

DEPARTMENT OF THE INTERIOR**Fish and Wildlife Service****50 CFR Part 17**

RIN 1018-AF56

Endangered and Threatened Wildlife and Plants; Final Rule To List the Alabama Sturgeon as Endangered**AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Final rule.

SUMMARY: We, the Fish and Wildlife Service (Service), determine the Alabama sturgeon (*Scaphirhynchus suttkusi*) to be endangered under the authority of the Endangered Species Act of 1973, as amended (Act). The Alabama sturgeon's historic range once included about 1,600 kilometers (km) (1,000 miles (mi)) of the Mobile River system in Alabama (Black Warrior, Tombigbee, Alabama, Coosa, Tallapoosa, Mobile, Tensaw, and Cahaba Rivers) and Mississippi (Tombigbee River). Since 1985, all confirmed captures have been from a short, free-flowing reach of the Alabama River below Millers Ferry and Claiborne Locks and Dams in Clarke, Monroe, and Wilcox Counties, Alabama. The decline of the Alabama sturgeon is attributed to over-fishing, loss and fragmentation of habitat as a result of historical navigation-related development, and water quality degradation. Current threats primarily result from its reduced range and its small population numbers. These threats are compounded by a lack of information on Alabama sturgeon habitat and life history requirements. This action extends the Act's protection to the Alabama sturgeon.

EFFECTIVE DATE: June 5, 2000.**ADDRESSES:** The complete file for this rule is available for inspection, by appointment, during normal business hours at the Mississippi Field Office, U.S. Fish and Wildlife Service, 6578 Dogwood View Parkway, Jackson, Mississippi 39213.**FOR FURTHER INFORMATION CONTACT:** Paul Hartfield at the above address (telephone 601/321-1125; facsimile 601/965-4340).**SUPPLEMENTARY INFORMATION:****Background**

The Alabama sturgeon (*Scaphirhynchus suttkusi*) is a small, freshwater sturgeon that was historically found only in the Mobile River Basin of Alabama and Mississippi. This sturgeon is an elongate, slender fish growing to about 80 centimeters (cm) (31 inches

(in)) in length. A mature fish weighs 1 to 2 kilograms (kg) (2 to 4 pounds (lb)). The head is broad and flattened shovel-like at the snout. The mouth is tubular and protrusive. There are four barbels (whisker-like appendages used to find prey) on the bottom of the snout, in front of the mouth. Bony plates cover the head, back, and sides. The body narrows abruptly to the rear, forming a narrow stalk between the body and tail. The upper lobe of the tail fin is elongated and ends in a long filament. Characters used to distinguish the Alabama sturgeon from the closely related shovelnose sturgeon (*Scaphirhynchus platyrhynchus*) include larger eyes, orange color, number of dorsal plates, dorsal fin ray numbers, and the absence of spines on the tip of its snout and in front of its eyes.

The earliest specimens of Alabama sturgeon in museum collections date from about 1880. The first mention of the fish in the scientific literature, however, was not until 1955, when a report of the collection of a single specimen from the Tombigbee River was published by Chermock. In 1976, Ramsey referred to the Alabama sturgeon as the Alabama shovelnose sturgeon, noting that it probably was distinct from the shovelnose sturgeon, which is found in the Mississippi River Basin and was also historically known from the Rio Grande. In 1991, Williams and Clemmer formally described the species based on a statistical comparison of relative sizes and numbers of morphological structures of Alabama and shovelnose sturgeons.

The methods used by Williams and Clemmer (1991) to justify species designation for the Alabama sturgeon have been criticized in unpublished manuscripts (e.g., Blanchard and Bartolucci 1994, Howell *et al.* 1995) and in one published paper (Mayden and Kuhajda 1996). The criticisms included identification of a variety of statistical and methodological errors and limitations (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), inappropriate statistical tests, and others). Bartolucci *et al.* (1998), using Bayesian Analysis statistical methodology, found no significant differences in multivariate means of measurement data, taken from Williams and Clemmer (1991).

Mayden and Kuhajda (1996) reevaluated the morphological distinctiveness of the Alabama sturgeon using improved statistical tests and new data derived from examination of

additional shovelnose sturgeon specimens from a larger geographic area. Mayden and Kuhajda (1996) identified eight new diagnostic characters, found little evidence of geographic clinal variation in these diagnostic features, and concluded that the Alabama sturgeon was a distinct and valid species.

Attempts to clarify taxonomic relationships of the Alabama sturgeon to other species of *Scaphirhynchus* using DNA sequencing have met with limited success. In an unpublished report, Schill and Walker (1994) used tissue samples from an Alabama sturgeon collected in 1993 to compare the three nominal *Scaphirhynchus* species. Based on estimates of sequence divergence at the mitochondrial cytochrome *b* locus, Alabama, shovelnose, and pallid sturgeons (*S. albus*) were indistinguishable. However, other studies have also found that the cytochrome *b* locus was not useful for discriminating among some congeneric fish species that were otherwise distinguished by accepted morphological, behavioral, and other characteristics (Campton *et al.* 1995).

In two unpublished reports for the U.S. Army Corps of Engineers (Corps) and us by Genetic Analyses, Inc. (1994, 1995), nuclear DNA fragments were compared among the three *Scaphirhynchus* species. The three Alabama sturgeon specimens examined were genetically divergent from pallid and shovelnose sturgeons, while there were no observed differences of DNA fragments between the pallid and shovelnose sturgeons. However, the 1995 study also found that two of the Alabama sturgeon differed substantially from the third, noted the small number of samples of Alabama sturgeon, and recommended additional studies to examine genetic diversity within the Alabama sturgeon population.

A comparative study of the mitochondrial DNA (mtDNA) d-loop of *Scaphirhynchus* species by Campton *et al.* (1995) provided genetic data consistent with the taxonomic distinction of the Alabama sturgeon from the shovelnose sturgeon. The d-loop is considered to be a rapidly evolving part of the genome. Campton *et al.* (1995) found that haplotype (genetic markers) frequencies of the d-loop from the three *Scaphirhynchus* species were significantly different, with the Alabama sturgeon having a unique haplotype. However, the relative genetic differences among the three species were small, suggesting that the rate of genetic change in the genus is relatively slow and/or they have only recently diverged. The genetic similarity

between the pallid and shovelnose sturgeon has been suggested to be due to interbreeding that has recently occurred as a result of niche overlap resulting from widespread habitat losses (Carlson *et al.* 1985, Keenlyne *et al.* 1994).

During open comment periods for the proposed rule, we received several reports and letters containing new data from mtDNA analysis of *Scaphirhynchus*. Both Campton *et al.* (1999) and Mayden *et al.* (1999) identified a haplotype common to the three Alabama sturgeon sampled that was not observed in a much larger sample (>70) of pallid and shovelnose sturgeons. Wells (*in litt.* 1999) also conducted mtDNA analysis on eight shovelnose sturgeon and identified several new haplotypes not found in previous studies. He did not find the haplotype unique to Alabama sturgeon in these shovelnose sturgeon. Fain *et al.* (2000) found that the mitochondrial cytochrome *b* gene was not useful to distinguish species within *Scaphirhynchus* or two other species groups within the sturgeon genus *Acipenser*. Campton *et al.* (in press) submitted a peer-reviewed report supporting species recognition of all three species within *Scaphirhynchus*, based on current morphological, biogeographic, and molecular genetic evidence.

We acknowledge that there is some disagreement concerning the Alabama sturgeon's taxonomic status. However, the description of the Alabama sturgeon (*Scaphirhynchus suttkusi*) complies with the rules of the *International Code of Zoological Nomenclature* (§ 17.11(b)). Recognition of Alabama sturgeon as a species (Williams and Clemmer 1991) is supported by Mayden and Kuhajda (1996), as well as by several recent unpublished genetic studies (Campton *et al.* 1995, 1999, in press; Genetic Analyses, Inc. 1994, 1995; Mayden *et al.* 1999). Furthermore, the Alabama sturgeon is nationally and internationally recognized as a valid species (see response to Issue 2''), and will continue to be so recognized unless overturned at some future date by the scientific community through the formal peer review and publication process.

Very little is known of the life history, habitat, or other ecological requirements of the Alabama sturgeon. Observations by Burke and Ramsey (1985) indicate the species prefers relatively stable gravel and sand substrates in flowing river channels. Verified captures of Alabama sturgeon have primarily occurred in large channels of big rivers; however, at least two historic records were from oxbow lakes (Williams and

Clemmer 1991). Examination of stomach contents of museum and captured specimens show that these sturgeon are opportunistic bottom feeders, preying primarily on aquatic insect larvae (Mayden and Kuhajda 1996). Mayden and Kuhajda (1996) deduced other aspects of Alabama sturgeon life history by a review of spawning habits of its better known congener (a species that is a member of the same genus), the shovelnose sturgeon. Life history of the shovelnose sturgeon has also been recently summarized by Keenlyne (1997). These data indicate that Alabama sturgeon are likely to migrate upstream during late winter and spring to spawn. Downstream migrations may occur to search for feeding areas and/or deeper, cooler waters during the summer. Eggs are probably deposited on hard bottom substrates such as bedrock, armored gravel, or channel training works in deep water habitats, and possibly in tributaries to major rivers. The eggs are adhesive and require current for proper development. Sturgeon larvae are planktonic, drifting with river currents, with postlarval stages eventually settling out to the river bottom. Sexual maturity is believed to occur at 5 to 7 years of age. Spawning frequency of both sexes is influenced by food supply and fish condition, and may occur every 1 to 3 years. Alabama sturgeon may live up to 15 or more years of age.

The Alabama sturgeon's historic range consisted of about 1,600 km (1,000 mi) of river habitat in the Mobile River Basin in Alabama and Mississippi. There are records of sturgeon captures from the Black Warrior, Tombigbee, Alabama, Coosa, Tallapoosa, Mobile, Tensaw, and Cahaba Rivers (Burke and Ramsey 1985, 1995). The Alabama sturgeon was once common in Alabama, and perhaps also in Mississippi. The total 1898 commercial catch of shovelnose sturgeons (i.e., Alabama sturgeon) from Alabama was reported as 19,000 kg (42,000 lb) in a statistical report to Congress (U.S. Commission of Fish and Fisheries 1898). Of this total, 18,000 kg (39,800 lb) came from the Alabama River and 1,000 kg (2,200 lb) from the Black Warrior River. Given that an average Alabama sturgeon weighs about 1 kg (2 lb), the 1898 commercial catch consisted of approximately 20,000 fish. These records indicate a substantial historic population of Alabama sturgeon.

Between the 1898 report and 1970, little information was published regarding the Alabama sturgeon. An anonymous article published in the Alabama Game and Fish News in 1930 stated that the sturgeon was not

uncommon; however, by the 1970s, it had become rare. In 1976, Ramsey considered the sturgeon as endangered and documented only six specimens from museums. Clemmer (1983) was able to locate 23 Alabama sturgeon specimens in museum collections, with the most recent collection dated 1977. Clemmer also found that commercial fishermen in the Alabama and Tombigbee Rivers were familiar with the sturgeon, calling it hackleback, buglemouth trout, or devilfish.

During the mid-1980s, Burke and Ramsey (1985, 1995) conducted a status survey to determine the distribution and abundance of the Alabama sturgeon. Interviews were conducted with commercial fishermen on the Alabama and Cahaba Rivers, some of whom reported catch of Alabama sturgeon as an annual event. However, with the assistance of commercial fishermen, Burke and Ramsey were able to collect only five Alabama sturgeons, including two males, two gravid females, and one juvenile about 2 years old. Burke and Ramsey (1985) concluded that the Alabama sturgeon had been extirpated from 57 percent (950 km or 589 mi) of its range and that only 15 percent (250 km or 155 mi) of its former habitat had the potential to support a good population. An additional sturgeon was taken in 1985 in the Tensaw River and photographed, but the specimen was lost (Mettee, Geologic Survey of Alabama, pers. comm. 1997).

In 1990 and 1992, biologists from the Alabama Department of Conservation and Natural Resources (ADCNR), with the assistance of the Corps, conducted searches for Alabama sturgeon using a variety of sampling techniques, without success (Tucker and Johnson 1991, 1992). However, some commercial and sports fishermen continued to report recent catches of small sturgeon in Millers Ferry and Claiborne Reservoirs and in the lower Alabama River (Tucker and Johnson 1991, 1992).

In 1993, our biologists and the ADCNR conducted another extensive survey for Alabama sturgeon in the lower Alabama River. On December 2, 1993, a mature male was captured alive in a gill net downstream of Claiborne Lock and Dam, at river mile 58.8 in Monroe County, Alabama (Parauka, U.S. Fish and Wildlife Service, pers. comm. 1995). This specimen represented the first confirmed record of Alabama sturgeon in about 9 years. This fish was moved to a hatchery where it later died.

On April 18, 1995, an Alabama sturgeon captured by fishermen below Claiborne Lock and Dam was turned over to ADCNR and Service biologists. This fish was carefully examined, radio-

tagged, and returned to the river where it was tracked for 4 days before the transmitter switched off (Parauka, pers. comm. 1995). In June 1995, it was determined that the tag had dislodged. On May 19, 1995, our biologists took another Alabama sturgeon in Monroe County, Alabama, near the 1993 collection site. Unfortunately, shortly after the fish was tagged and released, it was found entangled and dead in a vandalized gill net lying on the river bottom (Parauka, pers. comm. 1995). On April 26, 1996, a commercial fisherman caught, photographed, and released an Alabama sturgeon (estimated at about 51 to 58 cm (20 to 23 in) total length and 1 kg (2 lb) weight) in the Alabama River, 5 km (3 mi) downstream of Millers Ferry Lock and Dam (Reeves, ADCNR, pers. comm. 1996).

Due to the historic decline, lack of collection success, and the apparent rarity of the sturgeon, members of the Mobile River Basin Recovery Coalition began discussions in the spring of 1996 to develop and implement a conservation plan for the Alabama sturgeon that could receive wide support. A draft plan was subsequently endorsed in 1997 by the ADCNR, Mobile District Corps, representatives of the Alabama-Tombigbee Rivers Coalition, and us (1997 Conservation Plan). This Plan identified the need to develop life history information through capture, tagging, and telemetry; capture of broodstock for breeding and potential population augmentation; construction of hatchery facilities for sturgeon propagation; and habitat identification and quantification in the lower Alabama River (see discussion of 1997 Conservation Plan under State Conservation Efforts section).

In March 1997, the ADCNR implemented the collection component of the 1997 Conservation Plan. The Geological Survey of Alabama, Corps, Waterways Experiment Station, Alabama Power Company, and the Service also participated in the effort. Up to four crews were on the river at any one time using gill nets and trot lines. Most of the effort focused on the lower Alabama River where recent previous captures had been made. Personnel from the ADCNR caught one small sturgeon (1 kg (2 lb) weight) on April 9, 1997, immediately below Claiborne Lock and Dam.

The ADCNR continued fishing for sturgeon through the fall and winter and collected another sturgeon downstream of Millers Ferry Lock and Dam on December 10, 1997. This fish was also transported to the Marion Fish Hatchery, where both fish were held for potential use as broodstock. In January

1998, the two fish were biopsied to determine their sex. The April specimen was found to be a mature female with immature eggs, whereas the December fish was a mature male.

Alabama broodstock collection efforts in 1998 resulted in the capture of a single fish on November 12, 1998. A biopsy performed in December found the specimen to be a reproductively inactive male. The two 1997 fish were also biopsied at this time, and were determined to be candidates for propagation in the spring of 1999.

On March 27, 1999, the mature male and female sturgeon captured during 1997 were induced to spawn. The female produced about 4,000 mature eggs; however, the male failed to produce sperm, and the fertilization attempt was unsuccessful. On April 4, 1999, the captive female died from a bacterial infection that was apparently aggravated by spawning stress. Another sturgeon was captured on April 14, 1999, by commercial fishermen downstream of Claiborne Lock and Dam, delivered to ADCNR fisheries biologists, and transported to the Marion State Hatchery. This sturgeon died at the hatchery in February 2000, following a biopsy that identified it as a female. Another Alabama sturgeon captured on August 18, 1999, in the Claiborne Pool also died at the hatchery shortly after transport. To date, more than 4,000 man-hours of fishing effort by professional fisheries biologists over the past 3 years has resulted in the capture of five fish, three of which have died in captivity.

The chronology of commercial harvest, scientific collections, and incidental catches by commercial and sport fishermen demonstrate a significant decline in both the population size and range of the Alabama sturgeon in the past 100 years. Historically, the fish occurred in commercial abundance and was found in all major coastal plain tributaries of the Mobile River system. The Alabama sturgeon has apparently disappeared from the upper Tombigbee, lower Black Warrior, lower Tallapoosa, and upper Cahaba, where it was last reported in the 1960s; the lower Coosa, last reported around 1970; the lower Tombigbee, last reported around 1975; and lower Cahaba, last reported in 1985 (Clemmer 1983; Burke and Ramsey 1985, 1995; Williams and Clemmer 1991; Mayden and Kuhajda 1996). The fish is known from a single 1985 record in the Mobile-Tensaw Delta; however, no incidental catches by commercial or recreational fishermen have been reported since that time. Recent collection efforts indicate that very low numbers of Alabama

sturgeon continue to survive in portions of the 216-km (134-mi) length of the Alabama River channel below Millers Ferry Lock and Dam, downstream to the mouth of the Tombigbee River.

