DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AI23

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 226

[Docket No.; I.D. 020522126–3051–02]

RIN 0648–AQ03

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Gulf Sturgeon

AGENCY: Fish and Wildlife Service (FWS), Interior, and National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration, Commerce.

ACTION: Final rule.

SUMMARY: We, FWS and NMFS, collectively ''the Services,'' designate critical habitat for the Gulf sturgeon (*Acipenser oxyrinchus desotoi*), a threatened species listed under the Endangered Species Act of 1973, as amended (Act). We designate 14 geographic areas among the Gulf of Mexico rivers and tributaries as critical habitat for the Gulf sturgeon. These 14 geographic areas (units) encompass approximately 2,783 river kilometers (rkm) (1,730 river miles (rmi)) and 6,042 square kilometers (km^2) (2,333 square miles (mi^2)) of estuarine and marine habitat.

Critical habitat identifies specific areas that are essential to the conservation of a listed species, and that may require special management considerations or protection. Section 7(a)(2) of the Act requires that each Federal agency shall, in consultation with and with the assistance of the Services, insure that any action authorized, funded or carried out by such agency is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of critical habitat. Section 4 of the Act requires us to consider economic and other relevant impacts of specifying any particular area as critical habitat. We solicited data and comments from the public on all aspects of the proposal, including data on economic and other impacts of the designation.

DATES: The effective date of this rule is April 18, 2003.

ADDRESSES: The complete administrative record, including comments and materials received, as well as supporting documentation, used in the preparation of this final rule are available for public inspection, by appointment, during normal business hours at the Panama City Field Office, U.S. Fish and Wildlife Service, 1601 Balboa Avenue, Panama City, Florida 32405. Copies of the final rule, economic analysis, and information regarding this critical habitat designation are available on the Internet at *http://alabama.fws.gov/gs/.*

FOR FURTHER INFORMATION CONTACT: Gail Carmody, Field Supervisor, Panama City Field Office (see **ADDRESSES** section) (telephone 850/769–0552; facsimile 850/763–2177), or Stephania Bolden, Fishery Biologist, National Oceanic and Atmospheric Administration (NOAA) Fisheries, Southeast Regional Office, 9721 Executive Center Drive North, St. Petersburg, Florida 33702 (telephone 727/570–5312; facsimile 727/570–5517). Information regarding this designation is available in alternate formats upon request.

SUPPLEMENTARY INFORMATION:

Background

The Gulf sturgeon (*Acipenser oxyrinchus (=oxyrhynchus) desotoi*), also known as the Gulf of Mexico sturgeon, is an anadromous fish (breeding in freshwater after migrating up rivers from marine and estuarine environments), inhabiting coastal rivers from Louisiana to Florida during the warmer months and overwintering in estuaries, bays, and the Gulf of Mexico. It is a nearly cylindrical primitive fish embedded with bony plates or scutes. The head ends in a hard, extended snout; the mouth is inferior and protrusible and is preceded by four conspicuous barbels. The tail (caudal fin) is distinctly asymmetrical, the upper lobe is longer than the lower lobe (heterocercal). Adults range from 1.2 to 2.4 meters (m) (4 to 8 feet (ft)) in length, with adult females larger than males. The Gulf sturgeon is distinguished from the geographically disjunct Atlantic coast subspecies (*A. o. oxyrinchus*) by its longer head, pectoral fins, and spleen (Vladykov, 1955; Wooley, 1985). King *et al.* (2001) have documented substantial divergence between *A. o. oxyrinchus* and *A. o. desotoi* using microsatellite DNA testing.

Distribution and Status

Historically, the Gulf sturgeon occurred from the Mississippi River east to Tampa Bay. Its present range extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida. Sporadic occurrences have been recorded as far west as the Rio Grande River between Texas and Mexico, and as far east and south as Florida Bay (Wooley and Crateau, 1985; and Reynolds, 1993).

In the late 19th century and early 20th century, the Gulf sturgeon supported an important commercial fishery, providing eggs for caviar, flesh for smoked fish, and swim bladders for isinglass, a gelatin used in food products and glues (Huff, 1975; and Carr, 1983). Gulf sturgeon numbers declined due to overfishing throughout most of the 20th century. The decline was exacerbated by habitat loss associated with the construction of water control structures, such as dams and sills (submerged ridge or vertical wall of relatively shallow depth separating two bodies of water), mostly after 1950. In several rivers throughout the species' range, dams have severely restricted sturgeon access to historic migration routes and spawning areas (Boschung, 1976; Wooley and Crateau, 1985; and McDowall, 1988).

On September 30, 1991, we listed the Gulf sturgeon as a threatened species under the Act (16 U.S.C. 1531 *et seq.*) (56 FR 49653). Other threats and potential threats identified in the listing rule included modifications to habitat associated with dredged material disposal, desnagging (removal of trees and their roots), and other navigation maintenance activities; incidental take by commercial fishermen; poor water quality associated with contamination by pesticides, heavy metals, and industrial contaminants; aquaculture and incidental or accidental introductions; and the Gulf sturgeon's slow growth and late maturation. The Gulf sturgeon listing rule and the Gulf Sturgeon Recovery/Management Plan (FWS *et al.*, 1995), which was approved by the Services and the Gulf States Marine Fisheries Commission, provide a more detailed discussion of the reasons for the species' decline and threats to surviving populations (available by request or at the FWS Internet site, see **ADDRESSES**).

The Gulf Sturgeon Recovery/Management Plan (FWS *et al.*, 1995) recommended that genetic studies be done to determine geographically distinct management units. Some work in this regard has been completed (Stabile *et al.*, 1996), but we have not formally adopted management units at this time. For purposes of this final rule, we have used the term subpopulation to subdivide the Gulf sturgeon population

based on geography, degree of connectedness, and genetic interchange (Lande and Barrowclough, 1987; and King *et al.*, 2001). Seven subpopulations are described in the ''Critical Habitat Unit Descriptions'' section of this rule.

Feeding Habits

Gulf sturgeon feeding habits in freshwater vary depending on the fish's life history stage (*i.e.*, young-of-the-year, juvenile, subadult, adult). Young-of-the-year Gulf sturgeon remain in freshwater feeding on aquatic invertebrates and detritus approximately 10 to 12 months after spawning occurs (Mason and Clugston, 1993; and Sulak and Clugston, 1999). Juveniles (less than 5 kg (11 lbs) are believed to forage extensively and exploit scarce food resources throughout the river, including aquatic insects (*e.g.*, mayflies and caddisflies), worms (oligochaetes), and bivalve molluscs (Huff, 1975; and Mason and Clugston, 1993). Juvenile (ages 1 to 6) Gulf sturgeon collected in the Suwannee River are trophically active (foraging) near the river mouth at the estuary, but trophically dormant (not foraging) in summer holding areas upriver—a portion of the juvenile population reside and feed year round near the river mouth at the estuary, not just in winter (K. Sulak, U.S. Geological Survey (USGS), pers. comm. 2002). In the Choctawhatchee River, juvenile (ages 1 to 6) Gulf sturgeon did not remain near the estuary at the river mouth for the entire year, instead, they were located during winter months in Choctawhatchee Bay and returned upriver to resting areas in the spring (F. Parauka, FWS, pers. comm. 2002). Subadult (age 6 to sexual maturity) and adult (sexually mature) Gulf sturgeon do not feed in freshwater (Wooley and Crateau, 1985; and Mason and Clugston, 1993).

Many reports indicate that adult and subadult Gulf sturgeon lose a substantial percentage of their body weight while in freshwater (Wooley and Crateau, 1985; Mason and Clugston, 1993; and Clugston *et al.*, 1995) and then compensate the loss during winter feeding in the estuarine and marine environments (Wooley and Crateau, 1985; and Clugston *et al.*, 1995). Gu *et al.* (2001) tested the hypothesis that subadult and adult Gulf sturgeon do not feed significantly during their annual residence in freshwater by comparing stable carbon isotope ratios of tissue samples from subadult and adult Suwannee River Gulf sturgeon and their potential freshwater and marine food sources. A large difference in isotope ratios between freshwater food sources and fish muscle tissue suggests that subadult and adult Gulf sturgeon do not feed significantly in freshwater. The isotope similarity between Gulf sturgeon and marine food resources strongly indicates that this species relies almost entirely on the marine food web for its growth (Gu *et al.*, 2001).

Once subadult and adult Gulf sturgeon leave the river, having spent at least 6 months in the river fasting, we presume that they immediately begin feeding. Upon exiting the rivers, Gulf sturgeon are found in high concentrations near their natal river mouths. Lakes and bays at the mouths of the river systems where Gulf sturgeon occur are important because they offer the first opportunity for Gulf sturgeon exiting their natal rivers to forage. Gulf sturgeon must be able to consume sufficient quantities of prey while in estuarine and marine waters to regain the weight they lose while in the river system and to maintain positive growth on a yearly basis. In addition, reproductively active Gulf sturgeon require additional food resources to obtain sufficient energy necessary for reproduction (Fox *et al.*, 2002; and D. Murie and D. Parkyn, University of Florida (UF), pers. comm. 2002).

Adult and subadult Gulf sturgeon, while in marine and estuarine habitat, are thought to forage opportunistically (Huff, 1975), primarily on benthic (bottom dwelling) invertebrates. Gut content analyses have indicated that the Gulf sturgeon's diet is predominantly amphipods, lancelets, polychaetes, gastropods, shrimp, isopods, molluscs, and crustaceans (Huff, 1975; Mason and Clugston, 1993; Carr *et al.*, 1996b; Fox *et al.*, 2000; and Fox *et al.*, 2002). Gulf sturgeon from the Suwannee River subpopulation are known to forage on brachiopods (Murie and Parkyn, pers. comm. 2002); however, this is not a documented prey item of other subpopulations. Ghost shrimp (*Lepidophthalmus louisianensis*) and the haustoriid amphipod (*Lepidactylus* spp.) are strongly suspected to be important prey for adult Gulf sturgeon over 1 m (3.3 ft) (Heard *et al.*, 2000; and Fox *et al.*, 2002). This hypothesis is based on the following evidence: (1) Gulf sturgeon have been consistently located and observed actively feeding in areas where numerous burrows similar to those occupied by ghost shrimp exist (Fox *et al.*, 2000) and in areas having a high density of ghost shrimp and haustoriid amphipods (Heard *et al.*, 2000), (2) the digestive tracts of two adult Gulf sturgeon that died during netting operations contained numerous ghost shrimp (Fox *et al.*, 2000), (3) stomach contents of a 30 kg (67 lb) sturgeon taken in the upper portion of Choctawhatchee Bay contained more than 100 individual haustoriid amphipods and 67 ghost shrimp (Heard *et al.*, 2000), and (4) approximately one-third of 157 sturgeon guts analyzed by Carr *et al.* (1996b) contained exclusively brachiopods and ghost shrimp.

Reproduction

Gulf sturgeon are long-lived, with some individuals reaching at least 42 years in age (Huff, 1975). Age at sexual maturity for females ranges from 8 to 17 years, and for males from 7 to 21 years (Huff, 1975). Gulf sturgeon eggs are demersal (they are heavy and sink to the bottom), adhesive, and vary in color from gray to brown to black (Vladykov and Greeley, 1963; Huff, 1975; and Parauka *et al.*, 1991). Chapman *et al.* (1993) estimated that mature female Gulf sturgeon weighing between 29 and 51 kg (64 and 112 lb) produce an average of 400,000 eggs. Habitat at egg collection sites consists of one or more of the following: limestone bluffs and outcroppings, cobble, limestone bedrock covered with gravel and small cobble, gravel, and sand (Marchant and Shutters, 1996; Sulak and Clugston, 1999; Heise *et al.*, 1999a; Fox *et al.*, 2000; and Craft *et al.*, 2001). On the Suwannee River, Sulak and Clugston (1999) suggest a dense matrix of gravel or cobble is likely essential for Gulf sturgeon egg adhesion and the sheltering of the yolk sac larvae, and is a habitat spawning adults apparently select. Other substrates identified as possible spawning habitat include marl (clay with substantial calcium carbonate), soapstone, or hard clay (W. Slack, Mississippi Museum of Natural Science (MMNS), pers. comm. 2002; and F. Parauka, pers. comm. 2002). Water depths at egg collection sites ranged from 1.4 to 7.9 m (4.6 to 26 ft), with temperatures ranging from 18.2 to 23.9 degrees Celsius (°C) (64.8 to 75.0 degrees Fahrenheit (°F)) (Fox *et al.*, 2000; Ross *et al.*, 2000; Craft *et al.*, 2001). Laboratory experiments indicated optimal water temperature for survival of Gulf sturgeon larvae is between 15 and 20 °C (59 and 68 °F), with low tolerance to temperatures above 25 °C (77 °F) (Chapman and Carr, 1995). Researchers hypothesize that spawning must take place where the hydrological and chemical settings are appropriate for gamete (mature reproductive cell) function, and temperature, pH, and dissolved oxygen conditions are stable and appropriate for embryonic and yolk sac larval development (Sulak and Clugston, 1999).

Sulak and Clugston (1999) suggested that sturgeon spawning activity in the Suwannee River is related to the phase

of the moon, but only after the water temperature has risen to 17 °C (62.6 °F). Other researchers however, have found little evidence of spawning associated with lunar cycles (Slack *et al.*, 1999; and Fox *et al.*, 2000). Spawning in the Suwannee River occurs during the general period of spring high water, when ionic conductivity and calcium ion concentration are most favorable for egg development and adhesion (Sulak and Clugston, 1999). Fox *et al.* (2002) found no clear pattern between timing of Gulf sturgeon entering the river and flow patterns on the Choctawhatchee River. Ross *et al.* (2001b) surmised that the high flows in early March were a cue for sturgeon to begin their upstream movement in the Pascagoula River.

Atlantic sturgeon (*A. oxyrinchus*) exhibit a long inter-spawning period, with females spawning at intervals ranging from every 3 to 5 years, and males every 1 to 5 years (Smith, 1985). It is believed that Gulf sturgeon exhibit similar spawning periodicity, as male Gulf sturgeon are capable of annual spawning, and females require more than one year between spawning events (Huff, 1975; and Fox *et al.*, 2000).

Freshwater Habitat

In the spring (March to May), most adult and subadult Gulf sturgeon return to their natal river, where sexually mature sturgeon spawn, and the population spends until October or November (6 to 8 months) in freshwater (Odenkirk, 1989; Foster, 1993; Clugston *et al.*, 1995; and Fox *et al.*, 2000). Fox *et al.* (2000) found that some individuals of the Choctawhatchee River subpopulation do not enter the river until the summer months. Gulf sturgeon migration is further discussed in the ''Migration'' section of this rule. During their early life history stages, sturgeon require bedrock and clean gravel or cobble substrate for eggs to adhere to and for shelter for developing larvae (Sulak and Clugston, 1998). Young-of-the-year appear to disperse widely, using extensive portions of the river as nursery habitat. They are typically found on sandbars and sand shoals over rippled bottom and in shallow, relatively open, unstructured areas. Given that the river is generally nutrient poor with low levels of total phosphorus and organic carbon, suggesting low productivity, this dispersal may be an adaptation to exploit scarce food resources (Randall and Sulak, 1999). Clugston *et al.* (1995) reported that young Gulf sturgeon in the Suwannee River, weighing between 0.3 and 2.4 kg (0.7 and 5.3 lb), remain in the vicinity of the river mouth and estuary during the winter and spring.

Adult Gulf sturgeon spawn in upper river reaches. On some river systems such as the Pascagoula River and Apalachicola River, some adult and subadult Gulf sturgeon remain near the spawning grounds throughout the summer months (Wooley and Crateau, 1985; and Ross *et al.*, 2001b), but the majority move downstream to areas referred to as summer resting or holding areas. In other rivers, most Gulf sturgeon spawn and move downstream to aggregation areas also referred to as summer resting or holding areas. A few Gulf sturgeon have been documented remaining at or near their spawning grounds throughout the winter (Wooley and Crateau, 1985; Slack *et al.*, 1999; and Heise *et al.*, 1999a). Adults and subadults are not distributed uniformly throughout the river, but show a preference for these discrete areas usually located in lower and middle river reaches (Hightower *et al.*, in press). Often, these resting areas are located in close proximity to natural springs throughout the warmest months of the year, but are not located within a spring or thermal plume emanating from a spring (Clugston *et al.,* 1995; Foster and Clugston, 1997; and Hightower *et al.*, in press). These resting areas are also often located in deep holes or shallow areas along straight-aways ranging from 2 to 19 m (6.6 to 62.3 ft) deep (Wooley and Crateau, 1985; Morrow *et al.*, 1998a; Ross *et al.*, 2001a and b; Craft *et al.*, 2001; and Hightower *et al.*, in press). The substrates consisted of mixtures of limestone and sand (Clugston *et al.*, 1995), sand and gravel (Wooley and Crateau, 1985; and Morrow *et al.*, 1998a), or just sandy substrate (Hightower *et al.*, in press).

River flow may serve as an environmental cue that governs both sturgeon migration and spawning (Chapman and Carr, 1995; and Ross *et al.*, 2001b). If the flow rate is too high, sturgeon in several life-history stages can be adversely affected. Data describing the sturgeon's swimming ability in the Suwannee River strongly indicates that they cannot continually swim against prevailing currents of greater than 1 to 2 m per second (3.2 to 6.6 ft per second) (K. Sulak, USGS, pers. comm. cited in Wakeford, 2001). If the flow is too strong, eggs might not be able to settle on and adhere to suitable substrate (Wooley and Crateau *et al.*, 1985). Flows that are too low can cause clumping of eggs, which leads to increased mortality from asphyxiation and fungal infection (Wooley and Crateau *et al.*, 1985). Flow velocity requirements for age 0 sturgeon may vary depending on substrate type. Chan *et al.* (1997) found that age 0 Gulf sturgeon under laboratory conditions exposed to water velocities over 12 centimeters per second (cm/s) (4.7 inches per second (in/s)) preferred a cobble substrate, but favored water velocities under 12 cm/s (4.7 in/s) and then used a variety of substrates (sand, gravel, and cobble).

Gulf sturgeon require large areas of diverse habitat that have natural variations in water flow, velocity, temperature, and turbidity (FWS *et al.*, 1995; and Wakeford, 2001). Natural surface and groundwater discharges influence a river's characteristic fluctuations in volume, depth, and velocity (Leitman *et al.*, 1993; and Albertson and Torak, 2002). Change in temperature is thought to be an important factor in initiating sturgeon migration (Wooley and Crateau, 1985; Chapman and Carr, 1995; and Foster and Clugston, 1997) (see ''Migration'' section for temperature ranges). Laboratory experiments indicate that Gulf sturgeon eggs, embryos, and larvae have the highest survival rates when temperatures are between 15 and 20 °C (59 and 68 °F). Mortality rates of Gulf sturgeon gametes and embryos are highest when temperatures are 25 °C (77 °F) and above (Chapman and Carr, 1995) (see ''Reproduction'' section for more detail). Researchers have documented temperature ranges at Gulf sturgeon resting areas between 15.3 and 33.7 °C (59.5 and 92.7 °F) with dissolved oxygen levels between 5.6 and 9.1 milligrams per liter (mg/l) (Morrow *et al.*, 1998a; and Hightower *et al.*, in press).

In comparison to other fish species, sturgeon have a limited behavioral and physiological capacity to respond to hypoxia (insufficient oxygen levels) (Secor and Niklitschek, 2001). Basal metabolism, growth, consumption, and survival are sensitive to changes in oxygen levels (Secor and Niklitschek, 2001). In laboratory experiments, young shortnose sturgeon (*A. brevirostrum*) (less than 77 days old) died at oxygen levels of 3.0 mg/l and all sturgeon died at oxygen levels of 2.0 mg/l (Jenkins *et al.*, 1993). Data concerning the temperature, oxygen, and current velocity requirements of cultured sturgeon are being collected. Researchers plan to use information gained from these laboratory experiments on hatchery-reared sturgeon to develop detailed information on water flow requirements of wild sturgeon throughout different phases of their freshwater residence (Wakeford, 2001).

Estuarine and Marine Habitat

Most subadult and adult Gulf sturgeon spend cool months (October or November through March or April) in estuarine areas, bays, or in the Gulf of Mexico (Odenkirk, 1989; Foster, 1993; Clugston *et al.*, 1995; and Fox *et al.*, 2002). Studies of subadult Gulf sturgeon (ages 4 to 7) in Choctawhatchee Bay found that 78 percent of tagged fish remained in the bay the entire winter, while 13 percent ventured into a connecting bay. Possibly the remaining 9 percent overwintered in the Gulf of Mexico (FWS, 1998). Adult Gulf sturgeon are more likely to overwinter in the Gulf of Mexico, with 45 percent of the tagged adults presumed to have left Choctawhatchee Bay and spent extended periods of time in the Gulf of Mexico (Fox and Hightower, 1998; and Fox *et al.*, 2002). In contrast, Gulf sturgeon from the Suwannee River subpopulation are known to migrate into the nearshore waters, where they remain for up to two months and then depart to unknown feeding locations in the open Gulf of Mexico (Carr *et al.*, 1996b; and Edwards *et al.*, in prep.).

Research in Choctawhatchee Bay indicates that subadult Gulf sturgeon show a preference for sandy shoreline habitats with water depths less than 3.5 m (11.5 ft) and salinity less than 6.3 parts per thousand (Parauka *et al.*, in press). Fox and Hightower (1998) found that adult Gulf sturgeon monitored in Choctawhatchee Bay use some of the same habitats as subadults. The majority of tagged fish have been located in areas lacking seagrass (Fox *et al.*, 2002; and Parauka *et al.*, in press).

Craft *et al.* (2001) found that Gulf sturgeon in Pensacola Bay appear to prefer shallow shoals 1.5 to 2.1 m (5 to 7 ft) and deep holes near passes. Unvegetated, fine to medium-grain sand habitats, such as sandbars, and intertidal and subtidal energy zones resulting in sediment sorting and a preponderance of sand support a variety of potential prey items including estuarine crustaceans, small bivalve mollusks and lancelets (Menzel, 1971; Abele and Kim, 1986; American Fisheries Society, 1989; and M. Brim, FWS, pers. comm. 2002).

Habitats used by Gulf sturgeon in the vicinity of the Mississippi Sound barrier islands tend to have a sand substrate and an average depth of 1.9 to 5.9 m (6.2 to 19.4 ft). Preliminary data from bottom samples taken in these barrier island areas show that all samples contain lancelets (*Branchiostoma*). Since lancelets are a documented prey of Gulf sturgeon, it is likely that Gulf sturgeon are feeding along the sand substrate at barrier island passes (Ross *et al.*, 2001a). Gulf of Mexico nearshore (less than 1.6 km (1 mi)) unconsolidated, fine-medium grain sand habitats, including natural inlets and passes from the Gulf to estuaries, support crustaceans such as mole crabs, sand fleas, various amphipod species, and lancelets (Menzel, 1971; Abele and Kim, 1986; American Fisheries Society, 1989; and Brim, pers. comm. 2002).

Estuary and bay unvegetated habitats have a preponderance of sandy substrates that support burrowing crustaceans, such as ghost shrimp, small crabs, various polychaete worms, and small bivalve mollusks (Menzel, 1971; Abele and Kim, 1986; American Fisheries Society, 1989; and Brim, pers. comm. 2002). Gulf sturgeon are often located in these areas, and because their known prey items are present, it is assumed that Gulf sturgeon are foraging.

Migration

Migratory behavior of the Gulf sturgeon seems influenced by sex, reproductive status, water temperature, and possibly river flow. Carr *et al.* (1996b) reported that male Gulf sturgeon initiate migration to the river earlier in spring than females. Fox *et al.* (2000) found no significant difference in the timing of river entry due to sex, but reported that males migrate further upstream than females and that ripe (in reproductive condition) males and females enter the river earlier than nonripe fish (Fox *et al.*, 2000). Most adults and subadults begin moving from estuarine and marine waters into the coastal rivers in early spring (*i.e.*, March through May) when river water temperatures range from 16.0 to 23.0 °C (60.8 to 73.4 °C) (Huff, 1975; Carr, 1983; Wooley and Crateau, 1985; Odenkirk, 1989; Clugston *et al.*, 1995; Foster and Clugston, 1997; Fox and Hightower, 1998; Sulak and Clugston, 1999; and Fox *et al.*, 2000), while others may enter the rivers during summer months (Fox *et al.*, 2000). Some research supports the theory that spring migration coincides with the general period of spring high water (Chapman and Carr, 1995; Sulak and Clugston, 1999; and Ross *et al.*, 2001b), however, observations on the Choctawhatchee River have not found a clear relationship between the timing of river entrance and flow patterns (Fox *et al.*, 2002).

Downstream migration from fresh to saltwater begins in September (at about 23°C (73.4°F)) and continues through November (Huff, 1975; Wooley and Crateau,1985; and Foster and Clugston, 1997). During the fall migration from fresh to saltwater, Gulf sturgeon may require a period of physiological acclimation to changing salinity levels, referred to as osmoregulation or staging (Wooley and Crateau, 1985). This period may be short (Fox *et al.*, 2002) as sturgeon develop an active mechanism for osmoregulation and ionic balance by age one (Altinok *et al.*, 1997). On some river systems, timing of the fall migration appears to be associated with pulses of higher river discharge (Heise *et al.*, 1999a and b; Ross *et al.*, 2000 and 2001b; and Parauka *et al.*, in press).

Sturgeon ages 1 through 6 remain in the mouth of the Suwannee River over winter. In late January through early February, young-of-the-year Gulf sturgeon migrate down river for the first time (Sulak and Clugston, 1999). Huff (1975) noted that juvenile Gulf sturgeon in the Suwannee River most likely participated in pre- and post-spawning migrations, along with the adults.

Findeis (1997) described sturgeon (Acipenseridae) as exhibiting evolutionary traits adapted for benthic cruising. Tracking observations by Sulak and Clugston (1999), Fox *et al.* (2002), and Edwards *et al.* (in prep.) support that individual fish move over an area until they encounter suitable prey type and density, at which time they forage for extended periods of time. Individual fish often remained in localized areas (less than 1 km^2 (0.4 mi^2) for extended periods of time (greater than two weeks) and then moved rapidly to another area where localized movements occurred again (Fox *et al.*, 2002). It is unknown precisely how much benthic area is needed to sustain Gulf sturgeon health and growth, but because Gulf sturgeon have been known to travel long distances (greater than 161 km (100 mi)) during their winter feeding phase, significant resources must be necessary. These winter migrations are an important strategy for feeding and for occasional travel to non-natal rivers for possible spawning and resultant genetic interchange among subpopulations. Bays and portions of Gulf of Mexico waters adjacent to the lakes and bays near the mouths of the rivers where Gulf sturgeon occur are believed to be important for feeding and/or migrating (inter-river migrations that facilitate maintenance of the natural hierarchy of between river genetic variability).

When temperature drops occur that are associated with major cold fronts, researchers of the Escambia, Yellow, and Suwannee Rivers subpopulations have been unable to locate adult Gulf sturgeon within the bays (Craft *et al.*, 2001; and Edwards *et al.*, in prep.). They hypothesize that the drop in water temperatures associated with cold fronts disperses sturgeon to more distant foraging grounds. It is currently

unknown whether Gulf sturgeon undertake extensive offshore migrations, and further study is needed to determine whether important winter feeding habitat occurs in farther offshore areas.

Sulak and Clugston (1999) described two hypotheses regarding areas adult Gulf sturgeon may overwinter in the Gulf of Mexico in order to find abundant prey. The first hypothesis is that Gulf sturgeon spread along the coast in nearshore waters in depths less than 10 m (33 ft). The alternative hypothesis is that they migrate far offshore to the broad sedimentary plateau in deep water (40 to 100 m (131 to 328 ft)) west of the Florida Middle Grounds, where over twenty species of bottom-feeding fish congregate in the winter (Darnell and Kleypas, 1987). Available data support the first hypothesis. Evaluation of tagging data has identified several nearshore Gulf of Mexico feeding migrations, but no offshore Gulf of Mexico feeding migrations or areas. Telemetry data document that Gulf sturgeon from the Pearl River and Pascagoula River subpopulations migrate from their natal bay systems to Mississippi Sound and move along the barrier islands, with relocation of tagged individuals greatest in the passes between islands (Ross *et al.*, 2001a; and Rogillio *et al.*, 2002). Gulf sturgeon from the Choctawhatchee River, Yellow River, and Apalachicola River have been documented migrating in the nearshore Gulf of Mexico waters between Pensacola and Apalachicola Bays (Fox *et al.*, 2002; and F. Parauka, pers. comm. 2002). Telemetry data in the Gulf of Mexico usually locate sturgeon in depths of 6 m (19.8 ft) or less (Ross *et al.*, 2001a; Fox *et al.*, 2002; Rogillio *et al.*, 2002; and F. Parauka, pers. comm. 2002).

River-Specific Fidelity

Stabile *et al.* (1996) analyzed tissue from Gulf sturgeon in eight drainages along the Gulf of Mexico for genetic diversity. They noted significant differences among Gulf sturgeon stocks and suggested that they displayed region-specific affinities and may exhibit river-specific fidelity. Stabile *et al.* (1996) identified five regional or river-specific stocks (from west to east): (1) Lake Pontchartrain and Pearl River, (2) Pascagoula River, (3) Escambia and Yellow Rivers, (4) Choctawhatchee River, and (5) Apalachicola, Ochlockonee, and Suwannee Rivers.

Tagging studies suggest that Gulf sturgeon exhibit a high degree of river fidelity (Carr, 1983). From 1981 to 1993, 4,100 fish were tagged in the Apalachicola and Suwannee Rivers. Of these, 868 total fish were recaptured (FWS *et al.* 1995). Of the recaptured fish, 860 fish (99 percent) were recaptured in the river of their initial collection. Eight fish moved between river systems and represented less than 1 percent (0.009) of the 868 total fish recaptured (FWS *et al.*, 1995). We have no information documenting spawning adults in non-natal rivers. Foster and Clugston (1997) noted that telemetered Gulf sturgeon in the Suwannee River returned to the same areas as the previous summer, and suggested that chemical cuing may influence distribution.

To date, biologists have documented a total of 22 Gulf sturgeon making inter-river movements from natal rivers. They are as follows: Apalachicola River to Suwannee River, six Gulf sturgeon (Carr *et al.*, 1996b); Apalachicola River to Deer Point Lake (North Bay of the St. Andrew Bay system), one fish (Wooley and Crateau, 1985); Suwannee River to Apalachicola River, three sturgeon (Carr *et al.*, 1996b; and F. Parauka, pers. comm. 2002); Choctawhatchee River to Apalachicola River, one sturgeon (F. Parauka, pers. comm. 2002); Yellow River to Choctawhatchee River, three female sturgeon (two adult, one subadult) (Craft *et al.*, 2001); Yellow River to Louisiana Estuarine area, one female sturgeon (Craft *et al.*, 2001); Escambia River to Yellow River, one mature female on spawning grounds (Craft *et al.*, 2001); Suwannee River to Ochlockonee River, one sturgeon (FWS *et al.*, 1995); Choctawhatchee River to Escambia River, one male sturgeon (Fox *et al.*, 2002); Choctawhatchee River to Escambia, one female sturgeon (Fox *et al.*, 2002); Pearl River (Bogue Chitto) to Pascagoula River, one sturgeon (Ross *et al.*, 2001b); Choctawhatchee River to Pascagoula River, one subadult sturgeon (Ross *et al.*, 2001b); and Pascagoula River to Yellow River, one sturgeon (Ross *et al.*, 2001b).

Tallman and Healey (1994) noted that observed straying rates between rivers were not the same as actual gene flow rates, *i.e.*, inter-stock movement does not equate to interstock reproduction. The gene flow is low in Gulf sturgeon stocks, with each stock exchanging less than one mature female per generation (Waldman and Wirgin, 1998).

Previous Federal Action

Federal action on the Gulf sturgeon began in 1982, when the fish was included as a Category 2 candidate species for listing in the FWS's vertebrate notices of review dated December 30, 1982 (47 FR 58454) and September 18, 1985 (50 FR 37958), and in the animal notice of review dated January 6, 1989 (54 FR 554). At that time, the FWS gave Category 2 designation to species for which listing as threatened or endangered was possibly appropriate, but for which additional biological information was needed to support a proposed rule. A status report on the Gulf sturgeon (Hollowell, 1980) had concluded that the fish had been reduced to a small population due to overfishing and habitat loss. In 1988, the FWS completed a report on the conservation status of the Gulf sturgeon, which recommended listing it as a threatened species (Barkuloo, 1988).

