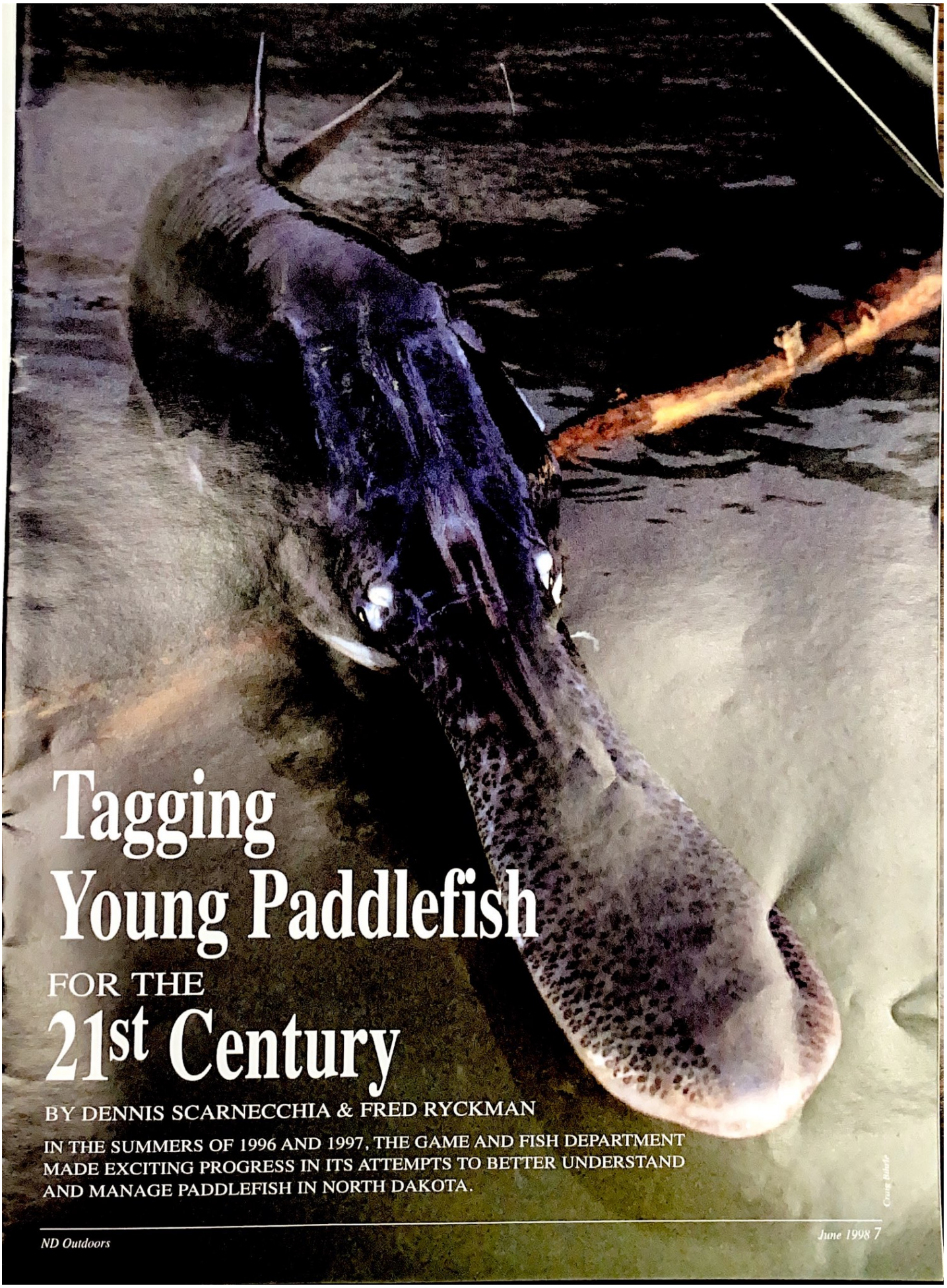

Tagging Young Paddlefish FOR THE 21st Century

BY DENNIS SCARNECCHIA & FRED RYCKMAN

IN THE SUMMERS OF 1996 AND 1997, THE GAME AND FISH DEPARTMENT MADE EXCITING PROGRESS IN ITS ATTEMPTS TO BETTER UNDERSTAND AND MANAGE PADDLEFISH IN NORTH DAKOTA.

Craig Bakke

Beginning in 1991, fisheries staff documented the presence of large numbers of young-of-the-year (YOY) paddlefish in the upper 30 miles of Lake Sakakawea in late summer. In the summer of 1996, for the first time anywhere in the paddlefish's range, wild YOY paddlefish were captured, weighed, measured, tagged and then released. Tiny magnetic tags with binary codes etched on them, known as coded-wire tags, were implanted in the paddles of young fish 6-14 inches long. Some of these tagged fish will be recaptured as adults eight to 50 years in the future, perhaps at still-popular fishing sites such as the Pumphouse near Williston, the Missouri-Yellowstone River Confluence area, at Sundheim Park on the Yellowstone River, and farther up the Yellowstone River at Intake, Montana.

Tagging and releasing fish for later recapture is one of the more valuable tools fishery managers use to obtain information on fish age, growth and movements, and on overall numbers and harvest. If a young fish of known age is tagged, released, and recaptured several years later, we can be certain of the fish's age and how fast it grew during the intervening years.