The historic population decline of the Alabama sturgeon was probably initiated by unrestricted harvesting near the turn of the century. Although there are no reports of commercial harvests of Alabama sturgeon after the 1898 report, it is likely that sturgeon continued to be affected by the commercial fishery. Keenlyne (1997) noted that in the early years of the 20th century, shovelnose sturgeon were considered a nuisance to commercial fishermen and were destroyed when caught. Interviews with commercial and recreational fishermen along the Alabama River indicate that Alabama sturgeon continued to be taken into the 1980s (Burke and Ramsey 1985). Studies of other sturgeon species suggest that newly exploited sturgeon fisheries typically show an initial high yield, followed by rapid declines. With continued exploitation and habitat loss little or no subsequent recovery may occur, even after nearly a century (National Paddlefish and Sturgeon Steering Committee 1993, Birstein 1993).

Although unrestricted commercial harvesting of the Alabama sturgeon may have significantly reduced its numbers and initiated a population decline, the present curtailment of the Alabama sturgeon's range is the result of 100 years of cumulative impacts to the rivers of the Mobile River Basin (Basin) as they were developed for navigation, especially during the last 50 years. Navigation development of the Basin affected the sturgeon in major ways. This development significantly changed and modified extensive portions of river channel habitats, blocked long-distant movements, including migrations, and fragmented and isolated sturgeon populations.

The Basin's major rivers are now controlled by more than 30 locks and/or dams, forming a series of lakes that are interspersed with short, free-flowing reaches. Within the sturgeon's historic range, there are three dams on the Alabama River (built between 1968 and 1971); the Black Warrior has two (completed by 1959); and the Tombigbee has six (built between 1954 and 1979). These 11 dams affect and fragment 970 km (583 mi) of river channel habitat. Riverine (flowing water) habitats are required by the Alabama sturgeon to successfully complete its life cycle. Alabama sturgeon habitat requirements are not met in impoundments, where weak flows result in accumulations of silt

making bottom habitats unsuitable for spawning, larval and postlarval development, and, perhaps, for the bottom-dwelling invertebrates on which the sturgeon feed.

Prior to widespread construction of locks and dams throughout the Basin, Alabama sturgeon could move freely between feeding areas, and from feeding areas to sites that favored spawning and development of eggs and larvae. Additionally, the sturgeon may have sought thermal refuges during summer months, when high water temperatures became stressful. Such movements might have been extensive, since other *Scaphirhynchus* species of sturgeons are known to make long-distance movements exceeding 250 km (155 mi) (Moos 1978, Bramblett 1996). Locks and dams, however, fragmented the sturgeons' range, forming isolated subpopulations between the dams where all the species' habitat needs were not necessarily met. With avenues of movement and migration restricted, these subpopulations also became more vulnerable to local declines in water and habitat quality caused by riverine and land management practices and/or polluting discharges. With access restricted by dams, habitat fragmentation also precluded recolonization of areas when subpopulations became extirpated.

Most of the major rivers within the historic range of the Alabama sturgeon have also been dredged and/or channelized to make them navigable. For example, the 740-km (459-mi) long Warrior-Tombigbee Waterway channel was originally dredged to 45 meters (m) by 2 m (148 feet (ft) by 7 ft) and later to 61 m by 3 m (200 ft by 10 ft). The lower Alabama and Tombigbee Rivers are routinely dredged in areas of natural deposition to maintain navigation depths. Dredged and channelized river reaches, in comparison to natural river reaches, have reduced habitat diversity (e.g., loss of shoals, removal of snags, removal of bendways, reduction in flow heterogeneity, etc.), which results in decreased aquatic diversity and productivity (Hubbard *et al.* 1988 and references therein). The deepening and destruction of shoals and shallow runs or other historic feeding and spawning sites as a result of navigation development likely contributed to local and overall historic declines in range and abundance of the Alabama sturgeon.

Dams constructed for navigation and power production also affected the quantity and timing of water moving through the Basin. Water depths for navigation are controlled through discharges from upstream dams, and

flows have also been changed as a result of hydroelectric production by upstream dams (Buckley 1995; Freeman and Irwin, U.S. Geological Survey, pers. comm. 1997).

The construction and operation of dams and development of navigation channels were significant factors in curtailment of the historic range of the Alabama sturgeon and in defining its current distribution. While these structures and activities are likely to continue to influence the environment (habitat) and its use by this species and others, the present effects of the operation of existing structures, flow regulation, and navigation maintenance activities on the sturgeon are poorly understood, in large part due to lack of specific information on the behavior and ecology of the Alabama sturgeon.

In 1994, we conducted an impact analysis with the Corps on potential effects of channel maintenance and other Federal actions in the Alabama River on the Alabama sturgeon. The analysis was summarized in a White Paper by Biggins (1994) (see text of the White Paper below). Based on limited information on the Alabama sturgeon and studies of the shovelnose sturgeon in the Mississippi River system, the White Paper noted that Alabama sturgeon appear to require strong currents in deep waters over relatively stable substrates for feeding and spawning, and they are not generally associated with the unconsolidated substrates that settle in slower current areas. Channel maintenance is primarily associated with specific shallow areas with unconsolidated substrates and produces small, localized, and temporary elevations of turbidity. Based on 1994 information, the White Paper concluded that the annual maintenance dredging program in the Alabama and lower Tombigbee Rivers does not adversely affect the Alabama sturgeon. Recent studies have also supported the conclusions of the White Paper (see discussion of maintenance dredging under Factor A). The White Paper in its entirety is at the end of this final rule.

In summary, the Alabama sturgeon has undergone marked declines in population size and range during the past century. Over-fishing and historical navigation development were significant factors in the sturgeon's decline. The Alabama sturgeon currently inhabits only about 15 percent of its historic range, and the species is known to survive only in the Alabama River channel below Millers Ferry Lock and Dam, downstream to the mouth of the Tombigbee River.

Previous Federal Actions

We included the Alabama sturgeon in **Federal Register** Notices of Review for candidate animals in 1982, 1985, 1989, and 1991. In the 1982 and 1985 notices (47 FR 58454 and 50 FR 37958), this fish was included as a category 2 species (a species for which we had data indicating that listing was possibly appropriate, but for which we lacked substantial data on biological vulnerability and threats to support a proposed rule; we discontinued designation of category 2 species in the February 28, 1996, Notice of Review (61 FR 7956)). In the 1989 and 1991 notices (54 FR 554 and 56 FR 58816), the Alabama sturgeon was listed as a category 1 candidate species (a species for which we have on file sufficient information on biological vulnerability and threats to support issuance of a proposed rule).

On June 15, 1993, we published a proposed rule to list the Alabama sturgeon as endangered with critical habitat (58 FR 33148). On July 27, 1993, we published a notice scheduling a public hearing on the proposed rule (58 FR 40109). We published a notice on August 24, 1993 (58 FR 44643), canceling and rescheduling the hearing. On September 13, 1993 (58 FR 47851), we published a notice rescheduling the public hearing for October 4, 1993, and extending the comment period to October 13, 1993. We held the October 4 public hearing on the campus of Mobile College, Mobile, Alabama. On October 25, 1993 (58 FR 55036), we published a notice announcing a second public hearing date, reopening the comment period, and stating the availability of a panel report. This second public hearing was canceled in response to a preliminary injunction issued on November 9, 1993.

On January 4, 1994 (59 FR 288), we published a notice rescheduling the second public hearing and extending the comment period. However, this hearing was subsequently rescheduled in a January 7, 1994, notice (59 FR 997). We held the second public hearing on January 31, 1994, at the Montgomery Civic Center, Montgomery, Alabama.

We published a 6-month extension of the deadline and reopening of the comment period for the proposed rule to list the Alabama sturgeon with critical habitat on June 21, 1994 (59 FR 31970). On September 15, 1994 (59 FR 47294), we published another notice that further extended the comment period and sought additional comments on only the scientific point of whether the Alabama sturgeon still existed. We withdrew the proposed rule on December 15, 1994 (59

FR 64794), on the basis of insufficient information that the Alabama sturgeon continued to exist.

On September 19, 1997, after capture of several individuals confirming that the species was extant, we included the Alabama sturgeon in the candidate species Notice of Review (62 FR 49403).

On March 26, 1999, we published a proposed rule to list the Alabama sturgeon as endangered, without critical habitat (64 FR 14676). We invited the public and State and Federal agencies to comment on the proposed listing; the comment period was open through May 26, 1999. On May 25, 1999, we published a notice announcing a June 24 public hearing on the proposal at the Montgomery Civic Center and an extension of the comment period through July 5, 1999 (64 FR 28142). To allow time for additional public comments, we reopened the comment period on July 12, 1999, through September 10, 1999 (64 FR 37492).

On January 11, 2000, we reopened the comment period (65 FR 1583), to make available for comment a 1999 study "The Development of a DNA Procedure for the Forensic Identification of Caviar" (Fain *et al.* 1999). On February 7, 2000 (65 FR 5848), we withdrew consideration of this study from the decision making process. For clarity and ease of understanding, we replaced it with a report containing information relevant to the Alabama sturgeon listing process (Fain *et al.* 2000). We accepted comments on this report through March 8, 2000.

We reopened the comment period again on February 16, 2000 (65 FR 7817), to announce the availability of and obtain comments on a Conservation Agreement and Strategy (Conservation Agreement Strategy) for the Alabama Sturgeon signed by the ADCNR, the Corps, the Alabama-Tombigbee Rivers Coalition, and us on February 9, 2000. We accepted comments on the Conservation Agreement Strategy and its relevance and significance to the listing decision until March 17, 2000.

We published Listing Priority Guidance for Fiscal Year 2000 in the **Federal Register** on October 22, 1999 (64 FR 57114). That guidance clarifies the order in which we will process rulemakings. Highest priority is processing emergency listing rules for any species determined to face a significant and imminent risk to its well-being (Priority 1). Second priority (Priority 2) is processing final determinations on proposed additions to the lists of endangered and threatened wildlife and plants. Third priority is processing new proposals to add species to the lists. The processing

of administrative petition findings (petitions filed under section 4 of the Act) is the fourth priority. This final rule is a Priority 2 action and is being completed in accordance with the current Listing Priority Guidance.

Summary of Comments and Recommendations

We have reviewed all written and oral comments received during the comment periods and have incorporated information updating the available data into the appropriate sections of this rule. We have organized substantive comments concerning the proposed rule, Fain *et al.* 2000, and the Conservation Agreement Strategy into specific issues, which may be paraphrased. We grouped comments of a similar nature or subject matter into a number of broader issues. These issues and our response to each are summarized in the three subsections below.

Proposed Rule

In the March 26, 1999, proposed rule (64 FR 14676), we requested all interested parties to submit factual reports or information that might contribute to the development of a final rule. We sent direct notification of the proposal to 192 institutions and individuals, including Federal and State agencies, county governments, scientific organizations, and interested parties. We published legal notices announcing the proposal and inviting public comment on April 18, 1999, in the Montgomery Advertiser, Montgomery, Alabama; and the Mobile Press-Register, Mobile, Alabama. The comment period closed on May 26, 1999. On May 6, 1999, we received a request for a public hearing from the Alabama-Tombigbee Rivers Coalition. We published a notice on May 25, 1999 (64 FR 28142), scheduling the public hearing and extending the comment period through July 5, 1999. We sent direct notification of the hearing and comment period extension to Federal and State agencies, county governments, scientific organizations, and other interested parties. Legal notices announcing the public hearing and comment period extension were published on June 20, 1999, in the Montgomery Advertiser, Montgomery, Alabama; and the Mobile Press-Register, Mobile, Alabama. We held the public hearing at the Montgomery Civic Center, Montgomery, Alabama, on June 24, 1999, with approximately 1,000 people in attendance. We received oral comments from 78 individuals; of these, 66 expressed opposition to the listing, 3 supported the action, and 10 did not

specifically state their position on the listing. Because of widespread concern over the proposed action, we reopened the comment period on July 12, 1999 (64 FR 37492), through September 10, 1999.

During the comment periods, we received approximately 4,000 cards, letters, and reports concerning the proposal. Most expressed opposition to, or concern about the proposed listing; however, a number of individuals supported the action. Opposition to the proposed listing primarily centered on perceived economic effects of the action, questions about taxonomy and science, and the adequacy of current State conservation actions to protect the sturgeon. We received comments from four Federal agencies and seven State agencies. The remaining comments were from individuals or representatives of organizations or groups. The Governor of Alabama and the ADCNR stated that existing State protection and recovery efforts are adequate, and opposed the listing. We convened a team of Service experts to review the issues raised, including issues of taxonomy and genetics, during the comment period for the Alabama sturgeon proposed rule and to ensure they were fully and correctly addressed prior to preparation of our final decision document on this species. Below are issues raised in these comments relating to this action and our responses to each.

Issue 1: The proposed listing was not based on the best scientific and commercial data available, as required by section 4(b)(1) of the Act. The literature cited to support the proposed rule was either not applicable, erroneous, incomplete, misinterpreted, or simply wrong.

Response: We thoroughly reviewed all scientific and commercial data in our possession in preparing the proposed rule. We sought and reviewed historic and recent publications and unpublished reports concerning the Alabama sturgeon, closely related species, and sturgeon literature in general, as well as literature and reports on human impacts to river systems and resulting responses in faunal composition and channel habitat integrity. Not all literature or reports reviewed were cited; however, the appropriate literature was cited to document the text in the proposal. We used our best professional judgment and, while we considered all of the information, we relied upon data and documents which in our professional opinion are the best scientific and commercial data and the most reliable.

Issue 2: The Service does not have sufficient scientific information to

conclude that the Alabama sturgeon is a distinct species from the common shovelnose sturgeon.

Response: The Alabama sturgeon is nationally and internationally considered a valid species. The Alabama sturgeon was initially described as a distinct species in a peer-reviewed, widely distributed museum periodical (Williams and Clemmer 1991). The species was considered valid in a catalog of fishes of Alabama (Boschung 1992) and in a catalog of fishes of North America (Mayden *et al.* 1992). Species status was reassessed, reaffirmed, and published in the ichthyological journal *Copeia* (Mayden and Kuhajda 1996). The Alabama sturgeon is listed as a separate species in State fish books for Alabama (Mettee *et al.* 1996) and Mississippi (Ross and Brenneman in press). The Alabama sturgeon is listed as a valid species in a catalog of fishes of the world (Eshmeyer 1998). Birstein *et al.* (1997) included the Alabama sturgeon in a list of all sturgeon species of the world. The Alabama sturgeon is considered a distinct and valid species by the American Society of Ichthyologists and Herpetologists (1995, 1999 *in litt.*), and by the Southern Fishes Council Technical Advisory Committee (Warren *et al.* in prep.). Thus, the Alabama sturgeon is currently recognized as a valid taxonomic species and will continue to be so recognized unless overturned at some future date by the scientific community through the formal publication and peer review process.

Issue 3: The Service should conduct comprehensive taxonomic and life history studies of the genus *Scaphirhynchus* on a river system by river system basis prior to listing.

Response: While having comprehensive knowledge of a species and its near relatives throughout their geographic ranges prior to listing would be ideal, it is seldom, if ever, possible. Resolution of all aspects of taxonomy and life history for this genus could take years, perhaps decades. The Act requires us to use the best available information to determine the status of a species, subspecies, or vertebrate population. The available information clearly indicates that the Alabama sturgeon is in danger of extinction. Resolving unpublished taxonomic dissent prior to a proposal or final decision is not required. The threat assessment that currently applies to the Alabama sturgeon as a taxonomic species would apply equally to a subspecies or distinct population segment.

Issue 4: The Service has failed to clearly indicate which reports or studies

they consider to be the best available scientific and commercial data.

Response: The list of literature cited in the proposal indicates which reports and studies we consider to be the best available scientific and commercial data. We have reviewed all information currently available to us in assessing the status of the Alabama sturgeon. A list of the literature cited in the proposal is available upon request, as noted in the proposed and final rules, and was provided to interested parties during the open comment period. We also allowed interested parties access to review our files and administrative record on two occasions. In conducting our analysis, we noted opposing views available to us on taxonomy; genetics; distribution and abundance; life history; historic, present, and future threats; and vulnerability to extinction. We evaluated all information with regard to its applicability to the determination of species status under the Act and acceptance by the scientific community.

Issue 5: The Service was provided, and has ignored, information discrediting species status for the Alabama sturgeon. Only 4 of 17 scientific reports, documents, and statements provided to the Service in 1993 and 1994 that opposed listing the Alabama sturgeon as a distinct species at that time, were cited in the 1999 proposed rule. The Service has ignored all opposing scientific documents, except a few.

