natal estuary. Both species are vulnerable to bycatch, poor water quality (which impairs spawning success), dredging, and water withdrawals, among other things. The shortnose sturgeon is listed as Endangered throughout its entire range and all five U.S. Atlantic sturgeon distinct population segments (DPS) are listed as Endangered or Threatened under the Endangered Species Act (ESA).

Though shortnose and Atlantic sturgeon have suffered vast historical losses, researchers recently rediscovered both within the St. Marys River. Shortnose sturgeon trends are largely unknown, but the St. Marys (Critical Habitat for the Atlantic sturgeon) supports a year-round population of Atlantic sturgeon and serves as seasonally important habitat for migrating individuals.[221] From 2013–2016, a total of 25 individuals were captured (20 unique).[222] In 2014, the discovery of age-one river resident juveniles represented the "first documented evidence of successful Atlantic sturgeon reproduction within the St. Marys river."[223] However, in light of poor recruitment levels—the juveniles were likely produced from a single spawning event in 2013—the population remains "precariously close to extirpation."[224] The surviving sturgeon are thus acutely vulnerable to point source pollution; fluctuations in temperature; changes in dissolved oxygen levels; and increased sediment loads—all of which may result from the proposed mine.

Given the scale of the proposed project, increased sediment discharges into the St. Marys River basin are inevitable and threaten to potentially degrade the spawning habitat that remains. Indeed, Atlantic sturgeon depend upon "well-oxygenated water, clean substrates for egg adhesion, crevices that serve as shelter for post-hatch larvae, and macroinvertebrates for food."[225] In addition to sediment loads, to the extent that the proposed mine discharges treated water into the St. Marys River, over the course of many years, this would change the composition of riparian communities, the pH levels to which sturgeon are accustomed, and the levels of dissolved oxygen.

The National Marine Fisheries Service (NMFS) has already made clear in a 2014 Biological Opinion that "the loss of a small number of [shortnose sturgeon] . . . can have an appreciable effect on the numbers, reproduction and distribution of the species . . . [especially when] there are very few individuals in a population, the individuals occur in a very limited geographic range, or the species has extremely low levels of genetic diversity."[226] The Atlantic and shortnose sturgeon of the St. Marys River likely satisfy these criteria. With potentially as few as three dozen remaining Atlantic sturgeon (and maybe even fewer shortnose individuals),

[221] Fox, Adam & Wirgin, Isaac & Peterson, Douglas. 2018. Occurrence of Atlantic Sturgeon in the St. Marys River, Georgia. Marine and Coastal Fisheries. 10. 606-618.

[222] *Id.* at 610.

[223] *Id.* at 613–614.

[224] *Id.* at 615.

[225] Atlantic Sturgeon, Life History and Habitat Needs, Atlantic States Marine Fisheries Commission.

[226] NOAA's National Marine Fisheries Service, Northeast Regional Office. Endangered Species Act Section 7 Consultation Biological Opinion, Tappan Zee Bridge Replacement (Apr. 2, 2014).