

DRIFTING

for paddlefish



Story by Ron Wilson

Photos by Mike Anderson

Justen Barstad, Game and Fish Department fisheries technician, holds one of a number of paddlefish netted in 2007 in the Garrison reach of the Missouri River. Ryan Thorson, Department seasonal aide, looks on. Inset: Barstad releases a tagged paddlefish unharmed back into the Missouri River.



This much is clear. Paddlefish alive nearly a half-century ago continue to endure in a stretch of Missouri River sandwiched between two gigantic dams in the Dakotas.

What's not apparent is the origin of a number of fish much younger than Garrison and Oahe dams, leaving biologists to consider whether they're the product of natural reproduction in the river, or downstream drift from Lake Sakakawea.

Oahe Dam was completed in 1962, nine years after Garrison, forever changing the face of a 200-mile stretch of river that once ran unchecked. Today, distorted flow regimes nowhere mirror what paddlefish were accustomed to for eons. The natural, gradual rise and fall of water levels is considered an important component of good paddlefish spawning habitat, scientists say. Rising flows in spring in unrestrained rivers such as the Yellowstone in northwestern North Dakota cue upstream spawning migrations in these fish.

In 1994, North Dakota Game and Fish Department fisheries biologists pioneered an effort to sample paddlefish in the Garrison reach, a stretch of Missouri River from Garrison Dam to the headwaters of Lake Oahe south of Bismarck. That year they netted 85 fish and aged 49, but then mostly left them alone until efforts were resumed 12 years later.

Since 2006, Department fisheries biologists have tagged 267 paddlefish, and in 2007, jaw samples were secured from 54 fish to determine their age. The samples have growth

rings that can be counted like tree rings under a microscope. "The oldest paddlefish we sampled was 50 years old," said Paul Bailey, Department south central district fisheries supervisor.

One-third of the fish were 30 years or older and the youngest was 4. "It's no secret that paddlefish have persisted in the Garrison reach for years," Bailey said.

Paddlefish are accidentally snagged by anglers every year in the Garrison reach and mostly returned unharmed to the river. There are also annual reports of fish getting hit by boats or cut by propellers.

Fisheries biologists sample paddlefish by drifting with nets downstream from the mouth of the Knife River near Stanton to the headwaters of Lake Oahe south of Bismarck. It takes two weeks to sample the entire stretch, something they did in 2007 in April, June, August and October. "Our goal last year was to learn the seasonal distribution of paddlefish in the reach," Bailey said.

The paddlefish found in the Garrison reach are called Oahe stock. These fish live in Lake Oahe part of the year and migrate upstream toward Garrison Dam on spawning runs that have yet to be determined successful. "It appears they start their upstream spawning migration in April downstream of Bismarck," Bailey said. "In June, more than 98 percent of the fish we netted were found upstream of Bismarck."

In August, fisheries biologists drifted downstream for two weeks without even netting a fish, leaving them to believe the



The Garrison reach of the Missouri River runs from Garrison Dam to the headwaters of Lake Oahe south of Bismarck.



Paul Bailey, south central district fisheries supervisor, prepares a paddlefish for tagging.

paddlefish had turned and headed in the direction of Oahe sometime before that. “We definitely found out where they weren’t in August,” Bailey said. “We could have been between two weeks to a month behind them. Who knows?”

Paddlefish require free-flowing rivers for spawning, like you find in the Williston reach in northwestern North Dakota where the Yellowstone flows undisturbed to its meeting with the Missouri. Biologists are uncertain of exact spawning sites in this area, which may change yearly, but eggs have been recovered in the Yellowstone in May and June.

Even though flows in the Garrison reach are regulated, resulting in a cooler, clearer river environment than you’d find in the Williston reach, fisheries biologists

can’t discount that some natural reproduction is taking place. Maybe some paddlefish, during years of high runoff, are migrating up Missouri River tributaries such as the Knife or Cannonball and spawning. Then again, maybe not, as paddlefish tend to stick to the bigger rivers during spawning, Bailey said.

To answer the recruitment question, Bailey said biologists will conduct water chemistry tests in the Yellowstone and main stem of the Missouri River in North Dakota and then compare the results to jawbone segments removed from paddlefish in the Garrison reach.

As paddlefish grow, they absorb the water chemistry of their environment. Because the water chemistry in the Missouri River likely differs along its course,

analyzing the jawbone would signal to biologists whether a paddlefish was the product of natural reproduction in the Garrison reach, or merely a fish that washed through the dam from Sakakawea.

