

Modern technology helps chase refuge rainbows, Dolly Varden

by Doug Palmer

The Kenai River supports one of the most popular sport fisheries for rainbow trout and Dolly Varden in Alaska. Both species are caught throughout the Kenai River, although the majority of fishing effort is above and below Skilak Lake on the Kenai National Wildlife Refuge.

Thousands of anglers flock to the river each year to chase rainbows and Dollies, using an assortment of artificial lures resembling salmon eggs and aquatic insects. Since 1995, the U.S. Fish and Wildlife Service and Alaska Department of Fish and Game have also been chasing these fish. Instead of traditional fishing equipment, however, we have taken a couple steps up the technology ladder and are using radio telemetry transmitters and receivers to track these species within the Kenai River watershed.

Over the last several years, we have surgically implanted radio transmitters into 280 rainbow trout and 400 Dolly Varden. These radio transmitters weigh only 10 grams and are digitally encoded to identify individual fish.

The surgical implanting takes five to six minutes. We use a light concentration of clove oil as an anesthesia to calm the fish, and irrigate the gills with water from a turkey baster during surgery. We then place the fish in a recovery tank before releasing it back into the river.

The battery life and programming of the transmitters have improved substantially since we began the study. Our first transmitters sent out a signal 24 hours a day and had a battery life of about one year.

Recent innovations in transmitter technology now allow various duty cycles to be programmed into each transmitter. Transmitters used since 1998 have been programmed with an eight-hour per day duty cycle that extends battery life to nearly three years.

We track the movements of radio-tagged fish using a combination of aerial and ground-based surveys. Ground-based tracking is conducted from boats and on foot. Aerial tracking is used primarily to track fish during the winter months and to find fish wandering into more remote areas of the watershed.

We use a global positioning satellite receiver to record latitude and longitude for each fish located during the tracking surveys, and then download these coordinates to a computer for plotting fish movements on a map.

Our telemetry research has led to several interesting discoveries. Movement patterns of rainbows tend to be more predictable than Dollies because most rainbows display a high level of fidelity to spawning, feeding and overwintering areas. Dollies also display a high level of fidelity to spawning areas, but tend to be more nomadic and range longer distances to meet their feeding and overwintering needs.

Most rainbows spend the winter in Skilak Lake or Kenai Lake, with smaller numbers of fish overwintering in the river. Rainbows move from winter sites to spawning areas during late April and early May. Most rainbows spawn during late May and early June in the mainstem Kenai River or tributary streams such as the Russian River.

After spawning, rainbows travel to feeding areas in the mainstem Kenai River. Some rainbows will use the same feeding area all summer, while others may select two or more areas.

Although feeding strategies may vary among rainbow trout, feeding behaviors of individual fish are generally predictable. For example, if a rainbow with transmitter No. 116 were found at river mile 71 in mid-August last year, it's a pretty good bet that this same fish will be in close proximity to river mile 71 during mid-August this summer.

Both rainbows and Dollies rely heavily on spawning salmon for food sources, and their movement patterns during summer are highly correlated with the timing and location of spawning salmon.

Rainbows typically move from summer feeding areas to overwintering locations during October and November. As with feeding locations, rainbow selection of overwintering areas is generally predictable, with a given fish returning to the same location year after year.

If we say that rainbows are conservative creatures

of habit, then Dolly Varden would have to be called the roaming gadflies.

Our telemetry research on Dolly Varden has focused on spawning populations in Quartz Creek, Cooper Creek, Snow River and the upper Kenai River. Dollies typically spawn during September and October in a creek or river, and then for overwintering they move to a lake such as Skilak, Kenai, Upper Trail, Tern or Tustumena.

One Dolly that we radio-tagged in the Kenai River above Skilak Lake during August 1996 traveled to Tustumena Lake to spend the winter, and then returned to the Kenai River the following summer. All the rest of our radio-tagged fish have stayed put within the Kenai River watershed.

Feeding areas used by Dollies include all reaches of the Kenai River and some tributary streams. Several of the radio-tagged Dollies from Cooper and Quartz creeks and the upper Kenai River routinely follow the early run of chinook salmon up the Killey River each year to take advantage of this food source. Snow River

Dollies, however, never enter the Killey River, but select feeding areas in the Kenai River near spawning sockeyes.

We are presently monitoring rainbows in the upper Kenai River, using 200 transmitters purchased for the study by the Kenai River Sportfishing Association. These fish have been cruising the blue-green waters of the Kenai River for several months now, allowing us to track their every move.

The end result will be a better understanding of the migratory behavior and important habitats used by the upper Kenai River rainbows.

The trout packing the transmitters are unaware that we are watching them, but they are helping us develop better management strategies for one of the most popular rainbow trout fisheries in Alaska.

Doug Palmer has been a fishery biologist at the Kenai Fishery Resource Office since 1990. Previous Refuge Notebook columns can be viewed on the Web at <http://kenai.fws.gov>.