



\$50 an ounce

Can Montana's paddlefish survive the growing international demand for their eggs?

Through-deep in the muddy Yellowstone River, Frank Wells is pulling on his fishing rod like a man hauling a piano up a flight of stairs. His forearms quiver, the cords in his neck bulge, and his fishing line sings like a guitar string as the fish he has hooked turns into the strong current and pulls line from his oversized reel.

Wells, who is from Wyoming, is going one-on-one with a paddlefish, the largest fish species in eastern Montana, and he's determined to land it. Keeping the rod's tip up and its lower section wedged between his arm and body, Wells gains a few feet of line each time the fish turns into slack water. After an exhausting 20-minute fight, he guides the fish to the shallows, where his fishing partner Mike Smith slides a hand under its jaw and drags it to shore. >>

STORY AND PHOTOS BY ANDREW MCKEAN





MUSCLING ONE IN Standing on the flooded banks of the Yellowstone River below Intake Dam near Glendive, an angler struggles to haul in a paddlefish with a fishing rod thick as a pool cue. Thousands of people from around the region take part in the annual springtime snagging season, providing an economic boost to local economies.

Gray flanks quivering under the bright May sun, the paddlefish appears as tired as Wells. It weighs 72 pounds but looks even heavier, with a mouth large enough to hold a volleyball and a belly round as a pony keg. The sexually mature female is full of eggs. A fish this size might hold roughly 400,000 BB-sized ova weighing a total of 15 pounds.

Those eggs, key to the species' longevity over the last 200 million years, could also threaten its survival. Prairie business boosters, caviar fanciers, and black marketers alike are positioning themselves to profit from the increasingly valuable charcoal-colored caviar derived from Yellowstone River paddlefish. Keeping a watchful eye on the growing commercial trade are Montana fisheries managers. Knowing that paddlefish populations are vulnerable to exploitation, the biologists try to find a balance between allowing adequate sport and caviar harvest without endangering the species' survival.

THE PADDLEFISH STOPS HERE

The epicenter of paddlefish harvest in eastern Montana is Intake Dam, near the North Dakota border just off Montana Highway 16 between Glendive and Sidney. Five feet tall and 700 feet wide, the rock weir spans the Yellowstone River and diverts part of the river's flow into a network of irrigation canals. In spring, as paddlefish move from North Dakota's Lake Sakakawea (an impoundment of the Missouri River) and up the Yellowstone (a Missouri River tributary) to spawn on shallow gravel bars, they run into the dam. During some years, thousands of paddlefish stack up in the swirling, chocolate-colored water below the structure.

Catching these migrating fish is not fishing in the traditional sense. Paddlefish eat only zooplankton, which they consume by swimming, massive mouth agape, through clouds of the microscopic organisms. The zooplankton are filtered from the water by gill combs called rakers. (Scientists believe the fish uses its spatula-shaped nose, called a rostrum, to find the zooplankton, perhaps by sensing electromagnetic signals emitted by the tiny organisms.) Paddlefish won't eat

bait, so the only way to catch them with hook and line is to use large treble hooks to snag the massive fish and stout saltwater tackle to horse them into shore.

Paddlefishing is at the other end of the style spectrum from fly-fishing. In fly-fishing, the goal is to delicately set a dainty bit of feather and fuzz above an indifferent trout sipping insects off the water surface. Paddlefishing is more like dragging a river for sunken logs. When the fishing is good, snaggers can catch several fish in a day cast-

PADDLEFISH
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ing into the Yellowstone below the dam. Male paddlefish run 20 to 30 pounds, and females range from 40 to over 100 pounds. The height of the paddlefish run at Intake is usually around Memorial Day weekend.

The lower Yellowstone and Missouri rivers in eastern Montana share one of only a few reproducing paddlefish populations in the United States. (Another distinct population in Montana exists upstream from Fort Peck Reservoir.) The fish need the heavy flows of large rivers to trigger their spawning run, and they reproduce best in turbid waters that hide their eggs from predators. Juvenile paddlefish require warm big-river backwaters rich in zooplankton.

The paddlefish is among the most primitive and ancient fish in the world. Evolutionary biologists trace it back to the Triassic period, even before the arrival of most dinosaurs. Somehow, paddlefish have managed to avoid extinction despite conti-

mental drift, drought, and the glaciers that have periodically rerouted the big rivers where they live. Their remarkable fertility helped paddlefish survive these habitat changes. A single female can carry a half-million eggs. When spawning and rearing conditions are right, the sheer number of young paddlefish in the system ensures that some will survive.

