



Fishermen Say Chinook Salmon Are Smaller

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**(AP)** Tanana fisherman Charlie Campbell doesn't need scientific studies or empirical data to prove Yukon River Chinook salmon \_ the mighty king of the species \_ are getting smaller. All he has to do is walk into his smokehouse.

"I'm noticing I have a lot more headroom in the smokehouse than I remember," said Campbell, a subsistence fisherman who uses a fishwheel in The Rapids area of the Yukon between Tanana and Rampart.

"Long salmon strips hang in your face and you have to duck to get underneath them. I'm 6-2, so it's an issue for me. With these shorter fish, shorter strips."

Campbell hasn't been alone in his hypothesizing. Dozens of fishermen along the middle and upper reaches of the 2,300-mile Yukon have been claiming for years that smaller kings are returning from the ocean to spawn.

A pair of U.S. Fish and Wildlife Service biologists released a study earlier this month that lends some scientific weight to that suspicion. Already there is a move under way to do something about the shrinking of the Chinook \_ a worrisome evolutionary trend that has devastated other vital commercial fisheries.

The federal subsistence board next year will consider reducing the depth gillnets can be dropped in the Yukon to allow more large fish to escape upriver. And the Alaska Department of Fish and Game's top Yukon manager said he is starting to think about introducing a modest decrease in mesh diameter.

Any changes are likely to impact the delicate commercial fishery at the mouth of the Yukon. But even those who aren't ready to buy the shrinking Chinook argument believe more scientific study should be done.

"If the data shows it and enough fishermen think this is an issue, we don't want to keep our head buried in the sand," said Jill Klein, executive director of the Yukon River Drainage Fisherman's Association.

Queen salmon

The common name given to *Oncorhynchus tshawytscha* is misleading. Among king salmon, the true giants are the females, who are built large for a couple of important reasons.

The larger the fish, the more eggs she can carry. And her great size \_ 70-pounders have been caught \_ gives her a better chance to survive one of nature's longest and most difficult

migrations.

"The Yukon River is kind of a gauntlet-type fishery," said Fred Andersen, National Park Service subsistence manager for the Yukon.

"Some of those fish go 1,200 or 1,500 miles to spawn. And there's a cumulative effect of that type of migration."

Andersen has spent more than 30 years managing subsistence fishing on the Yukon. He heard the stories and noticed the decline himself. Eventually, Andersen and Russ Holder of the Fish and Wildlife Service asked for a study in the attempt to quantify a well-educated hunch.

"Large fish are known to produce large fish," Andersen said. "And if you sift these large fish out of the population with large-mesh gillnets, it's Darwinian."

The largest fish Campbell pulled out of the Yukon with his family's fishwheel last summer weighed 36 pounds. It's been years since he heard of anyone catching anything much larger. Eighteen to 20 pounds seems to be the average and small males called jacks predominate.

That size reduction can be measured in a lot of ways. The king is a vital source of food in the Yukon's remote, road less villages. A loss of size and vitality in the stock would mean it becomes harder to feed a family of four or a village of 80.

"I also became aware of this when people were saying, 'Can you get us a nice big one, a 30- to 35-pounder,'" Campbell said. "But it's a long time between those fish now."

Fish and Wildlife biologists Karen Hyer and Cliff Schleusner were able to show a decrease in king size by analyzing admittedly spotty carcass and weir data on six Yukon tributaries. But definitive conclusions will have to wait for more study. And finding the exact cause is a mission scientists will have trouble completing.

"That is a much longer and more complex question," Schleusner said. "I think it would be challenging because the Chinook salmon is such a complex species."

### Life cycles

By the time it returns to spawn in its home stream, a king salmon has traveled several thousand miles in both freshwater and saltwater habitats.

King salmon are deep-water fish and the females lay their eggs among the large-bore gravel in channels of fairly deep rivers. They dig nests called redds and defend their fertilized eggs until they die.

The Chinook young pass through several development stages in their home streams before migrating down the length of the Yukon and into the Bering Sea.

After years strengthening themselves for the homeward migration, kings usually return to the Yukon between the age of 5 and 8, though 7- and 8-year-olds are increasingly rare.

Studies have shown that a salmon's development can be affected by its first winter and breakup, water temperature and salinity changes in the rivers and ocean, competition from hatchery fish and the decisions of fishermen and resource managers.

So little is known about a king's time in the ocean, it is entirely possible that the increasing loss of sea ice \_ and the large supply of nutrients the ice pack provides Bering Sea species \_ has had as much of an impact as gillnets.

"There's a lot of plausible explanations for this and the study didn't try to tease out cause," Schleusner said. "More than likely, there are a number of factors affecting the fish, in both positive and negative ways."

Holes in the data

People have subsisted on Yukon River salmon for centuries. The Chinook, chum and coho species that return each summer are most important in the villages that line the river and its tributaries. About 20 percent of the Yukon Basin's 130,000 residents live with limited or no road access, so fresh protein can be hard to come by. Fish taken for subsistence outnumber the commercial catch 2 to 1.

The first commercial sale of Yukon Chinook salmon came in 1918 and the fishery was closed by 1925 because of over fishing.

The Chinook run strength has fluctuated significantly over the years, according to Fish and Game figures, from a high harvest of 220,511 in 1980 to 55,066 in 2000.

Commercial fishing was closed in 2001, but the stock seems to have rebounded since. More than 157,000 kings passed the Pilot Station sonar point on the lower Yukon last summer and at least 70,000 passed into Canada.

Though much time, money and effort has been put into managing the fishery, very little scientific study has been done beyond gathering escapement numbers.

