Barely Afloat

As Montana's white sturgeon population sinks to fewer than a dozen individuals, biologists race against time to keep the majestic fish from disappearing altogether

By Ray Stout

THERE WAS A TIME, EONS AGO, when massive white sturgeon swam each spring from the Pacific Ocean up the Columbia River, from what is now Washington into British Columbia, through the northern tip of Idaho, and finally upstream to Kootenai Falls, located between today's Troy and Libby, Montana. The fish would spawn in the river's upper reaches and then head back downstream, traveling 700 miles or more to feed in the Pacific before returning again the following year.

That historic migration came to a halt at the end of the last ice age, roughly 11,000 years ago, when retreating glaciers created a waterfall, Bonnington Falls, on the west arm of Kootenay Lake, a natural wishbone-shaped lake perched above the Idaho border in British Columbia, just upstream of where the Kootenai River flows into the Columbia River. From that time on, fish above the falls could no longer move to and from the ocean, thus making them the only naturally landlocked white sturgeon population in North America (a dozen or so other populations have since become separated from the ocean by dams).

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Thousands of years after Bonnington Falls became a fish roadblock, the landlocked white sturgeon faced different and more severe changes to their natural surroundings. As the region was settled, mining and fertilizer processing polluted rivers with heavy metals and toxins, which killed the underwater insects that sturgeon eat. Dikes that drained bottomlands for farming and housing eliminated many river wetlands where young sturgeon previously hid and grew. Though Kootenay Lake is naturally made, the Corra Linn Dam built at its outlet in 1931 slowed the flow of the Kootenai River upstream, allowing suspended particles of silt to sink and fill in spawning cobble.

Another big setback to the white sturgeon came in the early 1970s, with the completion of Montana's Libby Dam. The hydropower structure traps nutrients in Lake Koocanusa, thus depriving organisms downstream of food. It also disrupts the natural rise and fall of the river, preventing the natural flood-borne scours that traditionally washed silt from downstream spawning cobble each spring.

All of which leaves the Kootenai River white sturgeon now wallowing on the federal government's list of endangered species, where it was placed in 1994. And it seems only occasionally that North America's largest freshwater fish—which can reach 15 feet long, weigh nearly a ton, and live more than a century—ever venture upstream into Montana anymore. In fact, according to the Montana Fish, Wildlife & Parks biologist heading the state's sturgeon recovery efforts, just a handful of white sturgeon still swim in the Treasure State portion of the Kootenai River.

"Only a few fish have been documented in Montana during the past decade," says Brian Marotz, who works out of Kalispell. "If I had to guess, I'd say fewer than ten remain here."

Preventing the extinction of the Kootenai River population—and then restoring it to self-sustaining levels—is the goal of an ambitious effort among Montana, Idaho, British Columbia, the

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ONE FOR THE FRYING PAN:

White sturgeon can reach 15 feet long and weigh nearly a ton. This specimen, taken from Idaho's Snake River in the early 1900s, weighed 850 pounds. The landlocked variety in the Kootenai River, however, rarely exceeds 350 pounds, because the fish can no longer reach the fertile Pacific Ocean to feed.

Below left: Kootenai Falls, near Troy, Montana, was the prehistoric upstream barrier for white sturgeon moving up the Columbia River into the Kootenai River.

A LONG, STRANGE TRIP: In prehistoric times, white sturgeon migrated from the Pacific Ocean up the Columbia and Kootenai Rivers as far east as Kootenai Falls, near what is today Troy, Montana. Roughly 11,000 years ago, retreating glaciers formed Bonnington Falls, in today's British Columbia, which blocked ocean-based sturgeon from moving farther upstream. The falls also trapped sturgeon in the Kootenai River, creating the only naturally landlocked white sturgeon population.

During the 20th century, the Kootenai River population was beset by pollution, riparian wetland drainage, and unnatural changes in river water levels. Today the number of sturgeon in Montana's portion of the river is estimated at only ten fish.

MONTANA OUTDOORS

U.S. Fish and Wildlife Service, and the Kootenai Indian Tribe. Federal, state, and tribal biologists are studying sturgeon movements, stocking hatchery-reared fish, and recommending water level adjustments to improve spawning conditions. They might also build structures that could enhance spawning sites so the white sturgeon could reproduce on their own. It's a huge effort, but with the population teetering on the verge of extinction, to not act aggressively would mean letting the Kootenai River population die out.

"Basically what it comes down to," says Marotz, "is that we have an obligation to not let things go extinct as a result of our actions on this land. We can't just let this fish disappear."