FROM DAWSON COUNTY TO TOKYO

The paddlefish's abundant eggs have kept the species alive, but they also could threaten its survival. Like those of sturgeon, paddlefish eggs can be made into caviar coveted by connoisseurs throughout the world. As import restrictions have limited the availability of caviar from the rare Caspian Sea sturgeon in southwestern Asia, paddlefish roe—made into caviar by experts who preserve the eggs in special salts—has become increasingly valuable. The retail price of bulk paddlefish caviar has jumped from around \$80 a pound a decade ago to more than \$300 a pound this year. A single ripe female contains eggs that, when prepared properly for conversion into caviar, sell for over \$1,000.

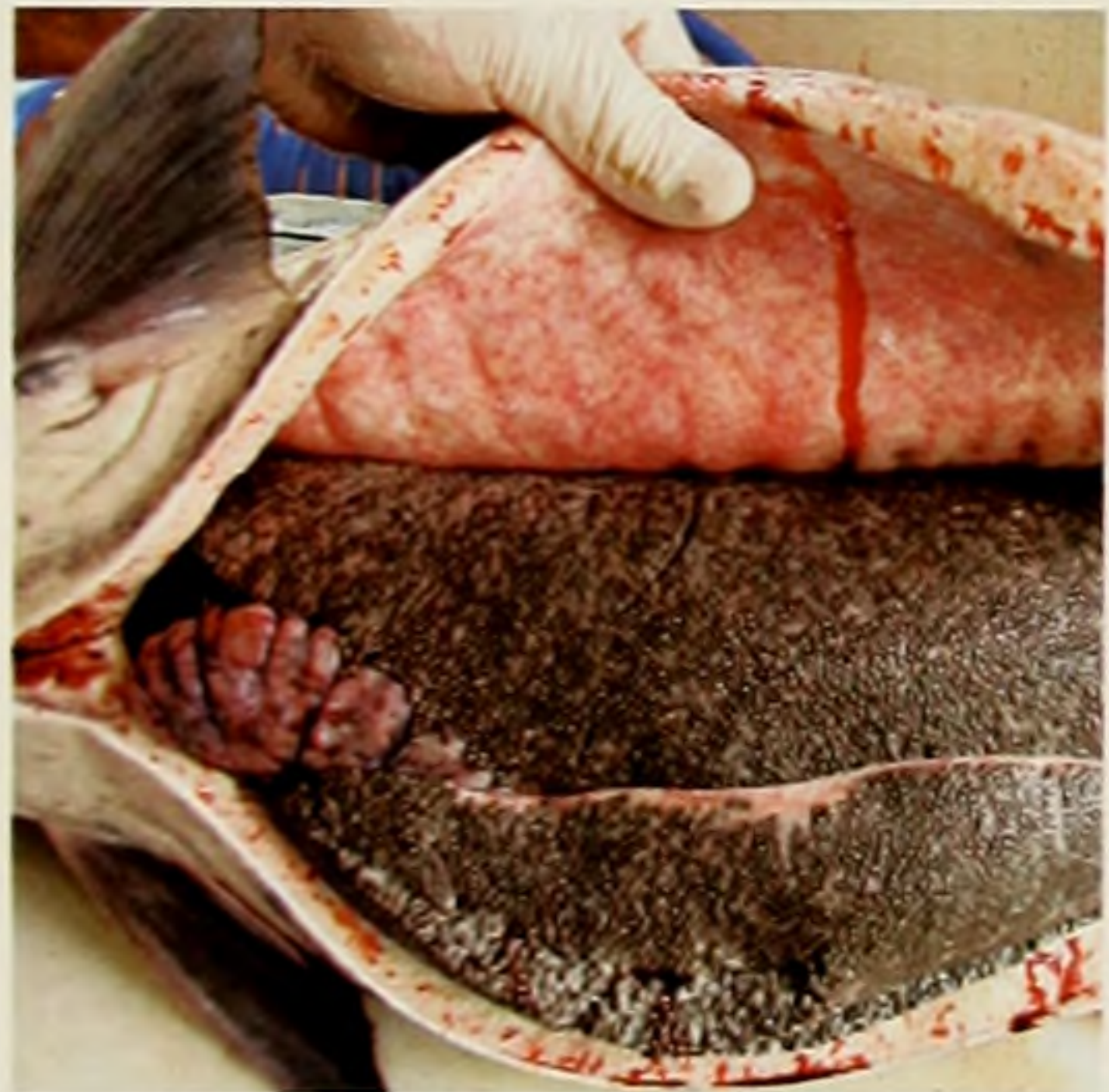
Twenty years ago, paddlefish eggs were considered garbage, useless offal discarded along with the guts and heads of snagged paddlefish along the shores of the Yellowstone River. No longer. Today, the eggs are carefully harvested in a gleaming aluminum trailer parked beneath the cottonwood trees at the Intake Fishing Access Site. The trailer is owned by the Glendive Chamber of Commerce, which hires processors to clean and package all the snagged paddlefish, which is done in exchange for eggs retrieved from the females.