When trying to put together data, Schleusner and Hyer had trouble coming up with consistent information. They studied carcass reports from the Andreafsky and Anvik rivers on the lower Yukon, the Gisasa, Salcha and Chena rivers in the middle and the Big Salmon River in Canada. They also used weir data from the Andreafsky and Gisasa.

But the time periods varied wildly from nine years on the Big Salmon to 28 years on the Salcha. In addition to the time series, they found differences in sampling strategies, measurement error, crew experience and environmental conditions.

There were also more practical problems in analyzing the material.

"Computers weren't near as handy back then," Schleusner said.

The study showed fewer Chinooks measuring 900 millimeters or more in four rivers \_ the Anvik, Chena, Salcha and Big Salmon. No change was evident on the Andreafsky or Gisasa.

The river with the biggest decrease in size was the Big Salmon, which the study's authors wrote was logical "since they typically have earlier run timing and are exposed to the combined effects of commercial and subsistence fisheries for a longer period of time than the lower-river stocks."

Klein said YRDFA hired its own biologist to analyze the data and points to the need for more study and a consensus before any changes are made to regulations.

"At this point in time, we would probably still fight (changes)," Klein said. "We're not as certain of the evidence. There's a lot of anecdotal evidence from fishermen and now we've got some science.

"I don't think it's conclusive yet."

Andersen, however, believes a thorough search of the scientific literature on Chinook salmon will turn up enough evidence to form a persuasive argument. For instance, he noted that the Tozitna River weir has been running mostly male over the past five years with an average run that includes just 24 percent females. The low point for females during that time was 14 percent.

Because fish stocks have a history of rapid evolution when the largest members of a species are targeted, Andersen believes change should happen now. Waiting a decade could rob the run of the few remaining heavyweights.

"That's a risk, that's something we ought not run the danger of," he said.

Hooked on fishing

Billy Charles has been fishing to provide for his family since he was old enough to reach over the side of a boat and pull in a net.

He's 50 now and, unlike his upriver counterparts, he doesn't buy into the shrinking chinook theory. He occasionally pulls a big fish out of the Yukon, just like when he was a child working on his father's boat.

"I remember catching 40-, 50-pounders back then, but it was very rare," the Emmonak fisherman said. "When we did catch 40- and 50-pounders, I did remember it because it didn't happen that often."

Charles opposes any changes in gear regulations because of the economic hardship they would bring. Commercial fishermen have already lost 15 feet of net depth to allow more large fish to escape upriver. And he believes reducing the maximum mesh size from the current 8 to 8 1/2

inches would have the unintended consequence of killing more large fish.

He said fishermen and scientists have found that large fish still become trapped in the smaller mesh. Instead of becoming completely entangled, a large king snared around the gills strangles, then falls free \_ the big one that got away.

"It's just a waste of fish," Charles said.

The Yukon River Chinook salmon commercial haul of 31,952 fish was worth \$2 million this year, according to Fish and Game. About 600 fishermen worked nets and were paid an average of \$3.43 a pound on the lower river (there is virtually no commercial fishing on the upper river where the 20 permit holders were paid 87 cents a pound).

Average income for each fisherman who participated in the lower-river commercial opening was \$3,372.

In Charles' village of Emmonak alone, he said 60 to 70 of the 800 residents fish for a living. Another 100 rely on jobs at the local processing plant. Many also fish the river for subsistence.

Charles believes changes to gear or openings would have a worrisome impact on downriver villages.

"It's the only economy we have in the lower river," Charles said.

### Management principles

Change is not something that comes easy on the Yukon River. After 20 years managing the fishery, Dan Bergstrom knows this fact well.

Politics act like a tidal force on all decisions. Fishermen square off against managers. Upriver residents spar with downriver residents. Fishwheel users fight net fishermen. Some like the taste of kings, other prefer the underappreciated chum.

"If you are going to make changes, you have to work with the fishermen," Fish and Game's Arctic-Yukon-Kuskokwim regional management supervisor said. "If you push something through, they're not going to take it well. And that's a matter of time. It's not just one meeting."

Bergstrom said Fish and Game biologists are seeing fewer 7-year-old fish, a parallel sign that Chinook stocks are changing. But without more study, Bergstrom is not ready to rush forward with changes to commercial fishing regulations. He finds especially "infuriating" a lack of data from Canada where the largest fish are headed. In addition to increasing study, Bergstrom said it's important to come to an agreement about what type of fishery users want, then manage toward that goal. Are big fish important? Opinion, as usual, runs the spectrum.

One subsistence fisherman at a recent meeting Bergstrom attended noted the relative health of recent returns. With so many fish, she said, who can complain about their size?

"I think it's something to be concerned about, but we don't see it as a crisis at this point," Bergstrom said. "We have time to look at it. I've been thinking about a very small change in mesh size. But we have time to work with the nets and see what sizes catch what fish."

Eagle fisherman Andy Bassich thinks it might already be too late. He has seen pictures from the early 20th century that show 60- and 70-pound females on the upper river. The biggest fish caught in Eagle this year was about 35 pounds.

The fish he's catching today don't compare with the burly hogs he caught when he started fishing 22 years ago.

"They're not the big, fat, robust fish anymore because those guys are getting nailed by the gillnets more easily than these long, slender guys," he said.

He doesn't want to see the Chinook go the way of the cod, swordfish or dozens of other species whose shrinking was a clear early signal of evolutionary decline. And once the big fish are gone, he said, there's no getting those genes back into the pool.

"If we put our heads together," he said, "we can come up with a fix that's good for the fish and good for the fishermen."

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Information from: Fairbanks Daily News-Miner, <http://www.newsminer.com>