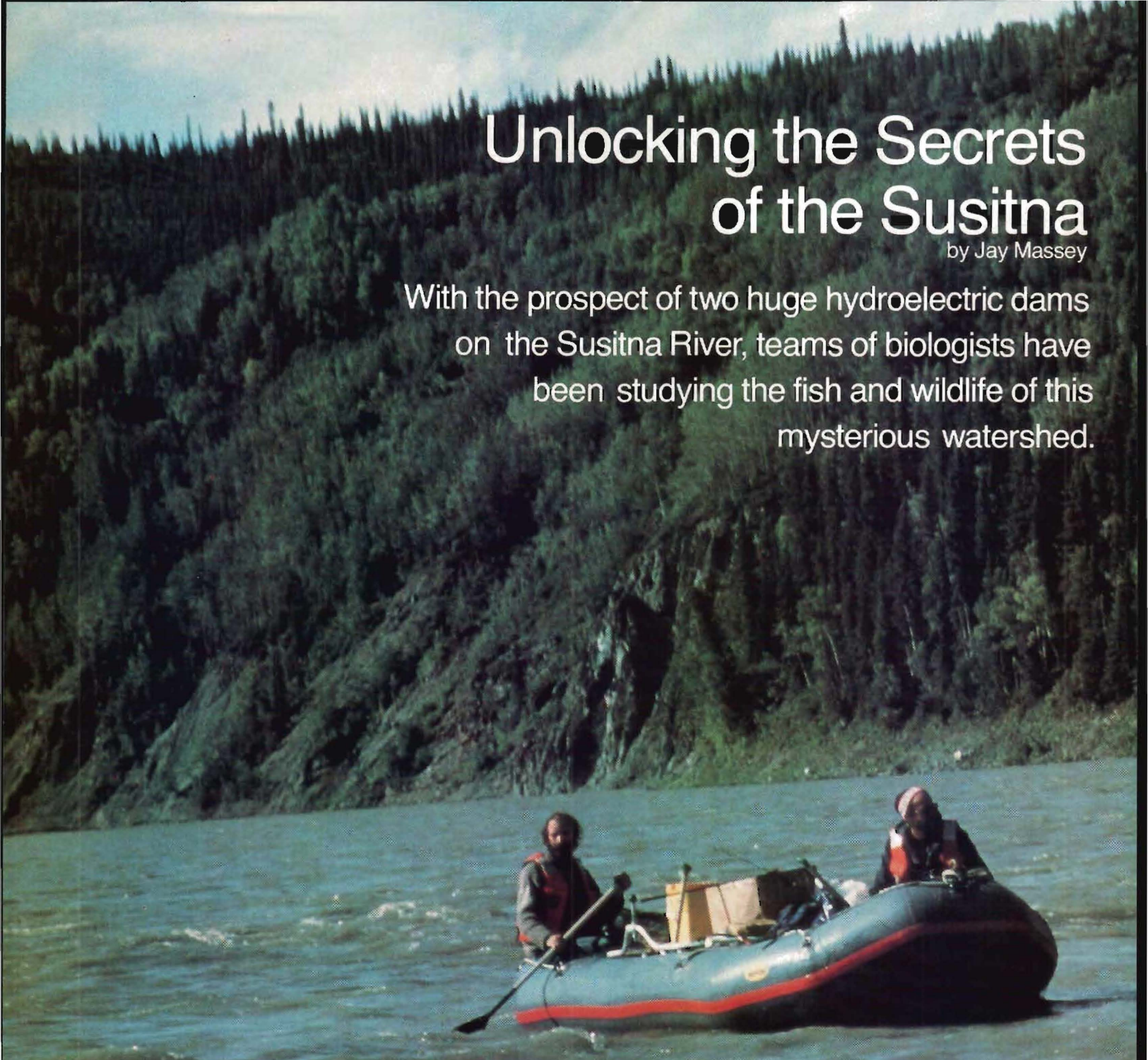
Unlocking the Secrets of the Susitna

by Jay Massey

With the prospect of two huge hydroelectric dams on the Susitna River, teams of biologists have been studying the fish and wildlife of this mysterious watershed.