The Services jointly proposed the Gulf sturgeon for listing as a threatened species on May 2, 1990 (55 FR 18357). In that proposed rule, we stated that designation of critical habitat was not prudent due to the species'' broad range and the lack of knowledge about specific areas used by the species. We published the final rule on September 30, 1991 (56 FR 49653) to add Gulf sturgeon to the list of threatened species, and included a special rule under section 4(d) of the Act to allow the take of Gulf sturgeon, in accordance with applicable State fish and wildlife conservation laws and regulations, for educational and scientific purposes, the enhancement of propagation or survival of the species, zoological exhibition, and other conservation purposes.

Section 4(a)(3)(A) of the Act requires that critical habitat be designated concurrently with a determination that a species is endangered or threatened, to the maximum extent prudent and determinable. When such a designation is not determinable at the time of final listing of a species, or if a prompt determination of endangered or threatened status is essential to the conservation of the species, section 4(b)(6)(C) of the Act provides for an additional year to promulgate a final critical habitat designation. In the final rule listing Gulf sturgeon as a threatened species, we found that a critical habitat designation may be prudent but was not determinable. We found that prompt determination of threatened status was essential to the conservation of the species and stated that we would make a final decision on designation of critical habitat by May 2, 1992. This decision, however, was not made.

On August 11, 1994, the Sierra Club Legal Defense Fund, Inc. (Fund), on behalf of the Orleans Audubon Society and Florida Wildlife Federation, gave written notice of their intent to file suit against the Department of the Interior for failure to designate critical habitat for the Gulf sturgeon within the statutory time limits established under

the Act. The Fund filed suit on October 11, 1994 (*Orleans Audubon Society* v. *Babbitt,* Civ. No. 94–3510 (E.D. La)). Following a court order on August 9, 1995, granting the Fund's motion for summary judgement, the Services published a notice of decision on critical habitat designation for the Gulf sturgeon on August 23, 1995 (60 FR 43721). We determined that critical habitat designation was not prudent based on the lack of additional conservation benefit to the species.

On September 22, 1995, the Services and the Gulf States Marine Fisheries Commission approved the Gulf Sturgeon Recovery/Management Plan (FWS *et al.*, 1995). The recovery plan established the criteria that must be met prior to the delisting of the Gulf sturgeon. The recovery plan also identified the actions that are needed to assist in the recovery of the Gulf sturgeon.

On August 12, 1996, the plaintiffs filed a motion to add the Department of Commerce as a defendant in the lawsuit. The Fund amended their complaint to challenge the August 1995 ''not prudent'' determination. On October 30, 1997, the court granted the plaintiffs' motion for summary judgment, with relief restricted to a remand of the ''not prudent'' determination to the Services, requiring that the Services publish a determination on designation of critical habitat, based on the best scientific information available. On February 27, 1998, we published a notice of decision (63 FR 9967) on critical habitat designation for the Gulf sturgeon. We again determined that lack of additional conservation benefit from critical habitat designation for this species made such designation not prudent.

On December 18, 1998, the Sierra Club sued the Services challenging the new determination not to designate critical habitat for the Gulf sturgeon (*Sierra Club* v. *U.S. Fish and Wildlife Service et al.* CA No. 98–3788 (E.D. La.)). On January 25, 2000, the Court issued an order granting our motion for summary judgment and dismissing the complaint. The Sierra Club filed an appeal and, in March 2001, the United States Court of Appeals for the 5th Circuit reversed the decision of the District Court and instructed the District Court to remand the decision to us for reconsideration (*Sierra Club* v. *U.S. Fish and Wildlife Service, 245 F.3d 434* (5th Cir. 2001)). On August 3, 2001, the District Court issued an order directing us to publish a proposed decision concerning critical habitat designation for the Gulf sturgeon by February 2, 2002, and a final decision by August 2, 2002. Negotiation with the plaintiff resulted in an agreement to submit the proposed decision to the **Federal Register** on or by May 23, 2002, and the final decision on or by February 28, 2003.

On June 6, 2002, we published a proposed rule in the **Federal Register** in which we announced our determination that designation of critical habitat was prudent, proposed designation of critical habitat for Gulf sturgeon, announced four public meetings and hearings, and requested comments on the proposal by September 23, 2002 (67 FR 39106). On August 8, 2002, we published a notice in the **Federal Register** (67 FR 51530) announcing the availability of the draft economic analysis and the extension of the comment period through October 7, 2002. We also corrected the address of a public hearing to be held in Defuniak Springs, FL on August 20, 2002. We held public meetings and public hearings on the proposed rule and draft economic analysis at four locations: Live Oak, Florida, on August 19, 2002; Defuniak Springs, Florida, on August 20, 2002; Biloxi, Mississippi, on August 21, 2002; and Kenner, Louisiana, on August 22, 2002.

Summary of Comments and Recommendations

We contacted appropriate Federal, State, and local agencies, scientific organizations, and other interested parties and invited them to comment on the proposal to designate critical habitat for the Gulf sturgeon. In addition, we published newspaper notices inviting public comment on the proposed rule and the draft economic analysis, and announced the public meetings and hearings in the following newspapers: *St. Petersburg Times,* Pensacola *News Journal,* Panama City *The News Herald,* Fort Walton *Daily News,* Crystal River *Citrus County Chronicle, Tallahassee Democrat,* and *The Gainesville Sun,* in Florida; *The Brewton Standard, Dothan Eagle, Geneva County Reaper,* and *Mobile Register,* in Alabama; Hinds County *The Clarion-Ledger* and Gulfport's *The Sun Herald,* in Mississippi; and New Orleans *The Times-Picayune* and Baton Rouge's *The Advocate* in Louisiana.

We held four public meetings and four public hearings on the proposed rule (see ''Previous Federal Action'' section for dates and locations). Transcripts of these hearings are available for inspection (*see* **ADDRESSES**).

We received written letters or e-mails from a total of 126 parties which included 2 congressional representatives from Georgia, 10 Federal agencies, 13 State agencies, 5 county governments, 93 groups or individuals, and 3 peer reviewers. Of the 128 total responses, 29 supported the proposed rule, 2 opposed it, and the rest were neutral.

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited independent opinions from six knowledgeable individuals having expertise either with the species, with the geographic region where the species occurs, and/or familiarity with the principles of conservation biology. Three of these experts provided a written response generally supporting the designation and provided additional information that we have incorporated into the rule as appropriate. We appreciate the responses of these peer reviewers, and believe their input has improved the content of this rule.

We reviewed all comments received for substantive issues and new data regarding critical habitat and Gulf sturgeon. Some comments resulted in changes between the proposed and final designations, and those comments are discussed in the ''Summary of Changes From the Proposed Rule'' section of this document. Written comments and oral statements presented at the public hearings and received during the comment period are addressed in the following summary. For readers' convenience we have assigned comments to major issue categories. We have combined similar comments into single comments and responses.

Peer Review Comments

Comment 1: Three peer reviewers recommended that additional areas be included as critical habitat, sometimes stating that the areas contain the primary constituent elements upon which Gulf sturgeon rely. Others requested inclusion based on historic use or potential use by the Gulf sturgeon in these areas. The areas requested for inclusion were St. Joseph Bay in Florida, the western portion of Lake Pontchartrain and all of Lake Maurepas in Louisiana, and the Strong River in Mississippi.

Also, twenty eight commenters recommended that additional areas be included as critical habitat, with some stating that the areas contain the primary constituent elements. Others requested inclusion based on historic use or potential use by the Gulf sturgeon in these areas. Other commenters expressed concerns that the proposed designation did not include all of the current range of the Gulf sturgeon. The areas requested for inclusion were the Ochlockonee River, Withlacoochee

River (central Florida river, not the tributary of the Suwannee River), West Bay, East Bay of St. Andrew Bay system, St. Andrew Bay, St. Joseph Bay, Tampa Bay, and the Hillsborough River in Florida; an additional Choctawhatchee River reach, Mobile Bay, Murder Creek (tributary of the Conecuh River), Alabama River, Bayou La Batre, and Perdido Bay in Mobile Bay, in Alabama; Strong River in Mississippi; the western portion of Lake Pontchartrain, Tickfaw River, Tchefuncte River, Lake Maurepas, Chandeleur Sound, in Louisiana; and the coastline from Mississippi to Tampa Bay, Florida.

Our Response: Section 4(b)(2) of the Act directs us to designate critical habitat on the basis of the best scientific data available. However, no or insufficient data were provided to us to support inclusion of any of the above areas as critical habitat. While many of these areas may have historically supported Gulf sturgeon populations and/or may currently support populations, we cannot document that they are essential to the conservation of the Gulf sturgeon.

The definition of critical habitat in section 3(5)(A) of the Act includes ''(I) specific areas within the geographic 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) which may require special management considerations or protection; and (ii) specific areas outside the geographic 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.'' By definition, essential critical habitat generally describes a subset of the area potentially containing primary constituent elements for a species. As discussed in the methods section of the proposed and this final rule, to determine areas essential for the conservation of the Gulf sturgeon, we used the best scientific data available pertaining to known habitat requirements of the species. Areas designated as critical habitat for the Gulf sturgeon are within the current known range of the species and contain one or more primary constituent elements essential for the conservation of the species. In our proposed and final designation of critical habitat, we selected essential habitat areas that currently contain populations or provide habitat components essential to the conservation of the species. During this analysis, it was determined that some areas containing one or more primary constituent elements did not represent suitable habitat or were otherwise not essential to the conservation of the species.

Comment 2: One peer reviewer stated that the designation of critical habitat for the Chickasawhay River (Unit 2) should be expanded upstream to the beginning of the Chickasawhay River starting at the confluence of the Chunky and Okatibbee Rivers, north of Enterprise (Clarke County, Mississippi). This area contains the primary constituent elements as noted in the proposed rule, including potential spawning habitat. Research efforts conducted during spring 2002 by the University of Southern Mississippi (USM)-MMNS Gulf sturgeon research group documented the most upstream movement of a radio-tagged individual on the Chickasawhay River traveling as far upstream as the confluence of the Chunky and Okatibbee rivers. This individual was originally tagged at the mouth of the Pascagoula River during early-March 2002.

Our Response: The area requested for inclusion would add 19 rkm (12 rmi) to the designation on the Chickasawhay River in Mississippi. However, we believe that what we proposed for the Gulf sturgeon including the portion of the Chickasawhay River proposed for designation, includes sufficient habitat to conserve the species. Accordingly, we have not made the requested change. Moreover, areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1) and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard and the section 9 take prohibitions.

Comment 3: One peer reviewer questioned whether all Gulf sturgeon overwinter in the marine and estuarine environment and what the potential impacts on the population would be if critical habitat had a temporal component to its designation.

Our Response: A few Gulf sturgeon have been documented remaining at or near their spawning grounds throughout the winter (Wooley and Crateau, 1985; Slack *et al.*, 1999; and Heise *et al,.* 1999a). However, this is an exception to the normal behavior of adult Gulf sturgeon. During winter months, juveniles often remain in the estuary near the river mouth, but adult and sub-adults leave the riverine habitat to forage in the estuarine and marine areas. Critical habitat has no temporal boundaries, only spatial. If an area is designated as critical habitat, it receives equal protection throughout the year regardless of the presence or absence of the species.

Comment 4: One peer reviewer and one commenter questioned our rationale for deriving seven subpopulations from the five that were proposed by Stabile *et al.* (1996).

Our Response: We first evaluated the Gulf sturgeon in the context of its current distribution throughout the historic range to determine what portion of the range must be designated to ensure conservation of the species. We considered several factors in this evaluation: (1) Maintaining overall genetic integrity and natural rates of inter-river genetic exchange, thereby minimizing the potential for inbreeding, (2) retaining potentially important selective pressure at the margins of the species' range by protecting the eastern- and western-most subpopulations, (3) decreasing the extinction risk of a subpopulation by protecting adjacent subpopulations that can provide a rescue effect, if needed, (4) avoiding the potential for subpopulation extirpation from environmental catastrophes, and (5) protecting sufficient habitat essential to the conservation of the species.

In their analysis of Gulf sturgeon subpopulations from eight drainages along the Gulf of Mexico for genetic diversity, Stabile *et al.* (1996) identified five regional or river-specific stocks (from west to east)—(1) Lake Pontchartrain and Pearl River, (2) Pascagoula River, (3) Escambia and Yellow Rivers, (4) Choctawhatchee River, and (5) Apalachicola, Ochlockonee, and Suwannee Rivers.

All five genetic stocks are represented by the seven subpopulations occupying the critical habitat units. The number, distribution, and range of the seven Gulf sturgeon subpopulations included in these units are necessary to protect and support the extent and diversity of the species' genetic integrity and can provide a rescue effect, if needed (see ''Methods'' section). We believe that these seven river systems, with their associated estuarine and marine environments, represent habitat that is essential for the conservation of the Gulf sturgeon.

Comment 5: Four commenters, including one peer reviewer, noted that the western boundary in Lake Pontchartrain (Unit 8) seemed arbitrary.

Response: Critical habitat areas in Unit 8 provide juvenile, subadult and adult feeding, resting and passage habitat for Gulf sturgeon from the Pascagoula and Pearl Rivers subpopulations. Lake Pontchartrain is divided into eastern and western areas by the Lake Pontchartrain Causeway (a twin highway bridge supported by pilings extending 33.6 km (20.9 mi) from the north to the south). Gulf

sturgeon from the Pearl River subpopulation have been documented (by tags) to use the eastern half of Lake Pontchartrain. Researchers believe that the eastern portion of the lake provides important winter habitat for juveniles and subadults, and they have located tagged individuals in Lake Pontchartrain and have repeatedly caught untagged sturgeon between Goose Point and Point Platte, an area believed to be used for winter feeding. While Gulf sturgeon have been documented in the western portion of the Lake (generally near the mouth of small rivers), it is not known whether those sturgeon are part of the Pearl and Bogue Chitto Rivers spawning subpopulation, or if they are part of a smaller spawning subpopulation that might exist within the Tickfaw, Tangipahoa, or Tchefuncte Rivers. We, therefore, conclude that the eastern portion, but not the western portion, of Lake Pontchartrain provides essential winter habitat for the Pearl River subpopulation, as data supports inclusion of the eastern portion of Lake Pontchartrain as critical habitat. Although the Lake Pontchartrain Causeway does not restrict fish movement, it does provide an appropriate and easily identifiable boundary.

Public Comments

Issue A: General Biological Comments

Comment 6: One commenter believes that forestry practices (*e.g.*, the use of silvicultural Best Management Practices and application of streamside management zones, to protect surface water quality during forestry operations) actively contribute to the conservation of the Gulf sturgeon by providing an important incentive for private landowners to retain forested riverine corridors adjacent to sturgeon habitat.

Our Response: We agree that Best Management Practices when applied correctly to silvicultural activities do protect and improve the quality of surface waters and, therefore, do contribute to the conservation of the Gulf sturgeon.

Comment 7: Some commenters questioned the basis of our statement that adult Gulf sturgeon do not feed while in freshwater.

Our Response: As stated in the proposed and final rules (see ''Feeding Habits'' section), many reports indicate that subadult and adult Gulf sturgeon fast and lose between 4 and 15 percent of their total body weight while in freshwater, and then compensate the loss during winter feeding in estuarine and marine environments (Carr, 1983; Wooley and Crateau, 1985; Clugston *et al*,. 1995; Morrow *et al.*, 1998a; Heise *et al*, 1999a; Sulak and Clugston, 1999; and Ross *et al.*, 2000). Gu *et al.* (2001) tested the hypothesis that subadult and adult Gulf sturgeon do not feed significantly during their annual residence in freshwater by comparing stable carbon isotope ratios of tissue samples from subadult and adult Gulf sturgeon and their potential freshwater and marine food sources. A large difference in isotope ratios between freshwater food sources and fish muscle tissue suggests that subadult and adult Gulf sturgeon do not feed significantly in freshwater. The isotope similarity between subadult and adult Gulf sturgeon and marine food resources strongly indicates that this species relies almost entirely on the marine food web for its growth (Gu *et al.*, 2001).

Comment 8: One commenter questioned whether fish tagging studies were limited to adults or whether they included other life stages as well.

Our Response: Juveniles (age 1 to 6 years), subadults (age 6 years to sexual maturity), and adults (sexually mature) have been marked with different types of equipment, but primarily with T-bar tags (external) and passive integrated transponder (PIT) tags (internal). Young-of-the-year less than 20 cm (7.8 inches) tail length are too small to tag with the standard markers and therefore are exclusively pit tagged (Mike Randall, USGS, pers. comm. 2002).

Comment 9: Four commenters had questions regarding Gulf sturgeon prey items and foraging areas.

Our Response: As stated in the proposed rule (67 FR 39107), the diet of the Gulf sturgeon depends on its life history stage. While adults are not known to forage in freshwater, juveniles and young-of-the-year do. We have used data from stomach content analysis and telemetry studies to identify probable Gulf sturgeon foraging areas, *i.e.*, those areas with substrate that supports the known prey items, coupled with tracking data indicating sturgeon presence. We relied on two observations to conclude that subadult and adult Gulf sturgeon do not forage in freshwater: (1) Gulf sturgeon lose a substantial percentage of their body weight while in freshwater in summer and then compensate for the loss during winter, and (2) stable isotopes from sturgeon muscle tissue and their potential marine food sources are similar, while there is a large difference between muscle tissue and potential freshwater food sources. Gulf sturgeon researchers and the Services are certain that the existing data support these conclusions regarding Gulf sturgeon food items and foraging locations.

Comment 10: Commenters wondered what we know of Gulf sturgeon's overall use of estuarine and marine waters.

Our Response: While research indicates that Gulf sturgeon utilize estuarine and marine areas for staging, resting and foraging, researchers continue to investigate Gulf sturgeon over-wintering behavior and locale. We are not able, at this time, to readily discern the Gulf sturgeon's overall utilization of marine and estuarine areas and we look forward to evaluating additional information when it becomes available.

Comment 11: Some commenters questioned whether we were knowledgeable of Gulf sturgeon migration routes.

Our Response: We have identified and described Gulf sturgeon spawning migrations from coastal/marine areas to the rivers; however, inter-riverine migratory patterns are not well understood. When we could identify inter-riverine movements (mostly from telemetry data), we included appropriate inshore coastal waters in the critical habitat designation to provide protection for migrating sturgeon (*e.g.*, Unit 11). Research is ongoing to investigate Gulf sturgeon inter-riverine migrations (*e.g.*, recording broad movement patterns via satellite tags), and researchers are presently collating data to analyze Gulf-wide movements.

Issue B: Site-specific Biological Comments

Comment 12: One commenter questioned whether any areas south of the Suwannee River in Florida were historic critical habitat for Gulf sturgeon.

Our Response: Since this is the first critical habitat designation for the Gulf sturgeon, we presume that the commenter is asking whether areas south of the Suwannee River were of importance to the Gulf sturgeon historically. There are few reported sightings of Gulf sturgeon using rivers south of the Suwannee River, but there are historic and recent records of Gulf sturgeon in Tampa Bay and Charlotte Harbor. At one time, the Tampa Bay area produced large commercial landings of Gulf sturgeon. There have been reported Gulf sturgeon sightings in the Florida Keys during winter months. Some biologists theorize that the Suwannee River population of Gulf sturgeon may winter in the Tampa Bay and Charlotte Harbor areas; however, further research is needed in this area.

Comment 13: Two commenters asked how we determined the upstream limit on the Suwannee River, and one commenter stated that the published literature does not report the use of the Suwannee River upstream of 230 rkm (143 rmi).

Our Response: We received unpublished information from Gulf sturgeon experts (Ken Sulak, USGS, pers. comm. 2002; Jim Clugston, retired USGS, pers. comm. 2002) of sightings of young-of-the-year Gulf sturgeon as far upstream on the Suwannee River as to the confluence with Roaring Creek at 304 rkm (200 rmi). This is approximately 11 rkm (18 rmi) upstream of the designated critical habitat, which stops at 293 rkm (182 rmi). We believe that the area known as Big Shoals on the Suwannee River captures the upstream-most significant spawning areas and, therefore, we included upstream to this point. We have included the 0.31 rkm (0.50 rmi) of habitat upstream from Big Shoals to the confluence with Long Branch for ease of identification. It is correct that the published literature on the Suwannee River documents spawning sites no further upstream than at 230 rkm (143 rmi), but we have relied on the above unpublished literature from reliable sources to determine the upstream limit on this system.

Comment 14: Two commenters requested that the Services omit areas adjacent to military lands from the designation under the Act's section 4(b)(2). The rationale presented included proximity to a military base that is used for military testing and training, restricting military's ability to quickly respond to training and testing due to long-lead time administrative considerations required for consultations, and reducing the number of formal consultations performed by the Services.

Our Response: The Department of Defense (DOD) did not request that areas adjacent to military lands be excluded from critical habitat designation. In any case, we have no data indicating that these areas should be excluded. We have been successfully and efficiently conducting section 7 consultations with military bases in these critical habitat areas for over 10 years, and we intend to continue working as partners with the armed forces to uphold the Act without compromising national security. We do not foresee any impacts to military readiness as a result of the adjacent critical habitat designation.

Comment 15: One commenter reported that unusually large fish have been taken from a fish trap on the Tennessee River near the mouth of Chickamauga Creek, above Chattanooga, Tennessee.

Our Response: Historic information indicates that Gulf sturgeon did not venture as far inland as Tennessee, so we are fairly certain the large fish captured in the fish traps were not Gulf sturgeon. These fish may have been lake sturgeon (*A. fulvescens*) or shovelnose sturgeon (*Scaphirhynchus platorhynchus*), although these species are uncommon, particularly in east Tennessee. Paddlefish (*Polyodon spathula*), which attain weights of over 45 kg (100 lb) are found in the Tennessee River; however, additional information would be necessary to clearly identify the species involved and none was provided by the commenter.

Issue C: National Environmental Policy Act (NEPA) Compliance

Comment 16: One commenter stated that the Services should withdraw the proposed rule pending compliance with NEPA, through preparation of an environmental assessment or an environmental impact statement (EIS). The commenter stated that FWS's position that NEPA only applies to critical habitat designations in the 10th Circuit, based upon that circuit's 1996 decision in *Catron County Bd. of Comm.* v. *USFWS*, 75 F.3d 1429, is unlawful. The commenter stated that the two exceptions to NEPA compliance identified by the 10th Circuit (*i.e.*, unavoidable conflict between NEPA and another statute or duplicative procedures provided by NEPA and a second statute) are not present in the case of critical habitat designation. The commenter stated that the proposed critical habitat rule was subject to NEPA because the effects of the designation are broader than protecting habitat. They believe that future Federal actions that are likely to adversely affect critical habitat will be prohibited. They also believe that an environmental assessment may reveal a more effective alternative to preventing extinction of the sturgeon than designating critical habitat.

Our Response: The Services believe that in *Douglas Co.* v. *Babbitt*, 48 F.3d 1495 (9th Cir. 1995), the Court correctly interpreted the relationship between NEPA and critical habitat designation under the Act. The Ninth Circuit Court rejected the suggestion, identical to that raised by the commenter, that irreconcilable statutory conflict or duplicative statutory procedures are the only exceptions to application of NEPA to Federal actions. The Court held that the legislative history of the Act demonstrated that Congress intended to displace NEPA procedures with carefully crafted procedures specific to critical habitat designation. Further, the *Douglas County* Court held that the critical habitat mandate of the Act conflicts with NEPA in that, although the Secretary may exclude areas from critical habitat if such exclusion would be more beneficial than harmful, the Secretary has no discretion but to include areas in the designation if exclusion of such areas would result in extinction. This lack of discretion renders application of NEPA procedures (*e.g.*, consideration of broad environmental impacts, alternatives analysis) superfluous (this lack of discretion to consider broad environmental impacts was the basis for the 6th Circuit's determination that NEPA does not apply to listing decisions under the Act, in *Pacific Legal Foundation* v. *Andrus*, 657 F2d 829 (6th Cir. 1981)). The Court noted that the Act also conflicts with NEPA's demand for impact analysis, in that the Act dictates that the Secretary ''shall'' designate critical habitat for listed species based upon an evaluation of economic and other ''relevant'' impacts, which the Court interpreted as narrower than NEPA's directive. Finally, the 9th Circuit, based upon a review of precedent from several circuits including the 5th Circuit, held that an EIS is not required for actions that do not change the physical environment.

In addition, we note that Federal actions that might adversely affect critical habitat are not necessarily prohibited. Many Federal actions may adversely affect critical habitat without the effect rising to the level of destruction or adverse modification of the critical habitat. In those cases where we find that a Federal project would destroy or adversely modify critical habitat, we must identify reasonable and prudent alternatives (RPAs) to the project that would avoid the destruction or adverse modification (see ''Effects of Critical Habitat Designation'' section). The RPAs must be capable of being implemented in a manner consistent with the intended purpose of the action, be consistent with the action agency's legal authority and jurisdiction, and be economically and technically feasible.

Issue D: Section 7 Consultation Issues

Comment 17: One commenter expressed concerns that the critical habitat designation will make it more difficult for fisheries managers to sample for non-endangered fish in these rivers and fears they will be required to apply for permits and provide annual reports, and that in some cases, fishery activities may be stopped due to

sampling being conducted in areas designated as critical habitat.

Our Response: The Gulf sturgeon is a listed species and thereby protected under the Act regardless of whether or not critical habitat has been designated, therefore permits and annual reporting may be necessary if the activities being conducted for fisheries management may result in the incidental take of a Gulf sturgeon. Given that the fish has been federally protected for 10 years and fisheries management in all states throughout the Gulf sturgeon's range has proceeded unhampered, we are unclear as to the reasons for this concern. Critical habitat designation may result in required project modifications only for activities with a Federal nexus and then only if the activity were to destroy or adversely modify the primary constituent elements contained in the designated habitat (*i.e.*, prey, spawning habitat, water quality, water quantity, sediment quality, or migratory passage).

Comment 18: One commenter questioned whether water quality issues may arise from the establishment of the critical habitat and another requested that the existing government databases be updated to reflect current water quality of southern rivers, since water quality has improved subsequent to the historic decline of the species.

Our Response: As required under section 7 of the Act, the Environmental Protection Agency (EPA) consults with us regarding water quality standards to ensure that they are protective of endangered and threatened species. The EPA anticipates consulting with us every three years as part of its triennial review of State delegated water quality standards for Alabama, Florida, Mississippi, and Louisiana under section 303(d) of the Clean Water Act. During each review period all data relative to Gulf sturgeon and water quality will be updated and reviewed to ensure that the standards continue to be protective. The EPA recently released a new database on the water quality of the nation's rivers. This information is available on its web site (www.epa.gov). Future consultations will consider impacts to Gulf sturgeon and associated critical habitat, and will take changes in water quality into account.

Comment 19: One commenter questioned whether the FWS provided information on flow requirements needed for critical habitat in the Apalachicola, Chattahoochee, and Flint Rivers (ACF) negotiations and whether such information was available to the public.

Our Response: The FWS presented information about the hydrological characteristics of potential sturgeon spawning habitat on the Apalachicola River as a result of separate requests from the Georgia and Florida negotiators to the ACF Compact. This information is summarized in our response to comment 42. Our information was based on a single set of measurements at one potential spawning site, and for reasons summarized in our response to comment 41, we do not characterize this information as ''flow requirements needed for critical habitat.'' This information is available to the public upon request. However, the U.S. Army Corps of Engineers (USACE) is conducting more detailed surveys intended to augment and refine our initial measurements and will use these new measurements in preparing its biological assessment of the effects of Federal reservoir operations on federally-protected species and their habitats.

Comment 20: One commenter requested that the Services withdraw their proposed critical habitat designation for the Gulf sturgeon and instead address any needs of the species in the context of the ongoing ACF Compact process.

Our Response: The ACF Compact is a Federal law that authorizes, among other things, the States of Alabama, Florida, and Georgia, but not the Federal government, to negotiate a water allocation formula for equitably apportioning the surface waters of the ACF Basin. Under the leadership of the non-voting Federal Commissioner to the Compact, Federal agencies, including the Services, have provided technical assistance to the States' negotiators on various water management issues, including the needs of species protected under the Act. The State negotiators are not obligated to act upon any such technical assistance, and the Compact does not relieve Federal agencies, including the Services, of responsibilities under other Federal statutes or court rulings. This rule designating critical habitat fulfills our requirements under the Act and the order of the United States Court of Appeals for the Fifth Circuit.

Comment 21: One commenter stated that by designating the Apalachicola River as critical habitat for the Gulf sturgeon, the Federal government necessarily becomes involved in the water negotiations for the ACF Compact and usurps authority from the State of Georgia to negotiate stream flows in that river basin.

Our Response: State and Federal roles under the ACF Compact are quite distinct, as noted in our response to comment 20, and this rule in no way alters those roles. No authority is taken from the States, as the critical habitat provisions of the Act apply to Federal agencies and their actions only. Federal agencies acting in the ACF Basin are obligated to comply with sections 7 and 10 of the Act with or without an ACF Compact, and the States are solely empowered to negotiate a water allocation formula for the ACF Basin with or without designated critical habitat for the Gulf sturgeon.

Comment 22: The USACE's Mobile District expressed concern with potential requirements to alter reservoir operations at the Jim Woodruff Lock and Dam on the Apalachicola River in Florida, in order to support minimum flow for Gulf sturgeon spawning. They are concerned that a critical habitat designation could require substantial upstream flow releases.

Our Response: As noted in the response to comment 42, preliminary data suggest that if adjustments to reservoir operations are reasonable and prudent in the conservation of the sturgeon, such adjustments would likely occur infrequently, since it appears that flows do not limit sturgeon spawning habitat availability in most years on the Apalachicola River. Under section 7(a)(2) of the Act, Federal agencies must avoid jeopardizing the continued existence of a species or the destruction or adverse modification of designated critical habitat. During the consultation process, Federal agencies share responsibility with us for determining what operational adjustments, if any, would be reasonable and prudent for sturgeon conservation. We acknowledge that the USACE must consider its responsibilities for flood control, power generation, navigation, water quality, other fish and wildlife, etc., as well as listed species conservation, in making its operational decisions, and we appreciate the complexities of these decisions.

Comment 23: One commenter objected to critical habitat designation because it would impede construction of any dam deemed necessary by the public for water supply, flood control, and recreation.

Our Response: The Act's requirements regarding proposed and designated critical habitat apply only to Federal actions, such as constructing Federal reservoirs or issuing Federal permits for non-Federal reservoirs (*e.g.*, a Clean Water Act section 404 permit). For such actions, the Federal agency's responsibility is to consult with us to ensure that its actions are not likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Reasonable and prudent alternatives to

avoid jeopardy or critical habitat destruction resulting from reservoir construction, or reasonable and prudent measures to minimize take resulting from reservoir construction, would depend entirely on the size, location, and operational plan of the reservoir and its effects on the primary constituent elements (*e.g.*, flow regime, water quality, passage). Reservoirs constructed downstream of spawning habitat would have far different and likely greater impacts than those constructed upstream of spawning habitat or on tributaries.

Comment 24: Three commenters requested clarification and examples of specific activities that may affect essential features of the designated area, a quantitative definition or explanation of ''appreciably reduce,'' and information on how we intend to quantify the degree of impacts. One commenter requested that a mechanism be developed to assess the severity of the action based on the ability of the impacted area to recover as viable habitat.