Response: We reviewed the information received in 1993 and 1994 that criticized the taxonomy of the Alabama sturgeon prior to preparing the March 26, 1999, proposed rule. The views expressed in the documents were generally summarized in the proposed rule, and several were cited as examples. In proposed and final rules, as well as in most scientific documents, only references used to document or clarify statements are explicitly cited.

The reports referenced by commenters that were not cited in the proposal criticized the original description of the Alabama sturgeon (Williams and Clemmer 1991) and expressed alternative views of its taxonomic status. We reviewed these documents and have not ignored their views; however, only one taxonomic treatment of the species (Mayden and Kuhajda 1996) has been published in the 9 years since the fish was first described. It supersedes the original description and postdates the unpublished accounts referenced that disputed taxonomic validity. Mayden and Kuhajda (1996) scientifically documented species recognition of the Alabama sturgeon. Several national and internationally

available articles have also been published since 1994 that recognize the taxonomic validity of the species (see response to Issue 2). Absent publication of alternative or differing taxonomic data and conclusions through the peer review scientific process, the species will continue to be recognized as *Scaphirhynchus suttkusi* by the taxonomic community at large.

Issue 6: No scientists have directly challenged any of the scientific data or conclusions of the dozen scientists who question the taxonomy of the Alabama sturgeon.

Response: With the one, limited exception discussed below, none of the data and conclusions of the scientists who question the taxonomy of the Alabama sturgeon have been made available for review by the scientific ichthyological community through the accepted process of peer review and publication. Only a single peer-reviewed paper has been published that questions the taxonomy of the Alabama sturgeon (Bartolucci *et al.* 1998). However, that publication was a methods paper concerning a statistical approach to compare the significance of morphological characters. It was published in a statistically oriented journal and not in a zoological, ichthyological, or systematics journal, and it made no attempt to formally revise the taxonomy of the Alabama sturgeon. We received letters from ichthyologists during the comment period pointing out shortcomings of Bartolucci *et al.* (1998) for taxonomic purposes. In a review of the systematics and taxonomy of the Alabama sturgeon, Mayden and Kuhajda (1996) presented new data, addressed many of the criticisms of the original description, and substantiated species status for the Alabama sturgeon.

Issue 7: The Service did not list the references that were cited in the proposed rule.

Response: In order to save publication space and expense, it is common practice not to include the references cited in the published proposal. The proposed rule clearly noted that a complete list of references was available upon request. We have provided copies of references to all who have requested them.

Issue 8: Some of the literature cited for scientific background was criticized as outdated and superseded by later reports. Other studies were said to be irrelevant to the status of the sturgeon because they did not directly address the Alabama sturgeon.

Response: We disagree with the assessment that the literature cited in the proposed rule is outdated and

superseded by later reports. Historic status reviews and surveys were cited, along with more recent studies (see Background section), to document efforts to determine the status of the species over a period of two decades. Review of studies on closely related and better known sturgeons provides virtually the only insight to the life history, ecology, and vulnerability of the Alabama sturgeon. It is common and accepted practice in science to deduce the needs and vulnerability of poorly known, rare species, or those that are difficult to study, by using information from more common and better known, related species. It is also common in science to use surrogate species to deduce effects of environmental changes on another species with appropriate caveats that recognize known similarities and differences. For example, it is a common practice in the biomedical sciences to use experimental studies of laboratory mice to infer the potential carcinogenic effects of environmental contaminants and to evaluate the physiological effects of new drug treatments before they are ever tested on humans.

Issue 9: The Service still claims that the 1991 description of the Alabama sturgeon, discredited by several scientists, is the best available information on the fish.

Response: We recognize errors in the original description (Williams and Clemmer 1991) that have been brought to our attention since 1993. Furthermore, we explicitly reference a rigorous taxonomic and systematic evaluation published in the journal *Copeia* (Mayden and Kuhajda 1996) that firmly establishes the species name, and the species name is widely used in peer-reviewed publications. In keeping with accepted practices in scientific nomenclature and regardless of errors in the original description, the Williams and Clemmer (1991) article will continue to be recognized by the ichthyological professional community as the source of the name *Scaphirhynchus suttkusi* as long as the taxonomy is considered valid (see also response to Issue 16"). As noted in our response to Issue 2," the Alabama sturgeon is currently and widely recognized in published literature as a valid taxonomic species.

Issue 10: Certain information presented in the proposal regarding the sturgeon's habitat needs, reproductive cycles, and life history requirements is without basis in fact or science.

Response: We have used the best available information for assessing the sturgeon's biological needs. This information has been in the form of

peer-reviewed literature and professional scientific reports. The Alabama sturgeon's habitat needs, reproductive cycles and life history requirements are not completely known. For those areas where there is insufficient or no information we have utilized information garnered from peer-reviewed scientific studies of the closely related pallid sturgeon and shovelnose sturgeon (see response to Issue 8").

Issue 11: Scientific disagreement with the 1991 Williams and Clemmer description constitutes substantial disagreement among recognized experts.

Response: Taxonomic disagreements are not uncommon in any field of systematic biology. While there may be individuals that disagree with the sturgeon's species status, we do not think that this disagreement is substantial. Taxonomic disagreements are resolved through the peer-review publication process, where evidence and interpretation are laid out to the rigorous scrutiny of the scientific community. None of the biologists who disagree with the validity of the specific status of the Alabama sturgeon has presented his or her views through the formal process of submitting papers to appropriate zoological journals. We will give consideration only to those disagreements which are found in the appropriate zoological journals. Regardless of the taxonomic status recognized in the proposal and final rule, the scientific process remains available to dissenting opinions through formal peer-review publication in appropriate journals.

Issue 12: Mayden and Kuhajda (1996) failed to do a thorough river system by river system analysis of shovelnose sturgeon.

Response: The Mayden and Kuhajda (1996) paper is the most thorough and comprehensive analysis of Alabama sturgeon systematics and taxonomy published to date. We are required to use the best scientific and commercial information that is available. The information and conclusions presented in this account were peer-reviewed and accepted for publication by *Copeia*, a highly respected scientific journal, and one recognized as appropriate for describing new species of fish.

Issue 13: The Mayden and Kuhajda (1996) paper is not the most recent science regarding the taxonomy of the Alabama sturgeon. Bartolucci *et al.* (1998) reviewed, criticized, and trumped the Mayden and Kuhajda (1996) paper.

Response: Bartolucci *et al.* (1998) was published in a journal oriented to statistical methodology, not an ichthyological or systematics journal.

This paper used Bayesian Analysis statistical methodology to compare the principal components of measurement data from samples of Alabama and shovelnose sturgeon. Their results supported previous unpublished conclusions (Howell *et al.* 1994) that the Alabama and shovelnose sturgeon were indistinguishable by principal component analyses of measurement data. The publication did not identify the measurement data that were analyzed, nor was the source of their data cited. Dr. Bartolucci later clarified in submissions at the June 1999 public hearing on the proposed rule that data provided by Williams and Clemmer (1991) were used. In addition, Bartolucci *et al.* (1998) did not review, criticize, or even reference the Mayden and Kuhajda (1996) evaluation of the taxonomy and systematics of the Alabama sturgeon, and additional mensural (based on measurements) and meristic (based on counts) data, as well as new diagnostic characters presented by Mayden and Kuhajda (1996) were not addressed.

Issue 14: The Service financially underwrote the 1996 Mayden and Kuhajda paper through a Service contract.

Response: We did not provide funds or any other type of support for the 1996 Mayden and Kuhajda paper.

Issue 15: The Service failed to evaluate Bartolucci *et al.* (1998) in its 1998 Status Review Report for the Alabama sturgeon and failed to analyze or consider the publication in the proposed rule, as evidenced by an erroneous reference to the paper in the proposal.

Response: We received comments on our 1998 Status Report from Dr. Howell referred to the publication of a recent and relevant paper (Bartolucci *et al.* 1998) and, at our request, provided us with a copy. We reviewed, analyzed, and considered the information published in Bartolucci *et al.* (1998) and cited the paper in the proposed rule as part of a brief review of the taxonomy of the Alabama sturgeon (refer to Issue 13 for a more detailed discussion of our analysis of this paper). We acknowledge that the text in the proposed rule is misleading as to the statistical methodology employed by Bartolucci *et al.* (1998). Therefore, we have modified the language to clarify that Bartolucci *et al.* (1998) used Bayesian Analysis statistical methodology to compare the multivariate means of measurements taken from samples of Alabama and shovelnose sturgeon (see Background section).

Issue 16: The Service has incorrectly cited the rules set forth by the

International Code of Zoological Nomenclature (ICZN). Complying with the rules does not validate a species. ICZN is heavily based on the law of priority. Based on priority, *Scaphirhynchus suttkusi* is a synonym of *S. platyrhynchus*.

Response: The ICZN deals with the criteria for publication of new scientific names. Chapter 3, Article 7, of the ICZN recommends publication in an appropriate scientific journal or monographic series. As stated in the proposed rule, the description of the Alabama sturgeon (Williams and Clemmer 1991) complies with ICZN rules and recommendations. Chapter 6, Article 23, of the ICZN sets forth the Principle of Priority. This principle states that The valid name of a taxon is the oldest available name applied to it * * * The oldest name applied to a distinct species of *Scaphirhynchus* endemic to the Mobile River Basin is *Scaphirhynchus suttkusi* Williams and Clemmer 1991.

Issue 17: The Service should request the ICZN to render an opinion on the question of the taxonomic validity of the Alabama sturgeon.

Response: The purpose of the ICZN's Principle of Priority is to promote stability of names. In rare cases, the ICZN may rule on nomenclature priority if requested. Regarding disagreements over newly described species, the accepted procedure is to present data, conclusions, and nomenclature changes in appropriate peer-reviewed journals.

Issue 18: Various genetic tests have been conducted on Alabama sturgeon, shovelnose, and pallid sturgeon. The results of these tests have been inconclusive and do not support the listing of the Alabama sturgeon as an endangered species.

Response: The proposed rule recognizes the limited results of genetic evaluations for distinguishing species of *Scaphirhynchus*. However, genetic studies cited in the proposed rule, and several received during the comment periods have been consistent with biogeographic arguments for recognizing Alabama sturgeon as an isolated phylogenetic (classification of organisms based on their deduced evolutionary relationships) lineage (Campton *et al.* 1995, 1999, in press; Genetic Analyses, Inc. 1994, 1995; Mayden *et al.* 1999). Mayden and Kuhajda (1996) further demonstrated that the degree of morphological divergence between Alabama and shovelnose sturgeon warranted taxonomic species status for the former. In preparing the proposed rule, we relied primarily upon the taxonomic and systematic evaluation of Mayden

and Kuhajda (1996). The genetic studies noted above are consistent with that distinction. The absence of detectable differences by other investigators (*e.g.*, Schill and Walker 1994, Fain *et al.* 2000) only attests to the very close evolutionary relationship between Alabama and shovelnose sturgeon. The Alabama sturgeon meets the definition of an endangered species.

Issue 19: The Service has completely ignored the Schill and Walker report (1994), which demonstrated that the shovelnose sturgeon and the Alabama sturgeon are the same species.

Response: The proposed rule cited Schill and Walker (1994) who noted that shovelnose, pallid, and Alabama sturgeon were indistinguishable at the mitochondrial cytochrome b locus. The proposed rule also noted similar findings for other currently recognized species. Dr. Jeffrey Wells (*in litt.* 1999), a geneticist hired by the Alabama-Tombigbee Rivers Coalition to review sturgeon genetic studies, also concluded that the Schill and Walker study, among others, does not disprove that the Alabama sturgeon is a separate species.

Issue 20: The Service hired Genetic Analyses, Inc., to conduct additional genetic studies. The 1999 proposal did not address their 1994 recommendation for more studies.

Response: In 1994, we were made aware of an imminent nuclear DNA genetic study of pallid and shovelnose sturgeon to be jointly funded by the U.S. Army Corps of Engineers, Omaha District, and the Service's Region 6. At our request, tissues from a single Alabama sturgeon available at that time were included in this previously arranged study. The 1994 Genetic Analyses, Inc., data indicated some genetic divergence of Alabama sturgeon from both pallid and shovelnose sturgeon. The report noted, however, that their results were based upon DNA samples from a single Alabama sturgeon and encouraged expanding the investigation should additional specimens become available. In 1995, Genetic Analyses, Inc., reported similar genetic results on two additional, recently collected Alabama sturgeon. They also noted differences between individual Alabama sturgeon, and again recommended additional studies. We provided these conclusions and recommendations in the proposal.

Issue 21: The U.S. Army Corps of Engineers, Mobile District, requested clarification of a number of issues raised in the Genetic Analyses, Inc., 1994 draft report. These issues were not addressed in the 1994 Genetic Analyses, Inc., final report.

Response: According to information available to us, the request for clarification by the Mobile District was made to the Omaha District, U.S. Army Corps of Engineers. The lack of response to requests for clarification from one Corps District to another has no bearing on us or the final report.

Issue 22: The Service claims that the three Alabama sturgeon samples tested by Genetic Analyses, Inc., (1995) are the same species even though one specimen was found to be genetically different from the other two, and genetically the same as the shovelnose.

Response: The 1995 study found that all three Alabama sturgeon genetic samples were substantially divergent from shovelnose and pallid sturgeon. However, two new Alabama sturgeon samples were equally divergent from a previously tested Alabama sturgeon sample. For this reason, Genetic Analyses, Inc., recommended examining nuclear DNA genetic diversity within the Alabama sturgeon population as additional samples become available. We made these findings clear in the proposed rule.

Issue 23: The Campton *et al.* (1995) report found a difference in only 1 base pair out of 435 between the Alabama sturgeon and the shovelnose sturgeon. The report concluded that the Alabama sturgeon is either a separate subspecies or a distinct population segment. The Service failed to explain the conclusion of the Campton *et al.* (1995) report and inappropriately interpreted the report to mean only that the Alabama sturgeon is a separate species.

Response: Campton *et al.* (1995) noted that the level of genetic similarity that they observed between Alabama sturgeon and pallid and shovelnose sturgeon was more typical of isolated populations or subspecies than congeneric species. However, they also referred the reader to similar levels of genetic similarity between species and even genera of cichlid fishes in Africa. The report concluded that the genetic data were consistent with biogeographic and morphological arguments for recognizing *S. suttkusi* (Alabama sturgeon) as an endangered species or distinct population segment * * *. In our summary of their results, we noted that the relative genetic differences among the three species was small. However, Campton *et al.* (1995) clearly demonstrated that pallid and shovelnose sturgeon are genetically distinct in areas where they naturally co-occur, and they also provided genetic (mtDNA) data consistent with the taxonomic distinction of Alabama sturgeon from shovelnose sturgeon. A follow-up study (Campton *et al.* 1999)

reaffirmed their earlier results regarding the genetic distinctiveness of Alabama sturgeon with additional samples of pallid and shovelnose sturgeon from the Atchafalaya River. To date, those investigators (Campton *et al.* 1995, 1999) have examined 75 specimens of *Scaphirhynchus* from the Missouri and Atchafalaya Rivers, and none of the specimens possessed the mtDNA haplotype that characterized the three Alabama sturgeon they examined. One nucleotide substitution out of 435 base pairs demonstrates only the relatively slow rate (*i.e.*, over geological time scales) at which genetic changes in DNA molecules occur over time. The genetic data are, thus, consistent with biogeographic arguments that Alabama sturgeon have been isolated in the Mobile River Basin for at least 10,000 years.

Issue 24: Dr. Jeffery Wells reviewed Campton *et al.* (1995), and Mayden *et al.* (1999) (received during the open comment period), and conducted mtDNA analysis on an additional eight shovelnose sturgeon using techniques described by Campton *et al.* (1995). Dr. Wells criticized the conclusions reached in both previous studies and stated that these studies, as well as his own, were inconclusive in determining the potential status of the Alabama sturgeon as a separate species using mtDNA.

Response: Genetic data are not commonly used to prove that allopatric (do not occur in the same place) populations are different species. However, Campton *et al.* (1995, 1999) and Mayden *et al.* (1999) identified a unique mtDNA haplotype for Alabama sturgeon that has not been observed among over 40 shovelnose and 30 pallid sturgeon examined to date from the Mississippi and Missouri River Basins. While this genetic data alone does not prove that they are distinct species, it is consistent with Mayden and Kuhajda's (1996) taxonomic description.

Issue 25: Reviews of Campton *et al.* (1999) by Drs. Mike Howell and Jeffrey Wells clearly indicate that more genetic testing is required to determine the true genetic status of the three species of *Scaphirhynchus*.

