THE FALL AND RISE OF LAKE STURGEON ACIPENSER FULVESCENS: KING OF FISH



Saint Paul, Minnesota

There are 27 species of sturgeon worldwide of which eight are found in North America. Sturgeon are often called living fossils or dinosaurs because they date back 208 to 245 million years ago to the Triassic Period (Wikipedia contributors 1). Yes, sturgeon and many species of dinosaur were contemporaries way back when.

In the Great Lakes region of North America, Lake Sturgeon *Acipenser fulvescens* are the largest and longest living fish species (Figure 1). An 80-inch long Lake Sturgeon caught in Canada in 1953 remains the oldest that scientists have aged at 152 years (National Geographic 2009). However, one historical account discussed later suggests this fish may not have yet reached middle age.

The Lake Sturgeon is a slow-growing species that requires many years to reach sexual maturity, and it spawns irregularly afterwards. The literature varies regarding both age at maturity and spawning intervals. A Minnesota Department of Natural Resources source (MDNR Lake Sturgeon species profile) reports that males may not spawn until they are 15 years old and females until they are 25. Males spawn every one or two years while females require a longer interval from four to eight years. These aspects of the Lake Sturgeon's life cycle make it extremely vulnerable to unregulated harvest.

The Great Minnesota Fish Book by Tom Dickson (2008) and *Fishing for Buffalo* by Rob Buffler and Dickson (1990) are two of the best sources regarding the natural history of Lake Sturgeon in the Upper Midwest.

Prior to European settlement, the lives of indigenous peoples in North American, especially tribes in forests of the Great



Figure 1. Left: Lake of the Woods commercial catch at Warroad, Minnesota. Right: Toasting a 95-pound/75-inch catch. (Minnesota Historical Society).

Lakes region, were intrinsically entwined with Lake Sturgeon much like the Plains tribes were with Bison. The species was harvested for its meat, skin, oil, and waterproofing fluid found in swim bladders. The Ojibwe called the fish *nah ma* meaning "king of fish." Mostly women harvested Lake Sturgeon in the spring when the fish congregated in shallow waters to spawn. During the winter, men speared Lake Sturgeon through holes cut in the ice.

In Europe, the flesh of other sturgeon species was also revered and coveted as a delicacy by nobility as far back as the Roman Empire. Caviar (i.e., salted sturgeon eggs) appeared in Russia during the Middle Ages and became more prized than the meat.

However, early settlers in America were not royalty and were apparently unaware of the renown of sturgeon cuisine in Europe. Buffler and Dickson wrote that, before 1855, immigrants described the flesh as "queer tasting" and that "most whites in the New World would have rather eaten skunk than sturgeon." Commercial anglers viewed Lake Sturgeon with disdain and as a nuisance that fouled and tore nets set for more valuable species such as Walleye *Sander vitreus* and whitefish *Coregonus* spp. The sheer numbers of Lake Sturgeon killed by commercial anglers created a problem of disposing the carcasses. Huge piles of sturgeon were stacked on shore and torched with kerosene. Dried, oil-rich "sturgeon logs" were stacked like cordwood on the decks of steam ships to stoke the engine's boilers. Entrepreneurs would search the beaches for rotting carcasses and harvest eggs to sell as pig feed. After 1855, commercial anglers began singing a different tune about Lake Sturgeon when a caviar processing plant opened in Sandusky, Ohio. Plant backers realized Lake Sturgeon were very much like the Russian Beluga Sturgeon *Huso huso*. The eggs of the latter produced a prized and very expensive caviar. However, Dickson wrote that, in terms of Lake Sturgeon survival, "being prized was no better than being despised." In the 1880s, ten million tons of Lake Sturgeon were removed from the Great Lakes for caviar and for meat that was now compared to veal. Swim bladders contained isinglass that was used to clarify beer and wine, cement pottery, and set jellies. Tanned skins produced a fine quality leather for shoes, belts, and handbags.

The wanton waste and later unregulated harvest almost dealt a death blow to this slowly maturing and infrequently spawning species. Lake of the Woods was known as the world's greatest sturgeon water, but the harvest declined 90 percent from 1893– 1900. Commercial fishing was banned in most states where Lake Sturgeon occurred by the 1950s, but this ban was too little too late; the species continued to decline. Recovery was further hindered by concurrent impacts of dams restricting migration, pollution from raw sewage and chemical wastes from growing cities and factories, and erosion from an ever-growing conversion of the landscape to agriculture (i.e., row crops). This sweeping land-use change resulted in sturgeon spawning habitats being buried with sediment from annual tillage, wetland drainage, clear-cutting forests, and channelizing streams and rivers.