Our Response: The value of critical habitat is appreciably diminished when an action considerably reduces the capability of designated or proposed critical habitat to satisfy requirements essential to the conservation of a listed species. We continue to consult with agencies to determine the effects of an action on the primary constituent elements within the designated critical habitat by utilizing the best available scientific data. It is our intent to carefully assess each proposed project within Gulf sturgeon critical habitat and analyze how the proposed action may impact (both directly and indirectly; both temporally and spatially) those physical or biological features that were the basis for determining the habitat to be critical. As stated in the proposed rule, actions that may destroy or adversely modify Gulf sturgeon critical habitat may include, but are not limited to, dredging; dredge material disposal; channelization; in-stream mining; land uses that cause excessive turbidity or sedimentation; water impoundment; hard-bottom removal for navigation channel deepening; water diversion; dam operations; release of chemicals, biological pollutants, or heated effluents into surface water or connected groundwater via point sources or dispersed non-point sources; release of chemical or biological pollutants that accumulate in sediments; and other physical or chemical alterations of channels and passes. Note, however, that these same activities may be carried out in a way that does not destroy or adversely modify critical habitat. Such assessments are highly site and fact specific and the information about the species and its habitat is continually expanding. Therefore, whether the ''appreciably diminish'' threshold has been met is a consultation-specific determination.

Comment 25: One commenter expressed concerns that the critical habitat designation will prevent maintenance dredging which is required for continued use of the Gulf Intracoastal Waterway (GIWW).

Our Response: Gulf sturgeon migration and feeding may occur within the GIWW in some of the proposed units. As stated in the proposed rule (67 FR 39114), portions of the GIWW that consist primarily of excavated land cuts and canals have been excluded from this designation because they were not available to the species historically, and therefore, are not considered to be essential for the conservation of the species.

The GIWW requires periodic dredging by the USACE to maintain safe and adequate passage. As stated in the proposed rule (67 FR 39125), dredging is an action that may destroy or adversely modify Gulf sturgeon critical habitat. We will work closely with the USACE to identify appropriate measures to reduce dredging impacts to Gulf sturgeon critical habitat while allowing maintenance dredging to continue in the GIWW without interruption.

Issue E: Public Involvement

Comment 26: Three commenters had questions and concerns regarding boating and sturgeon with regard to records of boat strikes on sturgeon and options for regulating boat speed. One commenter stated that critical habitat is just another way to impose restrictions and regulations on the boating public.

Our Response: Regulating speed of boats to prevent sturgeon injury or death would be an issue related to ''take'' of Gulf sturgeon and not related to critical habitat. Boat speed is unlikely to have any significant effect on primary constituent elements for Gulf sturgeon.

Comment 27: One commenter asked how anyone can be of help in our project of recovery and designation of critical habitat for the Gulf sturgeon.

Our Response: Maintaining a natural vegetative buffer along streams and rivers, and participating in watershed conservation groups that work on protecting and restoring river and bay habitat help conserve the sturgeon's critical habitat.

Comment 28: One commenter wondered how the critical habitat designation would raise public awareness and offer additional educational and informational benefit.

Our Response: Critical habitat provides non-regulatory benefits to the species by informing the public (via newspaper articles, newspaper notices, public meetings, public hearings, etc.) of areas that are important for species recovery and where conservation actions would be most effective. Designation of critical habitat helps focus conservation activities for a listed species on the areas that contain the physical and biological features that are essential for conservation of that species, and alerts the public and land-managing agencies to the importance of those areas.

Issue F: Methods

Comment 29: One commenter suggested that we have not included unoccupied habitat upstream of dams in the Apalachicola River Basin and the Hillsborough River Basin because access is not available. The commenter believes that these areas may be essential to the conservation of the species.

Our Response: The commenter provided no data to support why these two areas may be essential. Further, we have no historic records of Gulf sturgeon using the Hillsborough River. Areas upstream of water control structures were included elsewhere because they contain the only known suitable spawning habitat for a subpopulation that shows evidence of reproduction, and therefore, were deemed essential to the conservation of the species. We believe there is sufficient habitat downstream of the Jim Woodruff Lock and Dam on the Apalachicola River to sustain a population of Gulf sturgeon. We believe that what we have designated for the Gulf sturgeon is based on the best available scientific information and includes what we consider to be essential to the conservation of the Gulf sturgeon.

Comment 30: The Services intend to protect spawning habitats from catastrophic occurrences by including both the main stem spawning sites and at least one tributary site. One commenter asked why we included just one tributary site.

Our Response: Each subpopulation for which critical habitat was designated had historic records of sturgeon using a mainstem river and at least one additional tributary. We included at least one tributary for relief from potentially catastrophic events. Including additional tributaries without historic records was not feasible because we have no indication that the sturgeon

would use these areas, and therefore, no evidence that they are essential to the conservation of the species. When data documented fairly recent use of additional tributaries, those tributaries were included. For example, the Pascagoula River subpopulation has sections of the Bouie River, the Leaf River, and the Chickasawhay River designated as critical habitat because data support sturgeon use.

Comment 31: One commenter asked if any of the proposed critical habitat is in the State of Georgia.

Our Response: No. Although the historic range of the Gulf sturgeon includes the Flint River, and possibly parts of the Chattahoochee River, we determined that none of the historic habitat in Georgia is essential to the conservation of the Gulf sturgeon.

Comment 32: One commenter suggested that the critical habitat designation should be limited to a few specific areas within the range of the Gulf sturgeon that are most important to their continued survival (*e.g.*, spawning areas, nursery areas, summer holding areas, and fall and winter foraging areas).

Our Response: We considered the biological basis for a more site-specific approach and concluded that it would not secure all biological features essential for the conservation of the species. The site-specific approach would neglect the importance of a migration corridor between spawning, resting, and feeding areas. Also, young-of-year and possibly juvenile sturgeon (less than 5 kg (11 lbs) (Mason and Clugston, 1993)) actively forage throughout the riverine system.

Comment 33: One commenter requested that we discuss our rationale for not designating unoccupied areas when the Services had previously stated that unoccupied habitat would be necessary for Gulf sturgeon recovery.

Our Response: As we stated in the proposed rule, since approval of the Recovery Plan in 1995 and our 1998 ''not prudent'' finding, the science of conservation biology has matured. The methods section cites numerous recent publications that contributed to our decision to select the areas we did and why they constitute habitat sufficient for the conservation of the species. We have also collected significant new biological information on this species. For example, we now have a better understanding on status of the Pearl River system subpopulation; we are confident that adult Gulf sturgeon are accessing spawning habitats above Pools Bluff Sill and Bogue Chitto Sill during high flows; spawning was confirmed in 1999 on the Pascagoula River subpopulation; usage of the Chickasawhay River, a major tributary to the Pascagoula River, was recently documented; spawning was confirmed in 2001 at five locations on the Escambia River; young-of-year have been confirmed on the Yellow River system and population estimates are 580 Gulf sturgeon 1 m (3.3 ft) or greater in size; additional suitable spawning sites were documented on the Apalachicola River in 2002; and between 1993 and 1998, additional spawning sites were confirmed on the Suwannee River population. We believe that what we have designated for the Gulf sturgeon is based on the best available scientific information and includes those areas essential to the conservation of the Gulf sturgeon.

Comment 34: Three commenters requested that the Services provide additional detail or quantify the specific habitat requirements for each life history stage, specifically abundant prey, flow regime, water temperature, salinity, pH, oxygen content, etc.

Our Response: We have summarized the current knowledge of the species, including life history requirements in the ''Background'' section of this rule. However, data are not yet available to more quantitatively express the primary constituent elements of Gulf sturgeon critical habitat. To make the critical habitat rule adaptive to increasing knowledge, we have kept the primary constituent elements general. When consultations on projects occur, biologists will use the best available science available at the time of consultation to determine whether the functions of those elements would be adversely modified by the proposed Federal action. Research is ongoing, and as those data are collected, we expect to understand better Gulf sturgeon and its life history requirements.

Comment 35: One commenter stated that habitat is identified primarily for adults (spawning sites, resting areas, winter feeding), but not for larvae, juvenile, and subadult life stages. S/he also suggested a need to cite specific studies rather than using the term ''gathered all available'' data.

Our Response: The commenter is referring to statements in the ''Methods'' section, which is written in general terms to explain how we decided which riverine, estuarine, and marine areas to include as critical habitat. We disagree with the commenter that the rule ignores life stages besides the adult stage. We stated in the proposed rule that we included riverine habitat from the river mouth up to and including spawning grounds to provide sufficient habitat for the riverine life stages of Gulf sturgeon. These life stages require habitat for summer resting or staging areas, juvenile feeding, entire young-of-year life cycle (including larval stages), passage throughout the river (protects all life stages), and passage into and out of estuarine habitat for adults and subadults. All of the selected areas are known to be used by Gulf sturgeon for some portion of their life cycle. Subadult and adult sturgeon use estuarine and marine areas for feeding and passage between river systems. Designation of critical habitat units in estuaries and bays adjacent to the riverine units described above would protect both passage of sturgeon to and from their feeding and spawning grounds and also the abundance of estuarine and marine prey for juvenile and adult sturgeon.

Specific references used for making our determination are cited throughout the ''Background'' and ''Critical Habitat Unit Descriptions'' sections of the proposed and final rules. A complete list of all references cited is presented in the ''References Cited'' section of this final rule.

Comment 36: One commenter stated that the areas included in the proposal are those where studies have been directed toward sturgeon and that it should not be assumed that other rivers do not have critical habitat just because sturgeon have not been found in routine fishery surveys. They also stated that routine fishery surveys can and have missed the presence of sturgeon.

Our Response: We have based our designation on the best scientific data available. However, the level of research and status surveys conducted on many subpopulations is limited. Because of the limited availability of data specific to each river system and specific to the Gulf sturgeon's use of the marine and estuarine environment, we acknowledge that habitat other than that identified in this final rule may later be found to be essential to the conservation of Gulf sturgeon. To the extent feasible, we will continue to conduct and support surveys, research, and conservation actions on the species and its habitat in areas designated and not designated as critical habitat. If additional information becomes available on the species' biology, distribution, and threats, we will evaluate the need to designate additional critical habitat, delete or reduce critical habitat, or refine the boundaries of critical habitat. Gulf sturgeon in areas not included as critical habitat will continue to receive protection under the section 7 jeopardy standard and the section 9 prohibitions on take.

Comment 37: One commenter suggested that we clarify our use of vague terms in the proposed rule (*e.g.*, strongly suspect, believed to appear, possibly appropriate, relatively sediment free).

Our Response: We appreciate the commenter's sentiments. However, it is seldom possible to make statements with complete or even relative certainty when describing the biological and habitat requirements of an endangered or threatened species. We have expressed ourselves as definitively as possible using the best available scientific data, recognizing the need for consultation-specific flexibility over time as new information is developed about the species and its habitat.

Comment 38: Two commenters requested clarification of the lateral extent of the critical habitat unit descriptions in the estuarine and marine areas; clarification of our mean high water line determination, and clarification of our use of an average high water calculation over an 18.6 year period rather than using all available tidal data.

Our Response: Regulatory jurisdiction in coastal areas is administered by the USACE and is described in 33 CFR 329.14(a)(2) as ''the line on the shore reached by the plane of the mean (average) high water (MHW).'' 33 CFR 329.14(a)(2) further states that when precise determination of the MHW line is necessary, it is preferable to average tidal data over a period of 18.6 years, which is a Metonic cycle, *i.e.*, the period in which new and full moon recur in the same order and on the same days as in the preceding cycle.

Issue G: Jurisdiction

Comment 39: Three comments were received on the proposed jurisdictional responsibilities for the management of the Gulf sturgeon. Two commenters believe that FWS, instead of NMFS, should have jurisdiction in the estuarine areas, and one commenter requested clarification on the technical basis for determining areas of regulatory jurisdiction in coastal areas.

Our Response: In 1974, a memorandum of understanding (MOU) was developed to clarify jurisdictional responsibilities for the NMFS and FWS. Section 1(a) of the 1974 MOU outlines jurisdiction by waterbody and states that all non-mammalian species, with a few exceptions not including Gulf sturgeon, that reside the major portion of their lifetime in estuarine waters shall be under the jurisdiction of the NMFS. Similarly, the FWS would have jurisdiction over species that spend the major portion of their lifetimes on land and/or in fresh water.

While the MOU does not contain specifics on jurisdictional boundaries for critical habitat, the Services have applied the standard set for listing species to this critical habitat rule—that is, NMFS will have jurisdictional responsibility for marine waters and the FWS for fresh water. In estuarine waters, the Services will consult based on their respective expertise as described in the proposed rule. Under this arrangement, the FWS will consult with the EPA since it has expertise in water quality issues, and the NMFS will consult with the USACE to maximize efficiency for the action agency when other federally protected species may be present (*e.g.*, protected sea turtles which fall under the jurisdiction of NMFS in marine and estuarine waters).

Issue H: Economic Analysis

Comment 40: One commenter supported the two-baseline approach to the economic analysis used by the Services, and went on to suggest that the lower baseline, that identifies costs solely attributable to critical habitat designation, need not be included in the analysis to be responsive to the decision in *New Mexico Cattle Growers Association* v. *USFWS*, 248 F.3d 1277 (10th Cir. 2001). The commenter paraphrased the 10th Circuit's holding as requiring that costs resulting from the listing of a species must be considered along with the costs of critical habitat designation in determining whether the costs of such designation outweigh the benefits. The commenter went on to support the inclusion of costs associated with both jeopardy consultations and adverse modification consultations, and resulting project modification costs, in the economic analysis, stating that the full spectrum of impacts associated with the listing and critical habitat designation presents a more realistic and comprehensive understanding of probable impacts in the affected region.

Our Response: In *New Mexico Cattle Growers Association*, the 10th Circuit ruled that the full costs of critical habitat designation must be captured in an economic analysis performed in accordance with section 4(b)(2) of the Act, and thus that costs that might be incurred co-extensively as a result of both listing and critical habitat designation must be included in the analysis. For example, projects that might modify spawning habitat of Gulf sturgeon would give rise to a consultation on both jeopardy and adverse modification grounds, and the costs of such consultations must be attributable to critical habitat designation.

Comment 41: One commenter raised questions about impacts to Federal hydropower generation in the ACF Basin. Without specific details as to the minimum and maximum flows necessary for spawning and other flow-related habitat questions, the commenter contends ''the economic ramifications of this proposal cannot be properly considered, as required by law.''

Our Response: We agree that a meaningful assessment of economic impacts that could result from modifying the operations of the USACEs' ACF reservoirs to avoid or minimize impacts to Gulf sturgeon habitat in the Apalachicola River is not possible at this time because too many variables, such as those listed by the commenter, are unknown. Based on the limited data that are currently available about the flow rates that inundate potential spawning habitat, the FWS believes that any reasonable and prudent adjustments to ACF project operations to protect sturgeon spawning would be infrequent. As a result, the costs over time to project purposes such as hydropower would be relatively small. The basis for this preliminary determination and a brief description of the informal consultation that is underway between the USACE and the FWS about ACF project operations effects on sturgeon follows.

Possible flow-related limitations to spawning habitat in the Apalachicola River were not recognized until the spring of 2002, when project operations and unusually low basin runoff entering the fourth year of a regional drought exposed limestone outcroppings and other hard-bottom portions of the main channel. These hard-bottom areas, which likely support spawning by the small Apalachicola sub-population, are inundated during the spring months of most years by the combination of unregulated basin runoff and the USACEs' operations of the ACF reservoirs for project purposes other than the conservation of species and habitats protected under the Act. On May 2, 2002, FWS personnel surveyed a site near where sturgeon larvae were collected in 1977 (Wooley *et al.*, 1982) and 1987 (Foster *et al.*, 1988). FWS estimated the maximum discharge that would fully expose the outcropping and the minimum discharge that would fully inundate it. These estimates were 173 cubic meters per second (cms) (6,118 cubic feet per second (cfs)) and 317 cms (11,200 cfs), respectively. The minimum depth at which Gulf sturgeon eggs have been collected is 1.4 m (4.6 ft) (Fox *et*

al., 2000). The estimated discharge corresponding to 1.4 m (4.6 ft) inundation of the bottom of the limestone shelf was 424 cms (14,970 cfs), and 612 cms (21,610 cfs) for the top of the shelf. During the March 15 to May 15 timeframe, when sturgeon spawning most likely occurs, daily average flow rates have exceeded 424 cms (14,970 cfs) and 612 cms (21,610 cfs) 87 percent and 63 percent of the time, respectively, in the 1929 to 2002 flow record of the Chattahoochee gage. March 15 to May 15 average discharge exceeds these flow rates in 97 percent and 77 percent of the years, respectively.

If flow rates between 424 cms (14,970 cfs) and 612 cms (21,610 cfs) are sufficient for successful sturgeon spawning on the Apalachicola River, any adjustments to reservoir operations that appear reasonable and prudent for sturgeon conservation would occur relatively infrequently, during the occasional years when spring-time hydrologic conditions and operations for other project purposes do not provide flows in this range. However, this flow range is based on one set of measurements at one site and relies upon the minimum depth at which eggs have been previously collected (4.6 feet); other sites with different hydrologic characteristics may support spawning and depths less than 4.6 feet may allow for successful spawning. Annual monitoring of the Apalachicola sturgeon population by net sampling shows year classes represented for all years from 1986 to 1998. In none of these years were all days in the March 15 to May 15 time frame greater than 612 cms (21,610 cfs), but all of these years had at least 11 days greater than 612 cms (21,610 cfs). In 2002, no days from March 15 to May 15 had flow greater than 612 cms (21,610 cfs). We will not know for 3 years, when year class 2002 individuals would become large enough to sample with the nets used in annual monitoring, whether the unusually low spring flows of 2002 resulted in a lost year class.

The USACE and FWS have initiated a study of sturgeon spawning habitat in the Apalachicola River that will provide a more complete relationship between flow and habitat availability than the single site measured by FWS in May 2002. The USACE will use the results of this study and other information in a biological assessment of the effects of its current operations on the sturgeon, its proposed critical habitat, and other federally-protected species. This assessment will determine whether current operations may adversely affect federally-protected species and their habitats and if so, serve to initiate formal consultation with the FWS. Until this consultation is completed, it is premature to make estimates of its economic impact, which is dependent on the results of studies that are still underway and on USACE decisions relative to reservoir operations that will weigh its responsibilities under the Act with other statutory responsibilities.

Comment 42: One commenter stated that the economic analysis does not provide sufficient information to determine if the benefits of exclusion outweigh the benefits of inclusion of individual critical habitat units. The comment goes on to ask whether inclusion of any unit would materially affect the recovery of the Gulf Sturgeon, and requests that the Services provide a metric by which to determine whether inclusion of any unit is economically warranted.

Our Response: Section 4(b)(2) of the Act directs that critical habitat, areas containing biological and physical features essential to the conservation of the species, shall be designated after taking into account the economic impacts and other relevant impacts of such designation. The Secretaries of the Interior and Commerce have the discretion to exclude areas from such designation if the benefits of exclusion outweigh the benefits of inclusion, unless failure to designate such areas will result in the extinction of the species concerned. This language does not establish a test of whether inclusion is ''economically warranted.''

Comment 43: One commenter suggested that uncertainty over the spatial and temporal scale that would be involved in future application of the destruction or adverse modification standard should be acknowledged, that costs could depend upon whether that standard is applied to the designated critical habitat as a whole, within individual units, or some other scale, and whether the standard would be triggered by temporary or long term impacts.

Our Response: The Gulf sturgeon's affinity for natal river systems and the importance of every breeding unit of the species suggests that individual units or groups of units that are used by stocks or subpopulations which fulfill essential geographic distribution requirements are the appropriate scale for the analysis. The outcome of each destruction or adverse modification analysis is highly fact specific, dependent not only upon the species and designated critical habitat at issue, but also upon the particular project and its impact upon the primary constituent elements of the critical habitat. The economic analysis for this rule estimated costs of consultations on projects that the consulting Federal agencies advised were likely to be implemented in the next 10 years. Thus, the uncertainty in the analysis would be attributable to unforseen or uncertain projects and their impacts, as well as a lack of detail about each projected project, and there is no way to address this uncertainty in any non-speculative manner.

Comment 44: The Mobile and New Orleans Districts of the USACE raised questions regarding the economic analysis' incorporation of dredging windows as potential project modifications.

Our Response: Based on comments received from the USACE and further analysis by the Services, the economic analysis has been modified by removing dredging windows as potential project modifications that would be included in each formal consultation and omitting estimated costs of such. These changes reflect the extreme improbability that dredging windows would be recommended or adopted as a project modification to reduce impacts to critical habitat (as opposed to preventing take), given the availability of other means of protecting sturgeon or its habitat with adequate coordination and planning between the USACE and us.

Comment 45: Several commenters expressed concerns over the potential effects of critical habitat designation on water flow regimes in the Apalachicola River, and whether needs to alter flow regimes to protect sturgeon or its habitat might impose costs by impacting hydropower or businesses and recreation dependent on existing reservoirs (*e.g.*, Lake Sidney Lanier).

Our Response: Section 3.4 of the economic analysis has been revised to more fully discuss the factors associated with estimating economic impacts related to flow regime modifications that may emerge from consultation with the USACE as reasonable and prudent for the sturgeon and its habitat in the Apalachicola River. Conservation of listed species is one of many responsibilities the USACE must consider in operating the Apalachicola Basin reservoir projects, which are variously authorized for the purposes of flood control, hydropower, navigation, recreation, water quality, water supply, and fish and wildlife. Changing reservoir operations for sturgeon conservation could affect the degree to which the USACE is able to fulfill other project purposes; however, under normal and wet rainfall conditions, existing operations appear adequate to protect the sturgeon and its habitat. If

project operations do not release enough water, as is the case during droughts, spawning habitat may be exposed or too shallow for sturgeon to use successfully. The USACE and FWS are presently in informal consultation on the effects of ACF reservoir operations on federally-listed species, and are investigating the relationship between flow and sturgeon spawning habitat availability in the Apalachicola River. Although these studies are not yet completed, the FWS believes that project modifications for sturgeon conservation would likely represent reasonable minor adjustments to existing operations that would minimize the impacts of unavoidably adverse conditions. The economic analysis concludes that the effects of such modifications on the regional economy would be small (less than 0.1 percent).

Comment 46: Several commenters suggested that the economic analysis did not adequately address secondary impacts of critical habitat designation on the economy on a regional scale. These commenters expressed concerns about impacts on the shipping and navigation industries and their support services, on future commercial and industrial development, and on commercial fishing, particularly shrimp fishing.

Our Response: Section 2.1 of the economic analysis has been revised to provide more information on the current level of economic activity in the areas in or around the critical habitat designation. Specific information on State gross products and time series employment data have been added. Regional data on waterborne economic activity, including waterborne commerce, commercial fishing, recreational fishing, other water-based recreation, and hydropower generation are more fully presented. Thus, the revised economic analysis provides an appropriate economic baseline against which to evaluate the significance of section 7 costs associated with critical habitat designation.

After identifying and evaluating the activities likely to give rise to section 7 consultations and thus direct costs of critical habitat designation in section 3.2, the economic analysis discusses potential secondary impacts on the regional economy in section 3.4. Past consultations have not resulted in project changes that have affected the regional economy, including the particular activities of concern to the commenters, and no comments provided specific examples of how future consultations would result in regional economic impacts.

Waterborne commerce is unlikely to be affected by the critical habitat designation because all available evidence indicates that future operations and maintenance navigation projects will proceed without changes to timing and scope. Moreover, the frequently maintained portions of the major shipping channels located within the critical habitat designation are altered to an extent that any primary constituent elements for sturgeon that are still present in the channels are unlikely to be appreciably diminished from their current baseline by Federal actions in the channels. Portions of shipping channels that are not frequently maintained and new dredge material disposal sites likely contain one or more primary constituent elements and therefore have a higher likelihood for project modifications to be recommended.

No limitations to commercial fishing activities are expected to result from section 7 consultations pertaining to Gulf sturgeon (see Section 3.4.3 of the economic analysis).

Past consultations and available evidence do not indicate that county-wide economies or employment will be impacted by this critical habitat designation (see Section 3.4.4 of the economic analysis).

Comment 47: One Mississippi County Commissioner expressed concern over closure of a shipping channel through Little Lake and the lower Pearl River, and its impact on commercial navigation.

Our Response: If the shipping channel were closed, it would be attributable to litigation filed by the Tulane Environmental Law Clinic over water quality certification, and not due to sturgeon protection. Thus, no modifications were made to the economic analysis.

Comment 48: Two commenters stated that the economic analysis should acknowledge the controversy surrounding option and existence values and the methodologies available to estimate these values. One commenter, the USACE, stated that it does not allow these values to be claimed in its economic studies ''because the academic community does generally not accept the procedures used to estimate them.'' The USACE went on to state that the studies presented in the economic analysis are not related to the Gulf sturgeon, the studies' methods are not discussed, and inclusion of the information adds nothing to the document.

Our Response: The final economic analysis notes the controversy that the commenter discusses as revolving around the use of contingent valuation methodology. Therefore, the economic analysis in Section 5.2 has been revised to better explain the relevance of these values to this critical habitat designation, by including a fuller explanation of contingent valuation methodology, and adding more detail to the discussion and exhibits relating to the economic literature on valuation of natural resources such as threatened and endangered species, and the applicability of the benefits transfer methodology.

Comment 49: Two comments stated that the economic analysis presented a flawed analytical approach in ignoring the time value of money and present values.

Our Response: The economic analysis has been modified (see Section 4.3) to include the present value of the total estimated costs of the critical habitat designation, using 2 discount rates in order to provide a measure of sensitivity analysis. The economic analysis now also presents annualized cost estimates for the 10 year period considered for this designation.

Comment 50: Two comments state that the economic analysis fails to meet requirements for economic analyses, including using inappropriate and archaic research techniques.

Our Response: We believe that the methodology used is appropriate for and consistent with the analysis of economic impacts required by the Act, which does not mandate a strict cost-benefit analysis. The methodology used to produce the economic analysis has been peer-reviewed. We further believe that the research used is appropriate for the analysis required by the Act, and provides the best available scientific information available. Economic analyses are typically based on direct conversations with the action agencies regarding their expected future actions and costs.

Comment 51: One comment stated that it is unreasonable to predict zero costs associated with project modifications attributable solely to critical habitat designation.

Our Response: No information was provided, and none was available, regarding project modifications that would be attributable solely to critical habitat designation, as opposed to being attributed co-extensively to take of or jeopardy to the species.

Comment 52: One comment stated that the economic analysis did not fully consider costs to the States that might arise from consultations with EPA over pollution discharge permits.

Our Response: There is no evidence that past or future EPA projects have or

will be delayed due to consultations regarding sturgeon protection. Current EPA water quality standards take protection of endangered and threatened species and their habitat, including Gulf sturgeon, into account.

Comment 53: One comment asserted that the economic analysis should cover at least a 20-year period.

Our Response: To be credible, the economic analysis must estimate economic impacts based on activities that are reasonably foreseeable. The revised economic analysis does include annualized cost estimates to 10 years. It is difficult to predict the costs of consultations on activities beyond a 10-year window. Costs for section 7 consultations may increase or decrease dependent on factors other than inflation or deflation. For example, changes in requirements for development of a biological assessment may occur, or fluctuations in the cost of biologists and consultants. In order to maintain reasonable confidence in the estimated total section 7 costs, the analysis quantifies costs occurring within a ten year time frame. However, the final economic analysis does include annualized cost estimates, to the extent that these may inform the commenter's projections of costs over a 20-year period (see Section 4.3).

Comment 54: A few commenters stated that the economic analysis may underestimate impacts on small businesses secondarily impacted by consultations with Federal agencies.

Our Response: The courts have held that the Regulatory Flexibility Act requires an agency to perform a regulatory flexibility analysis only when a rule directly regulates them (Mid-Tex Elec. Coop, Inc. V. FERC, 773 F.2d 327 (D.C. Cir. 1985) and American Trucking Ass'ns, Inc. V. EPA, 175 F.3d 1027, 1044 (D.C. Cir. 1991)). Accordingly, the economic analysis considered the total costs that may affect small entities through section 7 of the Act. Activities likely to be impacted include those associated with operation and maintenance of navigation projects, highway bridge construction, and pipeline construction projects. The analysis found that less than one percent of these industries in the region would be affected and that it was likely that most of the costs imposed by the designation would be passed through to the Federal government as the government contracts for such services.

Issue I: Potential Impact to Commercial Shrimp Fishery

Comment 55: Three commenters requested clarification on how designation of critical habitat would impact the commercial shrimp fishery, and if sturgeon are a bycatch of shrimping.

Our Response: Shrimp trawling may impact both the Gulf sturgeon and its critical habitat. Shrimp trawling may directly affect Gulf sturgeon by capturing them in trawl nets. There is one documented non-lethal take of a sturgeon during testing of a Turtle Excluder Device (TED) equipped flounder trawl off Long Island, New York; the Atlantic sturgeon was approximately 1 m (3 ft) in total length, and was released alive (J. Mitchell, NOAA Fisheries, Pascagoula Laboratory, pers. comm. 2002). In addition, a single sturgeon is reported in the NOAA Fisheries shrimping bycatch database (E. Scott-Denton, NOAA Fisheries, Galveston Laboratory, pers. comm. 2002) as taken by shrimp trawling; an Atlantic sturgeon was captured off Georgia (Atlantic Ocean) in 1995. Anecdotal information indicates that while some sturgeon are taken by shrimp trawlers, many fish are alive as local researchers are often contacted so they may tag and release the fish (H. Rogillio, LADWF, pers. comm. 2002). Currently shrimp fishers report fewer sturgeon are being caught in the nets, which may reflect escapement through the TED or fewer incidents being reported. Regardless of critical habitat, the Gulf sturgeon was listed as a threatened species under the Act on September 30, 1991, and it, therefore, is protected wherever it occurs. Take of Gulf sturgeon that is not authorized (*e.g.*, through a section 7 consultation or through an incidental take permit) is unlawful.

The most likely effect of shrimp trawling on Gulf sturgeon critical habitat would be the disturbance of the benthic environment by trawling gear. This issue is being investigated at the NOAA Fisheries Galveston Laboratory. Until such time as conclusive data becomes available, any correlation between shrimp trawling and a negative effect on Gulf sturgeon critical habitat would be tenuous. While benthic molluscan and crustacean prey items favored by Gulf sturgeon could conceivably be disturbed as the shrimp trawl passes over the bottom, a possible effect of that disturbance would be to make them more susceptible to predation by Gulf sturgeon, possibly enhancing foraging opportunities. Although shrimp trawls may capture Gulf sturgeon, and the benthos within critical habitat may be disturbed, there is little to suggest that shrimp trawling significantly affects the Gulf sturgeon or its critical habitat at this time.

Issue J: Policy and Regulations

Comment 56: One commenter stated that the proposed action serves to provide an additional layer of bureaucracy without any tangible benefits and appears to be a redundant and reaction to litigation filed against the Services in 1994 by the Sierra Club Legal Defense Fund and the Florida Wildlife Federation. Three commenters stated that the Services previously made not prudent determinations regarding critical habitat and requested additional information (data/biological factors) and detail to explain the Services change in position.

Our Response: We had previously determined that designation of Gulf sturgeon critical habitat was not prudent given that such designation would not benefit the species based upon a view that jeopardy and adverse modification were essentially wholly overlapping standards under the Act. After the Fifth Circuit Court of Appeals rejected this interpretation, as stated in the proposed rule (67 FR 39112), we have reconsidered and found that designation will be clearly beneficial to the species. Recent research has determined and qualified numerous areas important for Gulf sturgeon spawning, resting, staging, and foraging. Many of these important areas are only utilized seasonally, and therefore not afforded the protection when the species is absent. By designating critical habitat, the Services will be able to manage impacts to those physical and biological features (primary constituent elements) that are essential to the conservation of the species regardless of the species presence or absence through the consulting mechanism under section 7 of the Act. For example, other Federal agencies will be required to consult with us on actions they carry out, fund, or authorize, to ensure that their actions will not destroy or adversely modify critical habitat. In this way, a critical habitat designation will protect areas that are necessary for the conservation of the species. It may also serve to enhance awareness within Federal agencies and the general public of the importance of Gulf sturgeon habitat and the need for special management considerations.

Summary of Changes From the Proposed Rule

Seven changes have been made from the proposed to the final rule designating Gulf sturgeon critical habitat—calculation of the total area included in designation; inclusion of identical amendments to both 50 CFR parts 17 and 226; verification of bridge

position in Unit 1; additional specifics on fish location in Unit 2; and exclusion of areas in Units 2, 8 and 9 under section 4(b)(2) of the Act.