Response: We received Campton *et al.* (1999) during the open comment period and, therefore, did not consider it in preparing the proposal. However, as mentioned previously, the report of Campton *et al.* (1999) is consistent with the results of their previous study (Campton *et al.* 1995) and reaffirms their conclusions regarding the genetic distinctness of the three *Scaphirhynchus* species. Genetics of *Scaphirhynchus* is poorly known and we acknowledge that more work is

needed. However, as discussed in the previous issue and Issue 60, genetic data alone is not conclusive in distinguishing species, particularly for those species which do not occur together. However, the genetic studies conducted to date by Campton *et al.* (1995, 1999) are consistent with the results of Mayden and Kuhajda (1996) and the taxonomic distinction of Alabama sturgeon.

Issue 26: Dr. Stephen Fain was inappropriately influenced by a Service listing biologist to withdraw from cooperative genetic studies of the Alabama sturgeon.

Response: Dr. Fain is the DNA Research Team Leader at the National Fish and Wildlife Service Forensics Laboratory in Ashland, Oregon. We were notified by ADCNR fisheries biologists that they had provided Dr. Fain with samples for genetic studies on the genus *Scaphyrhynchus*. We subsequently contacted Dr. Fain to ensure that he was aware of several previous genetic and morphological studies on the genus. We did not ask Dr. Fain to withdraw from cooperative genetic studies. We also informed Dr. Fain that we would welcome additional information on genetics of the Alabama sturgeon. Dr. Fain's research was completed in late 1999, and summarized in Fain *et al.* (1999, 2000). These reports were made available for public review and comment by reopening the comment period between January 11 and March 5, 2000. Comments pertaining to this work are summarized below in Issues 59 through 61.

Issue 27: The Service failed to explain which, if any, of the five factors they are relying upon to justify the proposed listing.

Response: Factor A clearly establishes the present curtailment of range and the apparent causes of curtailment. Factor E states that the primary threat to the immediate survival of Alabama sturgeon is its small population size and its apparent inability to offset mortality rates with reproduction and recruitment, as evidenced by declining rates of capture over the past two decades. At the conclusion of the summary of factors, the proposal stated: Endangered status is appropriate for the Alabama sturgeon due to extensive curtailment of its range and extremely low population numbers.

Issue 28: The Service's conclusion that current habitat conditions imperil the Alabama sturgeon is unsupported by the available scientific information.

Response: Factor A notes the disappearance of the Alabama sturgeon from about 85 percent of its historic range, and that human activities are

associated with its decline in range. This finding is supported by historic trends and recent collection efforts (see Background section). Our primary concern under Factor A is whether the quantity of habitat currently occupied by the sturgeon is adequate to support a self-sustaining, viable population. The Background section of the proposal and this final rule also cite studies reporting long-distance movements of the other species of *Scaphirhynchus*, possibly between feeding and spawning sites. While most of the impacts to the sturgeon's habitat were historic, gradual, and cumulative, they still may affect the sturgeon's ability to move within the system between areas for feeding and reproduction. A reduction in natural range from about 1,600 km (1,000 mi) to 216 km (134 mi) of river channel is certainly cause for concern in a wide-ranging fish species with possible migratory needs. This concern is supported by other examples in the fisheries literature (*e.g.*, salmon, striped bass, and robust redhorse, as well as other sturgeon species). Occupied habitat quality was not directly identified as a known threat. We have some concern that the timing of water releases below Millers Ferry Lock and Dam may have negative effects on sturgeon reproduction. Other sturgeon species' reproductive success has been affected by changes in water quantity and timing (see studies cited in the discussion under Factor A). We acknowledge, however, that the lack of specific information on Alabama sturgeon reproductive habitat requirements or the use of this area by the sturgeon for reproduction limits our ability to draw definite conclusions as to current impacts on the Alabama sturgeon.

Issue 29: The Service has failed to consider the myriad of existing Federal, State, and local laws that provide additional protection for the Alabama sturgeon and its habitat. Factor D fails to justify listing the Alabama sturgeon as an endangered species.

Response: We agree that a number of existing laws and regulations benefit the sturgeon and its habitat. Factor D, however, addresses the inadequacy of protective regulatory mechanisms. In the proposed rule and in this final rule, we note that, within the scope of other environmental laws or Alabama State law, there is currently no requirement to specifically consider the effects of actions on the Alabama sturgeon or ensure that a project will not jeopardize its continued existence. We concur that this issue alone does not present a significant threat to the Alabama sturgeon at this time. The Act requires

that a determination of endangered or threatened status be made on any one of the five factors under section 4(a)(1). See the discussion under the Summary of Factors Affecting the Species section for a complete description of the threats.

Issue 30: Minimum Viable Population (MVP) is a theoretical hypothesis and not an established quantifiable technique. The Service has no data (population size, mortality and reproduction rates, etc.) to determine an MVP.

Response: Over the past few decades, biologists have been studying the processes of extinction for small populations (see Soule 1987). The likelihood of species extinction and/or extirpation (loss) of isolated populations increases dramatically as population size diminishes (Shaffer 1987). The Alabama sturgeon has been reduced to about 15 percent of its historic range. Collection history and anecdotal accounts from commercial fishermen demonstrate a continued decline in catches over the past few decades or, at a minimum, an increased effort required to collect the fish.

A number of techniques have been developed to estimate the probability of extinction for populations of animals over time, or to predict the minimum population size (MVP) necessary for a population to persist for a given time period (see Soule 1987). In the proposed rule, we did not attempt to determine a hypothetical numerical population size necessary to sustain the Alabama sturgeon, and we concur that the information does not currently exist to define a numerical MVP. We used the MVP terminology to depict that the Alabama sturgeon's increasing restriction in range, its rarity, and its life history render the species highly vulnerable to chance extinction. However, for purposes of clarity, we have removed discussion of MVP from this final rule and instead refer to the threat presented to the Alabama sturgeon by its small population size.

Issue 31: The Service has offered no proof or evidence of a current or continuing decline in the Alabama sturgeon's population numbers in the Alabama River. Alabama sturgeon have been rare for decades and are as plentiful in the Alabama River today as they were 25 years ago.

Response: We concur that Alabama sturgeon have probably been uncommon in the Mobile River Basin for the past few decades. However, collection data over this time period demonstrate a decline in distribution, as well as a reduction in population size. For example, collection data indicate that the species has disappeared from the

Coosa, Tallapoosa, Black Warrior, upper Tombigbee, and upper Alabama Rivers since the 1960s (see Background section). Interviews with commercial fishermen and fisheries biologists also indicate that the Alabama sturgeon has disappeared from the Millers Ferry reach of the Alabama River, and the Cahaba, lower Tombigbee, and Mobile/Tensaw Rivers during the past 25 years. Recent collection efforts suggest a decrease in abundance of the species in the lower Alabama River and the Claiborne Dam reach during the past 15 years.

The first attempt to determine the status of the Alabama sturgeon in the Mobile River Basin was by Clemmer (1983). Although an ADCNR fisheries biologist reported regular catches of shovelnose (=Alabama) sturgeon in the Cahaba River during the early 1980s, Clemmer documented recent trends in lower numbers of sturgeon through interviews with commercial fishermen and professional fisheries biologists. Burke and Ramsey (1985) reached the same conclusion of declining Alabama sturgeon from interviews with veteran fisheries biologists, conservation officers, and full-time commercial fishermen. They conducted random stratified interviews with full-time commercial fishermen and reported 18 pre-1975 captures and 7 post-1975 captures. Commercial fishermen reported recent declines in captures of Alabama sturgeon in the Millers Ferry reach of the Alabama River and the Cahaba River. Burke and Ramsey (1995) described their ability in 1985 to capture Alabama sturgeon with relative ease in the Alabama River below Millers Ferry Lock and Dam. ADCNR biologists Tucker and Johnson (1991, 1992) reported on sturgeon collection efforts and interviews with conservation officers, fisheries professionals, and commercial and sports fishermen. They employed a variety of collection methods in the lower Alabama River, Claiborne Reservoir, Millers Ferry Reservoir, Tombigbee River, and Cahaba River without capturing any sturgeon. However, interviews yielded reports of several recent captures of small sturgeon in the lower Alabama and Cahaba Rivers during 1991 and 1992. As noted in the proposed rule, the most intensive fishing effort to date was initiated in early 1997. At the time of publication of the proposal, more than 3,000 man-hours of fishing effort directed toward sturgeon were expended over an 18-month period by professional fisheries biologists. In addition, commercial and recreational fishermen were asked to report any captures. As a result of this

intensive effort, only three sturgeon were captured in 1997 and 1998. Two additional fish have been collected during intensive fishing efforts since publication of the proposal in 1999. While it is unfortunate that directly comparable data do not exist through all decades, the disappearance of the species from much of its range, the anecdotal accounts by knowledgeable fisheries biologists and commercial fishermen of a decline in captures, and the documented intensive efforts required to capture the species during the last four years clearly indicate a reduction in the range and numbers of Alabama sturgeon in the Mobile River Basin over the past two decades.

Issue 32: There is no evidence that the 1898 reported catch of shovelnose sturgeon were not immature Gulf sturgeon.

Response: The U.S. Commission of Fish and Fisheries (1898) represents the best available commercial information on sturgeon fisheries at the turn of the century in the Mobile River Basin. The shovelnose sturgeon was described in 1820, and the Atlantic sturgeon (as the Gulf sturgeon was known at that time) was described in 1814. There is no evidence to suggest that the fisheries biologists compiling the 1898 statistics were not able to distinguish the two species. The lake sturgeon, another sturgeon species more similar in appearance to the Gulf sturgeon than the shovelnose, was also reported in the statistics.

Issue 33: The Service should address the State's efforts to conserve the Alabama sturgeon under Factor E.

Response: The ADCNR fishing and hatchery efforts are addressed in the Background section. The State's 1997 Conservation Plan was addressed in detail in the proposed rule under Available Conservation Measures. We have moved this discussion under Factor E in this final rule, as recommended.

Issue 34: The Service has consistently opposed suggestions to use shovelnose sturgeon from the Mississippi River drainage to augment Alabama sturgeon populations in the Mobile River drainage.

Response: Introducing shovelnose sturgeon from the Mississippi River drainage into the Mobile River drainage is ill-advised at the present time because doing so could lead to, or accelerate, the extinction of Alabama sturgeon through hybridization, genetic swamping, or competition.

Issue 35: The Service requires continued cooperation from commercial and recreational fishermen and the ADCNR to successfully recover the

Alabama sturgeon. Listing the Alabama sturgeon under the Act will impede that cooperation by enacting Federal take prohibitions and penalties, and funds available for candidate conservation cannot be used for recovery efforts.

Response: We agree that cooperation from ADCNR and commercial and recreational fishermen, as well as others, is essential to the recovery of the Alabama sturgeon. Section 6 of the Act allows us to enter into cooperative agreements with States to assist them in conserving endangered or threatened wildlife. A section 6 cooperative agreement between the State of Alabama and us recognizes the State's authority to establish and implement programs for the conservation of federally listed species and provides funding assistance towards their conservation. Under the cooperative agreement, the ADCNR may continue to implement the 1997 Conservation Plan for the Alabama sturgeon, or any future approved recovery plan. ADCNR is also eligible for funds for conservation of the sturgeon under our recovery and section 6 programs. Implementing regulations (50 CFR 17.21(c)(5)) also provide States under cooperative agreements certain authorities for conducting actions for the conservation (*i.e.*, recovery) of endangered species.

Listing the Alabama sturgeon under the Act increases penalties for already prohibited acts. Unauthorized removal of sturgeon from the waters of Alabama is already prohibited by State law. Cooperation and assistance from private individuals, such as recreational and commercial fishermen, can continue under both Federal and State permitting authority.

Listing of the Alabama sturgeon under the Act does not effect use of the fiscal year 2000 candidate conservation funds already given to the State. We have obligated this money to the State of Alabama; they may use it for the purpose of candidate conservation and it will not be rescinded.

Issue 36: The Service failed to consider the 1997 Conservation Plan and its favorable effect on the Alabama sturgeon in its proposal.

Response: We outlined the 1997 Conservation Plan in the proposed rule under Available Conservation Measures. Implementation efforts under the plan were also discussed under the Background section of the proposal. Implementation of the plan tasks, such as construction of hatchery facilities and collection efforts, is positive and provides opportunities for future population augmentation. However, the plan has not yet been successful in decreasing the threat of extinction to

where protection under the Act is no longer warranted.

Issue 37: The proposed listing of the Alabama sturgeon has made it more difficult for ADCNR to implement the 1997 Conservation Plan because of permitting requirements, conferencing limitations, and Service propagation policies.

Response: Proposed endangered status has not affected implementation of the 1997 Conservation Plan. We have no permitting requirements for proposed species; we will expedite permitting procedures once this final rule is published. The section 7 conferencing requirements were met with the White Paper (Biggins 1994) and subsequent correspondence between the Corps and us. We published a Draft Policy Regarding Controlled Propagation of Species Listed Under the Endangered Species Act on February 7, 1996 (61 FR 4716). We will work with the State to ensure that the Alabama sturgeon propagation program is in compliance with the policy, once we publish the policy in final form. Collection efforts have continued, and two fish have been caught since the listing proposal was published. The State conducted an unsuccessful attempt to propagate the sturgeon following publication of the proposal.

Issue 38: Candidate conservation funds appropriated for the FY 2000 budget cannot be used for sturgeon conservation, should the Alabama sturgeon be listed.

Response: Funds appropriated for Alabama sturgeon conservation in the FY 2000 budget were committed to Alabama sturgeon conservation efforts while the sturgeon was a proposed species. (Refer to Issue 35 for further information.)

Issue 39: Listing will transfer responsibility for managing the Alabama sturgeon from the State to the Service, and work on the 1997 Conservation Plan will stop for at least a year until a recovery plan is developed and approved.

Response: Our policy is to develop recovery plans for listed species within two and a half years of their designation as endangered or threatened species. Approved recovery plans, however, are not necessary to conduct recovery actions for listed species. Under the section 6 agreement between the State and us, the ADCNR may continue conservation efforts without delay.

Issue 40: The U.S. Coast Guard has stated that listing the Alabama sturgeon would seriously limit, if not hamper, the dredging of all navigable waterways in the historic Mobile River Basin.

Response: The U.S. Coast Guard comments were based on a premise that listing the sturgeon would stop navigation maintenance. They were unaware of an impact assessment on navigation maintenance conducted and agreed to by both us and the Mobile District Corps of Engineers that concluded that navigation dredging would not need to be eliminated, modified, or altered should the Alabama sturgeon be listed. They have since been provided with this information.

Issue 41: The White Paper is an informal agreement that must be endorsed at the national level to be believable. The Service should include the White Paper in its entirety in the final rule to list the Alabama sturgeon.

Response: The White Paper (Biggins 1994) is not an agreement, but a 1994 assessment of impact of a Federal agency's activities on a proposed species. This assessment found no adverse effect to the Alabama sturgeon from current Corps activities and permitting activities in the lower Alabama River. The no-adverse-effect determination was formalized by an exchange of letters between the two agencies that same year. In 1998 and 1999, both agencies reaffirmed this conclusion following studies that supported the determination. Federal agency activity impact assessments on listed species, required by the Act, are conducted at the field level. Should disagreements occur, they may be elevated to the Regional and District level. Although there was no disagreement between agencies concerning the no-adverse-effect determination on the Alabama sturgeon, letters reaffirming the determination were exchanged between the Service's Regional Director and the Corp's Division Commander because of continued public concern. There is no disagreement between the agencies at the field, Regional, or District levels; therefore, there is no need to elevate this assessment to the national level.

Much of the assessment and conclusions of the White Paper, as well as of the more recent correspondence, was incorporated into the proposed rule under Factor A, and the White Paper (Biggins 1994) was cited for reference. The White Paper and all subsequent correspondence relating to the White Paper and Federal activities within Alabama sturgeon habitat are currently a part of the administrative record to list the sturgeon under the Act. Publishing the White Paper and pertinent correspondence would not add to, or detract from, the protection of the Alabama sturgeon under the Act, or affect or change any Federal agency's

responsibility under the Act. We have, however, included the White Paper at the end of this rule and expanded and clarified the discussion of it and its findings in this final rule.

Issue 42: In the 1994 White Paper, the Service and the Corps concluded that listing the sturgeon would have no impact on State water quality standards. However, EPA has agreed in a Memorandum of Agreement Regarding Enhanced Coordination under the Clean Water Act and Endangered Species Act (MOA) between EPA and us to consider the effects of their programs and activities on listed species. Under the Agreement, EPA agreed that modified regulations will prohibit mixing zones likely to cause jeopardy to listed species. Therefore, listing the Alabama sturgeon may require changes in State water quality standards throughout its historic range.

Response: Under Factor A, we note that pollution may have contributed to the decline of the Alabama sturgeon in the past. However, at this time, we have no information that current water quality regulations are not protective of the Alabama sturgeon.

The MOA between the Service and EPA is to ensure appropriate implementation of both the Clean Water Act and the Endangered Species Act. The MOA does not change, or add to, the legal responsibilities of either agency under either Act. Currently, there are 62 listed species in Alabama that are subject to consultation on water quality standards under the MOA.