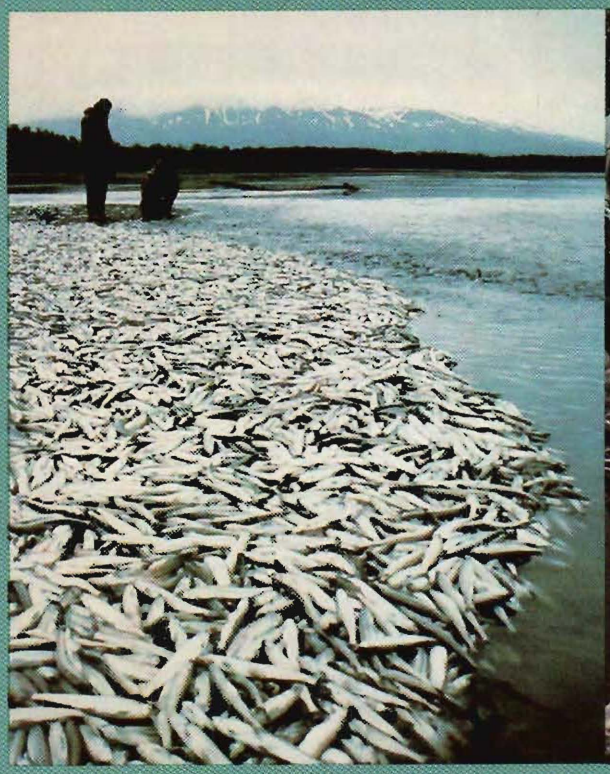


The Susitna River is not the largest river in Alaska, but it is among the most forceful and dramatic. This glacial river is born high on the rugged, snow-covered peaks of the Alaska Range, and grows quickly in speed and volume as it begins its 300-mile journey to the sea. Enroute, this glacial torrent will swallow up such rivers as the Maclaren, the Tyone, the Kosina, the Black, the Oshetna, the Tsusena, the Talkeetna, the Chulitna, and the Yentna, before braiding and flowing into Cook Inlet north of Anchorage.

Until recently, little was known of the Susitna: of the river, its fisheries, or the wildlife surrounding it. The Susitna kept her secrets hidden well. Her murky, swirling waters frustrated biologists' attempts at aquatic studies; the remoteness of her headwaters kept out all but a few die-hard hunters, trappers, and river runners.

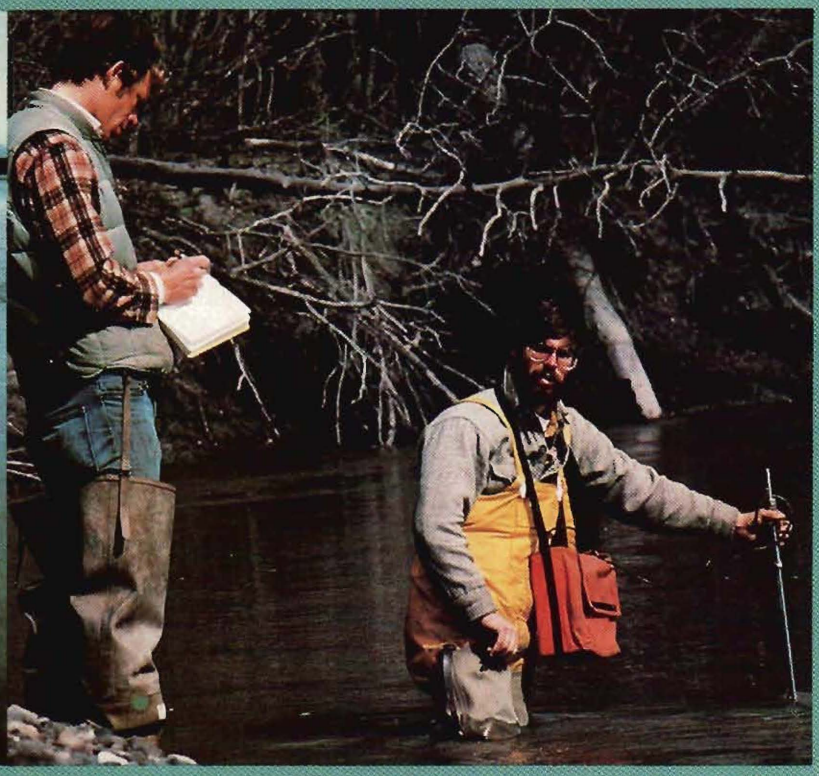
When the river did part with a few of her secrets, she often exacted a terrible price: some of Alaska's best pilots have perished in the rugged wilderness of the upper Susitna; some of the world's most adventurous kayakers have died while attempting to run the thunderous rapids of Devil Canyon.

