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KEY INFORMATION

Area of Concern

Western Atlantic: Alabama, Florida, Georgia, Louisiana, Mississippi, Arkansas, Missouri.

Year Identified as “Species of Concern”
1997

Factors for Decline

- Locks and dams blocking habitat access
- Habitat alteration
- Thermal alterations
- Poor water quality
- Siltation
- Dredging
- Bycatch

Conservation Designations

IUCN: Endangered

American Fisheries Society: Threatened

Species of Greatest Conservation Need:

AL, AR, FL, GA, KY, LA, MS, MO.

Brief Species Description:

The Alabama shad is a [euryhaline, anadromous](#) species that spawns in medium to large flowing rivers from the Mississippi River drainage to the Suwannee River, Florida (Figure 1). They once reached into freshwater systems as far inland as eastern Oklahoma, Iowa and across to West Virginia; present distributions extend up the Mississippi River drainage into eastern Arkansas and central Missouri. They are found in some Gulf coast drainages, but are thought to be extirpated from those drainages west of the Pascagoula drainage in Mississippi (Adams et al. 2000, Mettee and O’Neil 2003, Boschung and Mayden 2004). Alabama shad belong to the family Clupeidae and are closely related to and similar in appearance and life history to their sister species, the American shad (*A. sapidissima*). They also resemble the skipjack herring (*A. chrysochloris*) which occurs in the same areas (sympatric). Diagnostic characters of the Alabama shad are their upper jaw with a distinct median notch, and the number of gill rakers on the lower limb of the anterior gill arch (41-48). Alabama shad differ from other members of their family in the same area in that the lower jaw does not protrude beyond the upper jaw, black spots are present along the length of the lower jaw, and the dorsal fin lacks an elongate filament.

Alabama shad are a schooling species. During the day in the Pascagoula River system, small juveniles use sandbar habitats and as they grow, switch to open channel and steep bank habitats containing large woody debris (Mickle 2006). Within habitat types, they tend to select cooler water temperatures (Mickle 2006). While nothing is known of Alabama shad thermal tolerance, *Alosa* in general are notoriously sensitive to thermal stress (Beitinger et al. 2000, McCauley and Binkowski 1982). Nothing is known of the species’ behavior and habitat use in marine environments. Juveniles remain in fresh water for the first six to eight months of their lives, feeding on small fishes and invertebrates (Ross 2001). Adults broadcast spawn in the spring or early summer over coarse sand and gravel sediments swept by moderate currents when river temperatures are between 18 and 23°C. Males appear to enter the river at earlier dates and lower water temperatures than females (Laurence and Yerger 1966). Male and female spawning site arrival also



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varies by age (Mettee and O'Neil 2003). Adults likely do not feed during the spawning run; otherwise they are thought to forage on small fish. Females become larger than males; females reach 18 inches SL (457 mm), males reach 16.5 inches SL (419 mm). Spawning adults are primarily age-2; repeat spawning is common but the percentage of returning spawners is highly variable among years. Annual fecundity ranges from 40,000 to 360,000 eggs/female. Juvenile growth rate is about 1.2 inches (30 mm) per month from July to September and then 0.4 inches (10 mm) per month until December. Juveniles enter the seawater in late summer/early autumn when they are about 2 to 5 inches SL (50 - 130 mm). Some [natal](#) homing tendency is evidenced by genetic differences among drainage basins (Bowen 2005). The Alabama shad is relatively short-lived (up to 6 years).

Rationale for "Species of Concern" Listing:

Demographic and Genetic Diversity Concerns:

Although once abundant enough to support commercial fisheries in Alabama, Arkansas, Kentucky, Indiana and Iowa, Alabama shad are now rare throughout much of their former range (Ross 2001, Adams et al. 2000). Gunning and Suttkus (1990) report on collections between 1963 and 1988 in the Pearl River, Louisiana and Mississippi, in which the majority of individuals (384) were collected before 1965, with only 34 collected since then. None have been taken from the Pearl River since 1981 (Gunning and Suttkus 1990, Ross 2001). Barkuloo et al. (1993) report large declines in the Mobile River basin occurred shortly after new dams were built on the Alabama and lower Tombigbee rivers in the 1960s. Five adults have been captured in the basin in the past 25 years, and then only in years with very high river flows (Mettee and O'Neil 2003), suggesting that no spawning population remains. Catch rates of adult Alabama shad in the Choctawhatchee River, Alabama, ranged from 0.9 to 7.8 fish per hour during the spawning runs in 1999-2000 (Mettee and O'Neil 2003). The largest remaining population probably occurs in the Apalachicola River, Florida, downstream of the Jim Woodruff Lock and Dam (Barkuloo et al. 1993). Outside of Florida, spawning populations are thought to persist in the following drainages: Choctawhatchee and Conecuh Rivers, AL; Pascagoula River, MS; Ouachita River, AR; Missouri, Gasconade, Osage and Meramec Rivers, MO. Adams et al. (2000) and Mettee and O'Neil (2003) summarize the species' current status in more detail.