Table 1. Largest Lake Sturgeon reported in Minnesota and southern Manitoba.

Date	Waterbody	General Location	Map (Fig. 2)	Weight (pounds)	Length (inches)	Girth (inches)	Capture Method	Latitude	Longitude	Basin
7/15/1947	Rush Lake	Rush City, MN	1	225	N/A	N/A	Found dying	45.68763	-93.04979	St. Croix River
5/18/1985	Rush Lake	Rush City, MN	1	150	78	39	Angling	45.68763	-93.04979	St. Croix River
5/15/1968	Little Fork River	Littlefork, MN	2	163	78	N/A	Gaff hook	48.14222	-93.48778	Lake of the Woods
6/1/1908	Big Fork River	Big Falls, MN	3	112.5	N/A	N/A	N/A	48.19680	-93.80844	Lake of the Woods
6/15/1911	Lake of the Woods	Roosevelt, MN	4	236	84	N/A	Commercial catch	48.98500	-94.97361	Lake of the Woods
7/6/1911	Lake of the Woods	Roosevelt, MN	4	213	N/A	48	Commercial catch	48.98500	-94.97361	Lake of the Woods
5/28/1878	Otter Tail River	Fergus Falls, MN	5	128	80	36	N/A	46.29075	-96.02331	Red River of the North
12/19/1948	Lake Lida	Pelican Rapids, MN	6	102	74	N/A	Spear	46.58047	-95.96845	Red River of the North
4/26/1890	Detroit Lake	Detroit Lakes, MN	7	108	80	N/A	Spear	46.80504	-95.81662	Red River of the North
5/13/1926	White Earth Lake	White Earth, MN	8	176	87	38	Found dying	47.12851	-95.75445	Red River of the North
5/2/1941	Upper Red Lake	Waskish, MN	9	143	76	N/A	Pike spawn- ing net	48.17500	-94.51556	Red River of the North
10/3/1903	Roseau River	Dominion City, MB	10	407	180	N/A	Axe	49.14651	-97.14385	Red River of the North



Figure 2. Historical localities of Lakes Sturgeon over 100 pounds and others where natural distribution is suspect.

In their heyday and persisting into their decline, many accounts of large Lake Sturgeon were reported, but, are dismissed as tall tales today (Table 1 and Figure 2, numbers 1–10). Some reports have been verified from photographs, while others exist only as brief mentions in books, old newspapers, and faded and yellowed MDNR memos.

RED RIVER OF THE NORTH BASIN ACCOUNTS

Most of the accounts of monster Lake Sturgeon rise from this basin in northwestern Minnesota (Figure 2, numbers 5-10). Historically, the Red River and many of its tributaries supported an incredible Lake Sturgeon fishery. Alexander Henry "the younger" was a Canadian fur trader who explored North America from 1799 until his death in 1814. He kept a journal that covered his travels from Lake Superior to the Pacific Ocean and is credited with writing the most complete record ever of a fur trader's daily life in the north (Wikipedia contributors 2). On September 22, 1800, at the confluence of the Park and Red rivers near the presentday Drayton, North Dakota, Henry wrote, "Sturgeon continue to jump day and night." On May 10, 1808, in the Pembina River just upstream from it confluence with the Red (Pembina, North Dakota), he reported, "In the course of twenty-four hours we caught one hundred and twenty Sturgeon in one net, weighing from 60 to 180 lbs. each" (Gough 1988).

Later accounts were often published in local newspapers. For example, on May 28, 1874, Ashley Lunde was reported to have speared a 128 pound, 80-inch Lake Sturgeon in the Otter Tail River near Broken Down Dam (Figure 2, number 5). The fish pulled him into the river before he could land it (*The Daily Journal* 1972). The MDNR state fish record files have an unidentified newspaper account by Ken Prentice of a "sea serpent" seen many times from 1880-1890 in Detroit Lake (7). Some reports could have been for Minnesota's Loch Ness Monster as they claimed the creature was 30 feet long! Others reported hearing loud splashes in the distance sounding like a turbine water wheel. No one knew if it was a fish, sea serpent, or devil. Finally, a 25-dollar reward was offered for the capture of the "great unknown." On the night of April 26, 1890, the mystery was solved. Three fishermen armed with spears saw the monster and all apparently hit their mark, but the spears were either wrenched from their hands or broken. After an hourlong fight with one man thrown overboard and their boat halffilled with water, a Lake Sturgeon weighing 108 pounds and 80 inches long was finally captured (Figure 3). The same night, the fishermen saw another fish at least as large as the one captured, but they could never get within reach. Stewart and Watkinson (2004) reported the largest Lake Sturgeon ever known from the Roseau River east of Dominion City, Manitoba (10) on October 3, 1903 (Figure 3). The fish was found in pool and killed with an axe. It was a female full of roe and had to be hoisted from the river with a team of horses. The behemoth was weighed and measured at a grain elevator in Dominion City. The fish weighed 407 pounds and was 180 inches long. That's 15 feet! One must wonder how old she was. A guess based on the oldest aged Lake Sturgeon above, the Roseau fish may have been well into her third century!