For the proposed rule, river kilometers (and river miles) were measured with USACE mileage tables (USACE, 1985a and b), when available for a particular river reach. When not reported in the USACE mileage tables, several Geographic Information System (GIS) data layers were used to map all units and to calculate mileages, including data from NOAA, Environmental Systems Research Institute, Inc., and USGS. For the final rule, we still relied on the USACE mileage tables (USACE, 1985a and b) to calculate mileages when available for a particular river reach, but the remaining reaches were measured and mapped using the National Hydrography Dataset from the USGS at a scale of 1:100,000 (2001–2002 data set). This data layer, not available to us during the proposed rule, is available for the entire range of the mapped Gulf sturgeon critical habitat and has a higher resolution than the GIS data layers used for the proposed rule maps. Greater resolution results in the ability of the mapper to see and measure more of the rivers natural bends, thereby resulting in higher and more accurate river lengths. This change from using different data layers resulted in an additional river mileage of 259 rkm (161 rmi), which is a more accurate reflection, in reported total river kilometers and miles for all States, with no inclusion of additional areas.

In the proposed rule, we inadvertently provided different amendments to be included in 50 CFR part 17 (FWS) and part 226 (NMFS). For the final rule we are making identical amendments to both Parts. The amendment includes: (1) Maps and textual unit descriptions of all 14 critical habitat units, (2) the primary constituent elements essential for the conservation of Gulf sturgeon, and (3) a description of regulatory jurisdiction.

Below are descriptions of unit-specific changes. The changes stated below do not include those attributed to our more fine-scale mapping from the proposed rule.

Unit 1

On the Bogue Chitto River, Pike County, Mississippi, we reduced critical habitat in this river reach by approximately 3.2 km (2 mi) due to an error in what we believed to be the location of Quinn Bridge. We have documentation of a Gulf sturgeon sighting 1.6 km (1 mi) north of Quinn Bridge. In the proposed rule, we were given information that stated that Quinn Bridge was located on Mississippi (MS) Highway 570. Since the sighting was 1.6 km (1 mi) upstream of Quinn Bridge (MS Highway 570), in the proposed rule we ended the designation upstream of Quinn Bridge at Lazy Creek to encompass the fish location and to boundary at an area easily identifiable. We now know that Quinn Bridge is located along MS Highway 44 (Estes *et al.* 1991), so in order to include the fish location and to boundary the designation at an area easily identifiable, we have included up to MS Highway 570 in the unit, which is the first crossing north of MS Highway 44. See ''Map 1.1'' to clarify locations of MS Highly 570 and MS Highway 44.

Unit 2

On the Bouie River, Forrest County, Mississippi, we received more specific information during the comment period on the location of a Gulf sturgeon captured above the gravel pits above Glendale Road in 1977. This fish was located approximately 0.80 rkm (0.50 rmi) above Glendale Road, not further upstream as originally believed. For ease of identification, we have included up to the southern-most road crossing of Interstate 59 in the unit. We have, therefore, reduced this river reach by 14.5 rkm (9.0 rmi).

In the proposed rule, we inadvertently provided different amendments to be included in 50 CFR part 17 (FWS) and part 226 (NMFS). For the final rule we are making identical amendments to both Parts. The amendment includes: (1) Maps and textual unit descriptions of all 14 critical habitat units, (2) the primary constituent elements essential for the conservation of Gulf sturgeon, and (3) a description of regulatory jurisdiction.

The Services are also excluding major shipping channels in this unit, as identified on standard navigation charts and marked by buoys, under Section 4(b)(2).

Unit 8

The Services are excluding major shipping channels, as identified on standard navigation charts and marked by buoys, under Section 4(b)(2).

Unit 9

The Services are excluding major shipping channels, as identified on standard navigation charts and marked by buoys, under Section 4(b)(2).

Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Act as (I) the specific areas within the geographic 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 considerations or protection; and (ii) specific areas outside the geographic 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'' is defined in section 3(3) of the Act as the use of all methods and procedures that are necessary to bring any endangered or threatened species to the point at which listing under the Act is no longer necessary.

In order for habitat to be included in a critical habitat designation, the habitat features must be ''essential to the conservation of the species.''

When we designate critical habitat, we may not have the information necessary to identify all areas which are essential for the conservation of the species. Nevertheless, we are required to designate those areas we know to be critical habitat, using the best information available to us.

Within the geographic area of the species, we have designated only currently known essential areas. We will not speculate about what areas might be found to be essential if better information becomes available, or what areas may become essential over time. If the information available at the time of designation does not show that an area provides essential life cycle needs of the species, then the area will not be included in the critical habitat designation. Our regulations state that ''the Secretary shall designate as critical habitat areas outside the geographic area presently occupied by the species only when a designation limited to its present range would be inadequate to ensure the conservation of the species'' (50 CFR 424.12(e)). Accordingly, when the best available scientific data do not demonstrate that the conservation needs of the species require designation of critical habitat outside of occupied areas, we will not designate critical habitat in areas outside the geographic area occupied by the species.

Section 4(b)(2) of the Act requires that we take into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. We may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Methods and Criteria Used To Identify Critical Habitat

As required by section 4(b)(2) of the Act and its implementing regulations (50 CFR 424.12), this final rule is based on the best scientific information available concerning the species' present and historical range, habitat, biology, and threats. In preparing this rule, we reviewed and summarized the current information available on the Gulf sturgeon, including the physical and biological features that are essential for the conservation of the species (see ''Primary Constituent Elements'' section), and identified the areas containing these features. The information used includes known locations; our own site-specific species and habitat information; State-wide Geographic Information System (GIS) coverages (*e.g.*, land ownership, bathymetry (the measurement of depths of water in oceans, seas, and lakes), and estuarine substrates); the final listing rule for the Gulf sturgeon; recent biological surveys and reports; peer-reviewed literature; our recovery plan; discussions and recommendations from Gulf sturgeon experts; and information received during Gulf sturgeon recovery meetings. The Gulf Sturgeon Recovery/Management Plan (FWS *et al.*, 1995) contains valuable biological information, and it is cited throughout this document. However, the state of our knowledge regarding Gulf sturgeon biology and distribution has changed markedly since publication of the recovery plan for this species. The recovery criteria put forth in this recovery plan were deemed preliminary and may now warrant revision in light of new information. As a result of recent research and survey efforts directed towards this species, substantial portions of the biological information presented in the recovery plan are now dated or obsolete. Thus, although the recovery plan is a valuable source of information, it is not the final authority on the natural history and distribution of this species.

In the past, we had assumed, based on the information available at the time, that unoccupied habitat would be necessary for the recovery of the Gulf sturgeon. Since approval of the recovery plan in 1995 and our 1998 not prudent finding, we have collected new biological information on this species. We have analyzed what is necessary for the conservation of the Gulf sturgeon, as described above, and based on the best scientific information available at this time, we have determined that unoccupied habitat is not essential to the conservation of the Gulf sturgeon.

Determining the Scale of the Final Designation

We first evaluated the Gulf sturgeon in the context of its current distribution throughout the historic range to determine what portion of the range must be included to ensure conservation of the species. We considered several factors in this evaluation—(1) maintaining overall genetic integrity and natural rates of inter-river genetic exchange, thereby minimizing the potential for inbreeding, (2) retaining potentially important selective pressure at the margins of the species' range by protecting the eastern- and western-most subpopulations, (3) decreasing the extinction risk of a subpopulation by protecting adjacent subpopulations that can provide a rescue effect, if needed, (4) avoiding the potential for subpopulation extirpation from environmental catastrophes, and (5) protecting sufficient habitat to support conservation of the species.

The historic range of the Gulf sturgeon included nine major rivers and several smaller rivers from the Mississippi River, Louisiana, to the Suwannee River, Florida, and in marine waters of the Central and Eastern Gulf of Mexico, south to Tampa Bay (Wooley and Crateau, 1985; and FWS *et al.*, 1995). Seven of these major river systems continue to support reproducing subpopulations. These include (from west to east)—the Pearl, Pascagoula, Escambia, Yellow/Blackwater, Choctawhatchee, Apalachicola, and Suwannee Rivers.

The Gulf Sturgeon Recovery/Management Plan (FWS *et al.*, 1995) noted the importance of identifying and maintaining genetic integrity and diversity during restoration efforts on Gulf sturgeon. A severe loss of genetic variability may lead to a decline in the fitness of a species (Soulé, 1987). Evidence suggests that peripheral subpopulations are often genetically and morphologically divergent from central subpopulations (Lesica and Allendorf, 1995). Distinct traits found in peripheral subpopulations may be crucial to the species, allowing adaptation in the face of environmental change (Lesica and Allendorf, 1995; and Allendorf *et al.*, 1997). In light of these considerations, we determined that the inclusion of stocks or subpopulations from both the eastern and the western margins of the current range were necessary to protect the potential evolutionary importance of those subpopulations (Scudder, 1989; Lesica and Allendorf, 1995; and Young and Harig, 2001).

While telemetry data indicate that Gulf sturgeon from one genetically distinct drainage occasionally enter another river and also mix during the winter months in estuarine and marine habitats, a genetic analysis of tissue samples concluded that Gulf sturgeon exhibit strong natal river fidelity, with stocks exchanging less than one mature female per generation on the average (Waldman and Wirgin, 1998). These low gene flow estimates strongly suggest that natural recolonization of extirpated subpopulations of Gulf sturgeon would proceed slowly (Waldman and Wirgin, 1998). Semi-isolated subpopulations are more vulnerable to the effects of demographic and environmental population fluctuations (Forney and Gilpin, 1989; and Wahlberg *et al.*, 1996).

Gene flow estimates are usually higher between adjacent stocks, suggesting that migrants from semi-isolated subpopulations are exchanged primarily with neighboring subpopulations (Waldman and Wirgin, 1998). The loss of any intermediate subpopulations by a single environmental catastrophe could seriously limit a species' recovery (Kautz and Cox, 2001; and Young and Harig, 2001). In light of this, we determined that it is necessary to designate as critical habitat rivers used by subpopulations evenly spaced between the western- and eastern-most limits of the current range. To ensure conservation of the species, subpopulations must be geographically located so that they can serve as sources of sturgeon emigration, albeit at a slow rate (Waldman and Wirgin, 1998), to adjacent rivers and so that they can provide a rescue effect if an adjacent subpopulation is extirpated (Brown and Kodric-Brown, 1977; Hanski and Gyllenberg, 1993; and Young and Harig, 2001).

Designating critical habitat for only a few subpopulation units, or for units not spaced in a manner that allows genetic exchange with other subpopulations, could increase the vulnerability of the species due to isolation of subpopulations. Protection of a single, isolated, minimally viable population risks the extirpation or extinction of a species as a result of harsh environmental conditions, catastrophic events, or genetic deterioration over several generations (Kautz and Cox, 2001). To reduce the risk of extinction through these processes, it is important to establish multiple protected subpopulations across the landscape (Soulé and Simberloff, 1986; and Wiens, 1996).

Because of these considerations, we reached the conclusion that this designation should include critical habitat units within the major river

systems that support the seven currently reproducing subpopulations (FWS *et al.*, 1995) and associated marine habitats. These river systems include (from west to east)—the Pearl, Pascagoula, Escambia, Yellow/Blackwater, Choctawhatchee, Apalachicola, and Suwannee Rivers. We believe that with proper protection and management, these units collectively represent habitat necessary to provide for the conservation of the species. The number, distribution, and range of Gulf sturgeon subpopulations included in these units is necessary to protect and support the extent and diversity of the species' genetic integrity and can provide a rescue effect, if needed. The Services believe that these seven river systems, with their associated estuarine and marine environments, represent habitat that is essential for the conservation of the Gulf sturgeon.

Assessing Specific Habitat Areas Essential to the Conservation of Gulf Sturgeon

Once we determined that the proper scale of the critical habitat designation should cover the area occupied by the seven reproducing subpopulations, we evaluated which habitats used by those seven subpopulations are essential to their conservation. To conduct this evaluation, we assessed the critical life history components of Gulf sturgeon as they relate to habitat. Gulf sturgeon use the rivers for spawning, larval and juvenile feeding, adult resting, and staging, and to move between the areas that support these components. Gulf sturgeon use the lower riverine, estuarine, and marine environment during winter months primarily for feeding, and more rarely, for inter-river migrations.

We then investigated what habitat types support these life history components and where these habitat areas are located. We evaluated empirical data, published and unpublished literature, and solicited the views of experts. These habitat components are described in the ''Primary Constituent Elements'' section of this final rule. We identified known or presumed spawning sites in each of the seven river systems. Some spawning sites have been conclusively identified; others are presumed due to the presence of suitable habitat. We identified known or presumed sites used for resting or staging. We identified areas where subadult and adult Gulf sturgeon occur during winter and are presumed to be feeding. These areas are primarily in the marine or estuarine environment; young-of-the-year and juveniles feed mostly in the riverine environment. As a component of the above identifications, we gathered all available data on locations and habitat use of marked (tagged) fish.

To determine which areas should be designated as critical habitat, we then evaluated where the necessary constituent elements of Gulf sturgeon habitat intersected with areas known to be used by both marked and unmarked fish. Detailed location data, where available, is included with each unit description in the ''Critical Habitat Unit Descriptions'' section of this final rule. Because most of the sturgeon species' farthest upstream movement is for spawning (Bain, 1997; and J. Hightower, USGS-Biological Resources Division, pers. comm. 2002), we have determined that the designation should include areas as far upstream as the furthest known or presumed spawning site. Therefore, in rivers where spawning sites have been confirmed, critical habitat extends upstream to a geographically identifiable point, such as a river confluence upstream of those sites. In areas where spawning sites are presumed but not confirmed, we have included river reaches that contain the appropriate substrate necessary for spawning, if those areas occur within close proximity of Gulf sturgeon historic and/or current sightings or captures, and if they are still accessible to sturgeon (*e.g.*, not entirely blocked by dams). The riverine critical habitat units include areas that continue to offer at least periodic passage of Gulf sturgeon to known and presumed spawning sites. Successful reproduction and recent recruitment have been documented in each riverine unit by eggs, larvae, and/or juveniles, or by a mixed age structure. We are proposing to protect subpopulation extirpation from a catastrophic occurrence by including up to both the main stem spawning sites and at least one tributary site.

We have included riverine habitat from the river mouth upstream to and including spawning grounds in order to provide sufficient habitat necessary for the other riverine life stages of Gulf sturgeon while they reside in the riverine habitats. Habitat necessary for these life stages includes habitat for summer resting or staging areas, juvenile feeding, entire young-of-the-year life cycle, passage throughout the river, and passage into and out of estuarine habitat. All of the selected areas are known to be used by Gulf sturgeon for some portion of their life cycle.

Subadult and adult sturgeon use estuarine and marine areas for feeding and passage between river systems. Designation of critical habitat units encompassing estuaries and bays adjacent to the riverine units discussed above will protect unobstructed passage of sturgeon from feeding areas to spawning grounds. In evaluating the estuarine and marine areas, we first reviewed where Gulf sturgeon from the seven adjacent riverine units have been documented by telemetry relocations and tag returns from incidental captures. We also considered areas for which we have Gulf sturgeon sightings and targeted and incidental capture records. When available, we reviewed habitat data (*e.g.*, bathymetry, substrate type, and community structure) associated with these estuarine and marine systems and compared these data with studies pertaining to the habitat requirements and preferences of Gulf sturgeon. We also evaluated data for evidence of critical migratory pathways between the river systems and the adjacent bays and Gulf of Mexico that allow Gulf sturgeon to travel to important feeding areas, as well as allow for the occasional travel to non-natal rivers for possible spawning and genetic interchange. Where documented inter-riverine movements have occurred, but no telemetry data exist to identify the migratory path (*e.g.*, between the Pascagoula River and Yellow River, the Pascagoula and Choctawhatchee Rivers, and between Suwannee River and Apalachicola River), we have not designated a migration route. We then assessed the Gulf sturgeon's overall use of estuarine and marine waters and delineated specific critical habitat boundaries.

Migration and feeding may take place within the GIWW in some of the units. Portions of the GIWW that consist primarily of excavated land cuts and canals have been excluded from this designation because they were not available historically, and, therefore, are not considered to be evolutionarily significant.

This final designation includes a significant portion, but not all, of the species' historic range. The fourteen critical habitat units include riverine main stems and in some cases tributaries, distributaries (a river branch flowing away from the main stem in the floodplain) and adjacent estuarine and marine areas that contain one or more of the primary constituent elements essential for the conservation of the Gulf sturgeon (see ''Primary Constituent Elements'' section). The omission of some historically occupied river drainages and estuarine and marine areas from this critical habitat designation does not diminish their individual or cumulative importance to the species. Rather, it is our

determination that the seven riverine units with known spawning and seven associated estuarine and marine units included in this rule include the habitats essential for the conservation of the Gulf sturgeon. With unobstructed passage in the estuarine and marine habitat, the subpopulations within the designated critical habitat units may eventually populate presently unoccupied coastal river systems or augment adjacent surviving small subpopulations.

Although the Mobile River Basin is the largest Gulf of Mexico drainage east of the Mississippi River, it has been extensively impounded and modified for navigation. Further, there have been relatively limited reports of captures and no evidence of reproduction of Gulf sturgeon from that system for many years. Gulf sturgeon have been reported from other river systems. Some of these other systems historically supported a commercial fishery (*e.g.*, Mobile River, Ochlockonee River) and some may support small reproducing subpopulations (*e.g.*, Techefuncte River, Ochlockonee River, Mobile River); however, there is no recent documented spawning and we have no evidence at this time that these systems are essential to the conservation of the species. Therefore, we have not included them as critical habitat.

The data available to us are insufficient to support a determination that Lake Maurepas, Breton and Chandeleur Sounds, the Mississippi River Delta, St. Louis, Biloxi, Mobile, Perdido, St. Andrews, St. Joseph, Ochlockonee, or Apalachee Bays are essential to the conservation of the species. Records within the majority of these bays are relatively scarce. Although some Gulf sturgeon from the seven subpopulations may occasionally use these bays for winter foraging, there are insufficient data to support these bays' regular winter use or importance and no documented spawning. Therefore, we have not included these bays in our critical habitat designation.

The amount of research and status surveys conducted on many Gulf sturgeon subpopulations is limited. Because of the limited availability of data specific to each river system and specific to the Gulf sturgeon's use of the marine environment, we are aware that habitat other than that identified in this final rule may later be found to be essential to the conservation of Gulf sturgeon. To the extent feasible, we will continue, with the assistance of other Federal, State, and private researchers, to conduct surveys, research, and conservation actions on the species and its habitat in areas designated and not designated as critical habitat. If additional information becomes available on the species' biology, distribution, and threats, we will evaluate the need to designate additional critical habitat, delete or reduce critical habitat, or refine the boundaries of critical habitat. Gulf sturgeon surviving in, or moving to rivers that are not being included as critical habitat will continue to receive protection under the section 7 of the Act including the jeopardy standard and the section 9 of the Act prohibitions on take (see ''Critical Habitat'' section).

Primary Constituent Elements

In accordance with sections 3(5)(A)(i) and 4(b)(1)(A) of the Act and regulations at 50 CFR 424.12, in determining which areas to designate as critical habitat, we are required to base critical habitat determinations on the best scientific data available and to focus on those physical and biological features (primary constituent elements) that are essential to the conservation of the species and that may require special management considerations or protection. Such requirements include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historical geographical and ecological distribution of a species.

Based on the best available information, primary constituent elements essential for the conservation of the Gulf sturgeon include the following:

(1) Abundant food items, such as detritus, aquatic insects, worms, and/or molluscs, within riverine habitats for larval and juvenile life stages; and abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, molluscs and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages.

(2) Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;

(3) Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during fresh water residency and possibly for osmoregulatory functions;

(4) A flow regime (*i.e.*, the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging;

(5) Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;

(6) Sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and

(7) Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (*e.g.*, an unobstructed river or a dammed river that still allows for passage).

Need for Special Management Consideration or Protection

An area designated as critical habitat contains one or more of the primary constituent elements that are essential to the conservation of the species (see ''Primary Constituent Elements'' section), and that may require special management considerations or protection. Various activities in or adjacent to each of the critical habitat units described in this rule may affect one or more of the primary constituent elements that are found in the unit. These activities include, but are not limited to, those listed in the ''Effects of Critical Habitat'' section as ''Federal Actions That May Affect Critical Habitat and Require Consultation.'' For example, riverine spawning sites for Gulf sturgeon must be relatively sediment-free for successful egg development and may need best management practices implemented in the watershed upstream to prevent an excessive accumulation of sediment in these areas. None of the critical habitat units are presently under special management or protection provided by a legally operative plan or agreement for the conservation of the Gulf sturgeon. Therefore, we have determined that all units may require special management or protection.

Critical Habitat Designation

The areas designated as critical habitat for the Gulf sturgeon provide one or more of the primary constituent elements described above. Tables 1 and 2 summarize the location and extent of the designated critical habitat. All of the designated areas require special management considerations to ensure their contribution to the conservation of the Gulf sturgeon. The boundaries of critical habitat units are described generally below.

TABLE 1.—APPROXIMATE LINEAR DISTANCE OF THE RIVERINE CRITICAL HABITAT UNITS FOR THE GULF STURGEON

[Main Stems Are Listed First and Tributaries Are Indented]

Critical habitat unit—river systems	State	River kilometers	River miles
1. Pearl (East, West, and all distributaries)	Louisiana/Mississippi	632	393
Bogue Chitto		163	101
2. Pascagoula		203	126
Leaf		164	102
Bouie	Mississippi	10	6
Chickasawhay		232	144
Big Black Creek		8	5
3. Escambia	Florida/	117	73
Conecuh	Alabama	127	79
Sepulga		11	7
4. Yellow	Florida/	154	96
Blackwater	Alabama	18	11
Shoal		13	8
5. Choctawhatchee	Florida/	249	155
Pea	Alabama	92	57
6. Apalachicola	Florida	254	158
Brothers		24	15
7. Suwannee	Florida	293	182
Withlacoochee		19	12
Total		2,783	1,730

TABLE 2.—APPROXIMATE AREA OF THE ESTUARINE AND MARINE CRITICAL HABITAT UNITS FOR THE GULF STURGEON

Critical habitat unit—estuarine and marine systems	State	Kilometers [2]	Miles [2]
8. Lake Borgne	Louisiana/	718	277
Little Lake	Mississippi/	8	3
Lake Pontchartrain	Alabama	763	295
Lake St. Catherine		26	10
The Rigolets		13	5
Mississippi Sound		1,879	725
MS near shore Gulf		160	62
9. Pensacola Bay	Florida	381	147
10. Santa Rosa Sound	Florida	102	39
11. Near shore Gulf of Mexico	Florida	442	171
12. Choctawhatchee Bay	Florida	321	124
13. Apalachicola Bay	Florida	683	264
14. Suwannee Sound	Florida	546	211
Total		6,042	2,333

Critical Habitat Unit Descriptions

The river reaches within units 1 to 7 designated as critical habitat lie within the ordinary high water line. As defined in 33 CFR 329.11, the ordinary high water line on non-tidal rivers is the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas.

The downstream limit of the riverine units is the mouth of each river. The mouth is defined as rkm 0 (rmi 0). Although the interface of fresh and saltwater, referred to as the saltwater wedge, occurs within the lower-most reach of a river, for ease in delineating critical habitat units, we are defining the boundary between the riverine and estuarine units as rkm 0 (rmi 0).

Regulatory jurisdiction in coastal areas extends to the line on the shore reached by the plane of the mean (average) high water (MHW) (33 CFR 329.12(a)(2)). All bays and estuaries within units 8 to 14, therefore, lie below the MHW lines. Where precise determination of the actual location becomes necessary, it must be established by survey with reference to the available tidal datum, preferably averaged over a period of 18.6 years. Less precise methods, such as observation of the ''apparent shoreline,'' which is determined by reference to physical markings, lines of vegetation, may be used only where an estimate is needed of the line reached by the mean high water.

The term 72 COLREGS is defined as demarcation lines which delineate those waters upon which mariners shall comply with the International Regulations for Preventing Collisions at Sea, 1972 and those waters upon which mariners shall comply with the Inland Navigation Rules (33 CFR 80.01). The waters inside of these lines are Inland Rules waters and the waters outside the lines are COLREGS waters. These lines are defined in 33 CFR 80, and have been used for identification purposes to delineate boundary lines of the estuarine and marine habitat Units 8, 9, 11, and 12.

Unit 1. Pearl River System in St. Tammany and Washington Parishes in Louisiana and Walthall, Hancock, Pearl River, Marion, Lawrence, Simpson, Copiah, Hinds, Rankin, and Pike Counties in Mississippi

Unit 1 includes the Pearl River main stem from the spillway of the Ross Barnett Dam, Hinds and Rankin Counties, Mississippi, downstream to where the main stem river drainage discharges at its mouth joining Lake Borgne, Little Lake, or The Rigolets in Hancock County, Mississippi, and St. Tammany Parish, Louisiana. It includes the main stems of the East Pearl River, West Pearl River, West Middle River, Holmes Bayou, Wilson Slough, downstream to where these main stem river drainages discharge at the mouths of Lake Borgne, Little Lake, or The Rigolets. Unit 1 also includes the Bogue Chitto River main stem, a tributary of the Pearl River, from Mississippi State Highway 570, Pike County, Mississippi, downstream to its confluence with the West Pearl River, St. Tammany Parish, Louisiana. The lateral extent of Unit 1 is the ordinary high water line on each bank of the associated rivers and shorelines.

The majority of recent Gulf sturgeon sightings in the Pearl River drainage have occurred downstream of the Pools Bluff Sill on the Pearl River, near Bogalusa, Washington Parish, Louisiana, and downstream of the Bogue Chitto Sill on the Bogue Chitto River in St. Tammany Parish, Louisiana. Between 1992 and 1996, 257 Gulf sturgeon were captured from the Pearl River system (West Middle River, Bogue Chitto River, East Pearl River, and West Pearl River). The subpopulation was estimated at 292 fish, of which only 2 to 3 percent were adults (Morrow *et al.*, 1998b). The annual mortality rate was calculated to be 25 percent. Preliminary results from captures between 1992 and 2001 suggest a stable subpopulation of 430 fish, with approximately 300 adults (Rogillio *et al.*, 2002). These Pearl River distributaries are used for migration to spawning grounds, summer resting holes, and juvenile feeding. Gulf sturgeon have been captured in all of these distributaries and all are designated as critical habitat.

The presence of juvenile Gulf sturgeon (1 to 4 years old) in the Pearl River system indicates successful spawning at some location in the Pearl River system. It is believed that the only suitable habitat for spawning for the Pearl River subpopulation of Gulf sturgeon occurs above the sills on the Pearl River and the Bogue Chitto River with access to these areas only during high flows (Morrow *et al.*, 1996; and Morrow *et al.*, 1998a). Bedrock and limestone outcropping that are typical of Gulf sturgeon spawning areas in other systems do not occur here. However, within the Pearl drainage, spawning areas likely include soapstone, hard clay, gravel and rubble areas, and undercut banks adjacent to these substrates (W. Slack, pers. comm. 2001). Although the Pools Bluff Sill blocks upstream movement on the Pearl River during periods of low water, potential spawning sites have been identified upstream of the sill at various locations between Monticello, Lawrence County, Mississippi, and the Ross Barnett Dam spillway, Hinds and Rankin Counties, Mississippi (F. Parauka, pers. comm. 2002). Gulf sturgeon have also been recently reported as far upstream as Jackson, Hinds County, Mississippi (Morrow *et al.*, 1996; Lorio, 2000; and W. Slack, pers. comm. 2002). The Ross Barnett Dam upstream of Jackson prevents sturgeon movement further upstream at all flow conditions. Identified suitable spawning habitat, presence of juvenile fish, and documented adult captures support our inclusion of the Pearl River up to the spillway of the Ross Barnett Dam.

The Bogue Chitto Sill, located on the Bogue Chitto River near its confluence with the Pearl River, also hinders movement of Gulf sturgeon upstream of the sill except during high water flows. Suitable spawning habitat occurs within the Bogue Chitto upriver of the sill (W. Slack, pers. comm. 2001; W. Granger, FWS, pers. comm. 2002; and F. Parauka, pers. comm. 2002) and juvenile, adult and subadult Gulf sturgeon have been documented on the Bogue Chitto River as far upstream as one mile north of Quinn Bridge (Mississippi State Highway 44), McComb, Pike County, Mississippi (W. Slack pers. comm. 2001; D. Oge, Louisiana Department of Environmental Quality, pers. comm. 2002; and F. Parauka, pers. comm. 2002). We, therefore, have designated as critical habitat the main stem of the Bogue Chitto River upstream of Quinn Bridge (Mississippi State Highway 44) to Mississippi State Highway 570 for ease of identification.

Unit 2. Pascagoula River System in Forrest, Perry, Greene, George, Jackson, Clarke, Jones, and Wayne Counties, Mississippi

Unit 2 includes all of the Pascagoula River main stem and its distributaries, portions of the Bouie, Leaf, and Chickasawhay tributaries, and all of the Big Black Creek tributary. It includes the Bouie River main stem beginning on the southern-most road crossing of Interstate 59, Forrest County, Mississippi, downstream to its confluence with the Leaf River, Forrest County, Mississippi. The Leaf River main stem beginning from Mississippi State Highway 588, Jones County, Mississippi, downstream to its confluence with the Chickasawhay River, George County, Mississippi is included. The main stem of the Chickasawhay River from the mouth of Oaky Creek, Clarke County, Mississippi, downstream to its confluence with the Leaf River, George County, Mississippi is included. Unit 2 also includes Big Black Creek main stem from its confluence with Black and Red Creeks, Jackson County, Mississippi, to its confluence with the Pascagoula River, Jackson County, Mississippi. All of the main stem of the Pascagoula River from its confluence with the Leaf and Chickasawhay Rivers, George County, Mississippi, to the discharge of the East and West Pascagoula Rivers into Pascagoula Bay, Jackson County, Mississippi, is included. The lateral extent of Unit 2 is the ordinary high water line on each bank of the associated rivers and shorelines.

Subpopulation estimates, calculated from sturgeon captures in 1999 and 2000 in the summer holding areas on the Pascagoula River, range between 162 and 216 individuals (Heise *et al.*, 1999a; and Ross *et al.*, 2001b). Due to the sampling technique, these estimates are based primarily on large fish and do not account for juvenile or subadult fish (S. Ross, USM, pers. comm. 2001).

Gulf sturgeon spawning on the Bouie River was confirmed via egg collection in 1999 (Slack *et al.*, 1999; and Heise *et al.*, 1999a). This is the only confirmed spawning area in the Pascagoula River drainage. Downstream, the Bouie River is sometimes used as a summer holding area (Ross *et al.*, 2001b). Gulf sturgeon have been documented using the area above the known spawning habitat approximately 0.80 rkm (0.50 rmi) north of Glendale Road (Reynolds, 1993; and W. Slack, pers. comm. 2002). Additional

suitable spawning habitat has been identified in this upstream reach (F. Parauka, pers. comm. 2002), and since Gulf sturgeon have rarely been documented upstream of spawning grounds, we have included the 4.8 rkm (3 rmi) of river reach upstream of the confirmed spawning grounds. For ease of identification, we have stopped on the southern-most road crossing of Interstate 59, where it crosses the Bouie River. Confirmed use for spawning and use as a summer holding area support the inclusion of the Bouie River as critical habitat.

Documented sightings of Gulf sturgeon and identified suitable spawning habitat upstream to Mississippi State Highway 588 (Reynolds, 1993; W. Slack, pers. comm. 2002; and F. Parauka, pers. comm. 2002), confirmed use as a migration corridor, and confirmed use by juvenile Gulf sturgeon (W. Slack, pers. comm. 2002) support the inclusion of the Leaf River as critical habitat.

Documented sightings of Gulf sturgeon using the Chickasawhay River (Miranda and Jackson, 1987; Reynolds, 1993; and Ross *et al.*, 2001b) upstream to Quitman (Ross *et al.*, 2001b), and the presence of apparently suitable spawning habitat at Quitman (F. Parauka, pers. comm. 2002), support the inclusion of this river reach as critical habitat for spawning, migration, and juvenile feeding. We have included the suitable spawning habitat located within 0.8 rkm (0.5 rmi) upstream of Mississippi State Road 512 and have extended the designation 9 rkm (5.5 rmi) upstream to the confluence with Oaky Creek for ease of identification.

