

SNC000019

**Literature Regarding the
Shortnose Sturgeon**

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Campbell, J. G., and L. R. Goodman. 2004. Acute sensitivity of juvenile shortnose sturgeon to low dissolved oxygen concentrations. *Transactions of the American Fisheries Society* 133:772-776. DO sensitivity (LD50) in the 2-3 mg/L range in several tests at different temperatures and salinities. Highest temperature test of 30°C was tolerated, although the fish became more sensitive to low DO at this temperature (LD50 DO was 3.1 mg/L). It can be inferred from these studies that the thermal and DO habitat conditions near Vogtle in summer are not critically limiting for survival.

Collins, M. R., D. Cooke, B. Post, J. Crane, J. Bulak, T. J. I. Smith, T. W. Greig, and J. M. Quattro. 2003. Shortnose sturgeon in the Santee-Cooper reservoir system, South Carolina. *Transactions of the American Fisheries Society* 132:1244-1250. Sturgeon were demonstrated to inhabit rivers below reservoirs and are in the reservoirs in this nearby South Carolina river-reservoir system. Such a distribution in the Savannah River would be far upstream of Vogtle. See Duncan, et al. also.

Collins, M. R., W. C. Post, D. C. Russ, and T. I. J. Smith. 2002. Habitat use and movements of juvenile shortnose sturgeon in the Savannah River, Georgia-South Carolina. *Transactions of the American Fisheries Society* 131:975-979. Juveniles were tagged with electronic transmitters and tracked between river kilometer (rkm) 31.2 and 47.5 in the lower river. Fish moved upriver only to rkm 47.5 when temperatures >22°C, and returned to Savannah harbor when temperatures dropped. Recruitment has not increased from a decade earlier, despite stocking.

Collins, M. R., S. G. Rogers, and T. I. J. Smith. 1996. Bycatch of sturgeons along the southern Atlantic coast of the USA. *North American Journal of Fisheries Management* 16:24-29. This study clarifies that the adult range is generally in coastal waters. Sturgeon are caught in the shad fishery's nets along the coast near the Savannah River. Most shortnose sturgeon are mature when caught.

Collins, M. R., and T. I. J. Smith. 1997. Distributions of shortnose and Atlantic sturgeons in South Carolina. *North American Journal of Fisheries Management* 17:995-1000. Shortnose sturgeon occur upriver in the Savannah only during the spring spawning season when they are heading to (or returning from) spawning grounds much upriver of the Vogtle site.

Duncan, M. S., J. J. Isely, and D. W. Cooke. 2004. Evaluation of shortnose sturgeon spawning in the Pinopolis Dam tailrace, South Carolina. *North American Journal of Fisheries Management* 24:932-938. Shortnose sturgeon were studied spawning in dam tailrace. If this occurs in the Savannah River, it would occur far upstream of Vogtle in the tailwaters of J. Strom Thurmond Dam.

Duncan, W. W., and E. M. EuDaly. 2003 Draft Fish and Wildlife Coordination Act report on Savannah River Basin Comprehensive Study. U. S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia. This analysis of the fish and wildlife habitats of the Savannah River is mainly

oriented toward flow restoration recommendations for fish and wildlife, but also includes water quality recommendations (but not temperature). It can be inferred from this analysis that the Vogtle reach was not considered a particularly sensitive habitat.

Duncan, W. W., M. C. Freeman, C. A. Jennings, and J. T. McLean. 2003. Considerations for flow alternatives that sustain Savannah River fish populations. Proceedings of the 2003 Georgia Water Resources Conference, K. J. Hatcher, editor. The University of Georgia, Athens. As with Duncan and EuDaly (2003), this report is habitat oriented with regard to flow management in the Savannah. It makes a distinction between the biologically valuable shoal habitat near Augusta and the floodplain habitat of the middle river. Shortnose sturgeon is not mentioned, but Atlantic is mentioned, as using the shoal area for spawning.

Elvira, B. 2006. North American sturgeons and paddlefish: biology, threats and conservation. *Environmental Biology of Fishes* 76:1-15. General reference on sturgeon biology and conservation needs.

EuDaly, E. M. 1999. Reconnaissance planning aid report on Savannah River Basin Study. U. S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia. This administrative study recommends flow restoration for fish and wildlife (including sturgeon) and elimination of navigation plans.

Griggs, T. E. 2003. Diel movements of hatchery-reared and wild shortnose sturgeon in the Savannah River, South Carolina. MS thesis, Clemson University. Details of young sturgeon movements elsewhere in the Savannah River.

Grunwald, C., J. Stabile, J. R. Waldman, R. Gross, and I. Wirgin. 2002. Population genetics of shortnose sturgeon *Acipenser brevirostrum* based on mitochondrial DNA control region sequences. *Molecular Ecology* 11:1885-1898. Shortnose sturgeon populations in coastal rivers are genetically distinct and need to be managed separately. But see Smith, et al. 2002.

Hall, J. W., T. I. J. Smith, and S. D. Lamprecht. 1991. Movements and habitats of shortnose sturgeon, *Acipenser previrostrum*, in the Savannah River. *Copeia* 1991:695-702. There are Feb-March upriver spawning migrations; March-May downriver migrations, with adults leaving fresh water and adults and juveniles spending the rest of year near fresh/salt water boundary (feeding and nursery areas). Spawning sites at rkm 179-190 and rkm 275-278 (RM 111-118 and 171-173) well above the Vogtle reach.

Kynard, B. 1997. Life history, latitudinal patterns, and status of the shortnose sturgeon, *Acipenser brevirostris*. *Environmental Biology of Fishes* 48:319-334. General information.

National Marine Fisheries Service. 1998. Final recovery plan for the shortnose sturgeon *Acipenser brevirostris*. Department of Commerce, Washington, DC. The report indicated there was no critical habitat designation in the Savannah River.

Pikitch, E. K., P. Doukakis, L. Laudk, P. Chakrabarty, and D. L. Erickson. 2005. Status, trends and management of sturgeon and paddlefish fisheries. *Fish and Fisheries* 6:233-265. General information.

Smith, T. I. J., J. W. McCord, M. R. Collins, and W. C. Post. 2002. Occurrence of stocked shortnose sturgeon *Acipenser brevirostrum* in non-target rivers. *Journal of Applied Ichthyology* 18:470-474. Stockings into Savannah River are currently making up to nearly 40% of the population. Straying of marked and stocked fish into adjoining rivers is common.

Wike, L. D. 1998. Potential effect of increased SRS river water withdrawals on the Savannah River shortnose sturgeon population. Westinghouse Savannah River Company Report WSRC-TR-98-00424, Aiken, South Carolina. This analysis of population status in the early 1990s showed no likelihood of effects of SRS withdrawals on the Savannah River shortnose sturgeon population. As conditions have not changed appreciably, the analysis is likely still valid.