

CAVIAR COLLAPSE

Sending Ripples From the Caspian Sea to the Mississippi River

STORY AND PHOTOS BY JOE WILKINSON

Sunrise over the Mississippi River, where about 1,000 sturgeon were tagged and released by DNR biologists in the last two years. Facing page: Covered with bony plates, the reptile-like fish can hold up to 50,000 eggs; visible through the belly in its dark roe sacs. Four finger-like barbels above the flexible, vacuum-like mouth help sense bottom dwelling insect larvae and small fish.



BLACK MARKET PIRATES and world demand for caviar have decimated Caspian Sea sturgeon populations. **ARE IOWA STURGEON AND PADDLEFISH NEXT ON THE CAVIAR GAUNTLET? Can wild populations sustain the sky high demand? OR COULD COMMERCIALY RAISED FISH HELP SATISFY DEMAND FOR THIS Highbrow Delicacy?**

It's a sunny day on the water, yet the traffic on the Mississippi River below Bellevue is light. Playing out their trammel net, the crew takes care not to tangle it. Large red and white planer boards keep the top edge afloat. Below the surface, the 100-foot net creates a curtain across the main channel. After a 10-minute wait, the crew checks the net.

Folding it as they quickly gather it in, they look to the water below. "Here comes one," calls Iowa Department of Natural Resources fisheries technician Gene Jones. The retrieve stops while he works a 24-inch shovelnose sturgeon out of the 2-inch mesh. The bottom-feeding fish, dusky white on its flat underside, washed out gray-brown above, is plopped into an onboard tank of river water. An average haul brings up about five of the spiny, freakish-looking sturgeon wriggling in the net. They re-set the net a couple hundred yards from their first spot and turn their attention to the fish on board.

"If it is a female, it's about 7 years old, a little older, if it is a male," says fisheries biologist Kirk Hansen. "At that age, females are just starting to mature, and may begin to produce eggs. However, shovelnose sturgeon only spawn every two to three years. That's why they are prone to overharvesting." Hansen, Jones and seasonal worker Steve Pecinovski record the sturgeon's length, weight and the number of a tiny metal identification tag injected into it, before dropping the fish back into the river. On this run, they worked up 25 sturgeons ranging in size from 11 to 25 inches. Over the



STURGEON KILL ON DES MOINES RIVER REMAINS A MYSTERY

Hundreds, perhaps thousands, of shovelnose sturgeon died along a 50-mile stretch of the Des Moines River between Ottumwa and Bonaparte last July. Tissue samples sent to the U.S. Fish & Wildlife Service laboratory in LaCrosse, WI yielded inconclusive results.

"We strongly suspected a health issue with the fish; perhaps a viral pathogen," offers DNR fisheries biologist Mark Flammang. "However, the fish we provided (for testing) were too degraded to study further." Whether the cause is water quality related or due to the health of sturgeon populations is unknown.

Several midsummer sturgeon die offs occurred locally and in the Rock River in Illinois in the last decade, but researchers can't pin down a cause such as low water flow, high water temperatures, introduction of some agent into the water or a combination. "Even if a viral agent had been at work, we would still hope to find a water quality issue that might explain the large-scale stress that would allow a virus to affect so many fish. It's kind of baffling," says Flammang, who notes other species don't appear affected during sturgeon die offs. The magnitude of the 2006 kill, their continuing frequency, and the growing interest of sturgeon in commercial markets make finding a cause critical.

last two years, about 2,000 fish have been tagged in this stretch of the river.

At first glance, this is no different than other DNR fish sampling surveys. This project, though, seeks to snuff a ticking time bomb. The world caviar market has disintegrated and Iowa sturgeon and paddlefish are next up on the worldwide auction block. “We are trying to learn everything about sturgeon,” emphasizes Hansen. “There just aren’t that many big, mature ones out there.”