Several years ago, discussions began on the feasibility of using the Susitna's raw energy to generate power for the "railbelt" region of Alaska—the populated strip that runs 360 miles between Anchorage and Fairbanks. With the prospect of two gigantic hydroelectric dams on the Susitna, Alaskans suddenly realized it was time to start learning more about the fish and wildlife resources of the area. Since then, researchers with the Department of Fish and Game (ADF&G) have been working to uncover the secrets of this unique and mysterious river system. The Alaska Power Authority (APA), in fact, retained



Tom Trent

Biologists examine smelt on a beach in the Susitna system.



Tom Trent

Stream flow measurements are part of the data being collected about the Susitna.

ADF&G specifically to collect data for their studies of the river system and the surrounding habitat.

The goal: to learn more about the aquatic and terrestrial populations in order to protect them from unnecessary losses that might result from the construction of the hydroelectric project.

Two power dams have been proposed for the Susitna—one at Devil Canyon, 152 miles from the river's mouth, and one at the Watana site, another 35 miles upstream.

At first glance, the potential effects of these two power dams on the Susitna might seem minimal. Some Alaskans have even questioned the need for fish and wildlife studies there. After all, the river is too silty for sport fishing, and the country surrounding the river's headwaters is so remote that few hunters or anglers have ever seen it.

But few people realize that 50 percent of Alaska's sport fishing effort occurs in the Cook Inlet area, and much of it is a result of the Susitna River's contribution of fish. Many an angler has caught king salmon from the banks of such streams as the Deshka River or Willow Creek near their mouths, never realizing that some of these fish were actually bound further up the Susitna or that Susitna River habitats are important to king salmon production.

Few Alaskans realize that Game Management Units 13, 14, and 16, which surround the Susitna River, have traditionally provided the largest moose harvest in the entire state.

The Susitna River biological studies began early in 1980, when ADF&G accepted a contract through the Alaska Power Authority to provide big game population data to be used in the hydroelectric feasibility analysis. The department also initiated a fisheries study through its Susitna Aquatic Studies Team.

The game studies consisted of two parts: those upstream of the proposed dam sites and those downstream from the impoundments. There were two phases to the studies: first, a general look at the populations of animals that would likely be affected by the dams and then an analysis of how those populations might be affected.

The aquatic studies included three basic project areas: anadromous adult studies, resident and juvenile fish studies, and studies of the aquatic habitat and instream flow.

During the past few summers, fisheries biologists have operated eight sonar sites and 14 fishwheels along the Susitna River, and, in the process, turned up some surprising facts about the river system.

One surprise was that the Susitna River, not the Yentna, is the major producer of salmon in the northern parts of Cook Inlet. During 1981 and 1982, fisheries researchers learned that 60 percent or more of the adult salmon migrating up the Susitna River were heading up the mainstem above its confluence with the Yentna River.

The silty waters of the Susitna had kept this secret hidden until then.

Another discovery was the presence of mainstem salmon spawning areas in the Susitna River, used primarily by chum salmon, in the 50-mile stretch between Devil Canyon and the Talkeetna River. Before the studies began, biologists had never documented the spawning distribution of chum salmon in the Susitna system.

Further, biologists discovered a chum salmon run of far greater magnitude than had been expected.

"The Susitna River and its tributaries upstream of the Parks Highway Bridge are a very important chum salmon area," said aquatic studies coordinator Tom Trent.