FIRST STEPS TO RECOVERY

The first step to stem the population's decline came in 1979, when Montana banned white sturgeon fishing in the Kootenai River. A few years later, Idaho and British Columbia followed suit. Then, in 1994, the United States placed the fish on its list of endangered species.

How did the Kootentai River population qualify for federal listing when plenty of white sturgeon remain in the Columbia and Snake Rivers? Isolation from its sturgeon cousins has made the Kootenai River fish a genetically unique population, say scientists. What's more, fish in the two populations differ greatly in size. The largest anadromous white sturgeon ever caught weighed 1,837 pounds, while the largest Kootenai River sturgeon came in at "only" 350 pounds (Montana's state record, caught in 1968, weighed 96 pounds).

White sturgeon received another boost in 1999, when the U.S. Fish and Wildlife Service released its Kootenai River White Sturgeon Recovery Plan. The top goal of the plan: Prevent the population from going extinct. In 1997, the wild white sturgeon population in the Kootenai was estimated at roughly 1,500 fish, but according to recovery team leader Bob Hallock, a federal biologist, that number is now down to about 660. At that rate, say Hallock and other biologists, the wild population could wink out in just a few decades.

That rapid decline makes it essential to raise hatchery sturgeon and release them into the river. Currently there are about 13,000 hatchery fish in the Kootenai River population, and more are being raised. At the Kootenai Tribal Sturgeon Hatchery, near Bonners Ferry, Idaho, thousands of tiny white sturgeon cavort in 15-foot-long steel troughs filled with a steady stream of filtered river water. A year or so from now, they will be stocked into the best remaining habitat as part of the effort to restore the Kootenai River population

"You're looking at sturgeon about three months old!" shouts fisheries technician Eric Wagner, trying to be heard over the constant roar of water while lifting the lid off a waist-high, rectangular tub to reveal fish the size of his index finger.

Some of the roughly 4,000 sturgeon fingerlings rest quietly on the bottom, their tapered body and nose nearly flush with the floor as though sanded flat. Others jiggle to the top, turn over, and suck the surface with their mouth, which is below the head and can extend out like a tube. The fingerlings are looking for grains of fish food.

Along each fingerling runs a row of sharp plates, called scutes, which have already become tough enough to deter predators. The little sturgeons' whiskerlike barbels, below the snout, are covered in taste buds that allow the fish to find food. And the

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FISH OF THE FUTURE: At the Kootenai Tribal Sturgeon Hatchery in Idaho, thousands of finger-length white sturgeon are being raised for later release in the Kootenai River.

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DONALD M. JONES

BILL LINDNER PHOTOGRAPHY

FOOD CONTROL: Before Libby Dam was built, in the early 1970s, spring floods would wash silt from downstream gravel and cobble where sturgeon spawned. The dam now controls floods. It also traps nutrients in Lake Koocanusa, reducing the number of aquatic insects downstream that sturgeon eat. The massive fish, like this one caught and released in Idaho's Snake River, find food with their whisker-like barbels, which are covered in taste buds.

sharklike tail will later be able to power the adult against strong river flows.

Despite their name, these sturgeon aren't yet white. Sturgeon are born dark so they can hide from predators, says Wagner. Over the next few years, as they are exposed to natural daylight, the fish will lighten, though they will always retain some dark mottling throughout their lives.

Rearing these small sturgeon—which come from eggs and spawn taken from wild fish captured in a stretch of the Kootenai near Bonners Ferry—is difficult. The fish are susceptible to disease, and many don't survive the 15 months or so it takes for them to reach release size.

What's more, simply dumping a hatchery-reared sturgeon into the Kootenai doesn't necessarily create a self-sustaining population. Sturgeon don't spawn until about age 30. Because hatchery fish have been released into the Kootenai only since 1992, it may be another 20 years before they start producing young of their own.

Meanwhile, the relatively few remaining wild fish are getting older. "At some point those [wild] fish may get too old to be sexually fertile," says Marotz. "Or they could just die off."

If that happens before the hatchery-reared fish begin spawning, he says, there could be no source of eggs to rear in the hatchery—much less in the wild. At the current rate of population decline, it will be only 10 to 20 years before wild sturgeon spawning no longer helps support the Kootenai River population.

"It's a race against time," Marotz says.

EGGS SUFFOCATE

Though the hatchery effort is key to any hope of the white sturgeon's recovery, stocking fish to create a self-sustaining population will not work without a place for them to reproduce. That's why the recovery plan also focuses on changing water flow conditions to improve spawning habitat.