Gulf sturgeon use the West and East distributaries of the Pascagoula River during spring and fall migrations (Ross *et al.*, 2001b). Summer resting areas have been consistently documented on Big Black Creek and on the Pascagoula River (Ross *et al.*, 2001a and b). Confirmed use for migration and/or summer resting areas and probable feeding use by juveniles support our inclusion of these river reaches.

Unit 3. Escambia River System in Santa Rosa and Escambia Counties, Florida and Escambia, Conecuh, and Covington Counties, Alabama

Unit 3 includes the Conecuh River main stem beginning just downstream of the spillway of Point A Dam, Covington County, Alabama, downstream to the Florida State line, where its name changes to the Escambia River, Escambia County, Alabama, and Escambia and Santa Rosa Counties, Florida. It includes the entire main stem of the Escambia River downstream to its discharge into Escambia Bay and Macky Bay, Escambia and Santa Rosa Counties, Florida. All of the distributaries of the Escambia River including White River, Little White River, Simpson River, and Dead River, Santa Rosa County, Florida are included. The Sepulga River main stem from Alabama County Road 42, Conecuh and Escambia Counties, Alabama, downstream to its confluence with the Conecuh River, Escambia County, Alabama, is also included. The lateral extent of Unit 3 is the ordinary high water line on each bank of the associated lakes, rivers and shorelines.

Sufficient data are not yet available to estimate historic or current subpopulation size of the Escambia River drainage subpopulation. Collection and tagging of Gulf sturgeon, monitoring, and eventual subpopulation estimates are in the initial phases on the Escambia River in Florida and the Conecuh River in Alabama.

Suitable spawning habitat (Parauka and Giorgianni, 2002) and a reported larval sighting (N. Craft, Florida Department of Environmental Protection (FDEP), pers. comm. 2001), just below the Point A Dam (221 rkm (137 rmi)) on the Conecuh River support inclusion of critical habitat upstream to the Point A Dam. The Point A Dam prevents sturgeon movement further upstream at all flow conditions. In addition, spawning has been confirmed between rkm 161 and 170 (rmi 100 and 105.6) (Craft *et al.*, 2001) on the Conecuh River. The use of the river main stem for spawning, adult resting areas, juvenile feeding and resting, and the use for migration to these sites supports our inclusion of the Escambia/Conecuh River main stem as critical habitat for the Escambia River subpopulation of Gulf sturgeon.

Historic sightings reported from the 1910s and 1920s, and as recently as 1991, have been documented in Escambia County, Alabama, on the Sepulga River (Reynolds, 1993). Estes *et al.* (1991) describe the Sepulga as having smooth rock walls, and long pools with stretches of rocky shoals and sandbars. We included the Sepulga River reach upstream to Alabama County Road 42, Escambia County, Alabama, because it has suitable spawning habitat and documented sightings.

We believe it is most likely that Gulf sturgeon use the Escambia River main stem and all the distributaries for exiting and entering the Escambia/Conecuh River. Gulf sturgeon have been documented to use distributaries near the river mouth within other systems (*e.g.*, Suwannee, Pearl, and Pascagoula River systems) for migration into and out of riverine habitat. We, therefore, have included all distributaries on the Escambia River system (*i.e.*, White River, Little White River, Simpson River, and Dead River) in Unit 3.

Unit 4. Yellow River System in Santa Rosa and Okaloosa Counties, Florida and Covington County, Alabama

Unit 4 includes the Yellow River main stem from Alabama State Highway 55, Covington County, Alabama, downstream to its discharge at Blackwater Bay, Santa Rosa County, Florida. All Yellow River distributaries (including Weaver River and Skim Lake) discharging into Blackwater Bay are included. The Shoal River main stem, a Yellow River tributary, from Florida Highway 85, Okaloosa County, Florida, to its confluence with the Yellow River, is included. The Blackwater River from its confluence with Big Coldwater Creek, Santa Rosa County, Florida, downstream to its discharge into Blackwater Bay is included. Wright Basin and Cooper Basin, Santa Rosa County, on the Blackwater River are included. The lateral extent of Unit 4 is the ordinary high water line on each bank of the associated lakes, rivers and shorelines.

The USGS conducted a subpopulation study in the Yellow River system during the spring (May to July) and fall (October) of 2001. Based on the capture of 98 fish in the spring and the capture/recapture of 94 fish that fall, the USGS estimated the subpopulation to consist of 580 Gulf sturgeon of 1 m (3.3 ft) or greater in size (M. Randall, USGS, pers. comm. 2001). This estimate excludes fish younger than 3 to 4 years of age.

Five distinct limestone outcrops have been documented as possible spawning sites on the Yellow River, between rkm 43 and 134 (rmi 26.7 and 83.3) (Parauka and Giorgianni, 2002). Several sites consist of brittle marl and limestone, and others of porous limestone. The lowest downstream site (rkm 43 (rmi 26.7)) is a primitive rock revetment, a manmade structure with a fair amount of rock substrate (Craft *et al.*, 2001). In recent years, biologists working for the State of Alabama have observed young-of-the-year Gulf sturgeon near limestone outcrops 3.2 km (2 mi) south of Alabama State Highway 55 (136 rkm (84 rmi)) (Craft *et al.*, 2001), which confirms that reproduction is occurring within this subpopulation. The river upstream of Alabama State Highway 55 is shallow, sandy, and creek-like and, therefore, not believed suitable for spawning (M. Randall, pers. comm. 2001; F. Parauka, pers. comm. 2001; and G. Morgan, Conecuh National Forest, pers. comm. 2001). Preliminary surveys located four potential summer resting

areas on the Yellow River main stem (Craft *et al.*, 2001). Recent fish captures and the confirmation of spawning at the furthest upstream spawning habitat location near Alabama State Highway 55 support our inclusion of the Yellow River main stem to Alabama State Highway 55 (136 rkm (84 rmi)) as critical habitat for the Yellow River subpopulation of Gulf sturgeon.

The inclusion of the Shoal River, from the Yellow River confluence upstream to the Florida Highway 85 bridge (13 rkm (8 rmi)), is supported as critical habitat because it is a confirmed summer resting area (Lorio 2000). The potential for distributaries Weaver River and Skim Lake to be used for migration to and from the Yellow River system (Craft *et al.*, 2001) supports their inclusion as critical habitat. The current and historic use of deep holes by Gulf sturgeon on the Blackwater River main stem and between Wright Basin and Cooper Basin demonstrate the importance of this area for summer resting and staging (Reynolds, 1993; and Craft *et al.*, 2001) and support its inclusion as critical habitat for the Yellow River subpopulation.

Unit 5. Choctawhatchee River System in Holmes, Washington, and Walton Counties, Florida and Dale, Coffee, Geneva, and Houston Counties, Alabama

Unit 5 includes the Choctawhatchee River main stem from its confluence with the west and east fork of the Choctawhatchee River, Dale County, Alabama, downstream to its discharge at Choctawhatchee Bay, Walton County, Florida. The distributaries discharging into Choctawhatchee Bay known as Mitchell River, Indian River, Cypress River, and Bells Leg are included. The Boynton Cutoff, Washington County, Florida, which joins the Choctawhatchee River main stem, and Holmes Creek, Washington County, Florida, are included. The section of Holmes Creek from Boynton Cutoff to the mouth of Holmes Creek, Washington County, Florida, is included. The Pea River main stem, a Choctawhatchee River tributary, from the Elba Dam, Coffee County, Alabama, to its confluence with the Choctawhatchee River, Geneva County, Alabama, is included. The lateral extent of Unit 5 is the ordinary high water line on each bank of the associated rivers and shorelines.

Preliminary estimates of the size of the Gulf sturgeon subpopulation in the Choctawhatchee River system are 2,000 to 3,000 fish over 61 cm (24 inches (in)) total length (F. Parauka, pers. comm. 2001).

Biologists have located Gulf sturgeon within 0.8 rkm (0.5 rmi) downstream of the Elba Dam, Coffee County, Alabama, on the Pea River (Lorio, 2000) and have identified suitable spawning habitat from the Elba Dam to the Pea River mouth (Parauka and Giorgianni, 2002; and Hightower *et al.*, in press). The Elba Dam prevents sturgeon movement further upstream at all flow conditions. This river reach has one confirmed spawning site, and Gulf sturgeon often use the lower reach for summer resting (Fox *et al.*, 2000; and Hightower *et al.*, in press). Suitable spawning and resting habitat, confirmed spawning, and young-of-the-year and juvenile feeding (F. Parauka, pers. comm. 2001) support inclusion of the Pea River reach as critical habitat.

Five spawning sites and seven resting areas have been identified on the Choctawhatchee River main stem between the river mouth (0 rkm (0 rmi)) and upstream to 150 rkm (93 rmi) (Hightower *et al.*, in press). Biologists have identified suitable spawning habitat (limestone outcrops) periodically between 135 rkm (84 rmi) to the confluence of the West Fork Choctawhatchee River and East Fork Choctawhatchee River (224 rkm (139 rmi)) (Parauka and Giorgianni, 2000; H. Blalock-Herod, FWS, pers. comm. 2002; and Hightower *et al.*, in press). Fox *et al.* (2000) located a male at 150 rkm (93 rmi) and another male in spawning condition near Newton (214 rkm (133 rmi)) on the Choctawhatchee River, 8 rkm (5 rmi) downstream of the confluence of the West Fork Choctawhatchee River and East Fork Choctawhatchee River. Since Gulf sturgeon rarely occur upstream of spawning grounds, we have included up to the confluence of West Fork Choctawhatchee River and East Fork Choctawhatchee River for ease of identification and with the probability of unconfirmed spawning grounds. Suitable habitat, confirmed spawning, and young-of-the-year and juvenile feeding support the inclusion of the Choctawhatchee River main stem as critical habitat.

No sturgeon have been documented within Holmes Creek, except for the section that connects the Choctawhatchee River and Boynton Cutoff, north and south. We have included this river section of Holmes Creek because it acts as part of the Choctawhatchee River main stem. In 1994, Gulf sturgeon were captured during March and April at the mouths of Indian River, Cypress River, and Bells Leg, indicating that sturgeon probably use these distributaries as migratory corridors to and from the Choctawhatchee River main stem. All distributaries, including the Indian River, Cypress River, Bells Leg, and Mitchell River, are included as critical habitat.

Unit 6. Apalachicola River System in Franklin, Gulf, Liberty, Calhoun, Jackson, and Gadsen Counties, Florida

Unit 6 includes the Apalachicola River mainstem, beginning from the Jim Woodruff Lock and Dam, Gadsden and Jackson Counties, Florida, downstream to its discharge at East Bay or Apalachicola Bay, Franklin County, Florida. All Apalachicola River distributaries, including the East River, Little St. Marks River, St. Marks River, Franklin County, Florida, to their discharge into East Bay and/or Apalachicola Bay are included. The entire main stem of the Brothers River, Franklin and Gulf Counties, Florida, a tributary of the Apalachicola River, is included. The lateral extent of Unit 6 is the ordinary high water line on each bank of the associated rivers and shorelines.

Based on mark/recapture studies conducted in 1998 and 1999 in the Apalachicola River downstream of Jim Woodruff Lock and Dam, the summer subpopulation of subadult and adult Gulf sturgeon was estimated to be between 270 and 321 individuals (FWS, 1998; and FWS, 1999). Seventy-one sturgeon were collected in the upper Brothers River, upstream of the Brickyard Cutoff and downstream of Bearman Creek between June and September 1999 (FWS, 1999; and Lorio, 2000). Gulf sturgeon captured on the Brothers River have not been included in the Apalachicola River subpopulation size estimate although they are believed to be part of the subpopulation.

The Gulf sturgeon became restricted to the portion of the Apalachicola River downstream of the Jim Woodruff Lock and Dam upon the construction of the dam in the 1950s. Wooley *et al.* (1982) documented the capture of two Gulf sturgeon larvae on the Apalachicola River just downstream of the Jim Woodruff Lock and Dam, thereby confirming successful spawning up to the dam. Resting aggregations are often seen at the base of the dam. Seven potential spawning sites have been identified in the upper Apalachicola River between Highway 20 and the Jim Woodruff Lock and Dam (120 to 171 km (76 to 106 rmi)) (Parauka and Giorgianni, 2002). Suitable spawning and resting habitat, confirmed spawning, and young-of-the-year and juvenile feeding support inclusion of the Apalachicola River as critical habitat.

The entire main stem of the Brothers River, a major tributary of the Apalachicola River, is also included as critical habitat. Spawning has not been documented within this tributary, but an important resting area is located in the uppermost section of the Brothers River between Brickyard Cutoff and Bearman Creek (FWS, 1999; and Lorio, 2000). Sturgeon use the lower Brothers River as a resting and possible osmoregulation area (staging) before migrating into the estuarine and marine habitats for winter feeding (Wooley and Crateau, 1985). The Apalachicola River distributaries, including the East River, St. Marks River and Little St. Marks River, are included, based on information derived from other systems. Gulf sturgeon tend to use more than just the main stem for migration into and out of the river systems (*e.g.*, Suwannee, Choctawhatchee, and Pearl Rivers).

Unit 7. Suwannee River System in Hamilton, Suwannee, Madison, Lafayette, Gilchrist, Levy, Dixie, and Columbia Counties, Florida

Unit 7 includes the Suwannee River main stem, beginning from its confluence with Long Branch Creek, Hamilton County, Florida, downstream to the mouth of the Suwannee River. It includes all the Suwannee River distributaries, including the East Pass, West Pass, Wadley Pass, and Alligator Pass, Dixie and Levy Counties, Florida, to their discharge into the Suwannee Sound or the Gulf of Mexico. The Withlacoochee River main stem from Florida State Road 6, Madison and Hamilton Counties, Florida, to its confluence with the Suwannee River is included. The lateral extent of Unit 7 is the ordinary high water line on each bank of the associated rivers and shorelines.

The Suwannee River supports the largest Gulf sturgeon subpopulation among the coastal rivers of the Gulf of Mexico (Huff, 1975; and Gilbert, 1992). Sulak and Clugston (1999) reported 5,344 uniquely tagged Suwannee River sturgeons from 1986 to 1998. Multiple models using various age classes have been used to estimate the subpopulation size of Gulf sturgeon on the Suwannee River system. Chapman *et al.* (1997) estimated the subpopulation at 3,152 fish greater than age 6. Sulak and Clugston's (1999) estimate was 7,650 individuals greater than 61 cm (24 in) total length and older than age 2. Pine and Allen (2001) estimated the Suwannee River subpopulation at 5,500 individuals age 2 to 25. Based on intensive egg sampling efforts conducted between 1993 and 1998, Sulak and Clugston (1999) estimated that 30 to 90 female fish spawn per year.

Marchant and Shutters (1996) collected two Gulf sturgeon eggs from the Suwannee River in April 1993. These were the first Gulf sturgeon eggs collected in the wild. Between 1993 and 1998, three spawning sites were confirmed with the collection of Gulf sturgeon eggs on artificial substrate samplers (Marchant and Shutters, 1996; and Sulak and Clugston, 1999). Young-of-the-year have been documented using the river between rkm 10 to the confluence with Roaring Creek at approximately rkm 285 (177 rmi) on the Suwannee River main stem (Carr *et al.*, 1996a; Sulak and Clugston, 1999; K. Sulak, pers. comm. 2002; and J. Clugston, pers. comm. 2002). It is believed that the farthest upstream that sturgeon spawn during high water is Big Shoals, near White Springs, Hamilton and Columbia Counties, Florida, but adult sturgeon are probably unable to move upstream of Big Shoals (Huff, 1975; K. Sulak, pers. comm. 2002; and M. Randall, pers. comm. 2002). Suitable spawning habitat has been identified upstream to Big Shoals (Huff, 1975; H. Blalock-Herod, pers. comm. 2002). Foster and Clugston (1997) located five major resting areas throughout the Suwannee River. A deep river bend and a shallow sandy section were characteristic features of the resting areas (Foster and Clugston, 1997). Confirmed use for spawning, identified and probable spawning habitat upstream to Big Shoals, young-of-year and juvenile feeding, and summer resting support the inclusion of the Suwannee River as critical habitat. For ease of identification, the Suwannee River has been included in the unit upstream of Big Shoals 0.8 rkm (0.5 rmi) to its confluence with Long Branch Creek.

Adult Gulf sturgeon sightings and suitable spawning habitat on the lower Withlacoochee River near Florida State Road 141, Hamilton and Madison Counties, Florida, support the inclusion of this area as critical habitat. We have included shoals (5 rkm (3 rmi)) located just upstream of where sturgeon have been observed as possible spawning habitat, and have stopped at Florida State Road 6 (14 rkm (9 rmi)), upstream from the shoals, for ease of identification.

The Suwannee River branches near its mouth into the East Pass and West Pass. Gulf sturgeon adults use the East Pass and West Pass for emigration and immigration (Mason and Clugston, 1993; and Edwards *et al.*, in prep.). The West pass is divided into two primary channels—Wadley Pass, connected to the Gulf of Mexico by a straight dredged channel across the northern portion of the Sound, and Alligator Pass, used by juveniles (Huff, 1975), connected to the Gulf of Mexico by an undredged, natural channel. Confirmed use of the East Pass, West Pass, and Alligator Pass, and probable use of the Wadley Pass by adult and juvenile Gulf sturgeon for migration and feeding support the inclusion of all distributaries of the Suwannee River as critical habitat.

Unit 8. Lake Pontchartrain, Lake St. Catherine, The Rigolets, Little Lake, Lake Borgne, and Mississippi Sound in Jefferson, Orleans, St. Tammany, and St. Bernard Parish, Louisiana, Hancock, Jackson, and Harrison Counties in Mississippi, and in Mobile County, Alabama

Unit 8 encompasses Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, The Rigolets, Lake St. Catherine, Lake Borgne, including Heron Bay, and the Mississippi Sound. Critical habitat follows the shorelines around the perimeters of each included lake. The Mississippi Sound includes adjacent open bays including Pascagoula Bay, Point aux Chenes Bay, Grand Bay, Sandy Bay, and barrier island passes, including Ship Island Pass, Dog Keys Pass, Horn Island Pass, and Petit Bois Pass. The northern boundary of the Mississippi Sound is the shoreline of the mainland between Heron Bay Point, Mississippi and Point aux Pins, Alabama. Critical habitat excludes St. Louis Bay, north of the railroad bridge across its mouth; Biloxi Bay, north of the U.S. Highway 90 bridge; and Back Bay of Biloxi. The southern boundary follows along the broken shoreline of Lake Borgne created by low swamp islands from Malheureux Point to Isle au Pitre. From the northeast point of Isle au Pitre, the boundary continues in a straight north-northeast line to the point 1 nautical mile (nm) (1.9 km) seaward of the western most extremity of Cat Island (30°13′N, 89°10′W). The southern boundary continues 1 nm (1.9 km) offshore of the barrier islands and offshore of the 72 COLREGS lines at barrier island passes (defined at 33 CFR 80.815 ©)), (d) and (e)) to the eastern boundary. Between Cat Island and Ship Island there is no 72 COLREGS line. We, therefore, have defined that section of the unit southern boundary as 1 nm (1.9 km) offshore of a straight line drawn from the southern tip of Cat Island to the western tip of Ship Island. The eastern boundary is the line of longitude 88°18.8′W from its intersection with the shore (Point aux Pins) to its intersection with the southern boundary. The lateral

extent of Unit 8 is the MHW line on each shoreline of the included water bodies or the entrance to rivers, bayous, and creeks.

The Pearl River and its distributaries flow into The Rigolets, Little Lake, and Lake Borgne, the western extension of Mississippi Sound. The Rigolets connect Lake Pontchartrain and Lake St. Catherine with Little Lake and Lake Borgne. The Pascagoula River and its distributaries flow into Pascagoula Bay and Mississippi Sound.

This unit provides juvenile, subadult and adult feeding, resting, and passage habitat for Gulf sturgeon from the Pascagoula and the Pearl River subpopulations. One or both of these subpopulations have been documented by tagging data, historic sightings, and incidental captures as using Pascagoula Bay, The Rigolets, the eastern half of Lake Pontchartrain, Little Lake, Lake St. Catherine, Lake Borgne, Mississippi Sound, within 1 nm (1.9 km) of the nearshore Gulf of Mexico adjacent to the barrier islands and within the passes (Davis *et al.*, 1970; Reynolds, 1993; Rogillio, 1993; Morrow *et al.*, 1998a; Ross *et al.*, 2001a; Rogillio *et al.*, 2002; and F. Parauka, pers. comm. 2002). Substrate in these areas range from sand to silt, all of which contain known Gulf sturgeon prey items (Menzel, 1971; Abele and Kim, 1986; and American Fisheries Society, 1989).

The Rigolets is an 11.3 km (7 mi) long and about 0.6 km (0.4 mi) wide passage connecting Lake Pontchartrain and Lake Borgne (U.S. Department of Commerce (USDOC), 2002). This brackish water area is used by adult Gulf sturgeon as a staging area for osmoregulation and for passage to and from wintering areas (Rogillio *et al.*, 2002). Lake St. Catherine is a relatively shallow lake with depths averaging approximately 1.2 m (4 ft), connected to The Rigolets by Sawmill Pass. Bottom sediments in Sawmill Pass are primarily silt; Lake St. Catherine's are composed of silt and sand (Barrett, 1971). Incidental catches of Gulf sturgeon are documented from Lake St. Catherine and Sawmill Pass (Reynolds, 1993; and H. Rogillio, Louisiana Department of Wildlife and Fisheries, pers. comm. 2002). Based on the proximity of Little Lake, Lake St. Catherine, and Sawmill Pass to The Rigolets and Pearl River, we believe these areas are also used for staging and feeding and, therefore, we have included them with The Rigolets as critical habitat.

Rogillio (1990) and Morrow *et al.* (1996) indicated that Lake Pontchartrain and Lake Borgne were used by Gulf sturgeon as wintering habitat, with most catches during late September through March. Lake Pontchartrain is 57.9 km (36 mi) long, 35.4 km (22 mi) wide at its widest point, and 3 to 4.9 m (10 to 16 ft) deep (USDOC, 2002). Morrow *et al.* (1996) documented Gulf sturgeon from the Pearl River system using Lake Pontchartrain (verified by tags) and summarized existing Gulf sturgeon records, which indicated greater use of the eastern half of Lake Pontchartrain. Although Rogillio *et al.* (2002) did not relocate any of their sonic tagged adult Gulf sturgeon in Lake Pontchartrain, the eastern part of this lake is believed to be an important winter habitat for juveniles and subadults (H. Rogillio, pers. comm. 2002). Furthermore, we believe that Gulf sturgeon forage in Lake Pontchartrain during the winter. The Lake Pontchartrain Causeway, twin toll highway bridges, extends 33.6 km (20.9 mi) across Lake Pontchartrain from Indian Beach on the south shore to Lewisburg and Mandeville on the north shore. Sediment data from Lake Pontchartrain indicate sediments have a greater sand content east of the causeway than west (Barrett, 1976). Most records of Gulf sturgeon from Lake Pontchartrain are located east of the causeway, with concentrations near Bayou Lacombe and Goose Point, both on the eastern north shore (Reynolds, 1993; and Morrow *et al.*, 1996). While Gulf sturgeon have also been documented west of the causeway, generally near the mouths of small river systems (Davis, 1970), we have excluded the western portion of Lake Pontchartrain because we believe that the sturgeon utilizing this area are coming from western tributaries and not the Pearl River.

Lake Pontchartrain connects by The Rigolets with Lake Borgne. Lake Borgne, the western extension of Mississippi Sound, is partly separated from Mississippi Sound by Grassy Island, Half Moon (Grand) Island and Le Petit Pass Island. Lake Borgne is approximately 14.3 km (23 mi) in length, 3 to 6 km (5 to 10 mi) in width and 1.8 to 3 m (6 to 10 ft) in depth (USDOC, 2002). Most of Lake Borgne sediment is clay and silt (Barrett, 1971). Many Gulf sturgeon were anecdotally reported as taken incidentally in shrimp trawls in Lake Borgne 0.6 to 1.2 km (1 to 2 mi) south of the Pearl River between August and October from the 1950s through the 1980s (Reynolds, 1993). There are twenty-two additional records of Gulf sturgeon in Lake Borgne (D. Walther, FWS, pers. comm. 2002). Known locations are spread out around the perimeter of the Lake, including at the mouth of The Rigolets, Violet Canal, Bayou Bienvenue, Polebe, Alligator Point, and at Half Moon Island (Reynolds, 1993). We have included all of Lake Borgne as critical habitat.

The Mississippi Sound is separated from the Gulf of Mexico by a chain of barrier islands, including Cat, Ship, Horn, and Petit Bois Islands. Natural depths of 3.7–5.5 m (12 to 18 ft) are found throughout the Sound and a channel 3.7 m (12 ft) deep has been dredged where necessary from Mobile Bay to New Orleans (USDOC, 2002). Incidental captures and recent studies confirm that both Pearl River and Pascagoula River adult Gulf sturgeon winter in the Mississippi Sound, particularly around barrier islands and barrier islands passes (Reynolds, 1993; Ross *et al.*, 2001a; and Rogillio *et al.*, 2002). Pascagoula Bay is adjacent to the Mississippi Sound. Gulf sturgeon exiting the Pascagoula River move both east and west, with telemetry locations as far east as Dauphin Island and as far west as Cat Island and the entrance to Lake Pontchartrain, Louisiana (Ross *et al.*, 2001a). Tagged Gulf sturgeon from the Pearl River subpopulation have been located between Cat Island, Ship Island, Horn Island, and east of Petit Bois Islands to the Alabama State line (Rogillio *et al.*, 2002). Gulf sturgeon have also been documented within 1 nm (1.9 km) off the barrier islands of Mississippi Sound. We, therefore, have included 1 nm (1.9 km) offshore of the barrier islands of Mississippi Sound. Habitat used by Gulf sturgeon in the vicinity of the barrier islands is 1.9 to 5.9 m (6.2 to 19.4 ft) deep (average 4.2 m (13.8 ft)), with clean sand substrata (Heise *et al.*, 1999b; Ross *et al.*, 2001a; and Rogillio *et al.*, 2002). Preliminary data from substrate samples taken in the barrier island areas indicate that all samples contained lancelets (Ross *et al.*, 2001a). Inshore locations where Gulf sturgeon were located (Deer Island, Round Island) were 1.9 to 2.8 m (6.2 to 9.2 ft) deep and all had mud (mostly silt and clay) substrata (Heise *et al.*, 1999b), typical of substrates supporting known Gulf sturgeon prey.

Unit 9. Pensacola Bay System in Escambia and Santa Rosa Counties, Florida

Unit 9 includes Pensacola Bay and its adjacent main bays and coves. These include Big Lagoon, Escambia Bay, East Bay, Blackwater Bay, Bayou Grande, Macky Bay, Saultsmar Cove, Bass Hole Cove, and Catfish Basin. All other bays, bayous, creeks, and rivers are excluded at their mouths. The western boundary is the Florida State Highway 292 Bridge crossing Big Lagoon to Perdido Key. The southern boundary is the 72 COLREGS line between Perdido Key and Santa

Rosa Island (defined at 33 CFR 80.810 (g)). The eastern boundary is the Florida State Highway 399 Bridge at Gulf Breeze, Florida. The lateral extent of unit 9 is the MHW line on each shoreline of the included waterbodies.

The Pensacola Bay system includes five interconnected bays, including Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay, and the Santa Rosa Sound. The Santa Rosa Sound is addressed separately in unit 10. The Escambia River and its distributaries (Little White River, Dead River, and Simpson River) empty into Escambia Bay, including Bass Hole Cove, Saultsmar Cove, and Macky Bay. The Yellow River empties into Blackwater Bay. The entire system discharges into the Gulf of Mexico, primarily through a narrow pass at the mouth of Pensacola Bay.

The Pensacola Bay system provides winter feeding and migration habitat for Gulf sturgeon from the Escambia River and Yellow River subpopulations. Over the past four years, FDEP researchers have conducted tracking studies in the Pensacola Bay system to observe Gulf sturgeon winter migrations. They have identified specific areas in the bays where Escambia River and Yellow River Gulf sturgeon collect, or migrate through, during the fall and winter season. These studies also identified two main habitat types where Gulf sturgeon concentrate during winter months. Movement is generally along the shoreline area of Pensacola Bay. Gulf sturgeon showed a preference for several areas in the bay, including Redfish Point, Fort Dickens, and Escribano Point, near Catfish Basin (FWS, 1998; and Craft *et al.*, 2001). Sandy shoal areas, located along the south and east side of Garcon Point, south shore of East Bay (Redfish Point area) and near Fair Point, appear to be commonly used, especially in the fall and early spring. During midwinter, sturgeon are commonly found in deep holes located north of the barrier island at Ft. Pickens, south of the Pensacola Naval Air Station, and at the entrance of Pensacola Pass. The depth in these areas ranges from 6 to 12.1 m (20 to 40 ft). Other areas where tagged fish were frequently located include Escribano Point, near Catfish Basin, and the mouth of the Yellow River. Previous incidental captures of Gulf sturgeon have been recorded in Pensacola Bay, Big Lagoon, and Bayou Grande (Reynolds, 1993; and Lorio, 2000).

Unit 10. Santa Rosa Sound in Escambia, Santa Rosa, and Okaloosa Counties, Florida

Unit 10 includes the Santa Rosa Sound, bounded on the west by the Florida State Highway 399 bridge in Gulf Breeze, Florida and the east by U.S. Highway 98 bridge in Fort Walton Beach, Florida. The northern and southern boundaries of unit 10 are formed by the shorelines to the MHW line or by the entrance to rivers, bayous, and creeks.

The Santa Rosa Sound is a lagoon between the mainland and Santa Rosa Island that connects Pensacola Bay in the west with Choctawhatchee Bay in the east. The Sound extends east to west approximately 57.9 km (35.9 mi) and varies in width between 0.32 and 3.5 km (0.2 to 2.2 mi) (FDEP, 1993). The Intracoastal Waterway transects the sound. The Santa Rosa Sound is designated as critical habitat because we believe it provides one continuous migratory pathway between Choctawhatchee Bay, Pensacola Bay, and the Gulf of Mexico for feeding and genetic interchange. Within the last 3,000 years, periodic shoaling closed the opening of Choctawhatchee Bay to the Gulf of Mexico. For many years, the Santa Rosa Sound provided the only way for Choctawhatchee River Gulf sturgeon to migrate to the Gulf of Mexico (Wakeford, 2001). Recent locations of subadult and adult Gulf sturgeon within the Santa Rosa Sound confirm its present use by the Choctawhatchee River subpopulations (Fox *et al.*, 2002; and F. Parauka, pers. comm. 2002). The Escambia and Yellow Rivers subpopulations may also use this area due to its close proximity. Gulf sturgeon have been located mid-channel and in shoreline areas in 2 to 5.2 m (6.6 to 17.1 ft) depths and sand substrate. The approximate length of the critical habitat unit is 52.8 km (33 miles). Bridges were chosen as the eastern and western boundaries for ease in identification. Any portion of the sound not included in this unit is captured by the adjacent critical habitat units.

Unit 11. Florida Nearshore Gulf of Mexico Unit in Escambia, Santa Rosa, Okaloosa, Walton, Bay, and Gulf Counties in Florida

Unit 11 includes a portion of the Gulf of Mexico as defined by the following boundaries. The western boundary is the line of longitude 87°20.0′W (approximately 1 nm (1.9 km) west of Pensacola Pass) from its intersection with the shore to its intersection with the southern boundary. The northern boundary is the MHW of the mainland shoreline and the 72 COLREGS lines at passes as defined at 30 CFR 80.810 (a–g). The southern boundary of the unit is 1 nm (1.9 km) offshore of the northern boundary; the eastern boundary is the line of longitude 85°17.0′W from its intersection with the shore (near Money Bayou between Cape San Blas and Indian Peninsula) to its intersection with the southern boundary.

