

Alabama Sturgeon
(*Scaphirhynchus suttkusi*)

5-Year Review:
Summary and Evaluation



Photo: Paul J. Johnson, Alabama Aquatic Biodiversity Center

U.S. Fish and Wildlife Service
Southeast Region
Alabama Ecological Services Field Office
Daphne, Alabama

November 2010

5-YEAR REVIEW

Alabama Sturgeon (*Scaphirhynchus suttkusi*)

I. GENERAL INFORMATION

- A. Methodology used to complete the review:** In conducting this 5-year review, we relied on available information pertaining to historic and current distribution, life history, and habitat of this species. Our sources include the final rule listing this species under the Endangered Species Act; the Recovery Plan; peer reviewed scientific publications; unpublished field observations by Service, State and other experienced biologists; unpublished survey reports; and notes and communications from other qualified biologists or experts. A *Federal Register* notice announcing the review and requesting information was published on July 6, 2009 (74 FR 31972). Comments received and suggestions from peer reviewers were evaluated and incorporated as appropriate (see Appendix A). No part of this review was contracted to an outside party. This review was completed by the Service's lead Recovery biologist in the Alabama Field Office, Daphne, Alabama.

B. Reviewers

Lead Field Office – Daphne, AL, Alabama Ecological Services Field Office: Jeff Powell, 251.441.5858

Cooperating Field Office – Jackson, MS, Mississippi Ecological Services Field Office: Paul Hartfield, 601.321.1125

Lead Region – Southeast: Kelly Bibb, 404.679.7132; Nikki Lamp, 404.679.7118

C. Background

- 1. FR Notice citation announcing initiation of this review:** July 6, 2009, 74 FR 31972.
- 2. Species status:** Uncertain, 2010 Recovery Data Call. No new information is available to indicate that threats have increased since 2009. No information is available to determine the species status since 2009.
- 3. Recovery achieved:** 1 (0-25% recovery objectives achieved)
- 4. Listing history:**
 - Original Listing
 - FR notice: 65 FR 26437
 - Date listed: May 5, 2000
 - Entity listed: Species
 - Classification: Endangered

5. **Associated rulemakings:**
Designation of Critical Habitat: Designation of Critical Habitat for Alabama Sturgeon (*Scaphirhynchus suttkusi*), 06/02/2009, 74 FR 26487-26510
6. **Review History:**
Recovery Data Call: 2010, 2009, 2008, 2007, 2006, 2005, 2004, 2003, 2002, and 2001
Draft Recovery Plan: under development
7. **Species' Recovery Priority Number at start of review:** 5 (degree of threat is high, potential for recovery is low, and the taxonomy is at the species level)
8. **Recovery Plan or Outline:**
Name of plan: Technical Draft Recovery Plan for Alabama sturgeon (*Scaphirhynchus suttkusi*). The draft is under development and a final plan may be available by 2011.

II. REVIEW ANALYSIS

A. Application of the 1996 Distinct Population Segment (DPS) policy

1. **Is the species under review listed as a DPS?** No.
2. **Is there relevant new information that would lead you to consider listing this species as a DPS in accordance with the 1996 policy?** No.

B. Recovery Criteria

1. **Does the species have a final, approved recovery plan containing objective, measurable criteria?** No. A draft recovery plan is under development.
2. **Adequacy of recovery criteria.**
 - a. **Do the recovery criteria reflect the best available and most up-to-date information on the biology of the species and its habitat?** NA
 - b. **Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria?** NA
3. **List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information. For threats-related recovery criteria, please note which of the 5 listing factors are addressed by that criterion. If any of the 5-listing factors are not relevant to this species, please note that here.** NA

C. Updated Information and Current Species Status

1. Biology and Habitat

a. Abundance, population trends (e.g., increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:

Since the 2000 final rule listing the species, only three Alabama sturgeon have been captured or reported captured. One of these was captured, videotaped, and released in the lower Cahaba River shortly after publication of the final rule by a fisherman in July 2000. The most recent capture was an individual collected in April 2007 by the Alabama Department of Conservation and Natural Resources (ADCNR) from the Alabama River below Claiborne Lock and Dam. This fish was implanted with a sonic tag and released at the location at which it was captured (Rider and Powell 2009). The fish was tracked for two years, and in 2009, transmission was lost with the animal. Also on April 23, 2009, ADCNR biologists confirmed an Alabama sturgeon while electrofishing just downstream of R. F. Henry Lock and Dam. Although the specimen was not landed, a positive identification was made by two biologists aboard the shocking boat. Fewer Alabama sturgeon have been caught and reported in the last 10 years (three individuals) than from 1985 to 1999 (nine individuals) with continued sampling efforts, indicating the population abundance continues to decline as mortality is not offset by recruitment.

b. Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):

The Alabama sturgeon was described by Williams and Clemmer (1991). Critics of Williams and Clemmer (1991) questioned the genetic and morphological distinctions between the Alabama and shovelnose sturgeon, and identified a variety of statistical and methodological errors and limitations of the original description (e.g., small sample size, clinal variation (characteristics of a species correlated with changing ecological variables), allometric growth (growth of parts of an organism at different rates and at different times), and inappropriate statistical tests) (65 FR 26438). In 1996, many of these errors were corrected or addressed in a reexamination of the species by Mayden and Kuhajda (1996). New genetic techniques were also employed to examine relationships within the genus by Campton *et al.* (2000), Simons *et al.* (2001), and Ray *et al.* (2007) that demonstrated genetic differences between Alabama and shovelnose sturgeons. Today, the Alabama sturgeon is considered a valid species both nationally and internationally (Nelson *et al.* 2004, Eschmeyer 2010, Integrated Taxonomic Information System (ITIS) 2010, International Union for Conservation of Nature (IUCN) 2010).

c. Taxonomic classification or changes in nomenclature:

The Alabama sturgeon was first recognized in the literature as an isolated population of the shovelnose sturgeon (Chermock 1955). It was not until 1976 that Ramsey referred to the species as the “Alabama shovelnose” sturgeon. The species was formally described by Williams and Clemmer (1991). The type locality is the Alabama River just upstream of the confluence of Little River, Monroe County, Alabama.

The current taxonomy of the Alabama sturgeon (*Scaphirhynchus suttkusi*), as recognized by Nelson *et al.* (2004), Eschmeyer (2010), ITIS (2010), and the IUCN (2010) is *Scaphirhynchus suttkusi* (Williams and Clemmer 1991).

d. Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g. corrections to the historical range, change in distribution of the species’ within its historic range, etc.):

The Alabama sturgeon is endemic to rivers of the Mobile River Basin below the Fall Line (Mettee *et al.* 1996; Boschung and Mayden 2004; Kuhajda 2004). Its historical range encompassed nearly 1,600 kilometers (km) (1,000 miles (mi)) in the Mobile River Basin in Alabama and Mississippi. There are records of Alabama sturgeon from nearly all the major rivers in the Mobile River Basin including the Black Warrior, Tombigbee, Alabama, Coosa, Tallapoosa, Mobile, Tensaw, and Cahaba Rivers (Burke and Ramsey 1985, 1995). Its current range includes the Alabama River from R.F. Henry Lock and Dam downstream to the confluence of the Tombigbee River, including the Cahaba River (~402 km or 250 mi). Despite extensive efforts in the decade prior to its listing, only nine Alabama sturgeon were captured, or reported captured and released (Rider and Hartfield 2007). Since its listing in 2000, only three individuals have been captured, as mentioned above.

e. Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

No assessments have been conducted to evaluate habitat conditions for Alabama sturgeon. See 2(a) below for more information about habitat and ecosystem conditions.

2. Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

a. Present or threatened destruction, modification or curtailment of its habitat or range:

The Alabama sturgeon has declined and has experienced significant curtailment of its range due to extensive habitat modifications to its' historical range (e.g., dam construction, changes in natural flow regimes, navigational channel dredging). The entire historic range of the Alabama sturgeon in the Mobile River basin is now controlled by a series of more than 25 large locks and/or dams. These man-made structures have resulted in a series of impoundments that are interspersed with short, free-flowing reaches. However, long reaches of unobstructed riverine habitats (flowing water) are required by the Alabama sturgeon to successfully complete its life cycle. It is unlikely that Alabama sturgeon habitat and life cycle requirements can be met in riverine impoundments, where decreased flows typically cause silt and other fine sediments to accumulate over bottom habitats, creating unsuitable conditions for spawning, feeding, and larval development.

It should also be noted that many of these modifications have been deemed as essential components of the human economic infrastructure and are unlikely to be eliminated or significantly modified within the foreseeable future. However, there is existing technology that may be implemented to mitigate for some of their impacts, such as facilitating movement of sturgeon over and around dams, and improving flows and water quality. These types of recommendations have been made to the Army Corps of Engineers (Corps) (Mobile District) as they develop their environmental documents for the revised water control manuals for the Alabama River projects.