Factors for Decline:

The species is thought to have declined largely because of the many locks and dams blocking access to spawning areas and altering hydrology and river substrates (Adams et al. 2000, Ross 2001, Mettee and O'Neil 2003, Boschung and Mayden 2004). However, the population in the Pascagoula River, MS, is also small, and that river lacks physical barriers to migration. Other threats to the species probably include poor water quality, siltation, habitat alteration, commercial and navigational dredging of sand/gravel bars used for spawning, and perhaps [bycatch](#) in marine fisheries and altered thermal regimes or loss of freshwater thermal refugia. The early commercial fisheries may have contributed to their decline but catches were small and the fishery was short-lived.

Status Reviews/Research Underway:

The University of Southern Mississippi and the U.S. Forest Service are conducting research on shad ecology and population structure. The USGS South Carolina Cooperative Fish and Wildlife Research Unit has been conducting studies on the Alabama shad in Jim Woodruff Lock and Dam for 3 years. They have developed growth curves, and population and fecundity estimates for this population.



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Data Deficiencies:

Design and implementation of effective fish passage solutions and restoration of more natural hydrologic regimes are essential to species recovery. Fish passage can allow access to upstream spawning areas, but where spawning and rearing habitats are inundated by impounded water, providing passage alone will likely not lead to recovery. Hydrologic regime is likely important for providing migration cues to adults and juveniles as well as for maintaining areas of suitable spawning substrate and for sustaining the active river channels essential to providing the sandbar and bank habitats with woody shelter that are used by juveniles during their river residence. Research in the above areas is crucial. Research into the ecology of the marine phase including migrations, food habitats and bycatch are essential to identifying other threats to the species. Expanding knowledge of spawning, rearing, and other river habitat needs throughout the range will assist in restoration efforts. Spawning areas should be identified. Evaluation of population sizes across the range is essential to prioritizing populations for conservation action and will assist in identifying habitat characteristics associated with persistent populations.

Existing Protections and Conservation Actions:

Recent designation of Alabama shad as "Species of Greatest Conservation Need" in numerous southern states has helped stimulate research on this species.

References:

- Adams, S.B., S.T. Ross, and M.L. Warren Jr. 2000. Literature review, information needs assessment, and research proposal for Gulf sturgeon, Alabama shad and American eel: diadromous fishes of USFS Region 8. USDA Forest Service, Southern Research Station, Center for Bottomland Hardwoods Research, Oxford, MS.
- Barkuloo, J., M. Mettee, and L. Jenkins. 1993. Systematic and population status of Alabama shad in rivers tributary to the Gulf of Mexico. Report to U.S. Fish and Wildlife Service.
- Beitinger, T.L., W.A. Bennett, and R.W. McCauley. 2000. Temperature tolerances of North American freshwater fishes exposed to dynamic changes in temperature. *Environ Biol Fishes* 58:237-275.
- Boschung, H.T., and R.L. Mayden. 2004. *Fishes of Alabama*. Smithsonian Books, Washington D. C., pp 736.
- Bowen, B.R., 2005. Alabama shad phylogeography. M.S. Thesis. University of Southern Mississippi. Hattiesburg, pp 95.
- Gunning, G.E., and R.D. Suttkus. 1990. Decline of the Alabama shad, *Alosa alabamae*, in the Pearl River, Louisiana-Mississippi: 1963-1988. SFC proceedings No 21 pp 3-4.
- Laurence, G., and R. Yerger. 1966. Life history studies of the Alabama shad, *Alosa alabamae*, in the Apalachicola River, Florida. Proceedings of the 20th annual conference of the Southeastern Association of Game and Fish Commissioners. p 260-273.
- McCauley, R.W., and F.P. Binkowski. 1982. Thermal tolerance of the Alewife. *Trans Am Fish Soc* 111:389-391.
- Mettee, M.F., and P.E. O'Neil. 2003. Status of Alabama shad and skipjack herring in Gulf of Mexico drainages. In: Limburg, K., and J. Waldman (eds) Biodiversity, status, and conservation of the world's shads. American Fisheries Society Symposium 35, Bethesda, MD, p 157-170.