Unit 11 includes winter feeding and migration habitat for Gulf sturgeon from the Yellow River, Choctawhatchee River, and Apalachicola River subpopulations. Telemetry relocation data suggest that these subpopulations feed in nearshore Gulf of Mexico waters between their natal river systems (Fox *et al.*, 2002; and F. Parauka, pers. comm. 2002). Gulf sturgeon from the Choctawhatchee River subpopulation have been documented both east and west of Choctawhatchee Bay (Fox *et al.*, 2002; and F. Parauka, pers. comm. 2002). During the winter of 2001–2002, personnel from both USGS and FWS attached pop-up satellite tags to 20 Gulf sturgeon (12 from the Suwannee River, 4 from the Choctawhatchee River, 2 from the Apalachicola River, and 2 from the Yellow River) to identify winter feeding areas in the Gulf of Mexico. Due to a design flaw, errors in attachment, or sturgeon's ability to successfully shed the tags, the tags failed to report reliable data with only two exceptions. One of the Choctawhatchee River-tagged Gulf sturgeon was located in Hogtown Bayou in Choctawhatchee Bay; however, this provided no new information as we already knew that some adult Gulf sturgeon overwinter in this bayou. The other operating tag had been attached to a Yellow River Gulf sturgeon. Manual tracking in the vicinity of that Yellow River Gulf sturgeon led to the relocation of another tagged Gulf sturgeon. As a result, tagged individuals from three different subpopulations (Choctawhatchee, Yellow, and Apalachicola Rivers) were relocated on multiple occasions in close proximity to one another, suggesting an important feeding area just offshore of Mexico Beach, Crooked Island East, and Crooked Island West over sand substrate. These data suggest that Gulf sturgeon from the Yellow River, Choctawhatchee River, and Apalachicola River remain within 1.6 km (1 mi) of the coastline between these river systems (F. Parauka, pers. comm. 2002). Examination of bathymetry data along the Gulf of Mexico coastline between the Pensacola Bay and Apalachicola Bay reveals that depths of less than 6 m (19.7 ft), where Gulf sturgeon are generally found, are all

contained within 1 nm (1.9 km) from shore. Gulf nearshore substrate contains unconsolidated, fine-medium grain sands which support crustaceans such as mole crabs, sand fleas, various amphipod species, and lancelets (Menzel, 1971; Abele and Kim, 1986; and American Fisheries Society, 1989). Based on movement patterns, it appears these Gulf sturgeon were feeding in the nearshore Gulf of Mexico on route to their natal rivers. Given this information, we have included the nearshore (up to 1 nm (1.9 km)) Gulf of Mexico waters in this unit between Pensacola and Apalachicola Bays.

Unit 12. Choctawhatchee Bay in Okaloosa and Walton Counties, Florida

Unit 12 includes the main body of Choctawhatchee Bay, Hogtown Bayou, Jolly Bay, Bunker Cove, and Grassy Cove. All other bayous, creeks, and rivers are excluded at their mouths/entrances. The western unit boundary is the U.S. Highway 98 bridge at Fort Walton Beach, Florida; the southern boundary is the 72 COLREGS line across East (Destin) Pass as defined at 33 CFR 80.810 (f). The lateral extent of unit 12 is the MHW line on each shoreline of the included water bodies.

Choctawhatchee Bay provides important habitat for maintaining the health of subadult and adult Gulf sturgeon as evidenced by a large number of Gulf sturgeon overwintering in the system (FWS, 1997; FWS 1998; and Parauka *et al.*, in press). The Choctawhatchee Bay offers a feeding area for both subadults and adults (FWS, 1998; and Fox *et al.*, 2002). Tagged subadults showed a preference for shoreline habitats which are predominated by sandy substrates, low salinity and water depths less than 3 m (10 ft) (FWS, 1997; FWS, 1998; and Parauka *et al.*, in press). Most adult Gulf sturgeon were located in shallow water (2 to 4 m (6.6 to 13.1 ft)) with predominantly (greater than 80 percent) sandy sediment (Fox *et al.*, 2002). Ghost shrimp, a component of the sturgeon diet, are typically found in substrates ranging from sandy mud to organic silty sand (Felder and Lovett, 1989), and their densities were greatest nearshore along the middle and eastern portions of the Choctawhatchee Bay (Heard *et al.*, 2000), the area frequented by the Gulf sturgeon (Fox *et al.*, 2002). We have included the deeper central portion of the Bay in unit 12 as critical habitat because the Gulf sturgeon are known to use the deeper bay waters for movement between the shoreline areas (Fox *et al.*, 2002).

Unit 13. Apalachicola Bay in Gulf and Franklin County, Florida

Unit 13 includes the main body of Apalachicola Bay and its adjacent sounds, bays, and the nearshore waters of the Gulf of Mexico. These consist of St. Vincent Sound, including Indian Lagoon; Apalachicola Bay including Horseshoe Cove and All Tides Cove; East Bay including Little Bay and Big Bay; and St George Sound, including Rattlesnake Cove and East Cove. Barrier Island passes (Indian Pass, West Pass, and East Pass) are also included. Sike's Cut is excluded from the lighted buoys on the Gulf of Mexico side to the day boards on the bay side. The southern unit boundary includes water extending into the Gulf of Mexico 1 nm (1.9 km) from the MHW line of the barrier islands and from 72 COLREGS lines between the barrier islands (defined at 33 CFR 80.805 (e–h)); the western boundary is the line of longitude 85°17.0′W from its intersection with the shore (near Money Bayou between Cape San Blas and Indian Peninsula) to its intersection with the southern boundary. The eastern boundary of the unit is formed by a straight line drawn from the shoreline of Lanark Village at 29°53.1′N, 84°35.0′W to a point that is 1 nm (1.9 km) offshore from the northeastern extremity of Dog Island at 29°49.6'N, 84°33.2'W. The lateral extent of unit 13 is the MHW line on each shoreline of the included water bodies or the entrance of excluded rivers, bayous, and creeks.

The Apalachicola River empties into Apalachicola Bay near Little Bay and Big Bay. The Apalachicola Bay system, a highly productive lagoon-and-barrier-island complex, consists of the bay proper, East Bay, St. George Sound, Indian Lagoon, and St. Vincent Sound (Wakeford, 2001). It is relatively shallow, averaging 2 to 3 m (6.6 to 9.8 ft) in depth (Livingston, 1980). The benthic habitat type most often found in Apalachicola Bay system is soft sediment, comprising approximately 70 percent of the estuarine area (Livingston, 1980). Its composition of sand, clay, and silt varies considerably depending on the location in the bay. The Apalachicola Bay connects with the Gulf of Mexico through several passes, including Indian Pass, West Pass, East Pass, and Sike's Cut, a man-made opening established in the mid 1950s (Odenkirk, 1989).

Unit 13 provides winter feeding migration habitat for the Apalachicola River Gulf sturgeon subpopulation. Gulf sturgeon have been documented by sightings, incidental captures, and telemetry studies throughout Apalachicola Bay, East Bay, St. George Sound, St. Vincent Sound, and Indian Lagoon (Swift *et al.*, 1977; Wooley and Crateau, 1985; Odenkirk, 1989; FWS, 2000; and F. Parauka, pers. comm. 2002). Gulf sturgeon have also been documented in Indian Pass, West Pass, East Pass, and just north of Dog Island (Wooley and Crateau, 1985; Odenkirk, 1989; FWS, 2000; and F. Parauka, pers. comm. 2002). Substantial weight gains and the presence of suitable habitat for prey items indicate that Gulf sturgeon are feeding while within these bodies of water (Wooley and Crateau, 1985; and Odenkirk, 1989). These areas are also used for accessing adjacent marine and estuarine feeding areas designated in unit 11. Gulf sturgeon are believed to migrate from Apalachicola Bay into the Gulf of Mexico following prevailing currents and exiting primarily through the two most western passes (Indian and West) (Odenkirk, 1989). No Gulf sturgeon have been documented using Sike's Cut, a man-made opening established in the 1950s bisecting Little St. George Island and St. George Island; therefore, Sike's Cut is excluded from our designation.

Tag return data from incidental captures and recent relocation data document Gulf sturgeon south of the Apalachicola barrier islands, generally within a mile of the shoreline (Odenkirk, 1989; and FWS, 2000). On June 8, 1992, a commercial shrimp fisherman provided anecdotal information that he and other shrimp fishermen, had caught hundreds of Gulf sturgeon, with estimated weights generally between 22.7 to 27.2 kg (50 to 60 lbs), in the same location, each spring (April, May, and June), for the past thirty years (1962 to 1992) (F. Parauka, pers. comm. 2002). The fishermen described the location as south of St. George Island, within a few hundred yards of the beach. He described the capture areas as being adjacent to a shoal extending approximately 3.2 km (2 mi) offshore. Examination of bathymetric data shows that there are several shoals in that general vicinity. Since we are unable to confirm the specific location of the area described by this fisherman, we are extending this critical habitat unit only 1 nm (1.9 km) offshore of the barrier islands bordering Apalachicola Bay and Cape San Blas, a distance for which we have supporting telemetry data. In doing so, we will capture some of the shallow shoals extending south of the barrier islands, which we believe provide important foraging substrate.

Unit 14. Suwannee Sound in Dixie and Levy Counties, Florida

Unit 14 includes Suwannee Sound and a portion of adjacent Gulf of Mexico waters extending 9 nm from shore (16.7 km) out to the State territorial water boundary. Its northern boundary is formed by a straight line from the northern tip of Big Pine Island (at approximately 29°23′N, 83°12′W) to the Federal-State boundary at 29°17′N, 83°21′W; the southern boundary is formed by a straight line from the southern tip of Richards Island (at approximately 29°11′N, 83°04′W) to the Federal-State boundary at 29°04′N, 83°15′W. The lateral extent of unit 14 is the MHW line along the shorelines and the mouths of the Suwannee River (East and West Pass), its distributaries and other rivers, creeks, or water bodies.

The Suwannee River system is unique among Gulf sturgeon river systems in that the river flows directly into the Suwannee Sound and Gulf of Mexico without any intervening barrier islands. Suwannee Sound is a shallow (typically less than 2 m (6.6 ft)), estuarine basin, a little less than 10 nm (8 km) long and a little over 4 nm (8 km) wide at its widest point. It is enclosed on its seaward side by Suwannee Reef, an approximately 14.6 nm (27 km) long arc of oyster reefs and shoals (Edwards *et al.*, in prep.). The bathymetry of waters off the coastline and north and south of Suwannee Sound is different from the waters adjacent to other systems. Shallow waters are not confined to the nearshore environment, and depths less than 6 m (19.7 ft) extend 9 to 10 mi (14.5 to 16.1 km) off the coastline.

Telemetry data confirm that subadult and adult Gulf sturgeon leave the river during October and November and enter Suwannee Sound and the nearshore Gulf of Mexico (Carr *et al.*, 1996b; and Edwards *et al.*, in prep.). Tracking data indicate that Gulf sturgeon move slowly and remained offshore of Suwannee Sound in nearby shallow (less than 6 m (19.7 ft)) marine/estuarine habitats for a period of two months, until at least mid or late December. Overall movement patterns are punctuated by periods of slow movement within small areas, suggesting foraging (Edwards *et al.*, in prep.). Mason and Clugston (1993) found large, immigrating Suwannee River Gulf sturgeon fed on nearshore coastal shelf organisms lancelets (*Branchiostoma caribaeum*), brachiopods (*Glottida pyramida*), unidentified pelagic shrimps, polychaetes, unidentified marine molluscs, starfish and sea cucumbers. Carr *et al.* (1996b) found that adult Gulf sturgeon feed primarily on brachiopods and ghost shrimp, before entering the river. The consumption of brachiopods as a primary Gulf sturgeon food source is currently being researched by the University of Florida. Numerous underwater beds containing brachiopods have recently been located in the Suwannee River estuary and adjacent areas in Suwannee Sound (D. Murie and D. Parkyn, pers. comm. 2002). Recent stomach content analyses using a non-lethal method of stomach pumping (lavaging) support that Gulf sturgeon from the Suwannee River subpopulation feed primarily on brachiopods, and to lesser amounts on ghost shrimp, amphipods, and worms prior to entering the river (D. Murie and D. Parkyn, pers. comm. 2002).

Gulf sturgeon tracking and relocation data were used to delineate the boundaries of this critical habitat unit. In 1998, 18 out of 19 sonic-tagged Gulf sturgeon were consistently relocated and found to be concentrated in a relatively small area (115 km^2 (44.4 mi^2)) offshore of Suwannee Sound (Edwards *et al.*, in prep.). Specific locations within the concentration area were around Waldley Channel, West Gap, and Hedemon Reef. The farthest offshore area was Hedemon Reef, approximately 5 to 6 nm (9.3 to 11.1 km) from the Suwannee River opening. Previous telemetry data and tag recaptures documented Gulf sturgeon using Gulf of Mexico waters as far out as 9 nm (16.7 km) (Sulak and Clugston, 1999; and Edwards *et al.*, in prep.). More recently, on March 22, 2002, two Gulf sturgeon were observed jumping in the area of 29°14′N, 83°18′W, further substantiating the Gulf sturgeon's use of shallow State waters further offshore (greater than 6 nm (11.1 km)) (Harris, pers. comm. 2002). Benthic samples taken where the fish were jumping were comprised of fine sand substrate and lancelets. Although lancelets are recovered less frequently than brachiopods in the stomachs of Suwannee River Gulf sturgeon, this may be a result of quicker decomposition of lancelets during digestion compared to brachiopods. Our designation, therefore, includes waters out to 9 nm (16.7 km) to encompass these areas that we believe are essential for the conservation of the Gulf sturgeon. The northern extent of the tracked sturgeon concentration area depicted in Edwards *et al.* (in prep.) corresponds approximately to the northern-most extremity of Big Pine Island. We, therefore, have chosen that easy-to-identify location for the northern limit of this critical habitat unit. The southern extent of the concentration area depicted in Edwards *et al.* (in prep.) corresponds approximately to Richards Island. In addition to the telemetry data, Gulf sturgeon sightings are frequently reported around Deer Island and Derrick Key (F. Chapman, UF, pers. comm. 2002). Derrick Key is approximately 1 m (1.6 km) offshore of Richards Island. Based on these data, we are designating the southernmost extremity of Richards Island for the southern limit of unit 14.

Although Gulf sturgeon have been relocated both north and south of this critical habitat area (Reynolds, 1993; F. Chapman, pers. comm. 2002; and Edwards *et al.*, in prep.), records are relatively rare and encompass approximately 643.7 km (400 mi) of coastline (from Charlotte Harbor to Apalachicola Bay). While Gulf sturgeon may congregate in additional shallow water areas or migrate throughout the entire area, without additional information we cannot include additional areas as critical habitat.

Land Ownership

Upon statehood in 1811 for Louisiana, 1817 for Mississippi, 1819 for Alabama, and 1845 for Florida, these States were granted ownership of lands beneath tidally influenced and navigable waters up to the high water mark (*Pollard* v. *Hagan,* 44 U.S. (3 How.) 212 (1845)). It is possible that prior sovereigns or the States have made grants to private parties which include lands below mean high waters of the navigable waters included within this rule. Thus, this rule may affect limited parcels of private land. However, we believe that the majority of lands designated here as critical habitat are owned by the States of Louisiana, Mississippi, Alabama, and Florida. The majority of riparian lands bordering riverine critical habitat units are in private ownership. Table 3 summarizes public lands adjacent to designated critical habitat units.

TABLE 3.—PUBLIC LANDS ADJACENT TO DESIGNATED CRITICAL HABITAT UNITS

Unit 1. Pearl—Lefleur's Bluff SP, Pearl River WMA, Bogue Chitto NWR, Old River WMA, John C. Stennis Space Center.
Unit 2. Pascagoula—Desoto NF, Pascagoula River WMA, Ward Bayou WMA, MS Sandhill Crane NWR.
Unit 3. Escambia-Lower Escambia River WtrMA, Conecuh NF.
Unit 4. Yellow—Yellow River WtrMA, Eglin Air Force Base, Conecuh NF, Blue Spring WMA, Blackwater River Recreational Area.

TABLE 3.—PUBLIC LANDS ADJACENT TO DESIGNATED CRITICAL HABITAT UNITS—Continued

Unit 5. Choctawhatchee—Choctawhatchee River SF, Choctawhatchee River Delta Preserve, Choctawhatchee River WtrMA.
Unit 6. Apalachicola—Chattahoochee Nature Park, Torreya SP, Apalachicola Bluffs and Ravines Preserve, Apalachicola WMA, Apalachicola River WtrMA, Apalachicola NF, Apalachicola National Estuarine Research Reserve
Unit 7. Suwannee—Ft. Union CA, Holton Creek CA, Suwannee River SP CA, Twin Rivers SF, Madison Co. CA, Anderson Spring CA, Charles Spring CA, Allen Mill Pond CA, Peacock Spring CA, Little River CA, Troy Springs CA, Grady CA, Stuart Landing CA, Hatchbend CA, Rock Bluff CA, Log Landing CA, Wannee CA, Fanning Springs SRA, Andrews WMA, Manatee Springs SP, Fowler's Bluff CA, Cummer Sanctuary, Lower Suwannee NWR, Troy Springs SP, Convict Spring CA, Yellow Jacket CA, Suwannee River SP, Big Shoals SP, Big Shoals CA, Camp Branch CA, Deep Creek CA, Stephen Foster State Folk Culture Center, Suwannee Valley CA, Swift Creek CA, Woods Ferry CA
Unit 8. Lake Borgne, Mississippi Sound, Lake Pontchartrain—Biloxi WMA, Bayou Sauvage NWR, Big Branch Marsh NWR, Grand Bay NWR, Gulf Islands NS, Buccaneer SP, St. Hospital WMA, Fontainebleau SP, St. Tammany SWR, Pearl River WMA, Fort Pike State Historic Site
Unit 9. Pensacola Bay—Gulf Islands NS, Eglin AFB, Pensacola Naval Air Station, Garcon Point WMD, Yellow River WtMR, Lower Escambia River Mgt. Area, Bay Bluffs Park, Escambia Bay Bluffs, Fort Pickens AP, Yellow River Marsh AP
Unit 10. Santa Rosa Sound—Gulf Islands NS, Eglin AFB.
Unit 11. Near Shore GOM—Gulf Islands NS, Eglin AFB (main base and Cape San Blas), St. Vincent NWR, St. Joe SP, Salina Park, Tyndall AFB, St. Andrew SP, Camp Helen SRA, Deer Lake SP, Grayton SRA, Topsail Hill St. Preserve, Henderson SRA, Pensacola Naval Air Station, Perdido Key SRA, Fort Pickens AP, St. Andrew Bay AP, St. Joseph Bay AP
Unit 12. Choctawhatchee Bay—Choctawhatchee River Delta Preserve, Rocky Bayou State Recreation SRA, Eglin AFB, Basin Bayou Recreation Area.
Unit 13. Apalachicola Bay—St. Vincent NWR, St. George Island SP, Apalachicola WMA, Apalachicola National Estuarine Research Reserve, Apalachicola Bay AP
Unit 14. Suwannee Sound—Lower Suwannee NWR, Cedar Keys NWR, Big Bend Seagrasses AP.

*Abbreviations—AFB=Air Force Base, AP=Aquatic Preserve, CA=Conservation Area, NF=National Forest, NS=National Seashore, NWR=National Wildlife Refuge, SCA=State Commemorative Area, SF=State Forest, SP=State Park, SRA=State Recreation Area, SWR=State Wildlife Refuge, WMA=Wildlife Management Area, WMD=Water Management District, WtrMA=Water Management Area.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including us, to insure that their actions are not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. The regulatory effects of a critical habitat designation under the Act are triggered through the provisions of section 7, which applies to all activities conducted, authorized, or funded by a Federal agency (Federal actions). Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Individuals, organizations, States, local governments, and other non-Federal entities are affected by the designation of critical habitat if their actions occur on Federal lands, require Federal authorization, or involve Federal funding.

Consultation for Designated Critical Habitat

If a Federal action may affect a listed species or its designated critical habitat, the action agency must initiate consultation with us (50 CFR 402.14). Through this consultation, we would advise the agency whether the action would likely jeopardize the continued existence of the species or destroy or adversely modify its critical habitat, or both.

When we issue a biological opinion that concludes that an action is likely to result in the destruction or adverse modification of critical habitat, we must provide reasonable and prudent alternatives to the action, if any are identifiable. Reasonable and prudent alternatives are actions identified during consultation that can be implemented in a manner consistent with the intended purpose of the proposed action, are consistent with the scope of the action agency's authority and jurisdiction, are economically and technologically feasible, and would likely avoid the destruction or adverse modification of critical habitat (50 CFR 402.02).

Reinitiation of Prior Consultations

Following designation of critical habitat, regulations at 50 CFR 402.16 require a Federal agency to reinitiate consultation for previously reviewed actions that may affect critical habitat and over which the agency has retained discretionary involvement or control.

Activities That May Destroy or Adversely Modify Gulf Sturgeon Critical Habitat

Section 4(b)(8) of the Act requires us, in any proposed or final rule designating critical habitat, to briefly describe and evaluate those activities that may adversely modify such habitat, or that may be affected by such designation, to the maximum extent practicable. Activities that may destroy or adversely modify critical habitat for the Gulf sturgeon, or that may be affected by such designation, include, but are not limited to the following actions when authorized, funded or carried out by a Federal agency:

(1) Actions that would appreciably reduce the abundance of riverine prey for larval and juvenile sturgeon, or of estuarine and marine prey for juvenile and adult Gulf sturgeon, within a designated critical habitat unit, such as dredging; dredged material disposal; channelization; in-stream mining; and land uses that cause excessive turbidity or sedimentation.

(2) Actions that would appreciably reduce the suitability of Gulf sturgeon spawning sites for egg deposition and development within a designated critical habitat unit, such as impoundment; hard-bottom removal for navigation channel deepening; dredged material disposal; in-stream mining; and land uses that cause excessive sedimentation.

(3) Actions that would appreciably reduce the suitability of Gulf sturgeon riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, believed necessary for minimizing energy expenditures and possibly for osmoregulatory functions, such as dredged material disposal upstream or directly within such areas; and other land uses that cause excessive sedimentation.

(4) Actions that would alter the flow regime (the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) of a riverine critical habitat unit such that it is appreciably impaired for the purposes of Gulf sturgeon migration, resting, staging, breeding site selection, courtship, egg fertilization, egg deposition, and egg development, such as impoundment; water diversion; and dam operations.

(5) Actions that would alter water quality within a designated critical

habitat unit, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, such that it is appreciably impaired for normal Gulf sturgeon behavior, reproduction, growth, or viability, such as dredging; dredged material disposal; channelization; impoundment; in-stream mining; water diversion; dam operations; land uses that cause excessive turbidity; and release of chemicals, biological pollutants, or heated effluents into surface water or connected groundwater via point sources or dispersed non-point sources.

(6) Actions that would alter sediment quality within a designated critical habitat unit such that it is appreciably impaired for normal Gulf sturgeon behavior, reproduction, growth, or viability, such as dredged material disposal; channelization; impoundment; in-stream mining; land uses that cause excessive sedimentation; and release of chemical or biological pollutants that accumulate in sediments.

(7) Actions that would obstruct migratory pathways within and between adjacent riverine, estuarine, and marine critical habitat units, such as dams, dredging, point-source-pollutant discharges, and other physical or chemical alterations of channels and passes that restrict Gulf sturgeon movement.

Previous Section 7 Consultations

Many section 7 consultations for Federal actions affecting the Gulf sturgeon and its habitat have preceded this critical habitat designation. The action agencies have included the USACE, other DOD agencies, the U.S. Coast Guard, the National Park Service, the Federal Highway Administration, the Minerals Management Service (MMS), the Federal Energy Regulatory Commission, and others. We have also conducted intra-service section 7 consultations on our own actions.

Since listing, the FWS has conducted 320 informal and 14 formal consultations, and NMFS has conducted 70 informal and 4 formal consultations involving Gulf sturgeon. The informal consultations, all of which concluded with a finding that the Federal action would not affect or would not likely adversely affect the Gulf sturgeon, addressed a wide range of actions including navigation, beach nourishment, Gulf of Mexico fishery management planning, oil and gas leases, power plants, bridges, pipelines, breakwaters, rip-rap, levees and other flood-protection structures, piers, bulkheads, jetties, military actions, and in-stream gravel mining. The formal consultations, which followed a finding that the Federal action may affect Gulf sturgeon, have dealt exclusively with navigation projects, oil and gas leases, pipelines, review of water quality standards, and disaster recovery activities, and have resulted in biological opinions. Also, the Gulf sturgeon was mentioned in several biological opinions that were triggered by may-affect determinations for other listed species. To date, none of our opinions have concluded that a proposed Federal action would jeopardize the continued existence of the Gulf sturgeon.

Previous biological opinions for the Gulf sturgeon have included discretionary conservation recommendations to the action agency. Conservation recommendations are activities that would avoid or minimize the adverse effects of a proposed action on a listed species or its critical habitat, help implement recovery plans, or develop information useful to the species' conservation.

Previous biological opinions for the Gulf sturgeon also have included non-discretionary reasonable and prudent measures, with implementing terms and conditions, which are designed to minimize the proposed action's incidental take of Gulf sturgeon. Section 3(18) of the Act defines the term take as ''to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct.''

The conservation recommendations and reasonable and prudent measures provided in previous Gulf sturgeon biological opinions have included enforcement of marine debris and trash regulations; avoidance of dredging and disposal in deeper portions of the channel; monitoring and reporting of ''take'' events during project construction; operation of equipment so as to avoid or minimize take; monitoring of post-project habitat conditions; monitoring of project-area Gulf sturgeon subpopulations; limiting of dredging to the minimum dimensions necessary; limiting of the depth of dredged material placed in disposal areas; arrangement of the sequence of areas for dredging to minimize potential harm; screening of intake structures; avoidance of riverine dredging during spawning months; limiting of tow times of trawl nets for hurricane debris cleanup; addition of specific measures for species protection to oil spill contingency plans; and funding of research useful for Gulf sturgeon conservation.

The designation of critical habitat will only impact those private landowner activities that require Federal funding or permits. Designation of critical habitat is applicable to all activities approved, funded, or carried out by Federal agencies.

Jurisdictional Responsibilities for the Management of the Gulf Sturgeon

When the Gulf sturgeon was listed on September 30, 1991 (56 FR 49653), the Services had not resolved jurisdictional responsibilities for the management of the Gulf sturgeon. Both Services signed the listing rule in agreement that the species required protection. The final listing rule stated that until the jurisdictional issue was resolved, the FWS would be responsible for the species once the listing became effective. Although the issue has never been formally resolved, we have been operating under a verbal agreement in which the FWS maintains the lead for recovery actions. Consultation responsibilities were divided, with the FWS performing consultation review for projects impacting the Gulf sturgeon in the riverine and estuarine habitats, and NMFS performing consultation review for projects affecting the species in marine habitats.

We formalize here Gulf sturgeon jurisdictional responsibilities. In order to enhance consultation coordination efficiency for the action agencies, the following structure is adopted. The FWS will maintain primary responsibility for recovery actions in fresh water and the NMFS will assist in and continue to fund recovery actions pertaining to estuarine and marine habitats. In riverine units, the FWS will be responsible for all consultations regarding Gulf sturgeon and critical habitat. In estuarine units, we will divide responsibility based on the action agency involved. The FWS will consult with the Department of Transportation, EPA, the U.S. Coast Guard, and the Federal Emergency Management Agency. NMFS will consult with the DOD, USACE, MMS, and any other Federal agencies not mentioned here explicitly. In marine units, NMFS will be responsible for all consultations regarding Gulf sturgeon and critical habitat. For any Federal projects that extend into the jurisdiction of both the Services, as defined above, FWS will be the lead consulting agency, and coordinate internally with NMFS. Each agency will conduct its own intra-agency consultations as necessary.

Exclusions Under Section 4(b)(2)

Section 4(b)(2) of the Act requires us to designate critical habitat on the basis of the best scientific and commercial information available, and to consider

the economic and other relevant impacts of designating a particular area as critical habitat. We may exclude areas from critical habitat upon a determination that the benefits of such exclusions outweigh the benefits of specifying such areas as critical habitat. We cannot exclude areas from critical habitat when the exclusion will result in the extinction of the species concerned.

Economic Impacts

Following the publication of the proposed critical habitat designation, a draft economic analysis was conducted to estimate the potential economic impact of the designation, in accordance with the recent decision in the *N.M. Cattlegrowers Ass'n* v. *U.S. Fish and Wildlife Serv.*, 248 F.3d 1277 (10th Cir. 2001). The draft analysis was made publically available for review on August 8, 2002. We accepted comments on the draft analysis until October 7, 2002.

Our draft economic analysis evaluated the potential future section 7 effects, including indirect effects, associated with designating critical habitat for the Gulf Sturgeon. The categories of potential costs considered in the analysis included the costs associated with: (1) Conducting section 7 consultations associated with the listing or with the designation of critical habitat, including incremental consultations and technical assistance; (2) modifications to projects, activities, or land uses resulting from the section 7 consultations; (3) indirect economic impacts on local industries and enterprises resulting from the physical changes to habitat areas that may be associated with project modifications (*e.g.*, regional economic impacts). The most likely economic effects of critical habitat designation are on activities funded, authorized, or carried out by a Federal agency.

Following the close of the comment period on the draft economic analysis, a final analysis was completed that incorporated public comments on the draft analysis and made other changes in the draft. Based on the draft and final economic analyses, and in consideration of all other relevant impacts of the designation, the Services are excluding under Section 4(b)(2) major shipping channels, as identified on standard navigation charts and marked by buoys, in the following three units:

(1) *Unit 2. Pascagoula River System in Forrest, Perry, Greene, George, Jackson, Clarke, Jones, and Wayne Counties, Mississippi.*—The major shipping channel of this unit is the southernmost 2.4 km (1.5 mi) of the Pascagoula River. The specific area excluded extends from the river mouth (rkm 0 (rmi 0)) to the river crossing with the CSX railroad bridge, approximately 2.4 km (1.5 mi) north of the river mouth. This channel is generally marked on the USACE's Alabama-Mississippi stream mileage tables with drainage areas (USACE 1985).

(2) *Unit 8. Lake Pontchartrain, Lake St. Catherine, The Rigolets, Little Lake, Lake Borgne, and Mississippi Sound in Jefferson, Orleans, St. Tammany, and St. Bernard Parish, Louisiana, Hancock, Jackson, and Harrison Counties in Mississippi, and in Mobile County, Alabama.*—The major shipping channel of this unit is the GIWW and the approach channels to the Port of Pascagoula. Both channels are generally marked on USGS topographic maps and maps published for the public by the Corps of Engineers. The specific areas being excluded are marked by navigation buoys maintained by the U.S. Coast Guard.

(3) *Unit 9: Pensacola Bay System in Escambia and Santa Rosa Counties, Florida.*—The major shipping channels of this unit are in the southern portion of Pensacola Bay and serve the Port of Pensacola and the Pensacola Naval Air Station. These channels are generally marked on USGS topographic maps and maps published for the public by the Corps of Engineers. The specific areas being excluded are marked by navigation buoys maintained by the U.S. Coast Guard.

The Services have decided to exclude these areas after balancing the benefits of excluding against the benefits of including such areas as critical habitat. In the absence of other relevant factors, if excluding an area from a critical habitat designation will relieve a negative economic impact, and at the same time including the area fails to confer a counter-balancing positive benefit to the species, then the benefits of excluding the area from critical habitat outweigh the benefits of including it. The results of this type of evaluation will vary significantly depending on the landowners, geographic areas, and species involved.

(1) Benefits of Inclusion

The benefits of including these areas in the critical habitat designation is low. While Units 2, 8, and 9 are essential to the conservation of the Gulf sturgeon, the navigation channels contained within each of these units constitutes a small proportion of the individual unit. In areas that are frequently maintained by dredging (*e.g.* entrance channels to the Port of Pascagoula), the primary constituent elements for sturgeon that are still present in the channels are unlikely to be appreciably diminished from their current baseline by Federal actions in the channels.

In Unit 2, Gulf sturgeon use the West and East distributaries of the Pascagoula River during spring and fall migrations (Ross *et al.*, 2001b). Summer resting areas have been consistently documented on the Pascagoula River (Ross *et al.*, 2001a and b). The Pascagoula River Harbor is on the East Pascagoula River distributary, a small portion of this overall unit, but consistently used for migration.