During the studies, biologists also documented the presence of the Bering cisco in the Susitna—something previously unknown. They also found that rainbow trout, which spend summer in many side tributaries, overwinter in the mainstem of the Susitna. Burbot, they discovered, were abundant in the Susitna, perhaps more so than any other resident species.

Researchers also found two king salmon spawning areas above the proposed Devil Canyon Dam site. Before the aquatic studies began, most biologists assumed that the swift, turbulent waters of the river prevented upstream migrations of salmon beyond Devil Canyon.

Biologists also documented the relative run size and spawning locations of two very large runs of smelt, known locally as hooligan, in the Susitna River.

"The (smelt) runs we saw last year and this year were in the tens of millions of fish," said Trent.

But the big question—what will happen to resident and anadromous species of fish if the power dams are constructed on the Susitna—is a subject of continued study.

"We're still getting valuable and needed information," Trent said.

He said that one of the problems in studying a river like the Susitna is obtaining data that accurately reflect a wide range of flow conditions. For example, the summer of 1981 saw the Susitna River at high water levels and the summer of 1982 at extremely low levels.

"Basically, we've had two atypical flow years representing low and high flow extremes," Trent said. "To come up with meaningful information on how stream flow might affect the distribution, survival, and production of fish, biologists need to measure flows that provide middle point information.

The hypothesis of Trent and other biologists is that if you change the level of water in the river, you will also change the aquatic habitats used seasonally by fish. These changes can be either detrimental or beneficial.

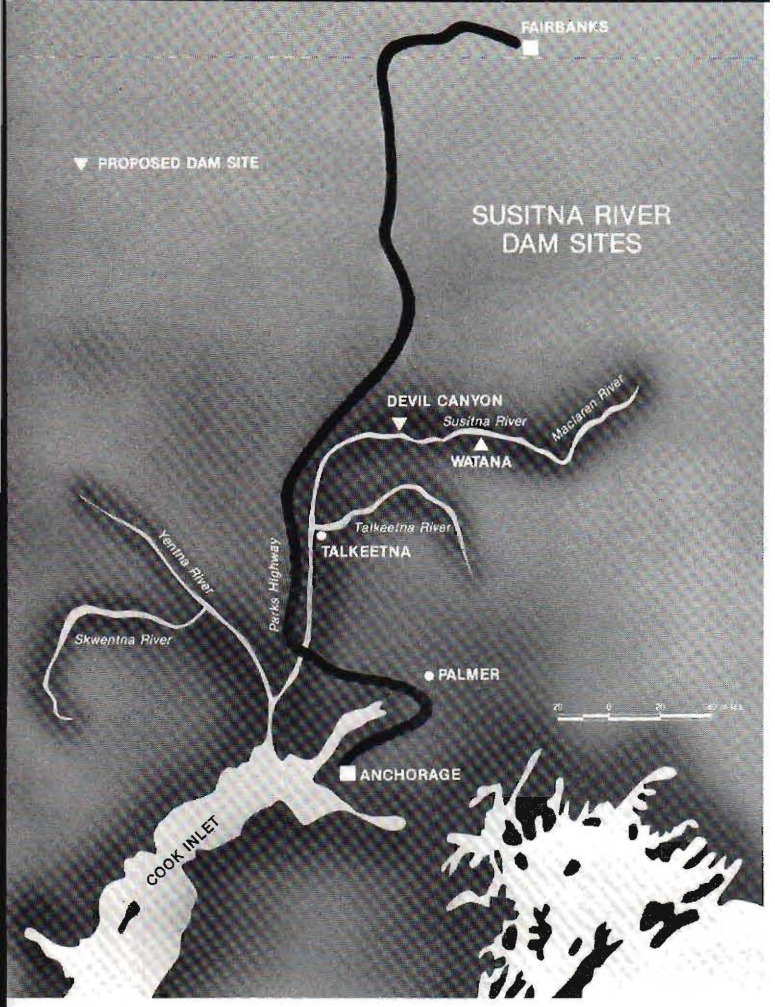
The work by ADF&G, to date, has been aimed at accurately describing the relationship of natural flows to rearing and spawning areas and other fish habitats. This information will be used by other participants in the APA's study to determine what the effects will be on fish and wildlife if the Susitna's stream flows are altered permanently through operation of a hydroelectric project.