As the twentieth century marched on following the destruction of the commercial fishery, accounts of big sturgeon were very rare. Joe Fellegy (1982) retold the story of two boys in May 1926 who heard splashes during the night coming from White Earth Lake (Figure 2, number 8). The following morning, they found a large Lake Sturgeon dying and stranded on a shallow bar. The fish weighed 176 pounds, was 84 inches long, and had a girth of 38 inches (Figure 3). MDNR fish surveys have used countless gill and trap nets through the years but have very few large sturgeons to show for the effort. One exception was May 2, 1941, when a Lake Sturgeon was found at a Northern Pike Esox lucius spawning station at the mouth of the Tamarac River on Upper Red Lake (9) near Waskish (The Conservation Volunteer 1941). The fish weighed 143 pounds and was 76 inches long (Figure 3). The last account of a large Lake Sturgeon for this basin is from 1948 and is for the "smallest" of the large sturgeons, but it was reported rightfully so as "The Monster Lake Sturgeon of Lake Lida" (5) (Gunderson 2018). The story was retold by two eyewitnesses who both were young children at the time of the two men sharing the spear shelter. On December 19, 1948, the men were at the ready in their spear house when a huge sturgeon swam by the hole. The spear was flung and the rope twanged as the shelter rocked on its skids like a boat in rough water. The man that threw the spear yelled to his buddy, "Get another spear." There wasn't one, but the other guy had his marching orders and was blind with excitement. He forgot all about using the door and smashed through the side of the shelter returning with a neighbor's spear that finally landed the 102-pound, 74-inch fish.

LAKE OF THE WOODS BASIN ACCOUNTS

As I mentioned before, Lake of the Woods (Figure 2, number 4) was the world's greatest sturgeon water, and during a three-week period in 1911 it lived up to its reputation. Two massive Lake Stur-





geon were brought into Warroad on the same steamer *Isobel*. The first was reported in the June 15 edition of the *Warroad Plaindealer* (1911a). This fish weighed 236 pounds and was 84 inches long. The second one was reported in the July 6 edition (1911b) and was "only" 213 pounds with a girth of 48 inches. There must have been a forgetful reporter working for the newspaper or maybe an editor asleep at the switch. While the first fish was correctly crowned in the article's title as "The Biggest Sturgeon," the second fish was reported as the heavier of the two.

Lake Sturgeon migrate upstream from Lake of the Woods to spawn in rapids of the Rainy, Big Fork, and Little Fork rivers. One account from the Big Fork River (3) on June 1, 1908, was in a letter sent to the MDNR in 1993. The grandson of the person who caught the fish (means unknown) retold the story that had been passed down in his family. Unfortunately, only a poor photocopy of the 112.5-pound catch was in the file. By the sheerest luck, another photo was found in the Minnesota Historical Society's archives (Figure 4). This must have been a special day to remember for the two young girls posing with the fish!

For many years, the hook-and-line state record for Lake Sturgeon stood at 163 pounds-78 inches from the Rainy River in 1968. Fellegy (1982) interviewed the angler for his book and got a sur-

Figure 3. Top row, left: Lake Sturgeon from Detroit Lake (Becker County) in 1890 (Minnesota Historical Society); center: Roseau River near Dominion City, Manitoba in 1903 (Franklin Museum in Dominion City); right: White Earth Lake (Becker County) in 1926 (Minnesota Historical Society). Left: Upper Red Lake (Beltrami County) in 1941.

prising confession about the fish. The angler knew it was long past the statute of limitations and he decided to come clean. At that time, the Rainy River was the only place where Lake Sturgeon could be taken legally. However, the angler revealed the fish was actually caught at Deadman Rapids on the Little Fork River. He had gotten a tip earlier from some guys who brought a 90-pound sturgeon from the rapids into Big Falls. The "angler" and his buddies headed for the rapids where they saw the gray bodies of 50 or 60 Lake Sturgeon spawning. He claimed some were over 200 pounds. The "gang "made a makeshift gaff hook and tied the handle with a long rope to a tree. The "gaffer" waded way out into the river, and after several swings and misses, a big one passed by rubbing his leg. He set the hook into the fish's back and yelled to the guys on shore, "Pull!" The sturgeon went "water skiing" across the river onto shore taking the gaffer along for a drenching 50-foot ride. Local game wardens got wind of the catch and the angler knew they didn't believe him when he said where the fish came from; but he stuck to his story. He smoked the sturgeon and had a "big feed" in Big Falls, commenting: "It was delicious but rich."