Before processing, the fish are weighed and measured by FWP crews, who also remove a piece of jaw. (Biologists later examine the growth rings of the bone under a microscope to determine the fish's age.) A conveyor belt takes the paddlefish into the trailer, where caviar specialists clean each fish with a few deft knife strokes. They slit open the belly of females and remove the glistening eggs, which are gently placed in a cooler. Later, the eggs are sprinkled with sea salt, potted in quart jars, and frozen. The paddlefish itself is filleted and the meaty steaks are

Andrew McKean manages the FWP regional Information and Education Program in Glasgow.



CAVIAR FACTORY Like those of sturgeon, the eggs of paddlefish can be made into caviar that is sold worldwide. At Intake Dam, FWP biologists weigh and measure the paddlefish before the fish are cleaned and filleted. The steaks are packaged and returned to anglers, and the eggs are washed, mixed with special salts, and frozen. To prevent the caviar and sport harvest from removing too many of the ancient fish, FWP crews (above) continually monitor the population to see how it is holding up.



packaged for the angler to take home.

The caviar can end up nearly anywhere in the world. Paddlefish eggs from eastern Montana are served on chilled glass plates in Japan, New York City, and Paris, where diners pay up to \$50 an ounce for the chilled, salted delicacy scooped with mother-of-pearl spoons (never metal) onto toast points.

The sale of game fish and wildlife meat is illegal in Montana. This prohibition discourages the sort of market hunting and fishing that nearly wiped out wildlife populations across the country in the late 19th century. But there's a loophole.

In 1989, a group of eastern Montana civic boosters lobbied the state legislature for an exemption that allows the Glendive Chamber of Commerce to collect and sell paddlefish eggs. Thirty percent of the profits pay for FWP paddlefish research, management, and fishing-site improvements. The rest stays with the chamber, which uses it to fund cultural, historical, and recreational projects across eastern Montana. Since the first caviar was marketed in 1990, the chamber has distributed more than \$500,000 to buy playground equipment, bankroll swim teams, install a disc golf course, and more.

"We've turned fish eggs into baseball uniforms and museum exhibits," says Norm Unterseher, one of several local volunteers who coordinate the paddlefish egg collec-

tion and marketing. "This is a real success story for eastern Montana. We took something nobody wanted and we've done a lot of good with it."

PADDLEFISH FOREVER

There's no question the caviar harvest program is helping Glendive and surrounding communities. But could it be harming the paddlefish population? With its share of the caviar profits, FWP has funded an extensive study of the Yellowstone paddlefish population. Biologists have learned that both caviar collection and paddlefish conservation can succeed—as long as marketers and managers keep the long-term health of the fishery as their top priority. "Throughout the world, the history of caviar is the history of fish population exploitation," says Brad Schmitz, FWP's regional fisheries manager for southeastern Montana. "If caviar stocks are not tightly regulated, the fish population can eventually disappear."

FWP, working cooperatively with North Dakota, monitors the paddlefish population's progress from year to year. It also regulates harvest to prevent too many fish from being removed from the population. "Like most fish and wildlife management, what we're doing here is like managing a bank account," says Schmitz. "You can't withdraw more than you put in, and we keep a very

close eye on the withdrawals, or harvest."

Schmitz and University of Idaho fisheries professor Dennis Scarnecchia, an authority on sturgeon and paddlefish who helps monitor the Yellowstone River stock, estimate the total adult population of paddlefish in North Dakota and Montana at around 30,000 fish. Working with North Dakota biologists, they have determined that 2,000 can be harvested each year without harming the population.

Factored into the safe harvest number is the fact that paddlefish are a long-lived species whose females don't reach sexual maturity until ages 17 to 20 and only spawn every third year. As a result, each ripe female that is harvested represents a significant share of that year's reproductive potential that has been removed from the population.

Montana and North Dakota have agreed to split the harvest, with a quota of 1,000 fish each. Montana has exceeded its quota some years, cutting into a population that surveys indicate has been slowly declining over the last 20 years. In addition to overharvest, the decline is likely due to the decade-long drought that has depleted Lake Sakakawea, reducing the amount of shallow reservoir habitat that juvenile paddlefish need. (The slack water of the full reservoir is like a zooplankton "sink" that provides food for young paddlefish.) Until the reservoir fills again, Schmitz expects the production

DOWN THE LONG ROAD Paddlefish are prehistoric fish that have lived in North America for millions of years. To help the Yellowstone population survive at least a few hundred more, biologists tag fish in the lower jaw and then monitor the progress of those individuals from year to year. If that research indicates the population is declining, the FWP Commission will reduce harvest quotas, as it has done this spring.