Currently, the best method for aging paddlefish is to count the number of annual rings, or annuli, on the lower jaw bone – the only true bone a paddlefish has. By reading the annuli on jaw bones from adult paddlefish of known age, it is possible to verify how well the number of observed annuli matches the known age of a particular fish. More importantly, this will allow researchers to develop confidence estimates for age determinations for untagged fish.

Additional information about paddlefish movement is gained by comparing a fish's location at initial capture and tagging, to its location at time of recapture. Another important component of fish tagging research is knowing the percentage of tagged fish that are recaptured. This allows estimates of the overall population, and what percentage of the total population is harvested.

Tagging fish is not a new technique. Although no one knows for certain when man first tagged fish, Europeans are known to have used string to tag salmon and trout hundreds of years ago. In recent years conventional tags such as anchor, jaw and disk tags have been improved. Technological advancements have led to development and widespread use of coded wire tags, passive integrated transponder (PIT) tags, and radio tags.

Fred Ryckman

In the summer of 1996 for the first time anywhere, tiny magnetic tags were implanted in the paddles of young paddlefish.

Fred Ryckman

A magnetic detector or wand is used to scan fish for the presence of a tag.

Genetic tags or markers have also been developed.

Coded-wire tags – tiny magnetic bars with a binary code etched onto their surface – have been widely-used in the past two decades. These tags are usually implanted into cartilaginous tissue in the fish's head and read with the aid of a microscope. These tags are used to mark batches of fish which all contain the same binary code (e.g., for use in marking large groups of hatchery fish), or they can be used to mark each fish with a sequential code that allows for identification of individual fish.

Because these tags are small and embedded in a fish, they are usually not easily seen with the naked eye. A magnetic detector or wand is used to scan fish for the presence of a coded wire tag. Biologists often give fish with a coded wire tag an additional mark, such as a fin clip, so they are more easily recognized by anglers and creel clerks. For several years, the Game and Fish Department has tagged young salmon with coded-wire as an integral part of its Sakakawea salmon management program.

On the Missouri River System downstream of North Dakota, adult and hatchery-reared YOY paddlefish are being tagged with coded wire as part of a research and management program involving several state and federal fisheries agencies. To date, virtually all of these tagged paddlefish are hatchery-reared. Only in upper Lake Sakakawea has it been possible to capture and tag large numbers of wild, naturally-reproduced YOY paddlefish.

In this area of the lake, YOY paddlefish are captured with dip nets as they flee from slow-moving boats (See "Unlocking the Secrets of Lake Sakakawea's Young Paddlefish" in the April-May 1995 issue of *North Dakota OUTDOORS*). When young paddlefish reach about five inches in length, their paddles have apparently

developed to a large enough size to force them to the surface when startled. They are vulnerable to capture at this size, although YOY fish become less vulnerable as they grow and become better swimmers. Yearling paddlefish are far better swimmers and even less vulnerable to capture, although several dozen of more than 30 inches in length were caught in this manner. Once captured, all fish are measured, tagged with coded-wire in their paddle or rostrum, and then released. Some are also weighed.

Some wild and hatchery-stocked YOY paddlefish tagged in 1997 were recaptured several days or weeks later; even a few hatchery YOY stocked in 1995 were captured as yearlings in 1996. After their second year, however, immature paddlefish are seldom observed or recovered. Until we develop ways to study older juvenile paddlefish, significant numbers of these fish will not be seen again until they become sexually mature and migrate up the Missouri and Yellowstone rivers to spawn. Only then will they become vulnerable to the popular snag fisheries in North Dakota and Montana, or to capture by managers using conventional netting gear.

Studies of annual rings on paddlefish jaw bones indicate that males first mature at ages 8-11, and females at 15 to 20. Although annual rings on jaw bones are highly reliable in determining paddlefish age, there is no way to absolutely verify these age estimates. When the first coded-wire-tagged, adult paddlefish are caught in the snag fisheries within the next decade, we will be able to verify ages based on jaw bone annuli counts for the first time. Since paddlefish can live 40-50 years, recaptures and age and growth verification of coded-wire-tagged fish will occur over the next several decades.

Tagging young paddlefish will continue to yield other benefits. Managers will be able to assess and compare survival of wild fish to that of tagged, hatchery-reared fish released into the reservoir in 1995 and 1997. As a result, the effectiveness of experimental stockings of hatchery fish can be more thoroughly evaluated.

Recaptures of coded-wire-tagged paddlefish have already provided insight into movements of young paddlefish, and have allowed managers to make the first ever population estimate for YOY paddlefish in a portion of upper Lake Sakakawea. Many other opportunities, some probably not yet even envisioned, may present themselves if we are able to tag significant numbers of known-age paddlefish.

Tagging wild, YOY paddlefish will continue as this program is a key to better understanding and managing North Dakota's paddlefish population in the 21st century.

Fred Ryckman

Note the different colors of these young paddlefish. The top one was reared at Garrison Dam National Fish Hatchery, the other one captured at Skunk Hollow near Williston in 1997.

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Yearling paddlefish, like this one displayed by fisheries worker Tom Crutchfield, are more difficult to capture than young-of-the-year fish because they are better swimmers; however, several dozen of more than 30 inches have been tagged after being caught by researchers using dip nets.