Slow to grow and to reproduce, the 25 species of sturgeon — and their distant cousins, the paddlefish — rate worldwide concern. Much of their range; The Caspian, Black and Aral Seas in southern Europe and west Asia and in North America, the coastal rivers of the Northwest and the large Midwest river systems have undergone radical changes in the last century. For a fish that has changed little in the last 300 million years, the damming of migration routes, loss of spawning grounds and rising pollution over the last few decades have walloped them in a relative blink of an eye. Now, there’s new threats: over-fishing and poaching.

Through the 1800s, North American Atlantic sturgeon supplied fine caviar for most of European and American high society. Over-fishing caused those populations to plummet. Not to worry, though. For the next century, the “caviar crowd” embraced the Caspian Sea, as it provided nearly 90 percent of the world’s Beluga, Osetra and Sevruga sturgeon roe; the eggs processed into the finest caviar. Life was good.

However, with the Soviet Union collapse in the 1990s, enforcement of sturgeon harvest quotas virtually disappeared. The Russian Mafia took over the lucrative business. Sturgeon poaching was rampant as profiteers eyed \$100 an ounce retail prices for top caviar. Compounding the crisis, the inland seas have shrunk as rivers are diverted for irrigation and other purposes. Water that trickles in is polluted. As a result, sturgeon have less area to live, cannot reach much of their historical spawning grounds and ingest increased levels of toxins. Populations have plummeted by about 80 percent. Some species are threatened with extinction.

It also has the caviar pendulum swinging back to North America, where biologists worry that sturgeon populations are too low to support the caviar industry in the long run. Commercial sturgeon ‘farms’ fill part of the demand. The concern, though, is that it unintentionally masks the illegal take of wild sturgeon and that regulations are not strong enough or are being flaunted to the point that wild populations might not recover from yet another heavy blow.



Biologists insert quarter-inch microchips under the leathery skin of netted shovelnose. If recaptured, a magnetic wand (below) activates the chip to transmit an identification code to track the condition, growth and movement of fish. Passive integrated transponders (PIT) are similar to tags used to identify household pets.



BIG FISH MUST DIE

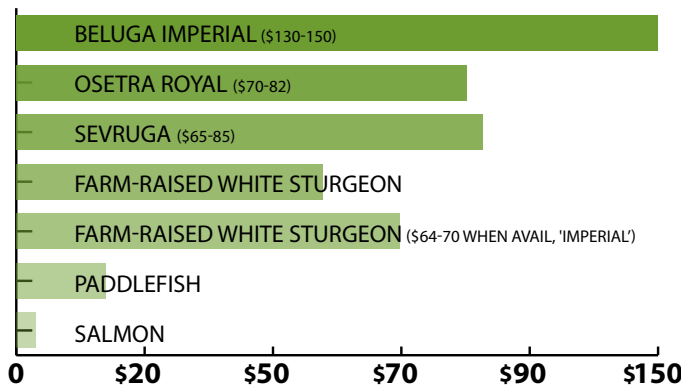
To harvest roe, the big fish must die. This is no delicate hatchery operation, where ‘ripe’ brood fish are massaged to release the eggs from their bellies before being returned to their well-fed existence in raceways or ponds. Though there is some experimentation with surgical roe removal and rehabilitation in commercial aquaculture situations, the standard practice is to kill females, cut them open and remove the eggs. Some fish hold thousands of dollars of future caviar in their bellies.

In Iowa, commercial shovelnose fishing is allowed on the Mississippi River. For decades, fishermen netted sturgeon; selling meat locally, fresh or smoked, or supplying regional markets. That market is now international and it is caviar, not smoked sturgeon, driving it. New Iowa regulations, which took effect this past summer, are designed to rein in the growing demand for a shrinking resource.

“We knew what was happening to the Russian caviar industry and we began seeing much more interest in sturgeon around here. We were getting a lot of out of state commercial fishermen, and they all were interested in sturgeon,” recalls Jones, a fisheries technician for

PRICES OF CAVIAR PER OUNCE, OCTOBER 2006

(sources for prices: Fine Food International and Markys.com)



the last ten years at the DNR's Bellevue management station on the Mississippi River. By the end of 2002, Iowa commercial anglers were required to report their harvest of sturgeon meat and eggs. They showed 235 pounds of roe taken that first year. One year later, the harvest leapt to 2,019 pounds. And it's gone up each year since.