GLEN MEIER

of enough new young fish—what he calls “the interest on the account”—to lag behind the harvest of older fish. Other obstacles to paddlefish reproduction: the dams at Intake and Fort Peck, which block spawning runs; reservoirs, which have flooded gravel bars historically used for spawning; and irrigation projects that can deplete rivers of water.

HOPEFULLY OPTIMISTIC

To help offset impediments to paddlefish procreation and keep Montana’s harvest from exceeding the 1,000-fish quota, FWP has instituted new regulations this spring (*see box below*). Schmitz believes the new regulations will help Montana sustain its paddlefish populations and buck the worldwide trend of losing caviar-producing fish populations. But that will only happen, he says, if long-term conservation takes priority over short-term recreational and economic benefits. “Because you won’t have those benefits down the road if you don’t take measures to ensure you harvest the resources sustainably,” he explains.

For paddlefish, “down the road” means looking many decades ahead. “Managing paddlefish happens in a whole different time frame than for other fish species,” says Schmitz. “They mature slowly and don’t spawn every year, so we might not see the ramifications of recent overharvest for 20 years or more.”

For years FWP was at loggerheads with the Glendive Chamber of Commerce over reducing the harvest quota. The chamber wanted more money for community projects; FWP was concerned the fishery was being overharvested. Recently the two sides have come to an agreement over the importance of the fishery’s long-term health and

the need for new harvest restrictions.

“Paddlefish are like any other wildlife species and have to be managed now so they’re around in the future,” says Kim Trangmoe, director of the chamber’s caviar program. “These fish have been around for millions of years, and if we all manage them right they’ll be around for millions more. In the meantime, I think everybody can benefit by managing the caviar as a beneficial byproduct of the paddlefish.”

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Also benefiting from this new cooperation are the recreational snaggers. The paddlefish fishery is a unique resource providing important outdoor recreation in eastern Montana each spring for thousands of people like Mike Smith. “I wouldn’t miss it,” says the Billings snagger of his annual pilgrimage to Intake each spring. “It’s a tradition that for me kicks off the summer.”

It also kicks off Glendive’s tourist season.

The recreational fishery gives a much-needed boost to motels and restaurants each May as resident and nonresident paddlefish pursuers descend on the city. Successful snaggers, in turn, go home with a freezerful of trimmed and packaged fillets, and fish remains are properly disposed of, keeping the fishing access site clean.

Schmitz notes that, in some ways, even the paddlefish population benefits from the snagging season and caviar harvest program. The proceeds continue to pay for monitoring that FWP might not otherwise be able to do. Also, by channeling the caviar collection through the chamber of commerce, Schmitz and others in the department can work directly with the people harvesting the eggs. If the egg harvest station didn’t exist, Schmitz says, a black market could emerge for paddlefish eggs, and overharvest could become uncontrollable.

For now, FWP and the chamber have a common vision for sustaining the Yellowstone River paddlefish stocks for the good of the community, the recreational fishery, and the fish population. But always looming on the horizon is the international caviar market, which could drive egg prices ever skyward and put new pressures on the paddlefish population. Just this past February, a new buyer from Japan toured the caviar production facility at Intake, and others will no doubt continue to court the chamber. Habitat loss, drought, and the species’ slow rate of reproduction are major impediments to the long-term conservation of Montana’s paddlefish. But restraining the insatiable appetite of the world caviar market may ultimately prove the most difficult challenge of all. 🐻



NEW SNAGGING REGULATIONS AT INTAKE

Starting in spring of 2007:

- FWP will close the snagging season at Intake when 800 fish have been harvested (the agency factors in an additional harvest of 200 paddlefish not at Intake).
- If it appears that total harvest along the Yellowstone will exceed Montana’s 1,000-fish quota, FWP may close the season with 24 hours notice.
- To reduce unrecorded harvest, snagging will be allowed only during daylight hours.
- To boost the length of the paddlefish season, harvest will be allowed only four days each week. Sundays, Mondays, and Thursdays during the season are now reserved for catch-and-release snagging only (the hardy fish almost always survive the rigors of being snagged and hauled in if they are released back to the water quickly).

For additional information on Montana’s paddlefishing regulations, visit the FWP website at fwp.mt.gov.