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Mickle, P.F. 2006. Life history of the juvenile Alabama shad, *Alosa alabamae*, in the Pascagoula River. M.S. Thesis, University of Southern Mississippi, Hattiesburg, pp 54.

Ross, S.T. 2001. The inland fishes of Mississippi. University Press of Mississippi, Jackson.

Point(s) of contact for questions or further information:

For further information on this Species of Concern, or on the Species of Concern Program in general, please contact NMFS, Office of Protected Resources, 1315 East West Highway, Silver Spring, MD 20910, (301) 713-1401, soc.list@noaa.gov; <http://www.nmfs.noaa.gov/pr/species/concern/>, or Dr. Stephania Bolden, NMFS, Southeast Region, Protected Resources Division, 9721 Executive Center Drive N., St. Petersburg, FL 33702, (727)570-5312, Stephania.Bolden@noaa.gov.

Alabama Shad SOC Range

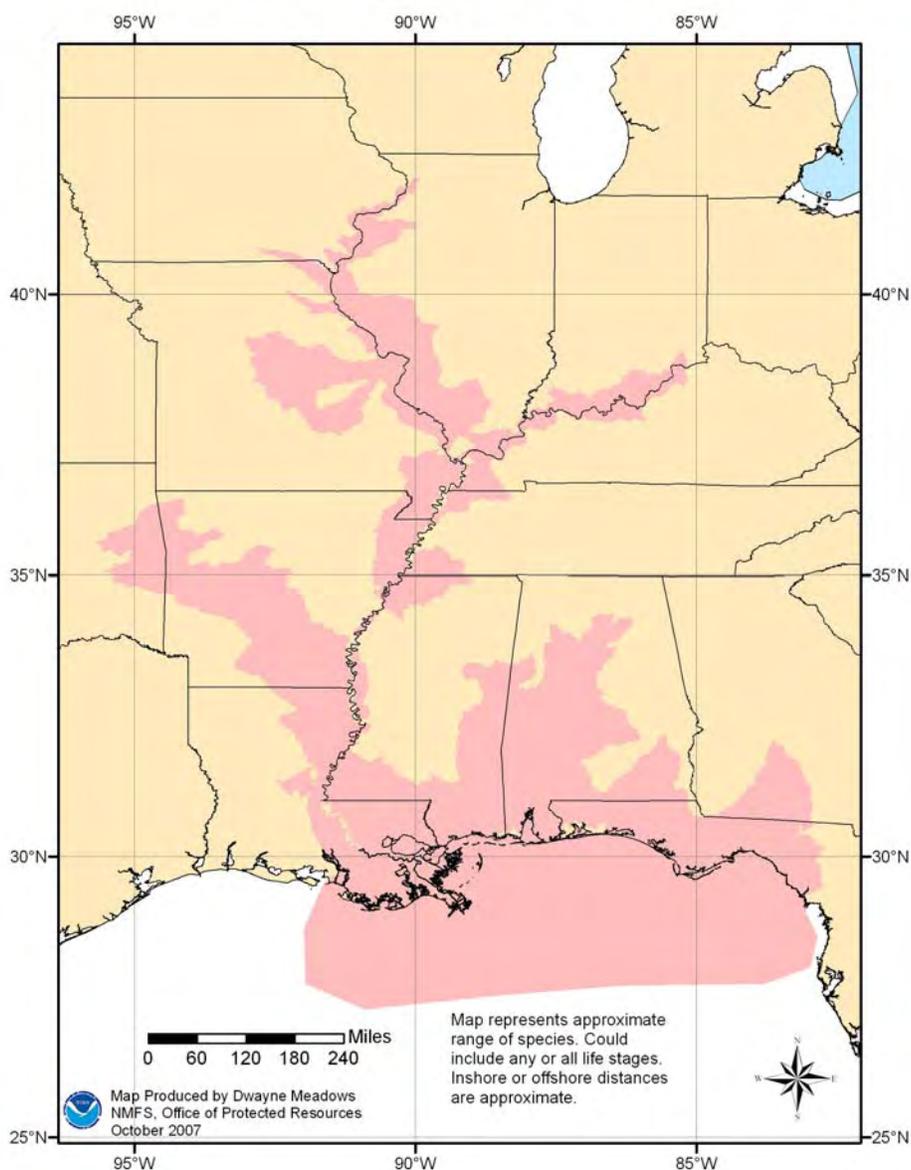


Figure 1. Map of range of the Alabama shad.