The effect of the proposed dams on land mammals is even harder to determine.

Karl Schneider, who is in charge of ADF&G's Susitna hydro game studies, said that biologists have identified many species that would be affected by the dams, but cannot predict exactly to what extent.

The problem, as Schneider describes it, is that many of the species are closely interrelated.

Moose, for example, would likely be affected by loss of habitat and winter range in the area above the dams, while brown bears and wolves would likely be affected less—at least in the short run. If prey populations such as moose are reduced through loss of habitat, how will their lower numbers be affected by predator populations that remain, at least initially, at higher levels? And could the situation be further aggravated by



An artist's conception of the proposed Devil Canyon Dam (far left). The map shows the sites of the proposed dams in the Susitna River drainage.

a severe winter? These are the sorts of questions biologists are trying to answer, and the answers will be important to opponents and proponents of the dams.

Of all the mammals found near the proposed dam sites, the black bear faces the most serious problem. Most of the black bear denning sites found by biologists during the studies are located near the river, where they would be inundated by the dam impoundments. Black bears also tend to concentrate in the proposed impoundment areas during spring to gather food.

Game biologists also expect some changes to occur below the dam sites, but according to Schneider, "it's not real clear what these changes will be."

Much of the wintering habitat for moose along the lower Susitna River consists of willow bars, which are formed by periodic spring flooding. How these willow bars would be changed by an altered stream flow is unknown.

Much of the information uncovered by game biologists came as a result of their radio-collaring work. During the study, biologists have maintained radio transmitters on nearly 150 moose, 50 black and brown bears, nearly 50 caribou, and several wolverines. Radio-collaring is also being used to monitor the half-dozen or so wolf packs in the area.

Researchers made an interesting and unexpected discovery during the radio-tracking operation when they found a separate sub-herd of the Nelchina caribou herd. This fairly distinct herd of about 2,000 animals tends to remain year-round in the Butte Lake area between the Denali Highway and the Susitna River.

The Susitna dam reservoirs, biologists predict, would most likely restrict seasonal movements of other caribou, but not actually reduce habitat.

Another finding that resulted from the radio-collaring work was that brown bears from the upper Susitna River country often migrate considerable distances to reach Prairie Creek, a tributary of the Talkeetna River, which has a sizeable run of king salmon. Some of these bears would encounter the impoundments formed by the Susitna dams during their annual summer movements to the creek.

Will the benefits from the Susitna hydroelectric project offset the loss of any fish and game resources that will result?

That question, biologists say, is not for them to answer. Their biggest concern has been to try to determine how the project might harm wildlife and to seek ways of minimizing the harm.

And although department researchers have learned much about the Susitna River to date, many questions remain unanswered. There are many avenues of study which could, and should, be explored. ■

Jay Massey is a free-lance outdoor writer who has lived in Alaska for the past 15 years, nine of which he spent as an ADF&G information officer in Anchorage.

FACTS ABOUT THE SUSITNA

- The Susitna River is roughly 300 miles long from its source on the southern slopes of the Alaska Range to its mouth on Cook Inlet.
- The Susitna has three forks: the west, which originates at the West Fork Glacier; the middle, which stems from the Susitna Glacier; and the east, which comes from a glacier with no name.
- At its mouth on Cook Inlet, the Susitna is nearly four-and-one-half miles wide.
- During periods of low-to-medium water, the Susitna River at Devil Canyon moves at a velocity of roughly 14 feet per second.
- At Devil Canyon, the Susitna River gorge is 600 feet wide and 200 to 400 feet deep.
- The proposed dam at Devil Canyon would be 650 feet high and span 1200 feet, creating a reservoir roughly 26 miles long with a maximum depth of 565 feet.
- The proposed upper dam at Watana would be 885 feet high and span three-quarters of a mile, creating a reservoir 55 miles long.

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