Under the Endangered Species Act, Federal agencies, including EPA, are obligated to consider the effects of their actions, including permitting actions, on endangered and threatened species, and to avoid jeopardizing the continued existence of the species. Only actions impacting the species need to be considered. The Alabama sturgeon is believed to be extirpated from approximately 85 percent of its historic range in the Mobile River Basin. Based on current knowledge of the species, only Federal actions affecting the lower 216 km (134 mi) of the Alabama River need to be assessed for impacts on the Alabama sturgeon. We are unaware of any permitted discharge within this river reach, or anywhere else, that is likely to jeopardize the continued existence of the Alabama sturgeon.

Issue 43: EPA recently proposed additions to Alabama's 303(d) list, based in part, on the presence of federally listed species in streams. A substantial portion of the Mobile River Basin could become subject to 303(d) designation based solely on the habitat/historic range of the Alabama sturgeon.

Response: Streams proposed by EPA for addition to Alabama's 303(d) list, due to listed aquatic species, have to meet certain criteria. These include a documented decline or extirpation of the listed species since 1975, and an identified pollutant that contributes to that decline (such as sediment or nutrients). These criteria limit the 303(d) proposals to a few stream segments with demonstrated problems, affecting only a small number of the streams that support listed species in Alabama. Currently, no pollutants have been implicated in the decline or extirpation of the Alabama sturgeon from any stream segment since 1975. The listing proposal pointed out that two localized river segments above Claiborne Lock and Dam have been reported as occasionally impaired due to nutrients and organic enrichment; however, this is not considered a significant impact on the Alabama sturgeon. We do not anticipate requesting EPA to consider adding streams or stream segments to the State 303(d) list based on the past or present occurrence of the Alabama sturgeon.

Issue 44: Any violation of a discharge permit into waters supporting Alabama sturgeon could potentially result in take of the species under the Act. Since critical habitat was not proposed for the sturgeon, any violation of a National Pollutant Discharge Elimination System (NPDES) discharge permit within the sturgeon's historic habitat in the Mobile River Basin would be subject to civil and criminal penalties under the Act.

Response: Since 1994, it has been our policy to notify the public of activities that could potentially result in a violation of the Act in proposed regulations to list species. In the proposed rule, we identified discharge permit and water withdrawal permit violations as having the potential to result in a take of Alabama sturgeon. We have received many comments expressing concern that common, minor violations of NPDES discharge permits throughout the historic range of the sturgeon will be prosecuted as take of Alabama sturgeon. This is not our intent. Only violations that result in injury or death to the listed species would be prosecutable under the Act. However, since illegal discharge of pollutants is also identified as a potential take, we have removed the section on permit violations from the referenced discussion in this final rule. Permit violations that result in death or injury to Alabama sturgeon or any other federally listed species, however, could be considered take.

Issue 45: Listing the Alabama sturgeon would have an adverse impact

on hydropower operations below Robert F. Henry and Millers Ferry Hydroelectric Projects, and may potentially impact operation of the Allatoona and Carters Hydroelectric Projects. There is also concern that the Service could make unsubstantiated claims of harm as a result of future changes in flow regimes in the lower Alabama River.

Response: The proposed rule noted that flow regimes below Millers Ferry Lock and Dam may have a negative effect on Alabama sturgeon reproduction and recruitment, based on studied responses of other sturgeon species to flow modifications within their habitats. However, we also noted that it is not currently known if this area is important to, or even used for, Alabama sturgeon reproduction. Therefore, we see no reason for recommending any modification of flow regime below Millers Ferry Lock and Dam at this time. Should future research determine that this area is important for sturgeon reproduction, and/or flow regimes were having a negative effect on sturgeon, we and the Corps would examine options available under section 7 consultation. Options might include working with the Corps and hydroelectric operator to provide more favorable flows for the sturgeon, and/or providing for any incidental take of sturgeon resulting from activities of the Corps and hydroelectric operator via an incidental take statement as part of a biological opinion.

Future proposed changes in flow regimes in the lower Alabama River should thoroughly consider potential impacts to the Alabama sturgeon, as well as other species. Continued research into the life history and habitat of Alabama sturgeon can provide a sound basis for future decisions regarding potential changes in flow regimes in the lower Alabama River.

The Alabama sturgeon is no longer believed to occur in the Millers Ferry Pool below Robert F. Henry Lock and Dam. The Allatoona and Carters hydroelectric projects in Georgia occur outside of, and are remote from, Alabama sturgeon's historic and currently occupied habitat. These projects are unlikely to affect the Alabama sturgeon, or be affected by its protection under the Act.

Issue 46: A recent economic impact analysis of the proposed listing, developed by economists at Troy State University, determined that a more than \$15 billion adverse economic impact will result from listing the Alabama sturgeon as endangered. There should be a cost/benefit analysis conducted

prior to listing the Alabama sturgeon under the Act.

Response: Section 4(b)(1)(A) of the Act requires us to base our decision on whether to list a species solely on the best scientific and commercial data available on the species' status and precludes us from considering economic or other impacts that might result from the listing. Public comments directed to economic or other potential impacts of listing are outside the scope of this rulemaking.

Section 4(b)(2) of the Act does require us to consider economic or other impacts associated with the designation of critical habitat. However, we believe that the referenced economic impact analysis cited above was based upon a set of incorrect assumptions about how the proposed listing would affect economic activity throughout the Mobile River Basin. The referenced analysis made no attempt to identify or quantify any past or present economic impact associated with 38 aquatic species currently listed throughout the Basin. For example, there are listed species associated with all of the navigation channels of the Mobile River Basin, yet no negative economic impact on navigation, ports, or marinas due to the presence of these species was documented in the economic analysis. The analysis assumes, however, without justification or examples, that all waterways within the Mobile River Basin will be closed to navigation by the designation of endangered status to the Alabama sturgeon, and estimates economic consequences that might result from a halt in all navigation in the Tennessee-Tombigbee, Tombigbee, Black Warrior, Mobile, and Alabama River channels, and the closing of ports and marinas. The Alabama sturgeon currently inhabits only the lower Alabama River. The Corps and the Service have determined that navigation maintenance has no adverse effect on the Alabama sturgeon. The proposed rule specifically stated that maintenance dredging is unlikely to result in a take of Alabama sturgeon. Therefore, navigation, ports, and marinas will be economically unaffected by this listing.

The economic analysis also assumed that water withdrawals and discharges within the Alabama, Coosa, Tallapoosa, Cahaba, Tombigbee, Black Warrior, and Mobile Rivers and their tributaries would be capped at present levels should the sturgeon be listed. As noted above, the Alabama sturgeon currently inhabits only the lower Alabama River. Water withdrawal has not been identified as a threat to the Alabama sturgeon. In addition, all of the rivers assumed to be impacted by the analysis,

and many of their tributaries, currently support populations of endangered and threatened species that have been listed for many years, and yet the analysis documented no negative economic impact from water withdrawal and discharge capping due to the presence of these listed species.

Issue 47: Listing the Alabama sturgeon may restrict the repair and/or construction of new and existing roads and bridges on the lower Alabama River.

Response: Section 7 of the Act requires Federal agencies, in consultation with us, to determine if their actions are likely to jeopardize the continued existence of listed species or adversely modify or destroy their critical habitat, and to conduct their activities in ways that are protective of listed species. This includes activities conducted or permitted by Federal agencies, such as road and bridge repair and construction. There are currently 38 listed aquatic species in the Mobile River Basin, including four currently inhabiting the Alabama River. As a result, consultations are a common occurrence in the Mobile River Basin, normally proceeding without attention of or impact to the general public. Based on our knowledge of conditions in the lower Alabama River, the life history and habitat of the Alabama sturgeon, and the localized and temporary nature of impacts associated with road and bridge construction, we do not foresee any restrictions necessary on bridge and road construction or repair resulting from addition of the Alabama sturgeon to the list of species protected under the Act.

Issue 48: Listing the Alabama sturgeon under the Act will result in third party lawsuits to stop Federal projects (such as maintenance dredging) or stop the issuance of discharge permits.

Response: Citizen suits are allowed under the Act. However, it has been our experience that fully complying with the requirements of the Act, as well as other Federal laws, is the best way to avoid citizen suits.

Issue 49: The Act clearly states that to the maximum extent prudent and determinable, critical habitat shall be designated concurrently with listing a species. By not proposing critical habitat concurrent with the listing, the proposal is in violation of the Act.

Response: Implementing regulations allow us to determine that critical habitat designation is not prudent if such designation would result in an increase in threat to the species, or if designation does not benefit the species. In the proposal, we determined that

because of the limited range of the species, critical habitat would provide no additional benefit for the species beyond that which it would receive from listing. In addition, we were concerned that an adverse public reaction to critical habitat designation would result in loss of cooperation by fishermen and other partners in current conservation efforts. Therefore, in the proposed rule we concluded that designation of critical habitat for the Alabama sturgeon was not prudent.

During the public comment period, we received numerous comments from both proponents and opponents of the species listing that favored designation of critical habitat. Due to this public response, we now believe that it is unlikely than any adverse effect on the sturgeon would occur as a result of critical habitat designation, and that such designation is indeed prudent, but not determinable at this time. Section 4(b)(6)(C) of the Act provides that a concurrent critical habitat determination is not required with a final regulation implementing endangered status and that the final designation may be postponed for one additional year beyond the period specified in section 4(b)(6)(A), if (i) a prompt determination of endangered or threatened status is essential to the conservation of the species, or (ii) critical habitat is not then determinable (see Critical Habitat section).

Issue 50: The Service did not provide actual notice of the proposed regulation to list the Alabama sturgeon to ADCNR, or to each of the three Alabama counties in which the sturgeon currently exists, as the Act requires.

Response: We provided advance notification, by facsimile, to the Governor of Alabama, the ADCNR, and the County Commissions of Wilcox, Clarke, Monroe, and Baldwin Counties, as well as other parties, of the proposal the day before its publication in the **Federal Register**. Upon publication of the proposal, we mailed them copies of the complete text as published in the **Federal Register** and solicited their comments. We have fully complied with the notification requirements of the Act.

Issue 51: The Service's proposed listing is based on the historic range of the Alabama sturgeon; therefore, the Service may be required to give actual notice to almost every county in Alabama and several counties in Mississippi.

Response: We are required to give notice and invite the comments of each county in which the species proposed for listing is believed to occur (see 50 CFR 424.16(c)(1)(ii) and 16 U.S.C. 1533(b)(5)(A)(ii)). The sturgeon is

extirpated from about 85 percent of its historic range in Alabama and Mississippi. It is currently believed to inhabit the Alabama River in Clarke, Monroe, and Wilcox Counties. We gave these counties notice of the proposed regulation and solicited their comments.

Issue 52: The Service must comply with the National Environmental Policy Act (NEPA) when designating critical habitat.

Response: Environmental assessments and environmental impact statements, as defined under NEPA, are not required for regulations enacted under section 4(a) of the Act (see 48 FR 49244). Please refer to the NEPA section of this final rule.

Issue 53: In submitting the proposed rule to scientific specialists for review, the Service must comply with the Federal Advisory Committee Act (FACA).

Response: FACA applies to committees established by Federal agencies to provide recommendations and advice to an agency. We provided copies of the proposed rule to five scientific specialists for independent review during the open comment period. We received individual comments from four of these reviewers during the open comment period. The fifth scientist provided comments through the Alabama-Tombigbee Rivers Coalition during the open comment period. Our request and receipt of comments from individual peer reviewers during the open comment period is fully consistent with FACA requirements.

Issue 54: The Service must comply with Executive Order 12866 and prepare a Regulatory Plan.

Response: Because section 4(b)(1)(A) of the Act specifically prohibits consideration of information other than scientific and commercial information, we are prohibited from applying the procedures of Executive Order 12866 to proposed and final listings.

Issue 55: The Service must prepare a regulatory flexibility analysis.

Response: In accordance with the requirements of section 4(b)(1)(A) of the Act mentioned under Issue 54 above, the Regulatory Flexibility Act does not apply to listing actions.

Issue 56: The Alabama sturgeon is protected by the State and there is a State-managed 1997 Conservation Plan in place. Listing the Alabama sturgeon will provide no added benefits to the current conservation efforts. There is no need for Federal protection of this species.

Response: We acknowledge that the State of Alabama protects the Alabama sturgeon from scientific and recreational

take, and has implemented conservation efforts for the species. To date, the 1997 Conservation Plan has not been successful at improving the status of the species such that it no longer requires protection under the Act. Section 4(a)(1) of the Act requires us to determine whether any species is an endangered species or a threatened species because of any of five factors. Listing the Alabama sturgeon will not detract from the efforts of the 1997 Conservation Plan. The Act requires us to cooperate with State agencies in conserving endangered species, and we will continue to cooperate with the ADCNR in conserving the Alabama sturgeon. Listing will also augment protection and conservation of the Alabama sturgeon. The Act requires Federal agencies to use their authorities to conserve listed species. Without protection under the Act, there is no legal requirement to specifically consider the effects of new Federal projects funded, carried out, or permitted within the Alabama sturgeon's habitat. Since many of the activities associated with the Alabama River channel habitat used by the sturgeon are funded, carried out, or permitted by Federal agencies, the Federal agency conservation responsibilities invoked by the Act will benefit the species. This does not mean that activities of Federal agencies or permittees will be impeded, rather that projects will be planned and implemented in ways that reduce harm or injury to the species, and avoid jeopardizing its continued existence.

Issue 57: It is not clear that listing the Alabama sturgeon will result in its recovery.

Response: The Act allows us to only consider information related to a species' status when determining as to whether protection is warranted under the Act. Therefore, we may not consider the feasibility of recovery in determining whether to list a species.

Issue 58: Listing the Alabama sturgeon under the Act may create restrictions on numerous permit actions.

Response: Federal agencies are required under the Act to consider the effects of their actions, including issuing permits, on endangered and threatened species. In cases where the action affects the species, the agency is required to consult with us. If during consultation, the action is determined to likely jeopardize the species' continued existence, it may be significantly modified, or even prohibited. However, this is rarely the case. In over 1,000 consultations in Alabama over the past decade, only two consultations resulted in a jeopardy determination, and in both of these cases, the programs were

modified and went forward. In most cases, projects that may affect listed species have been slightly modified to reduce or eliminate the effect, and/or the resulting biological opinion anticipates some level of take of the species, which is exempted from section 9 prohibitions. In addition, we and the Corps have already determined that most Corps permitting activities in the lower Alabama River currently are not known to adversely affect the Alabama sturgeon. Therefore, it is unlikely that listing the sturgeon under the Act will create restrictions on numerous permit actions.

Fain et al. (2000) Report

During the open comment period for the Fain *et al.* (2000) report on river sturgeon genetics, we received six comments and one peer-reviewed manuscript. One commenter felt that the use of mtDNA for forensics purposes should be thoroughly peer-reviewed for all sturgeon species. Two commenters believed that the report established that the Alabama sturgeon should not be considered a distinct species. Three commenters noted that the report establishes only that the cytochrome-*b* gene is not useful for examining genetic variation within the genus *Scaphirhynchus* and two other sturgeon species groups. The peer-reviewed manuscript we received during the comment period concluded that current mtDNA data provide a potentially diagnostic genetic character supporting taxonomic recognition of the Alabama sturgeon as a distinct species. Below are issues raised in these comments relating to this action and our responses to each.

Issue 59: Alabama and shovelnose sturgeons are genetically identical.

Response: A study by Schill and Walker (1994), discussed in the background section of the proposed rule, found no sequence divergence in a cytochrome *b* mtDNA sequence between a single specimen of the Alabama sturgeon and shovelnose sturgeon. All subsequent genetic studies with larger samples of Alabama and shovelnose sturgeons have revealed genetic differences between samples of the two species. Cytochrome *b* mtDNA sequences reported by Fain *et al.* (2000) indicate that the Alabama sturgeon sample had only one sequence type, A, whereas the shovelnose sturgeon sample included two sequence types, B and C, that were not found in the Alabama sturgeon sample. Although sequence A was found in both, it differed in frequency in Alabama (frequency = 1.0) and shovelnose (frequency = 0.86) sturgeons. Fain *et al.* (2000) concluded that these differences were not

diagnostic for forensic purposes. Campton *et al.* (in press) report a unique mtDNA sequence at the mtDNA control region found in all three Alabama sturgeons sampled, but was not found in any of a sample of 37 shovelnose sturgeon and putative shovelnose/pallid sturgeon hybrids. This potentially diagnostic genetic marker differed from the most similar shovelnose and pallid sturgeon sequences by a unique base-pair substitution. These results were confirmed by those of Mayden *et al.* (1999), which are discussed in our response to Issue 24. Nuclear DNA divergence detected between Alabama sturgeons and other *Scaphirhynchus* reported by Genetic Analyses, Inc., (1994, 1995) is discussed in our responses to Issues 20 and 22 and in the Background section of this rule.