In addition, impoundments, mining, toxic chemical spills, siltation, agriculture, runoff and discharge of organic and inorganic pollutants, channelization, dredging, streambank erosion, and other forms of non-point source pollution continue to impact the Alabama sturgeon and its habitat. Many of these impacts typically occur during the summer and fall months when flows are at their low point. Low stream flows tend to concentrate pollutants.

b. Overutilization for commercial, recreational, scientific, or educational purposes:

Although overfishing was originally implicated in the historic decline of the Alabama sturgeon, it is no longer a factor affecting the species due to State and Federal protection, as well as rarity of the species.

c. Disease or predation:

There are no currently known threats to the Alabama sturgeon due to disease or predation.

d. Inadequacy of existing regulatory mechanisms:

Under the consultation requirements of the Endangered Species Act, existing regulatory mechanisms (e.g., the Clean Water Act and Rivers and Harbors Act) require consideration of the species when projects are reviewed. Current State and Federal regulations regarding pollutants are assumed to be protective of native freshwater fishes; however, some species, including the Alabama sturgeon, may have lower thresholds to some pollutants than the test organisms commonly used in developing the criteria.

e. Other natural or manmade factors affecting its continued existence:

The primary issues affecting the Alabama sturgeon are its small population size and its apparent inability to successfully recruit. Recent information suggests that long stretches of uninterrupted flows are necessary for *Scaphirhynchus* sturgeons to successfully recruit. According to Braaten *et al.* (2008), the average larval shovelnose sturgeon may drift from 94 to 250 km and the average larval pallid sturgeon may drift from 245 to 530 km, depending on water velocity. In the Alabama River, the types of long, free-flowing habitats needed by Alabama sturgeon larvae to drift and develop may no longer exist. The maximum length of free-flowing habitat currently available to Alabama sturgeon larvae is about 161 km. Therefore, improvements in operations at Claiborne and Millers Ferry locks and dams must be made for the species to survive.

D. Synthesis

With only three documented occurrences in the last ten years, the Alabama sturgeon is undoubtedly one of the rarest freshwater fishes on the planet (Kuhajda 2004, Rider and Powell 2009, and IUCN 2010). Loss of riverine habitat and habitat fragmentation have resulted in small population sizes and little to no measurable recruitment over the last 50 years. Therefore, the species remains highly vulnerable to extinction and should remain listed as endangered with a RPN of 5.

III. RESULTS

A. Recommended Classification:

X No change is needed

IV. RECOMMENDATIONS FOR FUTURE ACTIONS

1. Continue efforts to pursue fish passage and/or bypass at all dams on the Alabama River.

2. Work with the Corps to improve operations at Claiborne, Millers Ferry, and R. F. Henry lock and dams by increasing the amount of free-flowing habitat available within the reservoirs.
3. Continue to monitor population levels, demographics, and habitat conditions of existing populations. This includes annual attempts to collect individuals for propagation and tracking.
4. Continue efforts aimed at obtaining individuals and improving techniques necessary for captive propagation of the species.
5. Continue efforts to identify locations along the Alabama and Cahaba Rivers for suitable spawning habitat.
6. Better understand the relationship between water quality and upstream dam releases, and continue monitoring seasonal and diurnal changes in water quality in the Alabama River.
7. Continue efforts to reduce non-point source pollution from agricultural activities by working through the Partners for Fish and Wildlife, Farm Bill, and other landowner incentive programs that implement best management practices.
8. While continuing to utilize existing legislation and regulations (Federal and State endangered species laws, water quality requirements, stream alteration regulations, etc.) to protect the species and its habitat, encourage water quality regulatory agencies to develop new criteria suitable for the species they are intended to protect.
9. Finalize and complete the Technical Draft Recovery Plan.

V. REFERENCES

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Alabama Sturgeon (*Scaphirhynchus suttkusi*)

Current Classification: Endangered

Recommendation resulting from the 5-Year Review

☐ **Downlist to Threatened**
☐ **Uplist to Endangered**
☐ **Delist**
☒ **No change is needed**

Review Conducted By Jeff Powell

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

Approve _____ Date _____

The lead Field Office must ensure that other offices within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. The lead field office should document this coordination in the agency record.

REGIONAL OFFICE APPROVAL:

Lead Regional Director, Fish and Wildlife Service

Approve _____ Date _____

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APPENDIX A:
**Summary of peer review for the 5-year review of Alabama Sturgeon (*Scaphirhynchus*
suttkusi)**

Peer Reviewers

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The Service was in agreement with all comments and concerns received from peer reviewers. Comments were incorporated into the 5-year review where appropriate. Peer reviewer comments are available at the Alabama Ecological Services Field Office.