Gulf of Mexico Science

Volume 14
Number 1 *Number 1*

Article 9

1996

# First Observations of Young-of-Year Gulf of Mexico Sturgeon (*Acipenser oxyrinchus de sotoi*) in the Suwannee River, Florida

Stephen H. Carr
*Caribbean Conservation Corporation*

Thomas Carr
*Caribbean Conservation Corporation*

Frank A. Chapman
*University of Florida*

DOI: 10.18785/goms.1401.09

Movement and surfacing behavior patterns of loggerhead sea turtles in and near Canaveral Channel, Florida (September and October 1981). NOAA Technical Memorandum NMFS-SEFC-112. Miami, Florida. 43 p.

LOHOEFENER, R., W. HOGGARD, K. MULLIN, C. RODEN, AND C. ROGERS. 1990. Association of sea turtles with petroleum platforms in the North-Central Gulf of Mexico. National Marine Fisheries Service, Pascagoula, Mississippi, Report to the U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, New Orleans, MMS Contract 14-12-0001-30398, OCS Study MMS 90-90-0025, 90 p.

RICHARDSON, J. I. 1990. The sea turtles of the King's Bay area and the endangered species observer program associated with construction dredging of the St. Mary's Entrance Ship Channel, p. 32–46. In D. D. Dickerson and D. A. Nelson (compilers), Proceedings of the National Workshop on Methods to Minimize Dredging Impacts on Sea Turtles. Miscellaneous Paper EL-90-5, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.

SCHROEDER, B. A. AND N. B. THOMPSON. 1987. Distribution of the loggerhead turtle, *Caretta caretta,* and the leatherback turtle, *Dermochelys coriacea,* in the Cape Canaveral, Florida area: results of aerial surveys. NOAA Technical Report NMFS 53:45–53.

SHOOP, C. R. AND R. D. KENNEY. 1992. Seasonal distribution and abundances of loggerhead and leatherback sea turtles in waters of the northeastern United States. Herpetol. Monogr. 6:43–67.

THOMPSON, N. B., E. S. DENTON, D. B. KOI, A. MARTINEZ, AND K. MULLIN. 1991. Turtles in the Gulf of Mexico: pelagic distributions and commercial shrimp trawling. NOAA Technical Memorandum NMFS-SEFC-286. Miami, Florida. 12 p.

JOANNE BRAUN AND SHERYAN P. EPPERLY, *National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center, Beaufort Laboratory, Beaufort, NC 28516.*

---

*Gulf of Mexico Science,* 1996(1), pp. 44–46


## FIRST OBSERVATIONS OF YOUNG-OF-YEAR GULF OF MEXICO STURGEON (*ACIPENSER OXYRINCHUS DE SOTOI*) IN THE SUWANNEE RIVER, FLORIDA.

Gulf of Mexico sturgeon, *Acipenser oxyrinchus de sotoi* (sometimes referred to as Gulf sturgeon), is an anadromous species with spawning migrations into rivers occurring primarily from late Feb. to early May (Huff, 1975; Wooley and Crateau, 1982; Chapman and Carr, 1995). The adult sturgeon remain in the river until the fall, when they migrate into the Gulf of Mexico (Huff, 1975; Wooley and Crateau, 1982).

Previous investigators have been unable to locate the spawning grounds of Gulf of Mexico sturgeon or to determine where young fish venture after they hatch. During early May, a single collection of 1–2-day-old-larvae was made by Wooley et al. (1982) working upstream in the Apalachicola River in northwest Florida. In the Suwannee River, primarily at the river's mouth, juvenile sturgeon [60–70 cm in total length (TL), 0.5–2.5 kg] are commonly captured during winter and spring; the smallest individual collected during this time was 42 cm TL and 300 g in body weight (J. P. Clugston, National Biological Service, pers. comm.).

The Gulf of Mexico sturgeon is federally protected as a threatened species (Federal Register, 1991). A mandate for sturgeon recovery is to identify essential habitats important to each developmental life stage of the species. In this study, we report the first observation of young-of-year sturgeon in the upper reaches of the Suwannee River.