Issue 60: Genetics is the best science for making taxonomic determinations and trumps morphological analyses.

Response: The most scientifically credible approach to making taxonomic determinations is to consider all available data involving as many different classes of characters as possible. Classes of characters that can be considered include morphological, karyological (chromosomal), biochemical (including DNA analysis and other molecular genetic techniques), physiological, behavioral, ecological, and biogeographic characters (Wiley 1981). The consideration given to any given class of characters in making a taxonomic decision depends on several factors. These include the availability and quality of the data, the appropriateness of the method and design of the study to the taxonomic issue in question, and the demonstrated utility of the method to similar issues or taxonomic groups. Genetic data have their greatest utility in making species-level taxonomic determinations when the putative species are sympatric (occur together) and the degree of natural genetic interaction can be evaluated. When the putative species are allopatric, as with Alabama and shovelnose sturgeons, genetic data provide a measure of divergence that must be evaluated along with all other available measures of divergence in making a determination whether species-level differences exist. When sample sizes are small, either in terms of number of individuals or number of genetic regions or loci tested, the taxonomic value of genetic data is diminished.

Issue 61: Based on the study by Fain *et al.* (2000), Alabama and shovelnose sturgeons are the same species (conspecific).

Response: The study of Fain *et al.* (2000) was designed to develop a procedure for the forensic identification of caviar; it was not designed to critically examine the taxonomy of sturgeons of the genus *Scaphirhynchus*. Their choice of a portion of the cytochrome *b* sequence is reasonable for their purpose of evaluating a number of different genera distributed over a wide geographic range across different continents. Failure to find a diagnostic marker for Alabama sturgeon in a gene region chosen to have a somewhat conservative rate of divergence does not mean that it is not a species or that genetic differences were not found; genetic differences are discussed in our response to Issue 59. Fain *et al.* (2000) observe that when minimal genetic variation is found with such a technique, it can mean that the species have recently diverged and there has not been time for fixation of genetic differences. That species formation can take place more rapidly than differentiation of genetic markers can become established has long been appreciated by systematists and taxonomists applying genetic data (Avice 1994). Cytochrome *b* is not the best choice of a genetic region for resolving the closely related species in the genus *Scaphirhynchus*. In such cases it is appropriate to examine a gene region known to have a faster rate of evolution that might be reflected in a difference between species. The study of Campton *et al.* (in press) employed the more rapidly evolving control region of mtDNA with the results described under Issue 59. Campton *et al.* (in press) also discuss other cases where speciation has occurred in fishes with very little genetic divergence in cytochrome *b*, and Fain *et al.* (2000) identifies lack of divergence between pairs of other sturgeon species. Interpreted in light of the minimal gene regions studied, the small sample sizes of Alabama sturgeon, and evidence from other species that species formation can occur with minimal detectable genetic differentiation in DNA regions commonly studied, the genetic data are consistent with and do not demand the rejection of taxonomic conclusions based on morphological and biogeographical data that the Alabama sturgeon qualifies for recognition as a valid species.

Conservation Agreement Strategy

During the open comment period for the Conservation Agreement Strategy, we received 259 letters recommending implementation of the Strategy and withdrawal of the listing action. We also received five letters opposing the use of

the Strategy to preclude listing. Below are issues raised in these comments relating to this action and our responses to each.

Issue 62: The Conservation Agreement Strategy fully addresses the threats identified in the proposed listing rule. Therefore, it provides the basis for either withdrawing the listing action for the Alabama sturgeon, or listing as threatened instead of endangered.

Response: Conservation actions for the Alabama sturgeon have been conducted over the past years by the State of Alabama, other concerned parties and us under a Conservation Plan. These actions have been successful to the extent of increasing our knowledge of methods to capture the fish and maintain it in captivity. However, the species remains vulnerable to extinction because of its small population size and restricted range. Early this year we were requested by the State of Alabama to develop and enter into a formal Conservation Agreement and Strategy with the State and others to continue and to increase conservation efforts for the Alabama sturgeon. We collectively developed a conservation strategy that is technologically and economically feasible and that has a good chance of addressing the threats to the continued existence of the Alabama sturgeon. We also released the Conservation Agreement Strategy for public review and comment. We then reviewed the comments received, and considered the certainty and effectiveness of the Conservation Agreement Strategy as it relates to the current and future status of the sturgeon.

We concluded that the Conservation Agreement Strategy is the best approach for conservation of the Alabama sturgeon; however, the certainty and effectiveness of these efforts in removing existing threats remain unproven and dependent upon many factors beyond human control. For example, the Strategy can only be effective if sufficient mature fish of both sexes can be captured. In the past 4 years we have only captured five fish, of which only one was in reproductive condition. While the Strategy calls for a dramatic increase in capture efforts over the next decade, the capture of sufficient fish in appropriate condition cannot be assured.

Collection history and anecdotal accounts from commercial fishermen indicate that the numbers of Alabama sturgeon have been declining since the construction of dams in the Alabama River during the 1960's and early 1970's. It is currently unknown if this decline is an effect of low population

numbers and the subsequent inability of the fish to reproduce successfully, or a result of inadequate habitat quantity, or a combination of factors.

Although the successful implementation of the Conservation Agreement Strategy will maintain current habitat quantity and quality and provide information on the habitat needs of the Alabama sturgeon, we cannot currently predict what effect that information may have on the future status of the species. Therefore, based on our analysis, the Conservation Agreement Strategy does not remove existing threats to the Alabama sturgeon to a degree to where it no longer warrants listing under the Act. The Conservation Agreement Strategy, however, does provide the best available actions for the conservation of the Alabama sturgeon, and may lead to its eventual recovery. The Strategy has outlined what the species needs for recovery, and it will make an excellent recovery plan.

Issue 63: The Conservation Agreement Strategy fails to address the factors sufficiently to have an effect on the listing determination of the Alabama sturgeon.

Response: We concur that the Strategy does not remove threats to the Alabama sturgeon to a degree that precludes its need for protection under the Act. However, the Conservation Agreement Strategy can influence many future actions covered under sections 4, 6, and 7 of the Act. For example, the Strategy provides the basis for an Alabama sturgeon recovery plan, identifying current and future recovery actions essential to the species' conservation. The Conservation Agreement Strategy could become the State's program to conserve the sturgeon under section 6 of the Act. In addition, the Corps' involvement, commitments, and actions under the Conservation Agreement Strategy would, in large part, fulfill their conservation obligations under section 7(a)(1) of the Act. Positive results of the Conservation Agreement Strategy could facilitate future section 7(a)(2) consultations.

Issue 64: The Department of the Interior had already made a decision regarding the listing of the Alabama sturgeon when the comment period opened in February.

Response: As stated in the February 16, 2000, **Federal Register** notice (65 FR 7817), we reopened the comment period to obtain public comment on the Conservation Agreement Strategy's relevance and significance to the upcoming listing decision. We reviewed all comments received prior to making

a determination to list the Alabama sturgeon as an endangered species.

Issue 65: The Conservation Agreement Strategy failed to allow public involvement in the development of the conservation goals and strategies, and did not appear to include consultation with scientific authorities with expertise in population ecology or dynamics. The result is an agreement that fails to consider the geographic scale needed for long term survival of the species.

Response: Much of the Conservation Agreement Strategy is based upon the 1997 Conservation Plan. This Plan had wide distribution and input, including that of private and public professional fisheries biologists and ecologists. Little had changed since development of the 1997 Conservation Plan. The parties used that Plan as a starting point and developed the Conservation Agreement Strategy. The Conservation Agreement Strategy was executed by the parties prior to public comment because the signatories were concerned, in part, about losing prime spawning time for the Alabama sturgeon if execution was delayed until after public comment. The parties to the Conservation Agreement Strategy agreed that an open comment period after execution was appropriate to provide the public and scientific community the opportunity for input in the Conservation Agreement Strategy, its objectives and its associated tasks, and that Strategy 2000 would be modified as deemed appropriate by the signatories.

Issue 66: The Service did not follow the rules of FACA when developing the Conservation Agreement Strategy.

Response: The Conservation Agreement Strategy is a joint effort by the parties to eliminate or significantly reduce current threats to the Alabama sturgeon. Entering into such agreements with states, other federal government entities and other interested private parties to accomplish mutual goals is a routine practice of the Service and other federal agencies. These are not the type of activities that are subject to FACA.

Peer Review

In accordance with our July 1, 1994 (59 FR 34270), Interagency Cooperative Policy on Peer Review, we requested the expert opinions of independent specialists regarding pertinent scientific or commercial data and assumptions relating to the supportive biological and ecological information in the proposed rule. The purpose of such review is to ensure that the listing decision is based on scientifically sound data, assumptions, and analyses, including input of appropriate experts and specialists.

We requested five academicians who possess expertise on Alabama and shovelnose sturgeon taxonomy and systematics to review the proposed rule by the close of the comment period. Four of these individuals responded directly to our request. All expressed their belief that the data support protection of the Alabama sturgeon under the Act. Three peer reviewers strongly supported the taxonomic status of the Alabama sturgeon, and two of these provided supporting information. One reviewer expressed some personal doubt regarding taxonomic status of the Alabama sturgeon, but felt the fish represented a subspecies, or at a minimum, a unique population that needed protection under the Act. This individual also noted that Mayden and Kuhajda (1996) convincingly argued for species status.

The fifth reviewer did not directly respond to our request for peer review; however, he provided comments opposing the proposal at the public hearing and through an organization opposed to the listing. We have addressed these comments in the Summary of Comments and Recommendations section, above.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, we determine that the Alabama sturgeon should be classified as an endangered species. We followed the procedures found at section 4(a)(1) of the Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) issued to implement the listing provisions of the Act. We may determine a species to be endangered or threatened due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Alabama sturgeon (*Scaphirhynchus suttkusi* Williams and Clemmer 1991) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* The best available data indicate that the Alabama sturgeon has disappeared from 85 percent of its historic range. Its decline has been associated with construction of dams, flow regulation, navigation channel development, other forms of channel modification, and pollution. Dams in the Alabama River have reduced the amount of riverine habitat, impeded migration of Alabama sturgeon for feeding and spawning needs, and changed the river's flow patterns. The species is now restricted to a 216-km (134-mi) reach of the Alabama River below Millers Ferry Lock and Dam, downstream to the mouth of

the Tombigbee River. Whether the quantity of fluvial (stream) habitat currently available to the species in this river reach is adequate to meet all of the ecological needs of a self-sustaining population is unknown.

Changes in natural river flow regimes by operation of hydroelectric dams are known to be detrimental to other sturgeon species (e.g., Khoroshko 1972, Zakharyan 1972, Veshchev 1982, Veshchev and Novikova 1983, Auer 1996). Flow quantity is believed to be adequate to maintain sturgeon in the lower Alabama River below Claiborne Lock and Dam (Biggins 1994). The Alabama Power Company currently releases 57 cubic meters per second (cms) (2,000 cubic feet per second (cfs)) seasonal minimum flow from Jordan Dam into the lower Coosa River, and 34 cms (1,200 cfs) minimum flow from Thurlow Dam into the lower Tallapoosa River. These two releases provide a combined 91 cms (3,200 cfs) minimum flow to the upper Alabama River for passage through the three Alabama River locks and dams. Alabama River flows are further augmented by generating flows from Jordan, Thurlow, and Bouldin dams, as well as other Alabama River tributary flows. The average daily flows measured over the last decade downstream of Claiborne Lock and Dam have ranged from over 100 cms to nearly 7,000 cms (3,500 to 247,000 cfs). While no evidence suggests that the Alabama sturgeon is limited by water quantity below Robert F. Henry and Millers Ferry Locks and Dams, these dams house hydropower facilities and neither is required to maintain a minimum flow. Current low flow releases from these two facilities can be as little as 3 hours of generation timed according to peaking needs, plus lockage releases. The effect of such daily flow fluctuations below Millers Ferry Lock and Dam on Alabama sturgeon reproductive, larval, or juvenile habitat requirements may be negative; however, the importance of the area between Robert F. Henry and Claiborne lock and dams for sturgeon reproduction is currently unknown.

The most visible continuing navigation impact within presently occupied Alabama sturgeon habitat is maintenance dredging of navigation channels. We have no evidence that such dredging currently constitutes a limiting factor to the sturgeon (Biggins 1994). The Corps has constructed 67 channel training works (jetties) at 16 locations in the lower Alabama River, eliminating about 60 percent of dredging requirements at those locations. In the Mississippi River drainage, such channel training works

are believed to be used as spawning areas by other sturgeon species (Mayden and Kuhajda 1996).

Maintenance dredging continues to be necessary in the Alabama River to remove seasonally accumulated material from deposition areas within the navigation channel. Dredged materials are usually placed on natural deposition features adjacent to the navigation channel, such as point bars or lateral bars. Due to the natural dynamics of river channels and annual sediment movement, maintenance areas have remained fairly constant over time, with the same areas repeatedly dredged or used for disposal. Recent investigations by the Corps, ADCNR, and us indicate that the distribution of stable benthic (bottom) habitats in the riverine portions of the Alabama River has been, and continues to be, strongly influenced by historical dredge and disposal practices. Changes in disposal practices could disrupt the existing equilibrium. For example, river channels are strongly influenced by the amount of sediment moving through them. Increases in sediment budget can cause aggradation (filling) of the channel, while decreases in sediment can cause degradation (erosion). With the upstream dams forming barriers to the movement of sediment through the Alabama River, additional reduction of sediment availability (e.g., through upland disposal) could increase river bed and bank erosion, including areas that are now important, stable habitats. In consideration of this situation, significant changes in current disposal methods in the Alabama River could adversely affect the Alabama sturgeon.

Recent investigations by ADCNR biologists and us have documented the presence of high-quality, stable river bottom habitats interspersed within and between dredge and disposal sites in the lower Alabama River (Hartfield and Garner 1998). These habitats included stable sand and gravel river bottom supporting freshwater mussel beds, and bedrock walls and bottom. Mussel beds are excellent indicators of riverine habitat stability because freshwater mussels may live in excess of 30 years, and mussel beds require many decades to develop (Neves 1993). Clean bedrock has been identified as potential Alabama sturgeon spawning habitat (Mayden and Kuhajda 1996). The significance of such areas of stability are suggested by the location of recent and historic Alabama sturgeon capture sites below Millers Ferry and Claiborne locks and dams. Dive surveys at 19 capture sites dating back to 1950 found 17 in the vicinity of dense mussel beds (15 sites) and/or clean bedrock riverine habitat

(11 sites) (Hartfield and Garner 1998). Depths at these areas (5 to 15 m (16 to 49 ft)) are well below the minimum navigation maintenance depth of 3 m (9 ft).

Sand and gravel mining has had historic impacts on riverine habitats in the lower Tombigbee and Alabama river channels. Instream dredging for sand and gravel can result in localized biological and geomorphic changes similar to those caused by channelization and navigation channel development. For example, mining of rivers has been shown to reduce fish and invertebrate biomass and diversity and can induce geomorphic changes in the river channel both above and below mined areas (Simons *et al.* 1982, Brown and Lyttle 1992, Kanehl and Lyons 1992, Hartfield 1993, Patrick and Dueitt 1996). Sand and gravel dredging of the Tombigbee and Alabama river channels within the historic and current range of the Alabama sturgeon has occurred periodically since the 1930s (Simons *et al.* 1982). We are not aware of any currently active sand and gravel dredging operations in the Alabama River. However, mining of gravel from stable river reaches used by the Alabama sturgeon would be detrimental to the species.

Water pollution may adversely impact sturgeon (Ruelle and Keenlyne 1993) and was likely a factor in the decline of the Alabama sturgeon, especially prior to implementation of State and Federal water quality regulations. Currently, the major sources of water pollution in Alabama are agriculture, municipal point sources, resource extraction, and contaminated sediments, in order of decreasing importance based on numbers of miles impaired (Alabama Department of Environmental Management 1994). Water quality in the lower Alabama River is generally good; however, two localized river segments above Claiborne Lock and Dam have been reported in the past as occasionally impaired due to excess nutrients and organic enrichment (Alabama Department of Environmental Management 1994). Sources of impairment were broadly identified as the combined effects of industrial and municipal discharges, and runoff from agriculture and silviculture. These river segments are also affected by hydropower discharges from Millers Ferry Lock and Dam. In 1994, an impact analysis on Federal activities in the Alabama River (Biggins 1994) concluded that no information suggests that current fish and wildlife standards for water quality are not protective of the Alabama sturgeon and that State water quality standards would not need

to be increased should the sturgeon be protected under the Act. No information developed since 1994 suggests otherwise.