Several years ago, one commercial operator reported taking sturgeon roe in Iowa. Now, there are at least 13. And with a wide open river, officers worry about what they can't see. "Some of our commercial harvesters are very honest. Some may not be," offers DNR conservation officer Burt Walters, who patrols the Mississippi River. "We have had commercial guys who come up from Tennessee. They tell us specifically they were here for sturgeon and getting \$80 to \$90 a pound for first cut sturgeon roe." Walters feels only a fraction of what is caught is reported.

Iowa's new regulations allow no commercial shovelnose sturgeon fishing from May 16 to Oct. 14. In season, a fish must be at least 27 inches long, with a maximum of 34 inches between Iowa and Wisconsin. Also, fish must remain intact until reaching the final processing facility. The length limit should allow more Mississippi River shovelnose to reach maturity and spawn. "We realize it had become big business for commercial fishermen. We don't want to take that away," explains Hansen. "At the same time, we have to ensure the fishery is sustainable. This is the last strong population of sturgeon on a large scale. It's about time we learned our lesson."

Or could it open the door for violators? "It's going to increase poaching," voices commercial fisherman Ralph Moen of Harper's Ferry. Substantial busts of sturgeon and paddlefish poachers have been reported in states that boast sturgeon populations, from the Midwest to the Deep South to the West Coast. "It's such big money down South that it is going to happen." Moen says he made only about \$500 from the sale of sturgeon roe last year — and that the restrictions only make it tougher for the few remaining in-state commercial anglers.

States from Wisconsin to the Deep South have clamped down on commercial sturgeon harvest, too. "They're targeting the shovelnose sturgeon because that's just

about the only one left in the country you can fish. All the others are threatened or endangered or protected," warned Bobby Reed in an Associated Press story. Reed is chair of the national paddlefish and sturgeon committee for the 23-state Mississippi Interstate Cooperative Resource Association (MICRA.)

Recreational fishing for sturgeon is still allowed throughout Iowa, with no daily or length limit. Recreational anglers, however, cannot sell any part of any fish they catch.

BOOM AND BUST

A decade or so ago in Iowa, high prices led to a big increase in the harvest of mussels on the Mississippi River. That pressure and, most likely, water quality factors pushed mussel populations to dangerous lows. Walters worries that the pressure on sturgeon mirrors the clamming industry's "boom and bust" past. That becomes quite obvious, with a key point in the annual harvest report. The roe harvest has skyrocketed but the meat harvest is dropping. "We've seen them out on the water sorting fish. They're tossing back the males and keeping the ripe females," says Walters. "Female sturgeon don't spawn every year anyway. They're removing years of spawning potential with each female kept."

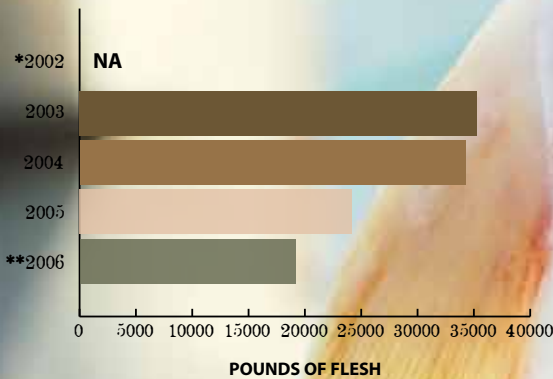
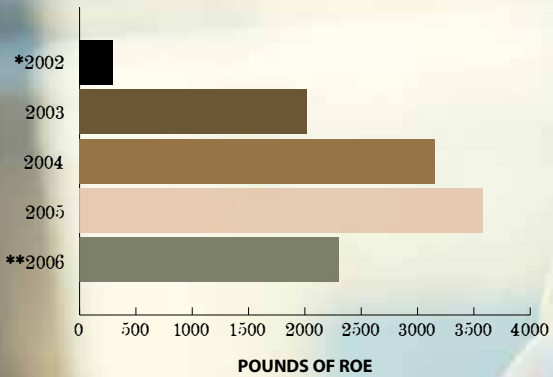
Caspian Sea Beluga caviar is the 'crème de la crème' of elite eats, gracing tables at the most elegant social affairs. Culinary experts urge use of gold spoons to deliver the shiny "black gold" from the crystal serving dish to discriminating palates. That is, when you can get roe. Lately, that hasn't been easy. Soon, it may be impossible. As the \$100 million global caviar industry turns upside down, the ripples are being felt all the way up the Mississippi River.