*Materials and Methods.*—We attempted to locate Gulf of Mexico sturgeon around aquifer springs that naturally seep into the Suwannee River (DER, 1985). We believe river areas in close proximity to springs are likely spawning sites for Gulf of Mexico sturgeon. Sturgeon require hard bottom substrates to deposit their eggs (Doroshov, 1985). Suwannee River natural spring areas are known to consist primarily of deep trenches and outcroppings of hard limestone (Rosenau et al., 1977). In addition, Chapman and Carr (1995) indicated that cool water temperatures (15–22 C) are necessary for optimal spawning and larval survival of Gulf of Mexico sturgeon. Water temperatures of the Suwannee River springs are stable at around 18–21 C (Rosenau et al., 1977), and adult sturgeon are often found in proximity to these springs (Chapman and Carr, 1995).

Sturgeon were captured with a dip net. The fish were also collected by hand by snorkeling divers. The term young-of-year (YOY) refers to juvenile sturgeon from 1 month to approximately 1 year in age (July 1). Fish were measured (TL in cm) and weighed (g) using a measuring tape and balance. Approximate sizes of sturgeon in the water were estimated from video and photographs taken at the site. Water temperatures were taken approximately 6 cm above the river bottom.

*Results and discussion.*—The number and body sizes of young Gulf of Mexico sturgeon ob-

TABLE 1. Body length and weight measurements of Gulf of Mexico sturgeon observed in the Alapaha Rise Spring area of Suwannee River, Florida. Total sturgeon observed n = 40 and collected n = 7.

| Sturgeon numbers (observed) collected | Date (1993) | Total length (cm) | Body weight (g) | Water temperature |
|---|---|---|---|---|
| (16) | 28 Aug. | 10–30 | — | 22.0 C |
| 1 | | 21.5 | — | |
| 2 | | 18.5 | — | |
| (16) | 4 Sep. | 10–30 | — | 23.9 C |
| 3 | | 17.6 | — | |
| 4 | | 19.6 | — | |
| (8) | 17 Sep. | 10–30 | — | 22.8 C |
| 5 | | 31.0 | 92.1 | |
| 6 | | 21.0 | 31.0 | |
| 7 | | 22.0 | 31.0 | |

served and collected in Suwannee River are summarized in Table 1. On 28 Aug. 1993, young-of-year Gulf of Mexico sturgeon were observed and collected in the upper Suwannee River, downstream from the Alapaha Rise Spring, approximately 2 km south of the C.R. 249 bridge and 206 km from the mouth of the river. The location was a shoal approximately 1 m in depth. The bottom was composed mostly of coarse sand, and the water was stained with a dark (tannin) color. Water temperature was 22 C. Adjacent to the shoal was a trough of deeper water approximately 3 m in width, 2 m in depth and 50 m in length. The bottom of the trough was composed of muddy sand and limestone rock outcroppings. A total of 16 small sturgeon were observed during a 2-hour reconnaissance of the area. All of the fish sighted were resting over sandy bottom undulations of the shoal area. When frightened, sturgeon would swim rapidly to the deeper area. Two fish were captured using a dip net, measured and released. The TL of the larger of the two sturgeon was 21.5 cm. The smaller fish had a TL of 18.5 cm. All other fish were between 10 and 30 cm TL. On 4 Sept. 1993, we sampled the same area, and 16 small sturgeon were again seen. This time, two sturgeon were captured by hand. Total lengths were 17.6 and 19.6 cm, respectively. The water temperature over the sand bars was 23.9 C. A total of eight sturgeon were sighted on 17 Sept. 1993. Five sturgeon were encountered at the same location as before, and the other three fish were sighted, separately, over sand bars 1 to 3 km downstream. Three fish were collected by hand, measured, and weighed. The largest sturgeon was 31.0 cm TL and weighed 92.1 g. The other two fish were 21.0 and 22.0 cm TL and weighed 31.0 g each. The water temperature in the area was 22.8 C.

Based on growth on Gulf of Mexico sturgeon in the laboratory (F. A. Chapman, unpubl. obs.; Mason et al., 1992), we estimate the sturgeon observed upstream in the Suwannee River were 110 to 175 days old. These sturgeon were probably YOY and born sometime in March, April, or early May. It is difficult to determine the age of YOY sturgeon using fin-ray sections. Laboratory studies demonstrate, however, that even in unfavorable conditions (i.e., high densities and restricted feeding), the length of Gulf of Mexico sturgeon after a 1-year growth period is substantially greater than the size of the fish we observed in the field (F. A. Chapman, unpubl. obs.).