B. Overutilization for commercial, recreational, scientific, or educational purposes. As discussed in the "Background" section of this final rule, the Alabama sturgeon was commercially harvested around the turn of the century. Alabama State law (sect. 220-2-.26-4) now protects the Alabama sturgeon and other sturgeons requiring that * * * any person who shall catch a sturgeon shall immediately return it to the waters from whence it came with the least possible harm. As a result, sturgeon are not currently pursued by commercial or recreational fishermen. Nonetheless, Alabama sturgeon are occasionally caught by fishermen in nets or trot lines set for other species. For example, one of the Alabama sturgeons caught in 1995 was hooked by a fisherman on a trot line, and the Alabama sturgeon caught in 1996 was trapped in a hoop net; both of these fish were released. Doubtless, there have been additional, undocumented incidental captures by commercial and sport fishermen. However, the surveys and collection efforts of the past decade have shown such captures to be rare.

C. Disease or predation. The Alabama sturgeon has no known threats from disease or natural predators. To the extent that disease or predation occurs, such threats become a more important consideration as the total population decreases in number.

D. The inadequacy of existing regulatory mechanisms. As we discussed under factor B, Alabama State law (sect. 220-2-.26-4) protects the Alabama sturgeon and other sturgeons requiring that * * * any person who shall catch a sturgeon shall immediately return it to the waters from whence it came with the least possible harm. As a result, sturgeon are not currently pursued by commercial or recreational fishermen. State regulations, however, do not generally protect the Alabama sturgeon from other threats. Several regulatory mechanisms currently benefit the Alabama sturgeon and its habitat (e.g., Clean Water Act and associated State laws, Fish and Wildlife Coordination Act, Federal Power Act, National Environmental Policy Act, Rivers and Harbors Act). However, within the scope of other environmental laws or Alabama State law, there is currently no requirement to specifically consider the effects of actions on the Alabama sturgeon and ensure that a project is not likely to jeopardize its continued existence.

E. Other natural or manmade factors affecting its continued existence. The primary threat to the immediate survival of the Alabama sturgeon is its small population size and its apparent inability to offset mortality rates with current reproduction and/or recruitment rates. As noted in the Background section, incidents of capture of Alabama sturgeon have been steadily diminishing for the past two decades, indicating declining population numbers over this time. Studies also demonstrate that small populations are inherently highly vulnerable to extinction (Soule 1987). In such cases, the species becomes very vulnerable to natural or human-induced events (e.g., droughts, floods, competition, variations in prey abundance, toxic spills), which may further depress recruitment or increase mortality (Belovsky 1987, Shaffer 1987).

Sturgeon species may be especially vulnerable to small population size for several reasons. Age at first spawning (ranging from 5 to 7 years for shovelnose sturgeon) is much delayed in comparison to many other fishes, and female sturgeons may not spawn for intervals of several years (Wallus *et al.* 1990). A recent attempt to propagate Alabama sturgeon at the Marion State Fish Hatchery indicates that males may not spawn annually as well. Thus, the number of adult males and females capable of reproducing in a given year is much smaller than the actual numbers of adult sturgeon present. Also, recruitment success in fish is subject to considerable natural variability owing to fluctuations of environmental conditions, and several years can pass between periods of good recruitment. Sturgeon may compensate for some of these aspects of their natural history by producing large quantities of eggs per female. However, successful spawning and production of large numbers of offspring by a single or a few fish may result in reduced genetic diversity for the overall population.

Currently, no population estimates exist for the Alabama sturgeon. Recent collection efforts demonstrate its increasing rarity. For example, beginning in the spring of 1997 through 1999, up to four crews of professional fisheries biologists have expended approximately 4,000 man-hours of fishing effort in the lower Alabama River to capture Alabama sturgeon for use as broodstock. This effort resulted in the capture of only five Alabama sturgeon, three of which have died in captivity. An additional incidental catch and release was reported by a commercial fisherman. Thus, approximately 18 months of fishing by professional, commercial, and

recreational fishermen resulted in the capture of only six Alabama sturgeon. Compared to the estimated 20,000 Alabama sturgeon reported in the 1898 harvest, the amount of effort currently required to capture Alabama sturgeon indicates that the species' population numbers are extremely low. This determination strongly indicates that the Alabama sturgeon is highly susceptible to the negative effects of a small population size and this factor, coupled with the reproduction characteristics of its natural history, renders the species very vulnerable to extinction.

State Conservation Efforts

Section 4(b)(1)(A) requires us, in making a listing determination, to take into account efforts being made by the State to protect the Alabama sturgeon. In 1996, the ADCNR developed a conservation plan for the Alabama sturgeon that attempted to address the most immediate threat to the species, its small population size. A variety of public and private groups, including the Service, Army Corps of Engineers, Geological Survey of Alabama, Auburn University, the Alabama-Tombigbee Rivers Coalition, and the Mobile River Basin Coalition have participated in, and/or endorsed, this plan. The immediate focus of the plan is to prevent extinction through a captive breeding program and release of propagated fish. Other objectives of the plan include genetic conservation, habitat restoration, and determining life history information essential to effective management of the species. A freshwater sturgeon conservation plan working group composed of scientists and resource managers from a variety of Federal and State agencies, industry, and local universities was formed in September 1996 to establish collection and handling protocols, and to recommend and participate in research efforts. Implementation of the conservation plan began in March 1997, with broodstock collection efforts. To date, five fish have been captured; however, three of these have died. Two male sturgeon are currently held at the Marion State Fish Hatchery. The hatchery has been upgraded to accommodate sturgeon propagation. An unsuccessful attempt to spawn the captive sturgeon was conducted during March 1999 (see Background section). Coordinated studies are currently in progress by the ADCNR, Corps, and us to identify and quantify stable riverine habitat in the Alabama River, and to develop strategies for its management. Life history and habitat studies in progress include habitat

characterization at historic sturgeon collection sites, prey density studies, and larval sturgeon surveys. To date, the 1997 Conservation Plan has not been successful in decreasing the threat of extinction to where protection under the Act is no longer warranted.

On February 9, 2000, the ADCNR, the Corps, the Alabama-Tombigbee Rivers Coalition, and the Service signed a formal 10-year Conservation Agreement and Strategy for the Alabama Sturgeon. The goal of the 10-year Conservation Agreement Strategy is to eliminate or significantly reduce current threats to the Alabama sturgeon and its habitat. Attaining the goal of the Conservation Agreement Strategy will require accomplishment of the following objectives: (1) Restore and maintain sufficient numbers of Alabama sturgeon in the lower Alabama River to ensure its long-term survival by increasing the numbers of sturgeon through hatchery propagation and augmentation; and (2) identify and protect existing occupied Alabama sturgeon habitat quantity and quality, develop information on the sturgeon's life history and habitat needs, and use this information to implement appropriate conservation measures and adaptive management strategies for the Alabama sturgeon and its habitat. The objectives will be accomplished through implementation of the Conservation Agreement Strategy for the Alabama Sturgeon.

The Conservation Agreement Strategy for the Alabama Sturgeon describes specific actions and strategies required to expedite implementation of conservation measures for the Alabama sturgeon to ensure the long-term viability of the species, and to establish benchmarks to measure the success of the program. The general conservation goals are to increase sturgeon numbers to a viable, self-sustaining level; maintain habitat currently occupied by the sturgeon; conduct research necessary to understand sturgeon life history and ecology and use this information to manage the species; identify occupied habitat within the lower Alabama River that might support sturgeon with appropriate management; and insure sturgeon accessibility to essential habitat that is identified through research.

The success of implementation during the life of the Agreement and Strategy will be measured by annual reviews to address the following: (1) Successful collection of broodstock; (2) successful hatchery propagation; (3) initial augmentation of the remaining wild stock of the species with hatchery-spawned Alabama sturgeon; (4) protection of existing occupied habitat;

(5) extending knowledge of the species' natural history, life cycle, and ecological needs; and (6) development and implementation of appropriate adaptive management strategies to conserve the species.

Implementation of the Conservation Agreement Strategy is the most viable approach to conservation of the Alabama sturgeon, based on current technology and information. However, the certainty on the effectiveness of these efforts in removing existing threats remain unproven and dependent upon many factors beyond human control. Therefore, the Alabama sturgeon still warrants protection under the Act (see responses to Issues 62 to 66).

The Mobile River Basin Aquatic Ecosystem Recovery Coalition, a partnership comprising diverse business, environmental, private landowner, and agency interests, has been meeting regularly to participate in recovery planning for 15 listed aquatic species in the Basin (U.S. Fish and Wildlife Service 1998). The Coalition promotes increased stewardship awareness by private landowners throughout the Basin, and encourages the control of non-point source pollution through the implementation of Best Management Practices. All aquatic habitats, including Alabama sturgeon habitat, will benefit from such efforts.

In determining to make this rule final, we have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by the Alabama sturgeon, while taking into account ongoing conservation efforts and commitments by the State and others. Based on our evaluation, the most appropriate action is to list the Alabama sturgeon as endangered. The Act defines an endangered species as one that is in danger of extinction throughout all or a significant portion of its range. The species is currently limited in distribution to a small portion of its historic range and is blocked by dams from recolonizing other portions of that range. Whether the quantity of habitat currently available to the Alabama sturgeon is adequate to meet the needs of a self-sustaining population is unknown. In addition, the Alabama sturgeon is vulnerable to extinction due to its small population size, aggravated by certain characteristics of its reproduction. Ongoing conservation efforts to increase sturgeon numbers have to date met with limited success.

Critical Habitat

Critical habitat is defined in section 3 of the Act as: (I) the specific areas within the geographical area occupied

by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management consideration or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. Conservation means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. Section 4(b)(2) of the Act requires us to consider economic and other relevant impacts of designating a particular area as critical habitat on the basis of the best scientific data available. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of its inclusion, unless to do so would result in the extinction of the species. Our regulations (50 CFR 424.12(a)(2)) state that critical habitat is not determinable if information sufficient to perform the required analysis of the impacts of the designation is lacking or if the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat.

In the proposed rule, we found that critical habitat designation for the Alabama sturgeon was not prudent because we believed it would provide no additional benefit beyond that of the listing. We also indicated that the designation of critical habitat was not prudent because of our concern that such designation could harm the species as a result of adverse public reaction and loss of cooperation by fishermen and other partners in ongoing conservation efforts. However, during the open comment period, we received numerous comments favoring critical habitat designation for the Alabama sturgeon. Commercial fishermen also continued to cooperate in conservation actions during the open comment period. Due to this response, we no longer believe that any significant adverse public reaction will result from the designation of critical habitat for the Alabama sturgeon.

In the absence of a finding that critical habitat would increase threats to a species, if any benefits would result

from critical habitat designation, then a prudent finding is warranted. In the case of the Alabama sturgeon, designation of critical habitat may provide some benefits. The primary regulatory effect of critical habitat is the section 7 requirement that Federal agencies refrain from taking any action that destroys or adversely modifies critical habitat. While a critical habitat designation for habitat currently occupied by this species would not be likely to change the section 7 consultation outcome because an action that destroys or adversely modifies such critical habitat would also be likely to result in jeopardy to the species, in some instances, section 7 consultation might be triggered only if critical habitat is designated. Examples could include unoccupied habitat or presently occupied habitat that may become unoccupied in the future. In addition, some educational or informational benefits may result from designating critical habitat. Therefore, we now find that critical habitat designation is prudent, but not determinable, for the Alabama sturgeon.

Section 4(b)(6)(C) of the Act provides that a concurrent critical habitat determination is not required with a final regulation implementing endangered status and that the final designation may be postponed for one additional year beyond the period specified in section 4(b)(6)(A), if (i) a prompt determination of endangered or threatened status is essential to the conservation of the species, or (ii) critical habitat is not then determinable. We believe that a prompt determination of endangered status for the Alabama sturgeon is essential to its conservation. Listing the sturgeon will augment protection for the species, require consideration by Federal agencies of the effects of their actions on its survival, and allow recovery planning to proceed, while allowing us additional time to evaluate critical habitat needs. While we received a number of comments advocating critical habitat designation, none of these comments provided information that added to our ability to determine critical habitat. Additionally, we did not obtain any new information regarding specific physical and biological features essential for the Alabama sturgeon during the open comment period or the public hearing. The biological needs of the Alabama sturgeon are not sufficiently well known to permit identification of areas as critical habitat. Insufficient information is available on spawning and juvenile habitat, instream flow needs, water quality, and other essential habitat

features. Through ongoing studies we are attempting to better ascertain the biological needs of the Alabama sturgeon and the habitat essential to those needs. This information is considered essential for determining critical habitat. Prior to a final designation, maps of proposed critical habitat, identification of essential features, and an economic analysis of any incremental regulatory effects (additive to the species listing) will be released for public review and comment. Protection of Alabama sturgeon habitat will be provided during the interim through the recovery process, the section 7 consultation process, and section 9 prohibitions on take.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with us.

Federal activities that could occur and impact the Alabama sturgeon include, but are not limited to, the carrying out or the issuance of permits for reservoir construction, stream alterations, discharges, wastewater facility development, water withdrawal projects, pesticide registration, mining, and road and bridge construction. In our experience, nearly all section 7 consultations have been resolved so that

the species have been protected and the project objectives have been met.

In addition, section 7(a)(1) of the Act requires all Federal agencies to review the programs they administer and use these programs in furtherance of the purposes of the Act. All Federal agencies, in consultation with us, are to carry out programs for the conservation of endangered and threatened species listed pursuant to section 4 of the Act.

The Act and its implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect; or to attempt any of these), import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any endangered wildlife. To possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally is also illegal. Certain exceptions apply to our agents and agents of State conservation agencies.

Our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), is to identify, to the maximum extent practicable, those activities that would or would not constitute a violation of section 9 of the Act for this species. The intent of this policy is to increase public awareness as to the effects of this final listing on future and ongoing activities within this species' range.

We believe, based on the best available information, that the following activities are unlikely to result in a violation of section 9:

(1) Discharges into waters supporting the Alabama sturgeon, provided these activities are carried out in accordance with existing regulations and permit requirements (e.g., activities subject to section 404 of the Clean Water Act and discharges regulated under the NPDES);

(2) Continuation of ongoing maintenance dredging of unconsolidated sediments undertaken or approved by the Corps of Engineers;

(3) Development and construction activities designed and implemented in accordance with State and local water quality regulations and implemented using approved Best Management Practices;

(4) Lawful commercial and sport fishing for species other than Alabama sturgeon, provided any Alabama sturgeon caught are immediately released unharmed; and

(5) Actions that may affect the Alabama sturgeon and are authorized,

funded, or carried out by a Federal agency when the action is conducted in accordance with an incidental take statement issued by us pursuant to section 7 of the Act.

Activities that we believe could potentially result in take of the Alabama sturgeon include:

(1) Illegal collection of the Alabama sturgeon;

(2) Unlawful destruction or alteration of the Alabama sturgeon's habitat (e.g., un-permitted instream dredging, channelization, discharge of fill material); and

(3) Illegal discharge or dumping of toxic chemicals or other pollutants into waters supporting the Alabama sturgeon.

Other activities not identified above will be reviewed on a case-by-case basis to determine if a violation of section 9 of the Act may be likely to result from such activity. We do not consider these lists to be exhaustive and provide them as information to the public.

You should direct questions regarding whether specific activities will constitute a violation of section 9 to the Field Supervisor, U.S. Fish and Wildlife Service, P.O. Box 1190, Daphne, AL 36526 (telephone 334/441-5181), or to the Field Supervisor of the Service's Mississippi Field Office (see **ADDRESSES** section).

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22. You may obtain permits for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. Send requests for copies of regulations regarding listed species and inquiries about prohibitions and permits to the U.S. Fish and Wildlife Service, Ecological Services Division, 1875 Century Boulevard, Suite 200, Atlanta, Georgia 30345 (telephone 404/679-7358; facsimile 404/679-7081).

National Environmental Policy Act

We have determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Paperwork Reduction Act

This rule does not contain any new collections of information other than those already approved under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, and assigned Office of Management and Budget clearance number 1018-0094. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid control number. For additional information concerning permit and associated requirements for endangered species, see 50 CFR 17.22.

References Cited

You may request a complete list of all references cited in this document, as well as others, from the Mississippi Field Office (see **ADDRESSES** section).

Author: The primary author of this document is Paul Hartfield (see **ADDRESSES** section) (601/321-1125).

Introduction to the White Paper (Biggins 1994)

Below is a document entitled Federal Activities That May Affect the Alabama Sturgeon and Anticipated Section 7 Consultations on These Activities. This document was developed jointly by representatives from the Corps and the Service in 1994 in response to concerns raised during public comment periods on the 1993 proposed rule to list the Alabama sturgeon as an endangered species. The document finalized on November 18, 1994, was referred to in the 1999 proposed rule to list the Alabama sturgeon as an endangered species and in this final rule as "Biggins 1994," and has become widely known as the White Paper.

