an Arctic char. This fish is a little known and often confused sister species of Dolly Varden. Arctic char has a unique distribution on the Kenai, being restricted to some 50 lakes in the Swanson River drainage and to Cooper Lake in the Kenai River drainage (see map). Worldwide, Arctic char occurs further north than any other freshwater fish and is most abundant in the Arctic and sub-Arctic areas of North America, Asia and Europe.

Arctic char and Dolly Varden are closely related species that some authorities believe separated from a common ancestor over a million years ago. Not only are they closely related, they are also look-a-like species. On the Kenai Peninsula these look-a-like chars seldom occur together. If you catch a char in Cooper Lake or in a Swanson River lake, chances are at least 50 to one that you've just caught an Arctic char, not a Dolly.

In 1964 state fishery biologist Larry Engle was the

first person to discover Arctic char on the Kenai Peninsula. He identified them in East Finger Lake and had his conclusion verified by biologists at the University of British Columbia. A couple of years later he conducted a study to determine why these char were a common catch in the fall, winter and spring sport fisheries but were seldom seen in the summer. In East Finger Lake 89% of his char catches in vertical gill nets were taken in water 55° or colder. During the summer, Arctic char frequent the deeper waters where there is adequate oxygen and cold water. This requirement explains why Arctic char contribute little to the summer sport fishery. They are catchable during the summer, however, if anglers are willing to fish deeper than 25 feet, with salmon eggs or shiny spoons.

Here's what we know about our local Arctic char. They are fall-spawners that utilize gravels in lakes for this purpose. Most spawning occurs during October although populations in Cooper Lake also spawn into late November. Adult Arctic char feed on aquatic insects, snails, sticklebacks and sculpins. They feed much more heavily on sticklebacks than do Dolly Varden. As a result Arctic char, especially the older larger fish, are heavily parasitized. Most of the parasites are attached to the abdominal organs that are removed during cleaning. We don't know if these parasites can infect people, and we recommend that Arctic char be thoroughly cooked. Our Arctic char do not reach large size. The largest one taken in a gill net on the Kenai Peninsula weighed only 4.55 pounds. Most of the char taken by anglers weigh less than a pound. I consider a two-pounder a large one and a three-pounder trophy-sized.

The known distribution of Arctic char on the Kenai Peninsula includes only two areas: fifty lakes in the Swanson River watershed and Cooper Lake in the Kenai River watershed. This limited distribution is hard to explain. Our present populations can be described as lake residents, but this species is often anadromous (like salmon) in colder climates and it may have been anadromous here in the past. One theory suggests that anadromous Arctic char populated the Swanson River lakes after the glaciers melted from the Kenai lowlands about 13,000 years ago. If this the-

ory is correct, there should also be Arctic char in suitable deep lakes in adjacent watersheds such as those of the Moose River, Bishop Creek and the Chickaloon River, which became ice-free about the same time. Opposing this theory is the fact that Arctic char have never been reported in these watersheds. Another theory suggests that Arctic char may have been present on the Kenai Peninsula before the last glacial period and they survived in ice-dammed lakes somewhere in the Swanson River watershed.

The presence of Arctic char in Cooper Lake is even harder to explain. At first glance, you might think that some fisherman pilot simply decided to do his own stocking by bringing some char over from the Swanson River drainage. In this case I doubt that we can pin this phenomenon on the “human factor,” because there are actually three forms of char in Cooper Lake: two color variants (orange and gray) and a dwarf variant. To have introduced Arctic char into Cooper Lake, a person would presumably have had to collect both color variants from Swanson River lakes, as well as to make a trip to the Lake Clark area, across Cook Inlet, which is the nearest source for dwarf char. Generally humans aren’t this energetic.

The Arctic char in Cooper Lake could not have come up from the Kenai River (prior to construction of the dam) because there are several impassable falls below the dam. We have angler reports of “Dolly Varden” in Cooper Lake from the 1950s, but I have never found any Dollies in Cooper Lake, and I am inclined to view the 1950s reports as mis-identified Arctic char. In any case I think that Arctic char have been in Cooper Lake for many years. My best guess is that toward the end of the last glacial period, anadromous Arctic char climbed the Resurrection River from the Seward side, crossed a shallow pass, and entered the Cooper Lake drainage from the pass. When the valleys were choked with glacial ice and ice-dammed lakes, there were probably water routes open for fish migration that are dry land today.

Little government agency effort has been directed towards Arctic char on the Kenai Peninsula since the 1960s. Most of the recent work has been done by volunteers like myself. My efforts have included fishing one third of the Swanson River char lakes, assisting with gill netting sampling, reviewing state and federal lake survey reports and gathering appropriate technical reports. Other work was done by Dr. Nels Anderson’s Soldotna Boy Scout Troop 151 who fished

for char in several Kenai mountain lakes for a genetic study. The Alaska Department of Fish and Game, U.S. Fish and Wildlife Service and U.S. Forest Service also provided local char for this genetic study. Analysis of some of these samples by the Canadian laboratories has found genetic differences between Dolly Varden and Arctic char, and has shown that Arctic char in the Swanson River lakes and Cooper Lake have the same genetic fingerprint.

Recently Chugach Electric Association hired an Anchorage consultant to study Arctic char in Cooper Lake. This will be the first focused Arctic char study carried out on the Kenai Peninsula in nearly 35 years. Cooper Lake is populated with both dwarf and normal sized Arctic char. The dwarf char appears to be unique in south-central Alaska. The consultant has already located two char spawning areas on silt free-cobble bottoms at depths of 25-35 feet. Hopefully this study will greatly expand our knowledge of both forms of Arctic char in this deep mountain lake on the Chugach National Forest.

Among freshwater fish I consider Arctic char to be the “canary in the coal mine.” They are susceptible to a variety of ills, including introduced non-native fish and also to climate change. For example, northern pike are now present in Stormy Lake near the mouth of the Swanson River. If pike become established in the Swanson River they will have access to most of the Arctic char lakes, where the presence of pike could be detrimental, to put it mildly. There are two land-locked char populations that could be impacted by hazardous material spills from the Wolf Lake natural gas field. Global warming could affect local populations by reducing the amount of suitable cold-water habitat in lowland lakes during the summer. Given these potential threats, this interesting and hard-fighting native species may require our continued attention to remain a part of our fishery heritage on the Kenai Peninsula.

Jack Dean describes himself as a “semi-retired” fishery biologist, having formally retired after 31 years with the U.S. Fish and Wildlife Service. He lives with his wife Betty in Sterling, and is currently studying arctic char and long-nosed suckers in the lakes of the Kenai Peninsula. For more information about the Refuge, visit the headquarters in Soldotna, call (907) 262-7021. Previous Refuge Notebook columns can be viewed on the Web at <http://kenai.fws.gov>.