“We honestly don’t know enough about the Garrison reach paddlefish to manage them effectively,” Bailey said. “That’s why we’re doing the research – to understand that whatever we do is right by the fish in terms of management.”

In contrast, the working knowledge gained in the last 15 years about the Sakakawea-Yellowstone stock – fish that reside within Lake Sakakawea and the Missouri and Yellowstone rivers – far exceeds what’s known about paddlefish in the Garrison reach.

Recruitment to the Garrison reach

population, whether natural reproduction or downstream drift, is extremely limited, Bailey said. This is a concern because the population could easily blink out over time. "We definitely have an aging paddlefish population," he said. "Of the 49 fish aged in 1994, only 12 percent were 30 years or older. In 2007, one-third of the paddlefish we aged were 30 or older."

Another concern is a change in paddlefish condition in the Garrison reach from 1994 to 2007. During that time, the mean relative weights of paddlefish dropped enough that they are now considered skinny compared to other North American paddlefish populations.

Skinny paddlefish may be the result of continued low river and Oahe reservoir levels. When water levels are low, the river is not as productive and tiny animals called zooplankton, the food of choice for filter-feeding paddlefish, aren't as abundant. A significant gizzard shad population may be compounding the situation as these fish are filter feeders too, competing

for the same limited food source.

"Then again, maybe it's neither," Bailey said. "But there is definitely less food as far as the paddlefish are concerned."

Because anglers are snagging the occasional paddlefish, or hearing about boaters nicking or severing fish with their props, there have been questions about a possible snagging season in the Garrison reach. Bailey said it's premature to even guess if the population could sustain a sport fishery, or if it would even be socially acceptable in an area known for its good walleye fishing.

"Even if we never have a sport fishery in the Garrison reach, there is value to have paddlefish," Bailey said. "It's another hedge in keeping a population from disappearing as paddlefish in other parts of North America aren't doing great because of the degradation of habitat."

RON WILSON is editor of *North Dakota OUTDOORS*.

through a winter in Sakakawea, as the big lake is the only Missouri River reservoir to entirely freeze over 50-plus years running. And three, if the gizzard shad sought warmer waters and migrated upstream to the Yellowstone River, their presence would complicate fish management efforts in Montana where they're understandably not welcome.

Given current conditions – both low forage abundance and productivity – Lake Sakakawea simply cannot support the numbers and sizes of game fish that anglers enjoyed at the turn of the century.

On the bright side, there are still millions of rainbow smelt left in Lake Sakakawea, and when habitat conditions improve, there are more than enough adults to ensure a quick rebound in the population.

Also keep in mind that ongoing low water conditions are laying the foundation for a remarkable rebound when water levels improve. The thousands and thousands of acres of exposed lake bed have been overgrown with vegetation, which will provide exceptional spawning habitat as well as dramatically increase reservoir productivity when conditions improve and Sakakawea begins to refill.

Waiting to Rebound

Paddlefish in the Garrison reach of the Missouri River aren't the only fish not getting enough to eat.

The Missouri River basin has been dry for years and Lake Sakakawea has remained at record low levels for five seasons, going on six. Rainbow smelt populations have declined significantly because their coldwater habitat has followed lake levels. Suitable spawning habitat for these forage fish – a staple for walleye, salmon and other game fish species – has also been mostly absent for some time. The last good smelt spawn in Sakakawea was 2002, and those short-lived fish have since died. In 2007, smelt abundance was about 10 percent of what it was in 2000.

Because of lingering low lake levels, Sakakawea just isn't as productive as it once was. Plankton, the foundation of the big lake's food chain, serves forage fish, young walleye and other species. Since plankton abundance in Sakakawea has mirrored reservoir elevations (meaning current densities are very low), the result is little food for those fish species that need it.

A declining forage base and low productivity also played a role in the decision to not stock walleyes in Lake Sakakawea since 2005. Test netting in 2007 showed a decline in walleye abundance, and walleye body condition in the same year was the poorest since smelt were introduced in 1971. This tells fisheries biologists that alternate forage species have not been adequate for the current walleye population.

So why not stock gizzard shad as an alternative forage species? There are a number of reasons this move wouldn't play out. One being that gizzard shad are filter feeders and would compete with other fish, including paddlefish, for the same scant plankton resource. Two, it would be highly unlikely that stocked shad would make it



There's plenty biologists have yet to learn about paddlefish inhabiting the Garrison reach of the Missouri River.