Will Iowa's new sturgeon regulations keep this relic of the dinosaur era from disappearing? Or will they block a small, very lucrative industry just getting off the ground? "We are definitely concerned because it takes so many years for them [fish] to mature. There is going to be a lull in the harvest," admits Hansen of the clampdown. "We have to protect this resource for Iowa anglers. Hopefully, this will help avoid a huge influx of people coming into Iowa to make a quick buck."

More sturgeon should reach maturity now; able to spawn at least once before reaching that 27-inch minimum length in Iowa's new regulations. Hansen's computer models indicate that should lead to a seven-fold increase in sturgeon eggs and a substantial increase in sturgeon numbers in the years ahead. "Every other species of sturgeon that has been exploited has crashed. We want to avoid that here." 🐟

- Minimum size limit **27 inches** (on border waters with Illinois)
- Minimum size limit **34 inches** (on border waters with Wisconsin)
- Season closed from **May 16 to October 14**
- **Fish must remain intact** until reaching final processing facility (from DNR notice of intended action, 2006)

SPIKE IN LEGAL ROE AND MEAT REPORTED



* reporting mandatory only for last several months
 ** through October

(from Gene Jones, Iowa DNR fisheries bureau, June 2006)



Shovelnose sturgeon produce roe upon maturity at 5 to 7 years of age. Females do not spawn every year.

THE INCREASED APPEAL OF PADDLEFISH ROE

They might not be as popular as sturgeon, but paddlefish make the gourmet wish list, too. The collapse of the Euro-Asian caviar industry is creating a big demand for paddlefish roe, as well as salmon, whitefish and bowfin eggs.

Paddlefish caviar sells for about \$14 an ounce. While not in the league with Beluga and other top-end products, the price creates a strong market. And with mature paddlefish tipping the scales at 15 to 20 pounds and up, (by comparison, mature shovelnose sturgeon weigh half that), they would seem to be a profit center. Unlike sturgeon, though, paddlefish are off limits to Iowa's commercial anglers.

But that doesn't necessarily let these

'ancient mariners' off the hook. Worried about lower paddlefish numbers, biologists in 23 states covered by the MICRA (Mississippi Interstate Cooperative Resource Association) have snagged the leathery-skinned paddlefish to weigh, measure and tag them for future identification. After a decade of study, it's a case of 'good news, bad news.'

In seven of the last 10 years, Iowa paddlefish showed good reproduction. That bodes well for the future, with more young fish appearing. However, few big paddlefish show up in research snagging. "We had a 38-pounder last spring and a few over 30 pounds. There were still a couple 50-pounders in 2004," recalls DNR fisheries technician Denny Weiss.

"But eight or ten years ago, we would regularly snag fish over 30 pounds, and others over 40; even several over 50 pounds. We just aren't getting the number of big ones anymore." Mortality rates are running about 60 percent in recent years, twice the rate from the 1970s. Their data doesn't provide a firm reason for the increase.

Migratory and environmental factors could impact the populations, but one leads back to the worst concerns of the caviar collapse: poaching. "Do we believe it is going on? Absolutely," declares DNR conservation officer Burt Walters. "Under the cover of darkness, a lot of things go on. We just are not seeing that 60 pound paddlefish that should be out there."