Libby Dam appears to have disrupted sturgeon spawning success. Biologists have captured only a few dozen wild-born juveniles since 1974, the year the dam began operation. Built to hold back water, the structure prevents floods that once scoured cobble spawning areas. As a result, the stones are now buried in silt.

Silt hampers spawning for many species, and the white sturgeon is no exception. Most newly laid sturgeon eggs only survive by sticking to clean cobblestones, where fresh water can flow and provide the embryos with oxygen. When silt fills in cobble, the eggs settle into the soft material and suffocate.

The sturgeon aren't helping matters, either. Biologists have discovered that some of the females have been spawning over sand, where the eggs die for lack of oxygen.

Vaughn Paragamian, senior fisheries research biologist for the Idaho Department of Fish and Game, suspects that disruptions in river water flow may disorient the spawners. Libby Dam reduces historic flows from upstream, while Corra Linn Dam creates lower levels in Lake Kootenay than were there during past millennia.

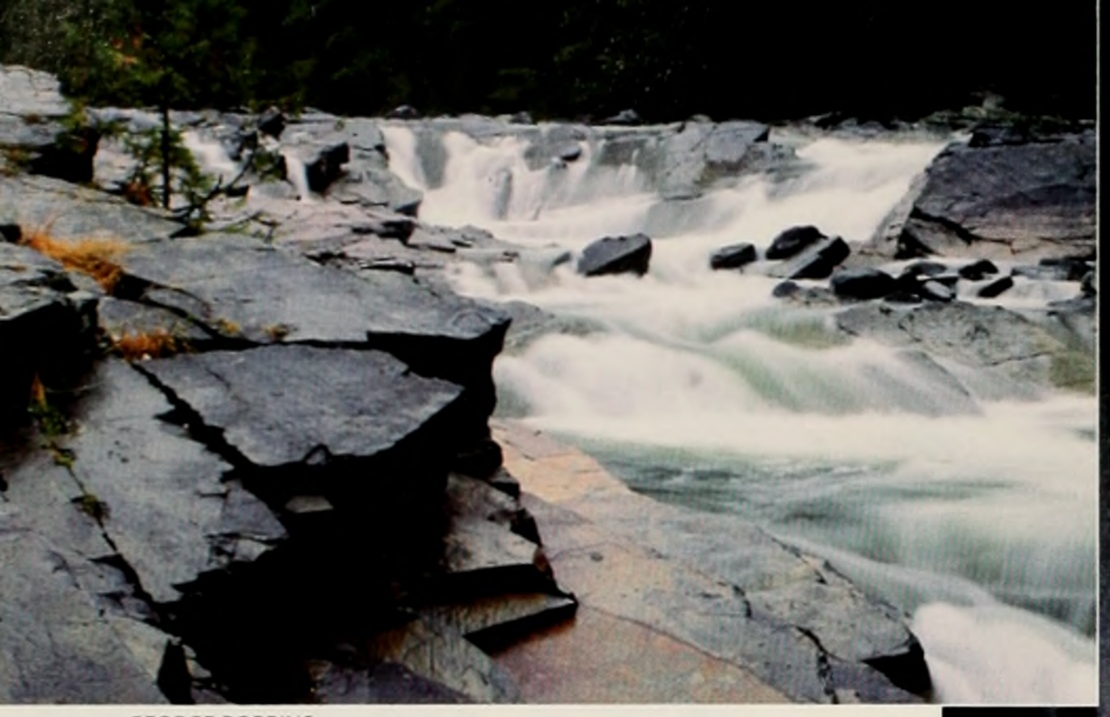
"That mix may be confusing white sturgeon to feel comfortable that they're spawning in the right place," says Paragamian.

The U.S. Fish and Wildlife Service has had some success convincing the U.S. Army Corps of Engineers, which controls Libby Dam, to modify flows to help mimic historic water flows. But much still needs to be done. Marotz hopes a new flood control strategy, called VARQ (for variable release flow, Q being a symbol for flow) and currently under review by the Corps, will do even more for sturgeon. The strategy calls for increasing dam water releases in spring, when sturgeon need it most, while still allowing the Corps to control floods and retain water for power generation and recreation in Lake Koocanusa.

Despite the promise of VARQ, Marotz doesn't think Libby Dam will ever be able to release enough water to adequately flush silt from the downstream spawning cobble. Many homes now sit in the river's floodplain, especially near Bonners Ferry and in Canada around Kootenay Lake.