ST. CROIX RIVER BASIN ACCOUNTS

It is an odd coincidence that the two "lunker lakers" that "surfaced" in this basin came from Rush Lake (Figure 2, number 1) in Chisago County near Rush City. The first Lake Sturgeon was found dying in 1947 and weighed 225 pounds (Taylor 1947). The second was caught angling during the Walleye opener on May 18, 1985 (Boxmeyer 1985). It took almost an hour to land the fish in the boat. Meanwhile, several boaters gathered around to get a peek, but the fish would not surface. Some hecklers were voicing

Date	Waterbody	General Location	Map (Fig. 2)	Weight (pounds)	Length (inches)	Girth (inches)	Capture Method	Latitude	Longitude	Basin
10/20/1998	Lake Harriet	Minneapolis, MN	А	105	75	32	Found dead	44.92183	-93.30506	Mississippi River Southeast
4/30/2004	Lake Mille Lacs	Garrison, MN	В	89	65	N/A	Gill net	46.29398	-93.82180	Mississippi River Headwaters
Before 1963	Crooked Lake	Garrison, MN	С	N/A	N/A	N/A	Spear	46.36991	-93.90250	Mississippi River Headwaters
9/23/1990	Mississippi River	Palisade, MN	D	40	49	N/A	Angling	46.70923	-93.48517	Mississippi River Headwaters

Table 2. Mystery occurrences of Lake Sturgeon

their opinion that it was just a big old carp. When the fish was finally hoisted out of the water, they realized it was a Lake Sturgeon that was 78 inches long with a girth of 39 inches. Someone in the party brought up that the sturgeon season didn't open until June 29, so the fish was released. The angler contacted the MDNR about his catch and staff fish biologists estimated the sturgeon's weight at 150 pounds based on the length and girth. Ironically, if this fish had been legally taken and submitted as a state fish record, then that record would have held by a hefty margin to the present. The current Lake Sturgeon certified weight state record was from the Kettle River (Pine County) in 1994. This fish had the following stats: weight 94 pounds, length 70 inches, and girth 26.5 inches. Newspaper articles included photos of the fish, but those photos reproduced too poorly from the microfiche to reprint here.

MYSTERY RECORDS

While searching for records of these goliaths, some very odd occurrences were found from above barrier falls where Lake Sturgeons should not be (Table 2 and Figure 2: letters A-D). Anderson (1998) reported on October 20, 1998, in the heart of Minneapolis, a dead Lake Sturgeon washed ashore in Lake Harriet (letter A). The fish weighed 105 pounds and measured 75 inches long with a girth of 32 inches. MDNR fish biologists estimated the age at 80 years. This is what is known about the fish; the big question is "How did it get there?" Lake Harriet is upstream of the 53-foot Minnehaha Falls (Figure 5). Lake Sturgeon could not have come up from the Mississippi River unless it was ten millennia or so ago before the falls formed. Anglers have never reported sturgeon from Harriet or other lakes in the watershed, nor has the MDNR despite decades of lake surveys. The reporter provided a more plausible explanation of a "rogue" state employee getting rid of fish that had been on exhibit during the state fair. If true, "the act was of more of convenience than mischief."

There is a cluster of records for Lake Sturgeon that defies explanation many miles upstream of St. Antony Falls in the Mississippi River Headwaters basin. The falls had been a fish barrier for several thousand years until the mid-1900s with 64 species known above and 123 below (Eddy et al. 1963). Lake Sturgeon were only known below the falls. In 1869, the falls were replaced with a concrete spillway, and the upper of the two locks was completed in 1963 for commercial navigation. During this almost century span, many other barrier dams were constructed on the Mississippi River and tributaries preventing passage to the cluster since 1963. The most recent Lake Sturgeon record from this basin is from Mille Lacs Lake on April 30, 2004 (letter B). The fish was captured in a tribal gill net near Garrison (Figure 6). The 89-pound, 65-inch fish was a female dripping eggs and was released alive. Possible vectors for how the fish got there include a livewell release by an angler or the fish crossing over a low basin divide between Mille Lacs Lake and the Snake River watershed which is part of the St. Croix River basin (Rick Bruesewitz - MDNR, personal communication).