Unit 8 provides juvenile, subadult and adult feeding, resting, and passage habitat for Gulf sturgeon from the Pascagoula and the Pearl River subpopulations. The Mississippi Sound is separated from the Gulf of Mexico by a chain of barrier islands, including Cat, Ship, Horn, and Petit Bois Islands. Natural depths of 3.7 to 5.5 m (12 to 18 ft) are found throughout the Sound and a channel 3.7 m (12 ft) deep has been dredged where necessary from Mobile Bay to New Orleans (USDOC, 2002). Incidental captures and recent studies confirm that both Pearl River and Pascagoula River adult Gulf sturgeon winter in the Mississippi Sound, particularly around barrier islands and barrier islands passes (Reynolds, 1993; Ross *et al.*, 2001a; and Rogillio *et al.*, 2002). Gulf sturgeon are frequently found at the mouths of the barrier island passes (Ross *et al.*, 2001a) adjacent to channels used by recreational and commercial craft entering and exiting the Gulf of Mexico. The GIWW is a small band traversing this unit from east to west.

Unit 9 includes Pensacola Bay and its adjacent main bays and coves. These include Big Lagoon, Escambia Bay, East Bay, Blackwater Bay, Bayou Grande, Macky Bay, Saultsmar Cove, Bass Hole Cove, and Catfish Basin. All other bays, bayous, creeks, and rivers are excluded at their mouths. The Pensacola Bay system includes five interconnected bays, including Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay, and the Santa Rosa Sound. The Escambia River and its distributaries (Little White River, Dead River, and Simpson River) empty into Escambia Bay, including Bass Hole Cove, Saultsmar Cove, and Macky Bay. The Yellow River empties into Blackwater Bay. The entire system discharges into the Gulf of Mexico, primarily through a narrow pass at the mouth of Pensacola Bay. The major shipping channel in this unit is the GIWW and extends to the Port of Pensacola and Pensacola Naval Air Station.

The Pensacola Bay system provides winter feeding and migration habitat for

Gulf sturgeon from the Escambia River and Yellow River subpopulations. Sturgeon movement through this area is generally along the shoreline area of Pensacola Bay. Gulf sturgeon showed a preference for several areas in the bay, including Redfish Point, Fort Pickens, and Escribano Point, near Catfish Basin (FWS, 1998; and Craft *et al.*, 2001). Sandy shoal areas, located along the south and east side of Garcon Point, south shore of East Bay (Redfish Point area) and near Fair Point, appear to be commonly used, especially in the fall and early spring. During midwinter, sturgeon are commonly found in deep holes located north of the barrier island at Ft. Pickens, south of the Pensacola Naval Air Station, and at the entrance of Pensacola Pass. The depth in these areas ranges from 6 to 12.1 m (20 to 40 ft). Other areas where tagged fish were frequently located include Escribano Point, near Catfish Basin, and the mouth of the Yellow River. Previous incidental captures of Gulf sturgeon have been recorded in Pensacola Bay, Big Lagoon, and Bayou Grande (Reynolds, 1993; and Lorio, 2000).

In sum, the Services believe that a critical habitat designation for the Gulf sturgeon would provide a relatively low level of additional regulatory conservation benefit to the species.

(2) Benefits of Exclusion

A major economic impact identified in the draft economic analysis was on dredging projects of the USACE. USACE plans the location and timing of dredging projects to ensure that channel reliability is always maintained. Frequency of dredging varies widely, from almost annual maintenance dredging to once every ten or twenty years, depending on the level of use of the waterway for shipping and the natural rate of sediment deposition. The major navigation channels must be maintained to Congressionally authorized depths and widths to allow shippers to enter ports. Failure to maintain the navigation channels accordingly greatly affects shippers who may be forced to use smaller vessels, light load (*i.e.*, remove shipped goods to reduce weight and therefore the depth of the barge), use alternative modes of transport, such as rail or truck transport, or travel on to another port. All of these alternatives increase the cost of transporting goods. In extreme cases, commercial facilities may close and economic activities may transfer to other locations.

The major risks of dredging projects to sturgeon are entrainment in dredges, prevention of migratory passage through channels and inlets due to blockage by large dredges, elevated turbidity causing increased siltation on feeding or spawning areas, and possible removal of food prey. Numerous formal and informal consultations on dredging activities are anticipated in the proposed critical habitat units over the next ten years.

Potential project modifications specific to dredging and disposal projects, and for which we have concerns regarding their potential implications, include:

- *Minimize extent of dredging activity.* In past consultations, FWS has requested that proposed dredging projects be limited to proposed depths only. Less likely, USACE could avoid dredging in deeper portions of the channel for riverine dredging projects, limit dredging of navigation channels to the minimum dimensions necessary, avoid performing advanced maintenance activities, or use silt curtains to enclose dredging sites when dredging in shallow water. For hydraulic dredging, USACE may raise the cutter head above the bottom during pipeline clearing and keep it as close to the surface as practicable while water is being pumped from the pipeline.
- *Sequence dredging.* For example, if a dredging project includes both a river mouth and a channel into a bay, USACE may arrange the project to dredge the estuary first and dredge the river second so that areas more sensitive to turbidity and hypoxia are dredged during a cooler time frame.
- *Dredging windows.* USACE has expressed concern about the effect of dredging windows on its operations. In past informal consultations, dredging windows have been recommended to avoid entrainment in the dredge or the preclusion of movement past the dredge during migratory periods, since avoiding work during times when sturgeon are known to be in the direct vicinity of the project is the most effective way to avoid harm to the species. If USACE cannot avoid dredging within the time frames suggested in an informal consultation, USACE will likely need to initiate a formal consultation with the Services during which modifications to the project other than dredging windows would be considered.

It is possible that critical habitat could influence the Services to be more likely to impose one or more of these measures to prevent habitat modification.

If dredging windows and other measures are required in consultation, the present value of expected direct costs of implementation of section 7 for these activities that may affect the sturgeon or its habitat over the next ten years would exceed the projected $22.7 million cost of consultations on operation and maintenance of navigation projects set forth in the final economic analysis. This section 4(b)(2) analysis also considered the possibility that the greater costs projected in the draft economic analysis may be incurred. Forecast costs are associated with expected administrative requirements and project modifications that may be recommended by the Services during the consultation process. To the extent that project modifications due to a critical habitat designation may result in delays or a reduction in channel capacity, the secondary economic effects may be high.

(3) The Benefits of Exclusion Outweigh the Benefits of Inclusion

Based on the above considerations, and consistent with the direction provided in section 4(b)(2) of the Act, we have determined that the benefits of excluding major shipping channels as critical habitat outweigh the benefits of including them as critical habitat for the Gulf sturgeon. This conclusion is based on the following factors: The benefits of designating critical habitat in the major shipping channels of these units is low because the areal extent of the shipping channels is a very small proportion of the entire unit. In addition the frequently maintained portions of the major shipping channels are altered to an extent that any primary constituent elements for sturgeon that are still present in the channels are unlikely to be appreciably diminished from their current baseline by Federal actions in the channels. The benefits of excluding these areas may be high if critical habitat designation were to increase the frequency of modifications to dredging practices or result in delays in maintaining channel depth. Therefore, the Services believe that the benefits of exclusion outweigh the benefits of including these areas as critical habitat.

(4) Exclusions Within These Units Will Not Cause Extinction of the Species

These exclusions will not cause the extinction of the Gulf sturgeon. Although the shipping channels may provide food resources needed in the winter months, other large areas of prey and corridors for migration are available in the remainder of the units to prevent the extinction of the species.

Economic Analysis

Section 4(b)(2) of the Act requires us to designate critical habitat on the basis of the best scientific information available, and to consider the economic

and other relevant impacts of designating a particular area as critical habitat. We may exclude areas from critical habitat upon a determination that the benefits of such exclusions outweigh the benefits of specifying such areas as critical habitat. We cannot exclude such areas from critical habitat when such exclusion will result in the extinction of the species.

Following the publication of the proposed critical habitat designation, a draft economic analysis was conducted to estimate the potential economic effect of the proposed designation. The draft analysis was made publicly available for review on August 8, 2002. We accepted comments on the draft analysis until October 7, 2002. Our draft economic analysis evaluated potential future effects associated with the listing of the Gulf sturgeon as a threatened species under the Act, as well as any potential effect of the critical habitat designation above and beyond those regulatory and economic impacts associated with listing. The categories of potential costs considered in the analysis included the costs associated with (1) conducting section 7 consultations associated with the listing or with the critical habitat, including incremental consultations, reinitiated consultations, and technical assistance; (2) modifications to projects, activities, or land uses resulting from the section 7 consultations; (3) uncertainty and perceived impacts on markets resulting from the designation of critical habitat and (4) potential offsetting beneficial costs associated with critical habitat.

The majority of consultations resulting from the critical habitat designation for Gulf sturgeon are likely to address dredging and sediment disposal activities to support navigation, shoreline stabilization, water quality standards, military actions, road and bridge construction, oil and gas leases in Federal waters and permitting of oil and gas pipelines. As described in the draft economic analysis, all areas included in the designated critical habitat are occupied, with the fish also occurring in areas not included in the critical habitat designation.

Following the close of the comment period on the draft economic analysis, a final revision was completed which incorporated public comments on the draft analysis. Based on comments, the cost of consultations was revised. Subsequently, the revised economic analysis concluded that the designation may result in approximately $3,310,000 to $4,953,000 per year in potential economic impact due to the total effects of critical habitat, including those effects resulting co-extensively from listing the species. Given the uncertainty regarding the implementation of project modifications for predicted projects concerning dredging and disposal modifications, a probability of adoption ratio was used in the final economic analysis based on the rate that the Services recommended various modifications in past formal and informal consultations where the proposed action would have impacted the sturgeon as well as its habitat.

Only those areas essential to the conservation of the Gulf sturgeon have been included in the critical habitat designation; the designation does not encompass the entire area currently occupied or utilized by the species, nor does it include any currently unoccupied areas. The economic analysis documents that the costs of including any particular unit range from $1,300 to $380,000 annually in administrative costs of consultation over 10 years (the low value represents the lowest per unit estimate of costs attributable solely to critical habitat designation and the high value represents the highest per unit estimates of costs attributable co-extensively with listing). Total co-extensive administrative cost across all units over 10 years range between $705,600 and $2,348,600 per year. Project modification costs for this analysis could not be attributed to any one unit, given the nature of the projects. However, total co-extensive costs of project modifications across all units over 10 years are estimated to be $2,604,000 annually; if the approximate one-to-one ratio of total administrative costs to total project modification costs reflects the per unit ratio of these costs, then the highest upper-bound per unit estimate of critical habitat designation would be approximately $700,000 per year over 10 years. Sixty-five percent of the total upper-bound costs estimated to be attributable to critical habitat designation are expected to consist of federal agency costs.

Required Determinations

Regulatory Planning and Review

As required by Executive Order 12866, we have provided a copy of the rule, which describes the need for this action and how the designation meets that need, and the economic analysis, which assesses the costs and benefits of this critical habitat designation, to the Office of Management and Budget (OMB) for review. The OMB determined that this rule may raise novel legal or policy issues and found it to be a significant rule.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

Under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (*i.e.*, small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities.

SBREFA amended the Regulatory Flexibility Act (RFA) to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities. SBREFA also amended the RFA to require a certification statement. We are hereby certifying that this rule designating critical habitat for the Gulf sturgeon will not have a significant economic impact on a substantial number of small entities. The following discussion explains our rationale for this certification.

Small entities include small organizations, such as independent non-profit organizations, small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents, as well as small businesses (13 CFR 121.201). Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and agricultural businesses with annual sales less than $750,000. To determine if potential impacts to these small entities are significant, we consider the types of activities that might trigger regulatory impacts under this rule as well as the types of project modifications that may result. In general, the term ''significant economic impact'' is meant to apply to a typical small business firm's business operations.

To determine if the rule would affect a substantial number of small entities, we consider the number of small

entities affected within particular types of economic activities (*e.g.*, housing development, grazing, oil and gas production, timber harvesting, etc.). In estimating the numbers of small entities potentially affected, we also consider whether their activities have any Federal involvement; some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation.

The vast majority of the designated critical habitat for the Gulf sturgeon, with few exceptions, is public land involving river, stream, estuary, or marine habitat. Activities with Federal involvement that may require consultation regarding Gulf sturgeon and its critical habitat include: activities regulated under the Clean Water Act, the Rivers and Harbors Act of 1899, and/or various Coast Guard authorities. Small entity economic activities that may require Federal authorization or permits include energy-related activities such as pipelines, harbors, and platforms; residential development including docks, piers, bridges, and shoreline protection; boating-related projects of small communities; private port operation including maintenance dredging and docks; small water supply or hydropower projects; and high speed marine events.

As required under section 4(b)(2) of the Act, we conducted an analysis of the potential economic impacts of this critical habitat designation. In the draft analysis, we found that the future section 7 consultations resulting from the listing of the Gulf sturgeon and the proposed designation of critical habitat could potentially impose total economic costs for consultations and modifications to projects to range between approximately $43.4 million to $57.2 million over the next 10-year period. Public comment on the draft economic analysis led to a revision of third party cost estimates that would result from section 7 consultations. The changes in cost estimates are discussed and reflected in the revised final Economic Analysis of Critical Habitat Designation for the Gulf Sturgeon (Industrial Economics, Inc. 2003), where we found that the future section 7 consultations resulting from the listing of the Gulf sturgeon and the proposed critical habitat could potentially impose total economic costs for consultations and modifications to projects in the range of between $33.1 million to $49.5 million over the next 10-year period.

In considering whether this critical habitat designation would have a significant economic impact on a substantial number of small entities, we examined the total estimated section 7 costs calculated in earlier sections of this report, including those impacts that may be ''attributable co-extensively''with the listing of the species. This results in a conservative estimate (*i.e.*, more likely to overstate impacts than understate them), because it utilizes the upper bound impact estimate from the earlier analysis. Using this approach, the economic analysis estimated that fewer than 6 small entities per year, would experience significant economic impacts. We do not believe this constitutes a substantial number of small entities. Therefore, the Services are certifying that the designation of critical habitat for the Gulf sturgeon will not have a significant economic impact on a substantial number of small entities. Accordingly, a regulatory flexibility analysis is not required.

Small Business Regulatory Enforcement Fairness Act (5 U.S.C. 804(2))

OMB's Office of Information and Regulatory Affairs has determined that this rule is not a major rule under 5 U.S.C. 804(2), the Small Business Regulatory Enforcement Fairness Act. In the draft economic analysis and the final economic analysis, we determined that designation of critical habitat would not cause (a) any annual effect on the economy of $100 million or more, (b) any increases in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions, or (c) any significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S.-based enterprises to compete with foreign-based enterprises. Refer to the final economic analysis (Industrial Economics, Inc., 2003) for a complete discussion of the effects of this determination.

Executive Order 13211

On May 18, 2001, the President issued Executive Order 13211, which applies to ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use.'' In order to ensure that Federal agencies ''appropriately weigh and consider the effects of the Federal government's regulations on the supply, distribution, and use of energy,'' the President has directed agencies to prepare and submit to the OMB's Office of Information and Regulatory Affairs a ''Statement of Energy Effects'' for their ''significant energy actions.'' The OMB has provided guidance for implementing this Executive Order that outlines nine outcomes that may constitute ''a significant adverse effect'' when compared with the regulatory action under consideration:

(1) Reductions in crude oil supply in excess of 10,000 barrels per day;

(2) Reductions in fuel production in excess of 4,000 barrels per day;

(3) Reductions in coal production in excess of 5 million tons per year;

(4) Reductions in natural gas production in excess of 25 million mcf;

(5) Reductions in electricity production in excess of 1 billion kilowatts per year or in excess of 500 megawatts of installed capacity;

(6) Increases in energy use required by the regulatory action that exceed the thresholds above;

(7) Increases in the cost of energy production in excess of one percent;

(8) Increases in the cost of energy distribution in excess of one percent; or

(9) Other similarly adverse outcomes.

There is one hydropower project located upstream of critical habitat Unit 6. Accordingly, we assessed the potential for a significant effect to energy supply, distribution, or use as relevant to this analysis in the final addendum to the economic analysis, reductions in electricity production in excess of 1 billion kilowatts per year or in excess of 500 megawatts of installed capacity.

The Gulf region derives a very small portion of its overall power supply from hydropower. Electricity supply and capacity data are collected and reported by the North American Reliability Council (NERC). Of its ten regional councils, the Southeastern Electrical Reliability Council (SERC) is the most contiguous with areas potentially affected by critical habitat for the Gulf sturgeon. The geographic area covered by the Southern section of SERC includes most of Alabama and Georgia, southeastern Mississippi, and the Florida panhandle. Another section of SERC, Entergy, covers southwestern Mississippi, the Gulf coast Louisiana, and portions of other States. Peninsular Florida is not covered by SERC, but by the Florida Reliability Coordinating Council (FRCC). Peak summer demand reached 43,736 megawatts for the Southern region and 25,747 megawatts for the Entergy region in 2001.

Only one dam located upstream and adjacent to the critical habitat Unit 6 supplies hydropower. Located near the Florida-Georgia border in Chattahoochee, Florida, the Jim Woodruff Dam is one of 23 hydropower sites operated by the USACE that generate power. The electric power and energy generated at Jim Woodruff Dam is marketed by the Federal Southeastern Power Administration for the wholesale energy market. Of the total installed

capacity of 3,092 megawatts, the Jim Woodruff Dam represented 30 megawatts, or less than one percent of Southeastern Power Administration market capacity during fiscal year 1999. In terms of actual volume marketed, the facility provided 205 gigawatt hours during fiscal year 1999, or 3.6 percent of the Southeastern Power Administration total. Based on data from 1995, USACE estimated total electricity capacity in the Apalachicola-Chattahoochee-Flint (ACF) Basin to be 6,657 megawatts. Of this total, 652 megawatts represent hydropower capacity. Compared to 2001 Southern region peak summer demand, hydropower units located in the ACF Basin contribute a small percentage of total regional electricity demand.

In 2001, Florida had a summer peak demand of 38,285 megawatts out of a total summer peak capacity of 42,609 megawatts. Coal, natural gas, oil, and nuclear sources fuel most of the State's energy needs. Electricity derived from hydropower from the Jim Woodruff Dam can account for only a small fraction of Florida's statewide capacity.

The maximum installed capacity for Jim Woodruff Dam is 30 MW (30,000 KW). Therefore, even when viewed in the context of a worst-case scenario, in which implementation of section 7 of the Act results in significant operational changes, however unlikely, to this hydropower project, the total capacity is 30 MW (30,000 KW) of hydroelectricity, so the impact on these hydropower facilities could not exceed the 500 MW (500,000 KW) threshold.

Therefore, even in the worst case scenario, implementation of section 7 for the Gulf sturgeon will not result in a ''reduction in electricity production in excess of 500 megawatts of installed capacity'' or an ''increase in the cost of energy production in excess of one percent.'' Consequently, this rule will not have a ''significant adverse effect'' on the supply, distribution, or use of energy, and no ''Statement of Energy Effects'' is required.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*):

(a) This rule will not ''significantly or uniquely'' affect small governments. A Small Government Agency Plan is not required. Small governments will be affected only to the extent that Federal agencies funding, permitting, or authorizing other activities must ensure that their actions will not adversely affect the critical habitat.

(b) For the reasons described in the economic analysis and this final rule, this rule will not produce a Federal mandate on State, local, or tribal governments of $100 million or greater in any year. The designation of critical habitat imposes no obligations on State or local governments. Therefore, it is not a ''significant regulatory action''' under the Unfunded Mandates Reform Act.

Takings

In accordance with Executive Order 12630 (''Government Actions and Interference with Constitutionally Protected Private Property Rights''), this rule does not have significant takings implications. A takings implication assessment is not required. As discussed above, the designation of critical habitat affects only Federal agency actions. Since the critical habitat includes only aquatic areas that are generally held in public trust, we believe that little or no private property is included in the designation. Based on current public knowledge of the species protection and the prohibition against take of the species both within and outside of the designated areas, we do not anticipate that property values will be affected by the critical habitat designation. Additionally, critical habitat designation does not preclude development of habitat conservation plans and issuance of incidental take permits.

Federalism

In accordance with Executive Order 13132, this rule does not have significant Federalism effects. A Federalism assessment is not required. In keeping with Department of the Interior and Department of Commerce policies, we requested information from, and coordinated development of both the listing and the proposal to designate critical habitat with, appropriate State resource agencies in Louisiana, Mississippi, Alabama, and Florida. The designation of critical habitat for the Gulf sturgeon imposes no restrictions in addition to those currently in place, and, therefore, has little additional impact on State and local governments and their activities. The designation may have some benefit to these governments in that the areas essential to the conservation of the species are more clearly defined, and the primary constituent elements of the habitat necessary to the conservation of the species are specifically identified. While this definition and identification does not alter where and what federally sponsored activities may occur, it may assist these local governments in long-range planning, rather than waiting for case-by-case section 7 consultations to occur.

Civil Justice Reform

In accordance with Executive Order 12988, the Office of the Solicitor of the Department of the Interior has determined that the rule does not unduly burden the judicial system and meets the requirements of sections 3(a) and 3(b)(2) of the Order. We are proposing to designate critical habitat in accordance with the provisions of the Endangered Species Act. The rule uses standard property descriptions and identifies the primary constituent elements within the designated areas to assist the public in understanding the habitat needs that are essential for the conservation of the Gulf sturgeon. We have made every effort to ensure that the final determination contains no drafting errors, provides clear standards, simplifies procedures, reduces burdens, and is clearly written, such that the risk of litigation is minimized.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain new or revised information collection for which Office of Management and Budget approval is required under the Paperwork Reduction Act. Information collections associated with permits under the Act are covered by an existing OMB approval, and are assigned clearance No. 1018–0094, with an expiration date of July 31, 2004. Detailed information for Endangered Species Act documentation appears at 50 CFR 17. 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 OMB control number.

National Environmental Policy Act

The FWS has determined that it does not need to prepare an Environmental Assessment or an Environmental Impact Statement as defined by the National Environmental Policy Act of 1969 in connection with regulations adopted under section 4(a) of the Act. The FWS published a notice outlining its reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

The proposed rule stated that NMFS had determined that this action is categorically excluded from NEPA requirements. However, NMFS had not at that time finalized its NEPA analysis for this rule. In response to comments received on the proposed rule (see comment 16), and based on additional research and deliberation, NMFS has concluded that the FWS position is

correct, and that NEPA does not apply to designation of critical habitat under the Act.

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951), Executive Order 13175, and the Department of Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. We have determined that there are no tribal lands essential for the conservation of the Gulf sturgeon. Therefore, designation of critical habitat for the Gulf sturgeon has not been designated on Tribal lands.

References Cited

A list of references is available upon request (see **ADDRESSES.**)

Authors

The primary authors of this document are Patty Kelly, FWS, (850/769–0552, extension 228); and Stephania Bolden and Jennifer Lee, NMFS, (727/570–5312) (see **ADDRESSES** section).

List of Subjects

50 CFR Part 17

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

50 CFR Part 226

Endangered and threatened species.

Regulation Promulgation

For the reasons outlined in the preamble, we amend part 17, subchapter B of chapter I, and part 226, subchapter C of chapter II, 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. In §17.11(h), revise the entry for the ''Sturgeon, Gulf'' under ''FISHES'' in the List of Endangered and Threatened Wildlife to read as follows:

§ 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, Gulf	*Acipenser oxyrinchus (=oxyrhynchus) desotoi.*	U.S.A. (AL, FL, GA, LA, MS).	Entire	T	444	17.95(e), 226.214	17.44(v)
*	*	*	*	*	*		*

3. Amend § 17.95(e) by adding critical habitat for the Gulf sturgeon (*Acipenser oxyrinchus desotoi*), in the same alphabetical order as the species occurs in § 17.11(h) to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(e) Fishes. * * *

Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)

(1) Critical habitat units are depicted for Louisiana, Mississippi, Alabama, and Florida on the maps below.

(2) The primary constituent elements essential for the conservation of Gulf sturgeon are those habitat components that support feeding, resting, and sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support these habitat components. The primary constituent elements include:

(i) Abundant prey items within riverine habitats for larval and juvenile life stages, and within estuarine and marine habitats and substrates for juvenile, subadult, and adult life stages;

(ii) Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone or hard clay;

(iii) Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during fresh water residency and possibly for osmoregulatory functions;

(iv) A flow regime (*i.e,.* the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging; and necessary for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larvae staging;

(v) Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;

(vi) Sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and

(vii) Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (*e.g.* a river unobstructed by any permanent structure, or a dammed river that still allows for passage).

(3) Gulf sturgeon is under the joint jurisdiction of the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS). The FWS will maintain primary responsibility for recovery actions and NMFS will assist in and continue to fund recovery actions pertaining to estuarine and marine habitats. In riverine units, the FWS will be

responsible for all consultations regarding Gulf sturgeon and critical habitat. In estuarine units, we will divide responsibility based on the action agency involved. The FWS will consult with the Department of Transportation, the Environmental Protection Agency, the U.S. Coast Guard, and the Federal Emergency Management Agency. NMFS will consult with the Department of Defense, U.S. Army Corps of Engineers, Minerals Management Service and any other Federal agencies not mentioned here explicitly. In marine units, NMFS will be responsible for all consultations regarding Gulf sturgeon and critical habitat. Any Federal projects that extend into the jurisdiction of both the Services will be consulted on by the FWS with internal coordination with NMFS. Each agency will conduct its own intra-agency consultations as necessary.

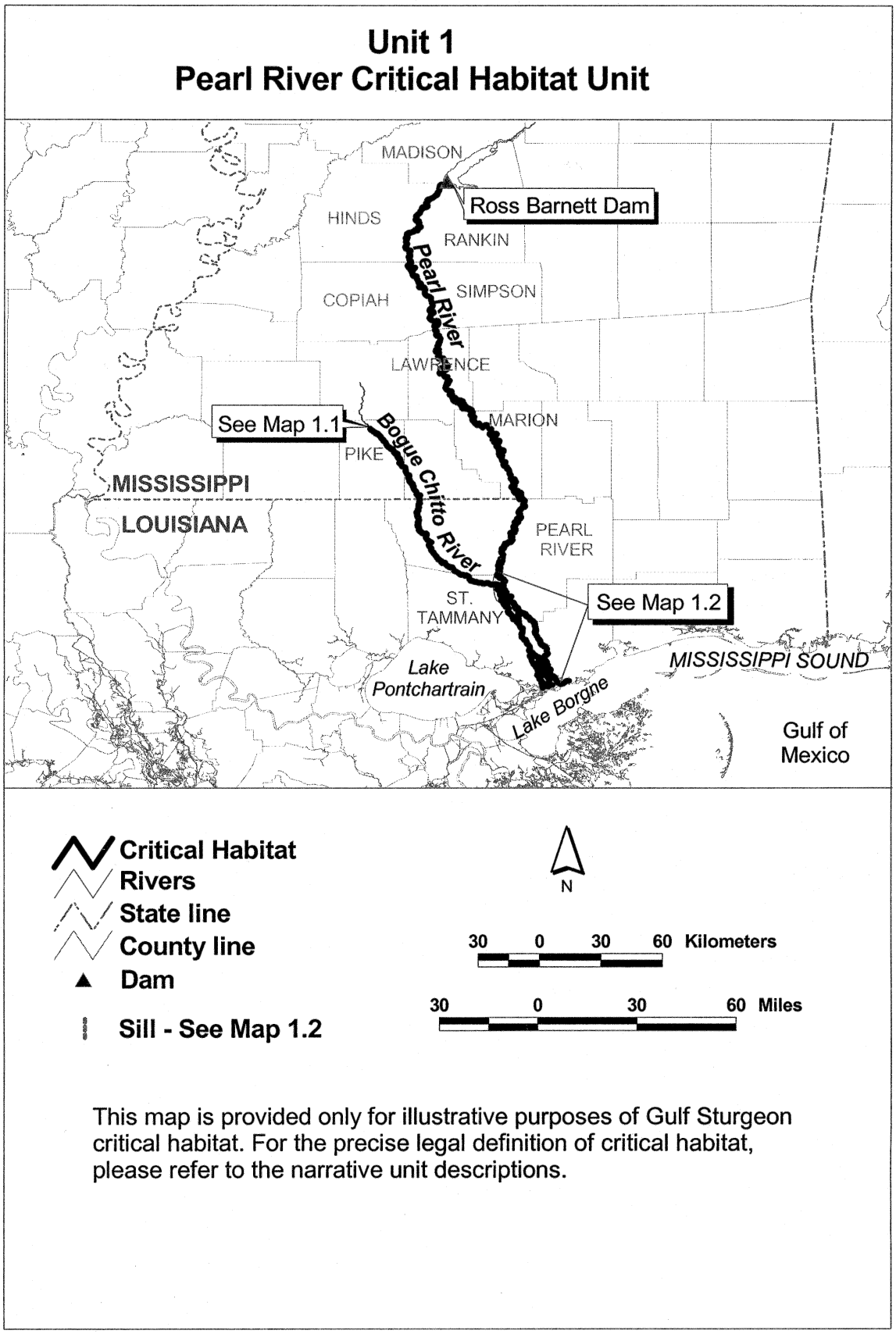
(4) The textual unit descriptions below are the definitive source for determining the critical habitat boundaries. General location maps by unit are provided at the end of each unit description and are provided for general guidance purposes only, and not as a definitive source for determining critical habitat boundaries.

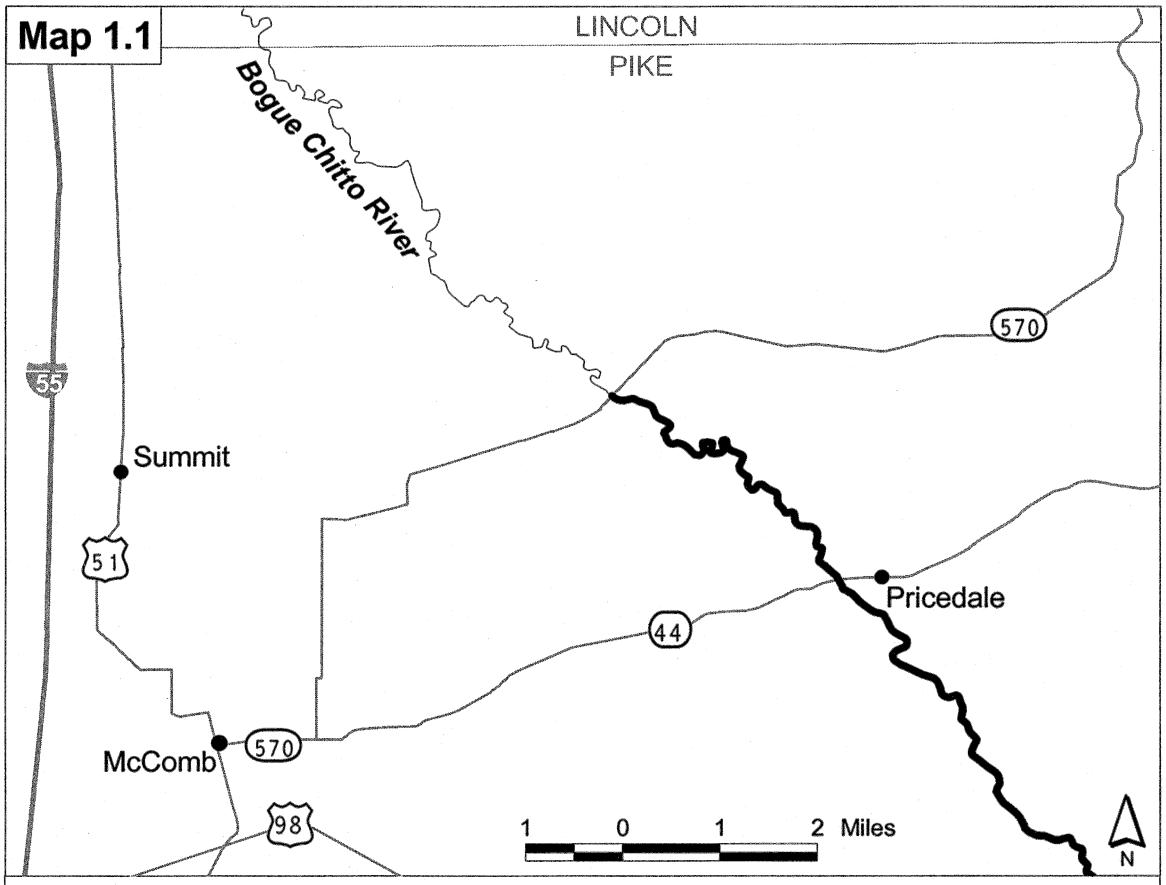
(5) *Unit 1:* Pearl River System in St. Tammany and Washington Parishes in Louisiana and Walthall, Hancock, Pearl River, Marion, Lawrence, Simpson, Copiah, Hinds, Rankin, and Pike Counties in Mississippi.