"This is a huge problem," he says. "With all the people now living in the floodplain, I don't see much hope for getting adequate water releases to help sturgeon."

Adds Paragamian, "I think we're going to



GEORGE ROBBINS

CRAIG & LIZ LARCOM

A HANDFUL REMAINING: Though white sturgeon are still caught by anglers in the Snake River and Columbia River (right), the fish has become rare in Montana. The last one seen by anglers or biologists was caught in 2001 from a tributary of the Yaak River (above).

have to bring something to the fish to compensate."

For example, he explains, the spawning areas could be artificially enhanced. One possibility would be to add rock weirs in areas of the river. The structures would be built to constrict the river flow, creating a faster current that flushes out the sand and silt that smother sturgeon eggs.

Another way of improving fish habitat might be to add nutrients to the river below Libby Dam to boost food production. However, though it may hold some promise for helping the sturgeon, nutrient addition isn't something Montana wants to begin trying yet. "At least not until some scientific evidence supports doing that," Marotz says. But he does favor a feasibility study now being done in Idaho, where scientists are learning how adding various amounts of nitrogen and phosphorous would affect the Kootenai River ecosystem.

HOW MANY LEFT?

Further frustrating biologists is the fact that white sturgeon seem to use just a fraction of their available habitat. Though the fish in the Kootenai River population can use roughly 170 miles of water between Corra Linn Dam and Kootenai Falls, they spend most of their time in Kootenay Lake. And they only spawn in a tiny portion of their range, roughly an 11-mile stretch downstream from Bonners Ferry. Perhaps the most perplexing mystery of the Kootenai white sturgeon population, say biologists, is why those fish rarely swim upstream into Montana waters.

"It's troubling that they aren't utilizing this part of their habitat," says Marotz. "We've got plenty of clear cobble up here that would be great for spawning, but for some reason they just don't come up here anymore—if they ever did."

Sue Ireland, the Kootenai Tribal Sturgeon Hatchery's administrator and lead biologist, wants to plant more juvenile sturgeon in Montana waters. If the existing sturgeon won't spawn by Kootenai Falls, maybe ones stocked near there would.

"We would like to know if sturgeon released in Montana would stay in Montana and utilize that part of the river," she says, "or if they would just move downstream like they did during a release in Montana in 1994."

Ireland, like other biologists, is puzzled by what seems to be some invisible barrier keeping the big fish from heading upstream into the Treasure State.

"We know there used to be sturgeon in Montana," she says, "and we would like to know if the habitat provides the necessities for juvenile rearing."

For several years, Paragamian has been following sturgeon captured in Kootenay Lake then surgically tagged or fitted with radio or sonic transmitters and released.

"We have never had one go into Montana," he says.

At least a few untagged sturgeon may still haunt the state's waters, however. Daryl Anderson saw one several years ago, and he'll never forget the sight. Anderson, sheriff of Montana's Lincoln County, was fishing on the Kootenai when the massive fish surfaced.

"The devil came up right in front of me," Anderson recalls. "He was a good 5 feet long—a big sturgeon." The fish rose nearly out of the water, rolled, and came down with a huge splash. "I almost fell off the rock there," he says.

In 2001, a Montana angler caught a white sturgeon from a tributary of the Yaak River, which runs into the Kootenai. That was the last one anyone has seen in Montana. Marotz says he and other FWP staff members recently tried to find and capture a white sturgeon, but with no success. "We really gave it a good effort," he says.

Pat Graham, FWP director during the 1990s, recalls the thrill of seeing a white sturgeon in 1980 downstream of the falls. He was working as an agency fisheries biologist searching underwater in scuba gear for the elusive fish. Graham says the 4- to 5-foot sturgeon darted away when he and other FWP divers first saw it while searching nearly 100 feet below the river surface. It then lay on the dark river bottom, illuminated by their flashlights.

"When you realize how few of them there are, the fact that we even saw one was quite exciting," says Graham, currently director of the Arizona Chapter of The Nature Conservancy.

Unfortunately, few people ever get to view a white sturgeon to appreciate it firsthand. That's frustrating for sturgeon supporters such as Marotz. He says that anyone who sees the majestic fish would be convinced that white sturgeon merit protection and restoration.

"These fish have been around this region, doing well, since the last ice age and probably before that," he says. "This is such a precious thing, and when you see one of these fish, which are 50, 100 years old or older, you're just struck by how important it is to have this living relic of Montana's natural heritage still with is. We can't just lose that."