Eddy et al. (1963) mention a Lake Sturgeon illegally speared in Crooked Lake also near Garrison (C), but he cautions that this record cannot be verified because neither specimen nor photo exists.



Figure 4. Lake Sturgeon from the Big Fork River at Big Falls in 1908 (Minnesota Historical Society).



Figure 5. Minnehaha Falls downstream of Lake Harriet, a barrier to fish migrating upstream from the Mississippi River. (Wikimedia Commons contributors)



Figure 6. Lake Sturgeon from Mille Lacs Lake (Mille Lacs County) in 2004 (Great Lakes Indian Fish & Wildlife Commission).

The final mystery fish was caught in the Mississippi River near Palisade (D) on September 23, 1990. There is a photo clearly showing a Lake Sturgeon stretched across the hood of a car, but again the photo reproduced too poorly to reprint (*Aitkin Independent Age* 1990).

FAKE NEWS

The inherent motive of some people to spread hoaxes solely to deceive others is baffling. A case in point: a Google Search for "Lake of the Woods Lake Sturgeon," returned a link to a blogger (Hanback 2010) who posted an account and photo (Figure 7) received in his email box. He cautions his readers that he could not vouch for the story which made the following request, "Please show this to anyone you know that likes to fish. This sturgeon was caught on LAKE OF THE WOODS, KENORA, ONTARIO. It weighed out at over 1,000 lbs. and measured out at 11'1". It was 56" around the girth and took over 6 1/2 hours for the 4 guys taking turns reeling it in." The identical photo showed up on another website as a White Sturgeon A. transmontanus with the following caption: "This world record White Sturgeon was caught on the Fraser River in Canada in 2002 by Len's Sport Fishing Adventures. It weighted approximately 1,500 pounds and runs 179 inches long." A word of warning: I also cannot vouch this world record claim is authentic!

A LIGHT AT THE END OF THE TUNNEL

Ever so slowly things started to change for the better. In 1948, the Federal Water Pollution Control Act was enacted. The



Figure 7. Internet hoax of a White Sturgeon from the Fraser River in British Columbia falsely reported as a Lake Sturgeon from Lake of the Woods in Ontario.

Act was amended (rewritten) in 1972 and became commonly known as the Clean Water Act. The Act was also amended by the Water Quality Act of 1987 (Wikipedia contributors3). Perhaps the most sweeping water quality improvements, albeit far from making our lakes and streams pristine again, have been due to reductions in point source pollution through improved waste water treatment. Reducing non-point pollution such as run off of soil and chemicals from crop land and impervious surfaces (e.g., concrete, asphalt, and buildings) from cities has proved to be more challenging, and portions of the Act directed at reducing nonpoint pollution have been much less effective. Yes, water quality has improved, but it also must be conceded that the goals stated by Congress in the 1972 act have not been achieved: "to make all US waters fishable and swimmable by 1983, to have zero water pollution discharge by 1985, and to prohibit discharge of toxic amounts of toxic pollutants."

On another front, old, failing dams are being removed, allowing Lake Sturgeon and many other fishes access to spawning habitats from which they have been barred for a century or more. In Minnesota, most of these stream restoration projects have occurred in the Red River of the North basin (Figure 8). Projects include dams replaced with sloping rapids, artificial channels that bypass dams, and modifying impassable road culverts (Aadland 2010). Only two mainstem Red River dams remain that are barriers. One at Drayton, North Dakota, is slated to be replaced with fish-passable rapids. In 1997, juvenile Lake Sturgeon were translocated from the Rainy River to the Red, and then stocking of hatchery-reared fingerlings (Figure 9) began in 1999 (Kallok 2017). Lakers are recovering in all



Figure 8. Stream restoration projects in the Red River of the North basin.



Figure 9. Stocked Lake Sturgeon trawled from the Red River of the North at Grand Forks, North Dakota on 17 October 2012. (Photo by Konrad Schmidt)

basins where they historically occurred with a little help from the same species that almost wiped them out. The population structure is still a far cry from what it was historically, but four to six footers are now rather common (Figure 10). In early February 2019, the species' future burned even brighter when a new Lake Sturgeon catchand-release record was set from Lake St. Croix near Bayport, Minnesota. The fish was 78 inches long and had a 29.5-inch girth. It was estimated to be 120 pounds. Sturgeon outlasted the dinosaurs and might just outlast we humans, too.

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Figure 10. A mere teenager at 58 pounds-58 inches from Lake Pepin in Wabasha County. (Photo by Konrad Schmidt)

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