Spring spawning migrations by sturgeon in the Suwannee River were first reported by Huff (1975) and more recently by Chapman and Carr (1995). Our observations and collection of YOY in the field confirm that Gulf of Mexico sturgeon spawn during the spring. Most important, our observations also suggest that YOY sturgeon remain in the river after they hatch. Chapman and Carr (1995) suggested that natural springs of cool water (18–21 C) flowing into the Suwannee River provide an essential habitat for adult Gulf of Mexico sturgeon in summer months. Our observations indicate that these spring areas also provide suitable habitat for the YOY sturgeon. It is unknown when YOY Gulf of Mexico sturgeon swim downstream and into the estuary. In the Suwannee River, adult sturgeon remain in the river after spawning, and in the fall (Oct.–Nov.) they migrate into the Gulf of Mexico (Huff, 1975; Chapman and Carr, 1995). Perhaps at this time of year, YOY sturgeon also move into the estuary. Larvae and juvenile Atlantic (*A. oxyrinchus*) and shortnose (*A. brevirostrum*) sturgeon are known to remain upstream in rivers during the warmer months of the year (when water temperatures are above 20 C), and move downstream to congregate in deeper brackish waters before they migrate out to sea (Gilbert, 1989).

*Acknowledgments.*—The Gulf of Mexico sturgeon project is possible primarily because of the charitable contributions of the Phipps Florida Foundation. We express our gratitude to Mr. John E. Phipps for his financial support and enduring concern for protection of these species.

## Literature Cited

Chapman, F. A., and S. H. Carr. 1995. Implications of early life stages in the natural history of the Gulf of Mexico sturgeon, *Acipenser oxyrinchus de sotoi.* Environ. Biol. Fishes 43:407–413.

DER (Department of Environmental Regulation). 1985. Limnology of the Suwannee River, Florida. State of Florida, Department of Environmental Regulation, Biology Section, Tallahassee, FL.

Doroshov, S. I. 1985. Biology and culture of sturgeon acipenseriformes, p. 251–274. *In:* J. F. Muir and R. J. Roberts (eds.). Recent Advances in Aquaculture. Vol. 2. Westview Press, Boulder, CO.

Federal Register. 1991. Rules and regulations 49653-58. Vol. 56, No. 189-1991.

Gilbert, C. R. 1989. Species profiles: Atlantic and shortnose sturgeons. U.S. Fish Wildl. Serv. Biological Report 82(11.122). U.S. Army Corps of Engineers TR EL-82-4.

Huff, J. A. 1975. Life history of Gulf of Mexico sturgeon, *Acipenser oxyrhynchus desotoi,* in Suwannee River, Florida. Florida Department of Natural Resources Marine Research Laboratory, Contribution No. 261.

Mason, W. T., J. P. Clugston, and A. M. Foster. 1992. Growth of laboratory-held Gulf of Mexico sturgeon (*Acipenser oxyrhynchus desotoi*). Prog. Fish-Culturist 54:59–61.

Rosenau, J. C., G. L. Faulkner, C. W. Hendry Jr., and R. W. Hull. 1977. Springs of Florida. State of Florida, Department of Natural Resources, Bull. 31.

Wooley, C. M., and E. J. Crateau. 1982. Observations of Gulf of Mexico sturgeon (*Acipenser oxyrhynchus desotoi*) in the Apalachicola River, Florida. Florida Scientist 45:244–248.

Wooley, C. M., P. A. Moon, and E. J. Crateau. 1982. A larval Gulf of Mexico sturgeon (*Acipenser oxyrhynchus desotoi*) from the Apalachicola River, Florida. Northeast Gulf Sci. 5:57–58.

Stephen H. Carr and Thomas Carr, *Caribbean Conservation Corporation, PO Box 2866, Gainesville, Florida 32602; and* Frank A. Chapman, *Department of Fisheries and Aquatic Sciences, University of Florida, 7922 NW 71st Street, Gainesville, Florida 32653.* Send reprint requests to FAC.