The White Paper carefully reviews the anticipated impacts of a variety of activities in the lower Alabama River to the Alabama sturgeon. To summarize, the 1994 White Paper found the following: (1) Based on the information available at the time, the Corps' annual maintenance dredging program was not likely to adversely affect the Alabama sturgeon. However, the Corps, in conjunction with the Service, agreed to pursue research to more fully evaluate impacts of maintenance dredging activities, particularly with regard to turbidity issues. (2) While removal of rock shelves may adversely affect the Alabama sturgeon, concerns can be adequately addressed through routine consultation between the Corps and the Service, and this consultation is not likely to result in a jeopardy situation or delays in activities. (3) While channel training devices could reduce impacts to the Alabama sturgeon, additional

training devices are not required to avoid jeopardy to the species. (4) The removal of unconsolidated materials from the river bottom through non-Federal maintenance dredging activities is not considered a direct threat to the Alabama sturgeon. (5) Current flow patterns are likely adequate to sustain the Alabama sturgeon where it is currently known to occur. (6) There is no need to modify the State's water quality standards to protect the Alabama sturgeon. (7) Direct or indirect impacts to the Alabama sturgeon from coalbed methane extraction are not anticipated. (8) In-stream gravel mining may adversely affect the Alabama sturgeon and would need to be addressed through consultation. (9) The Alabama sturgeon would need to be considered under other non-Federal activities permitted by the Corps; however, delays in activities are not anticipated.

The findings of the White Paper have been affirmed, reviewed, and reaffirmed through a variety of correspondence between the Corps and us over the last 5 years. Immediately following the finalization of the White Paper, in a letter dated November 23, 1994, the Corps determined that maintenance dredging and disposal activities had no effect on the Alabama sturgeon. We supported that determination in a letter dated November 28, 1994. Between October 1998 and April 1999, we and the Corps again carefully reviewed the details and findings of the White Paper (four letters—Service, October 21, 1998; Corps, December 21, 1998; Corps, February 2, 1999; and Service, April 7, 1999). These letters are all part of the administrative record for this final rule, and summarily clarify and reaffirm the findings of the White Paper.

The findings of the White Paper relative to the annual maintenance of the existing navigation channel of the Alabama River were further supported through an exchange of letters from the Service's Southeast Regional Director, Sam D. Hamilton (June 24, 1999 and February 1, 2000) and the Corps' Division Engineer, Brigadier General J. Richard Capka (November 15, 1999). In these exchanges, Regional Director Hamilton affirmed that the annual navigation channel maintenance dredging programs would have no effect on the Alabama sturgeon and would not need to be eliminated, modified, or altered should the Alabama sturgeon be listed. Brigadier General Capka concurred with this finding and requested that the White Paper be published in its entirety with the final rule. In response to this request, the White Paper follows in its entirety.

Finally, this latest exchange of letters between Regional Director Hamilton and Brigadier General Capka identified the need for a Memorandum of Agreement between the two agencies to ensure open communication and formalize a cooperative process for dealing with new information that may alter the earlier no effect finding. The Service and Corps are currently drafting this agreement.

The White Paper (Biggins 1994)

Federal Activities That May Affect The Alabama Sturgeon and Anticipated Section 7 Consultations on These Activities

Annual maintenance dredging by the Corps: Maintenance dredging by the U.S. Army Corps of Engineers (Corps) to maintain the navigation channel on the Alabama and lower Tombigbee Rivers annually removes 1.5 to 3.8 million cubic meters (2 to 5 million cubic yards) of unconsolidated aggregate (e.g., sand, mud, and silt). Dredge material from the Tombigbee River downstream of Coffeetown, Alabama, is disposed of at upland sites and within the banks of the river. On the Alabama River, fewer upland disposal areas have been established, and the majority of the dredge materials is placed within the shallow reaches of the river.

Based on limited information on the Alabama sturgeon and studies of the shovelnose sturgeon, it appears that these fish require currents over relatively stable substrates for feeding and spawning. They are generally not associated with those unconsolidated substrates that settle in slower current areas and must be removed annually to maintain navigation. Therefore, removal and disposal of unconsolidated materials is not perceived as a threat to the sturgeon or to its feeding or spawning habitat.

In the proposed rule, the U.S. Fish and Wildlife Service (Service) expressed concern that turbidity increases associated with the Corps' annual maintenance dredging could affect the sturgeon, and the Service still has some concern regarding this issue. However, based on the fact that (1) The Alabama and Tombigbee Rivers are currently characterized as turbid rivers; (2) channel maintenance activities produce only localized and temporary elevation of turbidity; (3) the extent to which turbidity impacts the Alabama sturgeon is unknown; and (4) the Corps in cooperation with the Service has agreed to pursue research (within three years and based on the availability of funds) regarding the potential impacts of maintenance dredging activities,

including turbidity, on the shovelnose sturgeon, the Service has concurred with the Corps' determination that based on current information their annual maintenance dredging program does not adversely affect the Alabama sturgeon.

Thus, as it is currently believed that the Corps' annual maintenance dredging program on the Alabama and lower Tombigbee Rivers is not likely to affect the Alabama sturgeon, these channel maintenance activities will not need to be eliminated, modified in timing or duration, or altered to protect the Alabama sturgeon. Therefore, no loss of revenue from diminished annual channel maintenance activities will be associated with the listing of the Alabama sturgeon.

Maintenance dredging by the Corps to remove rock shelves: The Alabama and Tombigbee Rivers naturally move laterally, and to some extent, vertically. This natural river channel movement exposes rock shelves at the outer bends of the river. In order to provide for a reliable and safe navigation channel, these rock shelves must sometimes be removed, and similar channel alignment improvements of covered consolidated material are sometimes necessary on the inside bends. Although the removal of these obstructions to navigation are usually infrequent and restricted to isolated areas, this activity may adversely affect the Alabama sturgeon.

The Corps and the Service have discussed the potential impacts to the Alabama sturgeon of removing these rock shelves, and both agencies agree that section 7 consultation will be required prior to the commencement of any rock shelf removal project within or adjacent to potential Alabama sturgeon habitat. However, since both agencies agree that rock shelf removal projects are generally not emergency projects, there will be a sufficient period of time prior to the next dredging season for both agencies to consider the timing and habitat improvements which may be possible by the design and construction of the remaining shelf after excavation and by selective placement of the excavated material. Thus, the Service does not anticipate that these consultations will result in a jeopardy situation or result in delays in these maintenance dredging activities.

Use of training devices by the Corps: In the proposed rule, the Service cited studies by the Corps and others that the use of channel-training devices (e.g., training dikes, jetties, sills, and revetments) in several rivers in the eastern half of the United States reduced dredging requirements by over 50 percent. The Corps' own data stated that

structures in the Alabama River were assumed to eliminate about 60 percent of dredging requirements at the specific location where such structures were designed and constructed in the last phase of training works on the Alabama River. The present system on the Alabama River consists of 67 channel training works at 16 locations. The Corps has subsequently stated that based on the Mobile District's criteria for the use of training works, these structures are already used to the maximum extent practicable. However, the Service understands that the Corps will continue to evaluate their use, will modify existing structures as necessary, and may construct additional training devices when justified.

Although the Service believes that training devices could reduce impacts to the Alabama sturgeon and encourages the Corps to consider their use in future planning, the Service does not believe that more training devices are required to avoid jeopardy to the Alabama sturgeon.

Maintenance dredging for non-Federal activities: The Corps authorizes maintenance dredging for non-Federal navigation projects. Although these projects are usually on a much smaller scale than the Corps' annual maintenance dredging activities, they involve the removal of unconsolidated aggregate from navigable waters of the United States and include the discharge of some material back into the waterways. Thus, maintenance dredging by non-Federal entities comes under the Corps' authority pursuant to section 10 of the RHA (33 U.S.C. 403) and section 404 of the CWA (33 U.S.C. 1344).

Maintenance dredging by non-Federal entities for navigation removes unconsolidated aggregate (e.g., sand, mud, and silt) that washes down from upstream portions of the river and from tributaries. Based on limited information on the Alabama sturgeon and studies of the shovelnose sturgeon, it appears that these fish require currents over relatively stable substrates for feeding and spawning. They are generally not associated with the unconsolidated substrates that settle in slower current areas. Therefore, removal of unconsolidated materials is not considered as a direct threat to the sturgeon or to its feeding or spawning habitat.

Prior to the Corps' issuance of a section 404 permit for non-Federal maintenance dredging, the applicant must receive State water quality certification from the State of Alabama pursuant to section 401 of the CWA. As the Service does not believe that more restrictive water quality standards will

be needed to protect the Alabama sturgeon from this activity, the likelihood of an applicant receiving a State water quality certification will not be affected by the listing of the Alabama sturgeon. Additionally, as addressed above under Annual maintenance dredging by the Corps, temporary increases in turbidity associated with maintenance dredging activities are not currently believed to adversely affect the Alabama sturgeon; and as dredge material from non-Federal maintenance dredging projects is traditionally disposed of at upland sites, potential impacts to the sturgeon are further reduced.

Changes in river flow patterns: A series of dams now control water flows in much of the Mobile River system. Changes in the natural flow patterns have probably had both direct and indirect effects on the Alabama sturgeon and its habitat. In the proposed rule, it was stated that The Service expects that continuous minimum flows of approximately 3,000 [cfs] will be required [to sustain the Alabama sturgeon] below both Robert F. Henry and Millers Ferry Locks and Dams on the lower Alabama River and that

* * * minimum flows below Claiborne Lock and Dam are already maintained at approximately 5,000 cfs to provide for cooling water intake of downstream industry. Although the Service concedes that little information on the flow needs of the sturgeon is available, a minimum figures of 90 cms (3,000 cfs) was arrived at by Service and other biologists familiar with the Alabama River and its fish populations.

The Service now has evidence of the continued existence of the Alabama sturgeon in the free-flowing portion of the Alabama River downstream of Claiborne Lock and Dam and that the Alabama Power Company (APC), through an agreement with the Corps, attempts to maintain (for the purposes of navigation) a minimum average daily flow of approximately 149 cms (4,640 cfs) over any seven consecutive day period and a minimum average daily flow of approximately 81 cms (2,667 cfs) over any three consecutive day period downstream of Claiborne Lock and Dam. Further, the average daily flows over the last decade downstream of Claiborne Lock and Dam have ranged from 114 to 6,912 cms (3,800 to 244,000 cfs). Therefore, the Service believes that the minimum average daily flows, as agreed to by the Corps and the APC, coupled with historic and Federal Energy Regulatory Commission ordered flow patterns, are likely adequate to sustain the Alabama sturgeon in this river reach.

The Service's opinion on flow requirements for river segments upstream of Claiborne Lock and Dam, as stated in the proposed rule, has changed somewhat. The Service's position remains that the best biological judgement at this time is that a minimum average daily flow of approximately 90 cms (3,000 cfs) from the Robert F. Henry and Millers Ferry Locks and Dams would be required to maintain a population of the Alabama sturgeon upstream of Claiborne Lock and Dam. However, the continued existence of the sturgeon upstream of Claiborne Lock and Dam has not been substantiated in nearly a decade, although anecdotal evidence exists.

Therefore, based on our current knowledge of the Alabama sturgeon and its distribution, no changes in water releases from these structures or from structures located in the headwaters of the Alabama River system (e.g., Coosa and Tallapoosa Rivers) are being suggested for the benefit of the sturgeon nor are they anticipated by the Service as a result of this listing. Thus, without changes in flow releases from power-generating dams, there should be no loss of electrical power revenue resulting from listing the Alabama sturgeon.

State water quality standards: Although it is possible that some point-source discharges negatively impact the Alabama sturgeon, there is no evidence to support the conclusion that the State's water quality standards must be changed if the fish is listed. As discussed in the proposed rule, the potential exists for point discharges to impact the Alabama sturgeon, and it is noted that there is an increasing demand for discharge permits in the Mobile River system. However, there are two factors that work to minimize any impacts to this fish from point-source discharges: (1) As the Alabama sturgeon inhabits larger channel areas, the effects of any point discharge into its habitat would likely be minimized by dilution and (2) the State of Alabama, with assistance from and oversight by the EPA, sets water quality standards that are presumably protective of aquatic life.

It is the Service's position, as stated in the proposed rule, that as long as current fish and wildlife standards under the CWA are used to issue discharge permits and the conditions of the permits are enforced, there is no need to modify the State's water quality standards to protect the Alabama sturgeon. A violation of State water quality standards would be a violation of the CWA, and listing the Alabama sturgeon could potentially increase noncompliance penalties. However, the

listing, based on current information, would not increase the need for changes in State water quality standards.

Coalbed methane: The extraction of coalbed methane can necessitate the release of produced water into the environment, and this discharge was mentioned as a potential threat to the Alabama sturgeon in the proposed rule. The Corps authorizes produced-water discharge structures pursuant to section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) if the outfall structure is placed into navigable waters of the United States. The Corps typically authorizes these structures with a Letter of Permission. Letters of Permission are a type of permit issued through an abbreviated processing procedure that includes coordination with Federal (including the Service) and State fish and wildlife agencies, as required by the Fish and Wildlife Coordination Act, and a public interest evaluation, but without publishing an individual public notice. Letters of Permission may be used in those cases subject to section 10 when, in the opinion of the District Engineer, the proposed work would be minor, would not have significant individual or cumulative impacts on environmental values, and should encounter no appreciable opposition. Additionally, prior to discharge, the applicant must receive a permit from the State of Alabama under NPDES guidelines. As the Alabama sturgeon exists far downstream of these permit activities, the Service does not believe that any modification to existing discharge structure authorization procedures is needed to protect the Alabama sturgeon.

The potential coalbed methane wells are far upstream of known Alabama sturgeon habitat and any discharge must meet State water quality standards (the Service has stated that the water quality standards will not have to be modified in order to protect the Alabama sturgeon). Therefore, the Service does not anticipate any direct or indirect impacts to the Alabama sturgeon from properly permitted produced-water discharges.

Gravel mining: In-stream gravel mining involves work in navigable waters of the United States and includes the discharge of the noncommercial dredge material back into the waterway. Thus, in-stream gravel mining comes under the Corps' authority, pursuant to section 10 of the RHA (33 U.S.C. 403) and section 404 of the CWA (33 U.S.C. 1344). The Service believes that the Alabama sturgeon likely uses relatively stable substrate for breeding and feeding habitat. Thus, mining of this stable substrate could threaten the species. However, the Service believes the

mining of unconsolidated material or relatively stable material that is covered by several inches of fine sediment would not be likely to jeopardize the species' continued existence.

Prior to the issuance of a permit by the Corps for in-stream gravel mining, the applicant must receive State water quality certification from the State of Alabama pursuant to section 401 of the CWA. As the Service does not believe that more restrictive water quality standards will be needed to protect the Alabama sturgeon from this activity, the likelihood of an applicant's receiving State water quality certification will not be affected by the listing of the Alabama sturgeon. However, as in-stream gravel mining generally produces higher turbidity levels than are produced by maintenance dredging, the Service believes that increases in turbidity within Alabama sturgeon habitat from in-stream gravel mining activities could be considered a "may adversely affect situation that the Corps would need to address through section 7 consultation with the Service. However, the Service does not anticipate that turbidity produced from gravel-mining of unconsolidated substrates would likely jeopardize the continued existence of the Alabama sturgeon.

Other regulatory activities of the Corps: The Corps authorizes other non-Federal activities (e.g., pipelines, piers, wharfs, and small boat channels) within waters of the United States within the

historic range of the Alabama sturgeon. These non-Federal activities are regulated through the Corps' regulatory program and evaluated on a case by case basis. Although these activities are on a much smaller scale than most other activities authorized by the Corps, these actions are more numerous and therefore could present a greater number of opportunities for the Service to consider impacts to the sturgeon. Thus, concern has been expressed that if the Alabama sturgeon is listed permit applicants will be burdened by time delays and by requirements to conduct sturgeon surveys. The Service recognizes that some of the non-Federal activities authorized by the Corps (e.g., bridge pier placement and pipeline crossings) in the Alabama River system could be delayed by a requirement to conduct endangered species surveys (Alabama sturgeon plus other listed species). However, it has been the experience of the Service that most of these non-Federal activities do not require a survey and further are not delayed because of endangered species issues.

Prepared: November 18, 1994.

This document [White Paper] was prepared jointly by the Fish and Wildlife Service and the U.S. Army Corps of Engineers in accordance with the September 1994 Memorandum of Understanding on Implementation of the Endangered Species Act.

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Note: Material contained in this document will be included in any final Alabama sturgeon rule that might be produced by the Service.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as follows.

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500, unless otherwise noted.

2. Amend § 17.11(h) by adding the following to the List of Endangered and Threatened Wildlife, in alphabetical order under FISHES:

§ 17.11 Endangered and threatened wildlife.

* * * * *
(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Fishes:							
* Sturgeon, Alabama.	* <i>Scaphirhynchus suttkusi.</i>	* U.S.A. (AL, MS)	* Entire	* E	* 697	* NA	* NA
*	*	*	*	*	*	*	*

Dated: April 30, 2000.
Jamie Rappaport Clark,
 Director, Fish and Wildlife Service.
 [FR Doc. 00-11131 Filed 5-2-00; 8:45 am]
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