(i) Unit 1 includes the Pearl River main stem from the spillway of the Ross Barnett Dam, Hinds and Rankin Counties, Mississippi, downstream to where the main stem river drainage discharges at its mouth joining Lake Borgne, Little Lake, or The Rigolets in Hancock County, Mississippi, and St. Tammany Parish, Louisiana. It includes the main stems of the East Pearl River, West Pearl River, West Middle River, Holmes Bayou, Wilson Slough, downstream to where these main stem river drainages discharge at the mouths of Lake Borgne, Little Lake, or The Rigolets. Unit 1 also includes the Bogue Chitto River main stem, a tributary of the Pearl River, from Mississippi State Highway 570, Pike County, Mississippi, downstream to its confluence with the West Pearl River, St. Tammany Parish, Louisiana. The lateral extent of Unit 1 is the ordinary high water line on each bank of the associated rivers and shorelines.

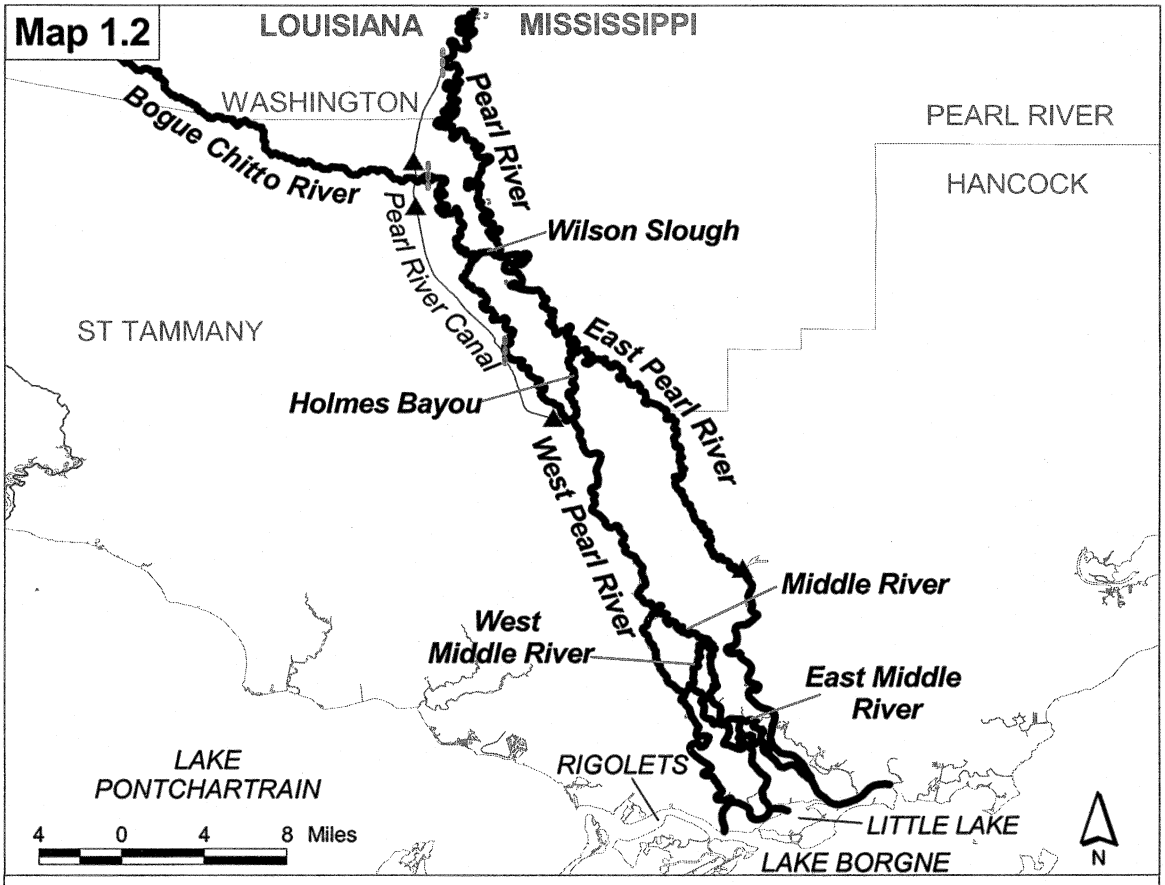
(ii) Maps of Unit 1 follow:

BILLING CODE 3510–22–P


Unit 1
Pearl River Critical Habitat Unit
MADISON
Ross Barnett Dam
HINDS
RANKIN
Pearl River
SIMPSON
COPIAH
LAWRENCE
MARION
See Map 1.1
Bogue Chitto River
PIKE
MISSISSIPPI
LOUISIANA
PEARL RIVER
See Map 1.2
ST. TAMMANY
MISSISSIPPI SOUND
Lake Pontchartrain
Lake Borgne
Gulf of Mexico
Critical Habitat
Rivers
State line
County line
Dam
Sill - See Map 1.2
N
30 0 30 60 Kilometers
30 0 30 60 Miles
This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.



This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.



This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.

BILLING CODE 3510–22–C

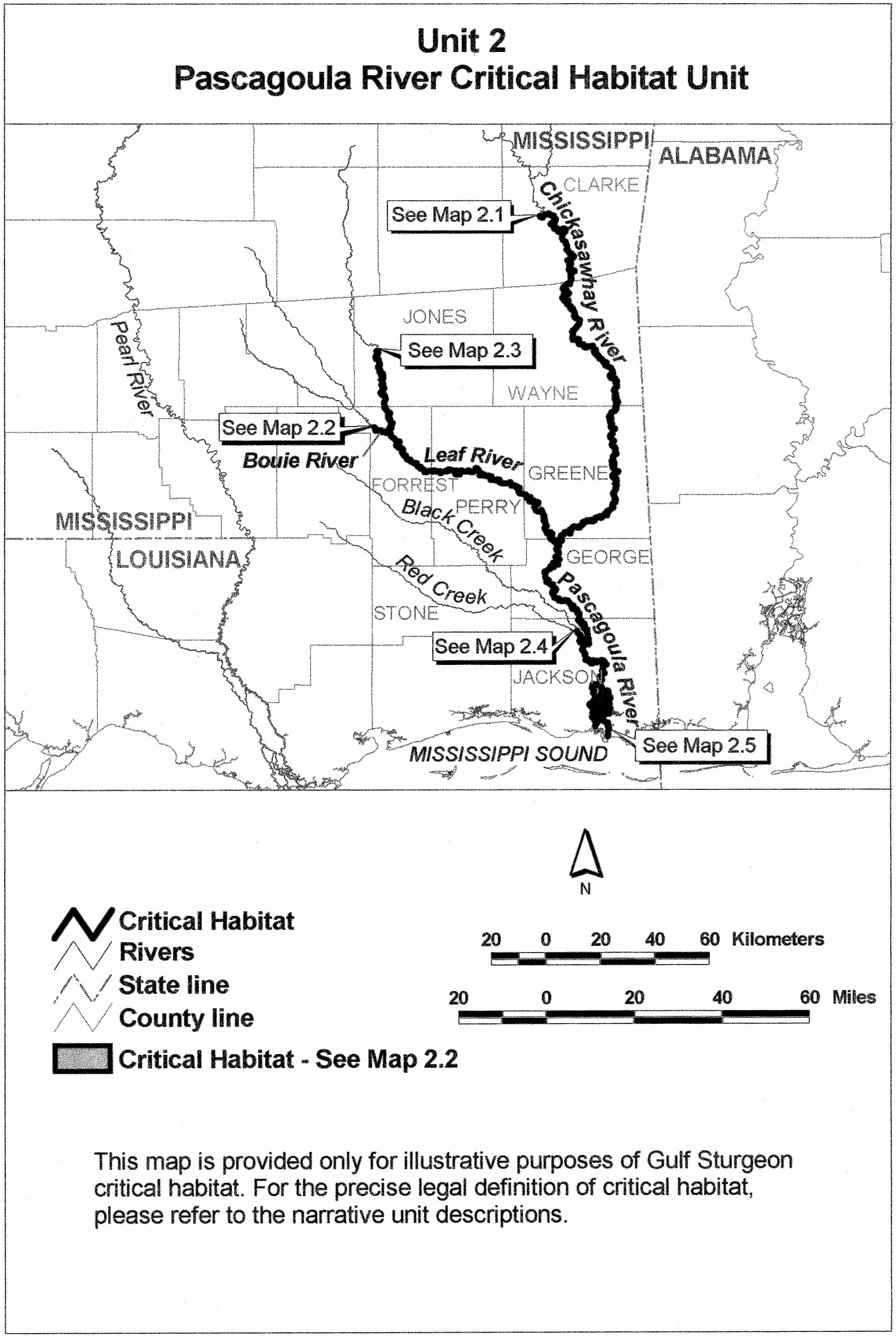
(6) *Unit 2:* Pascagoula River System in Forrest, Perry, Greene, George, Jackson, Clarke, Jones, and Wayne Counties, Mississippi.

(i) Unit 2 includes all of the Pascagoula River main stem and its distributaries, portions of the Bouie, Leaf, and Chickasawhay tributaries, and all of the Big Black Creek tributary. It includes the Bouie River main stem beginning on the southern-most road crossing of Interstate 59, Forrest County, Mississippi, downstream to its confluence with the Leaf River, Forrest County, Mississippi. The Leaf River main stem beginning from Mississippi State Highway 588, Jones County, Mississippi, downstream to its confluence with the Chickasawhay River, George County, Mississippi is included. The main stem of the Chickasawhay River from the mouth of Oaky Creek, Clarke County, Mississippi, downstream to its confluence with the Leaf River, George County, Mississippi is included. Unit 2 also includes Big Black Creek main stem from its confluence with Black and Red Creeks, Jackson County, Mississippi, to its confluence with the Pascagoula River, Jackson County, Mississippi. All of the main stem of the Pascagoula River from its confluence with the Leaf and Chickasawhay Rivers, George County, Mississippi, to the discharge of the East and West Pascagoula Rivers into Pascagoula Bay, Jackson County, Mississippi, is included. The lateral extent of Unit 2 is the ordinary high water line on each bank of the associated rivers and shorelines.

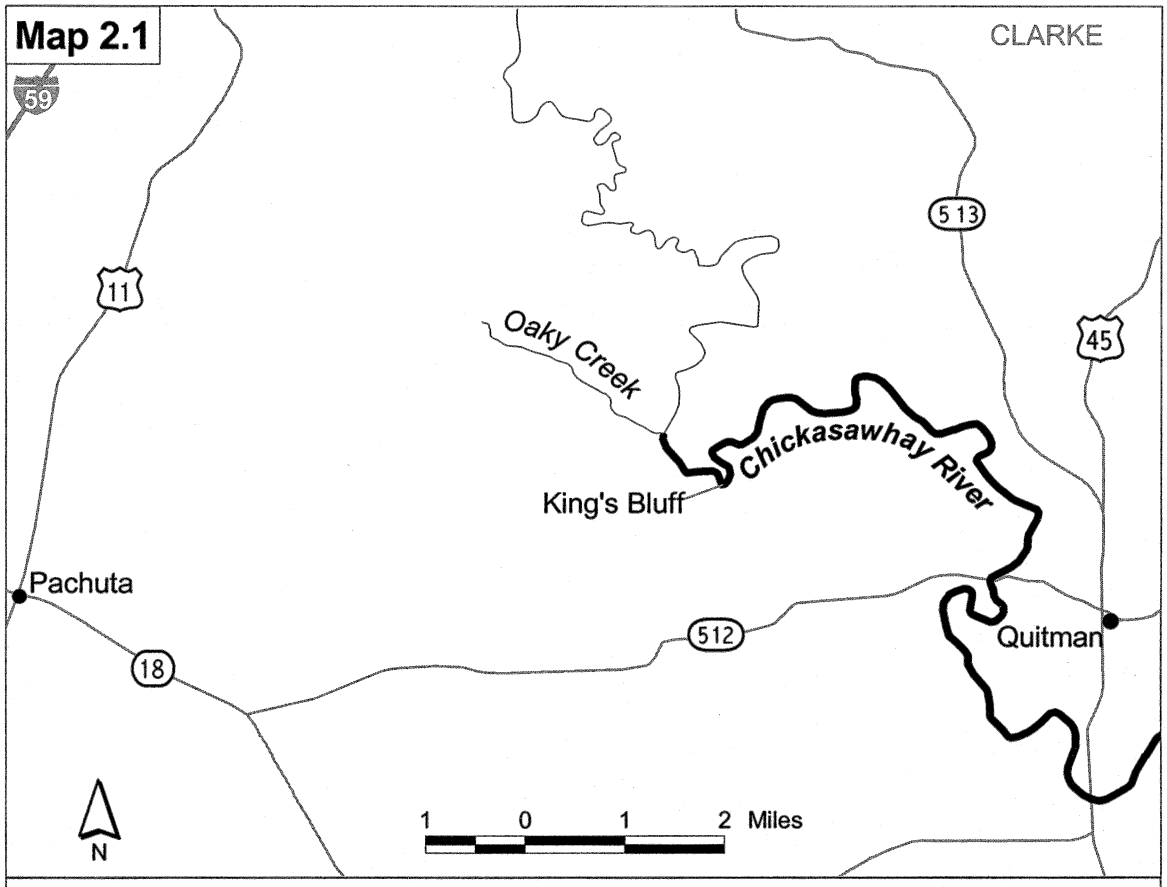
(ii) Major shipping channels in this unit are excluded under section 4(b)(2) of the Act.

(iii) Maps of Unit 2 follow:

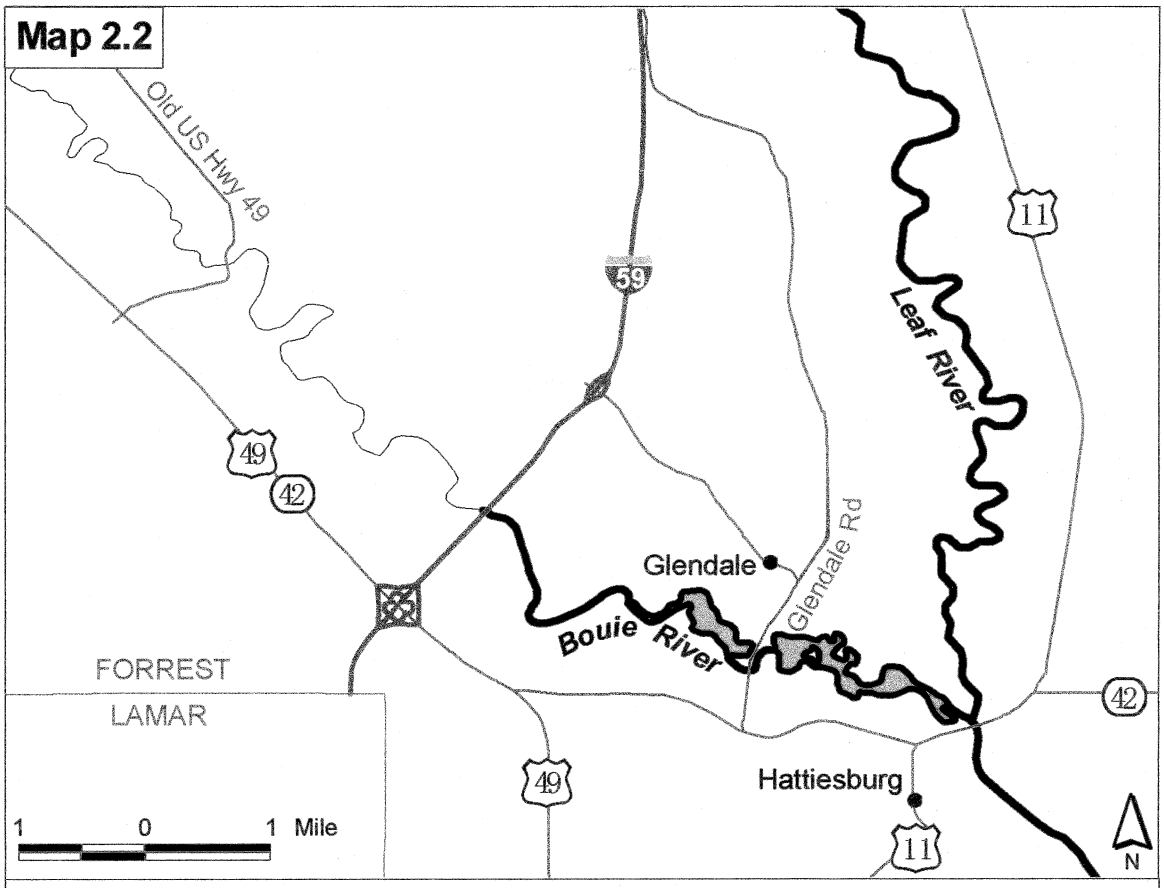
BILLING CODE 3510–22–P



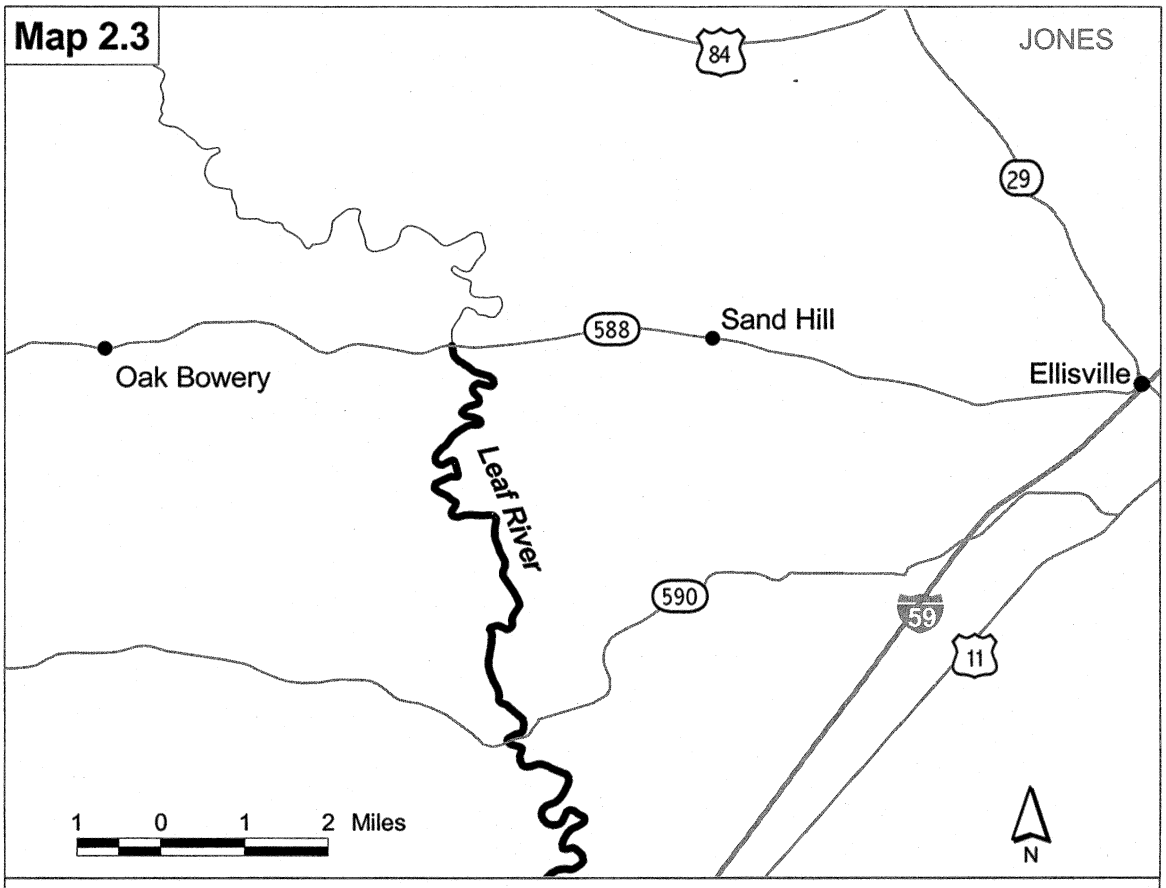
This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.



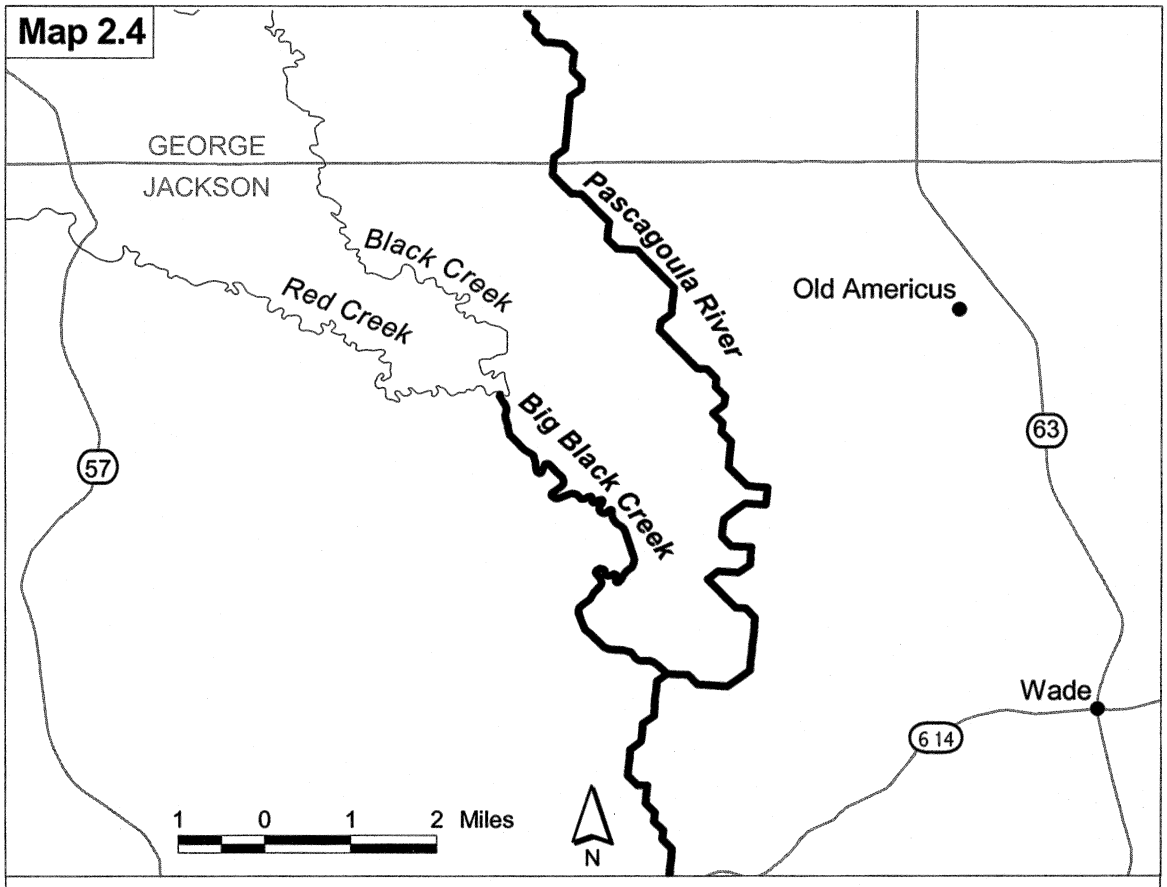
This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.



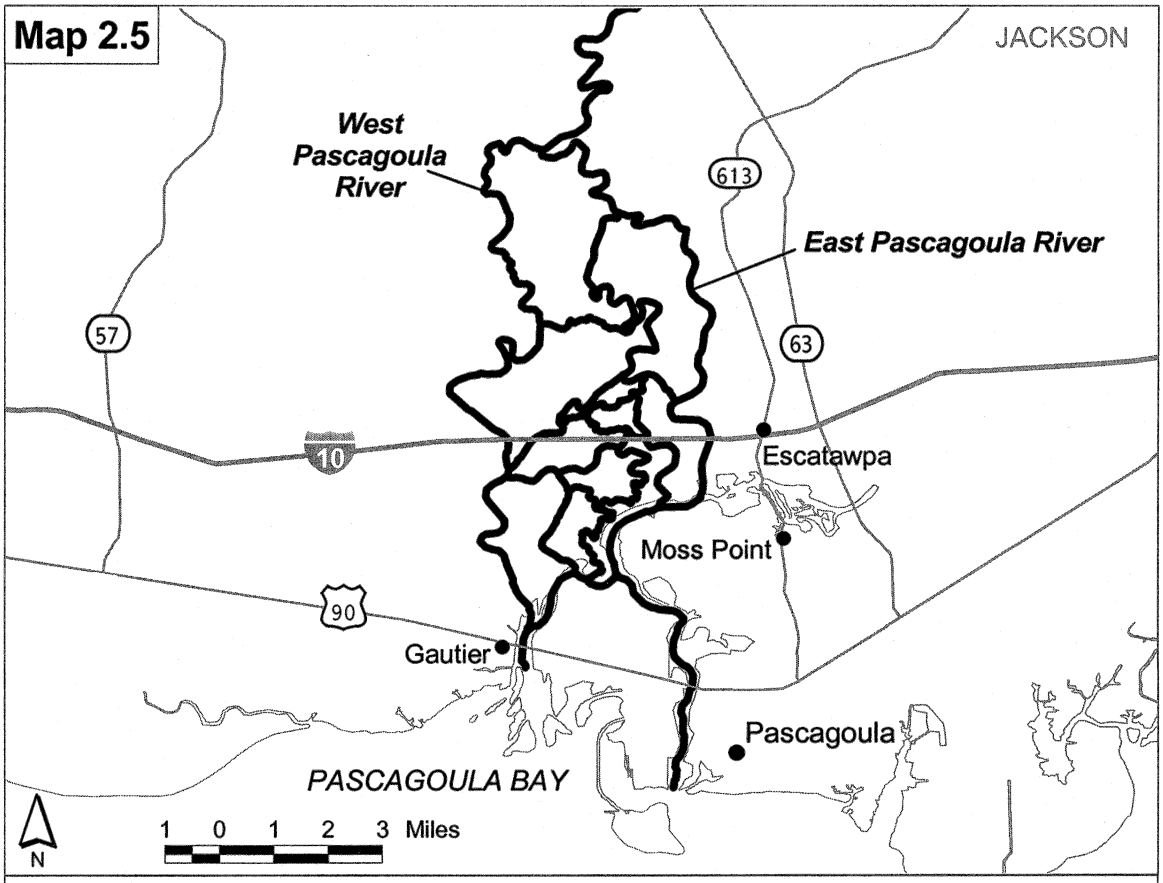
This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.



This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.



This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.



This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.

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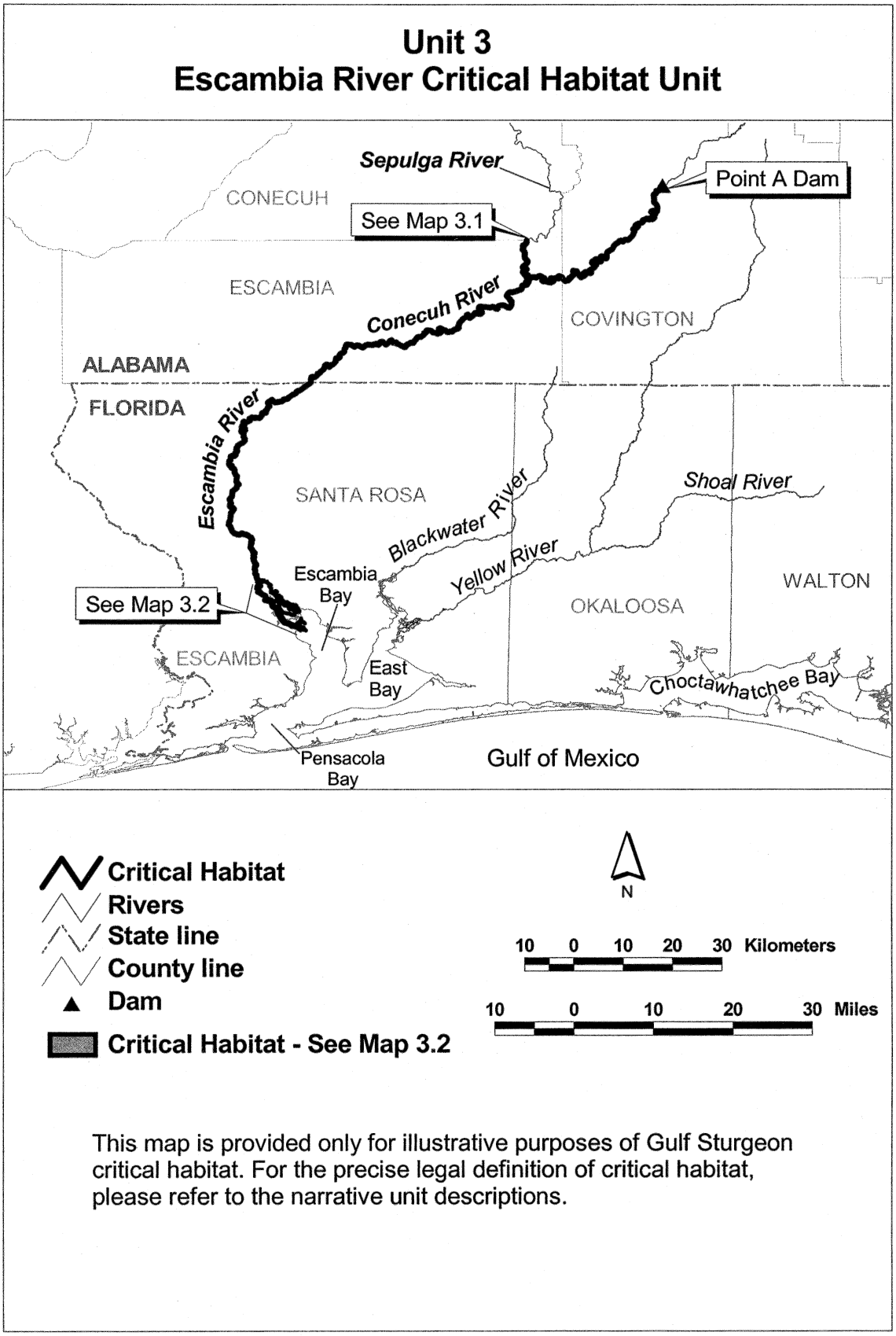
(7) *Unit 3:* Escambia River System in Santa Rosa and Escambia Counties, Florida and Escambia, Conecuh, and Covington Counties, Alabama.

(i) Unit 3 includes the Conecuh River main stem beginning just downstream of the spillway of Point A Dam, Covington County, Alabama, downstream to the Florida State line, where its name changes to the Escambia River, Escambia County, Alabama, and Escambia and Santa Rosa Counties, Florida. It includes the entire main stem of the Escambia River downstream to its discharge into Escambia Bay and Macky Bay, Escambia and Santa Rosa Counties, Florida. All of the distributaries of the Escambia River including White River, Little White River, Simpson River, and Dead River, Santa Rosa County, Florida are included. The Sepulga River main stem from Alabama County Road 42, Conecuh and Escambia Counties, Alabama, downstream to its confluence with the Conecuh River, Escambia County, Alabama, is also included. The lateral extent of Unit 3 is the ordinary high water line on each bank of the associated lakes, rivers, and shorelines.

(ii) Maps of Unit 3 follow:

BILLING CODE 3510–22–P


Unit 3
Escambia River Critical Habitat Unit
Sepulga River
Point A Dam
CONECUH
See Map 3.1
ESCAMBIA
Conecuh River
COVINGTON
ALABAMA
FLORIDA
Escambia River
SANTA ROSA
Shoal River
Blackwater River
Yellow River
Escambia Bay
See Map 3.2
OKALOOSA
WALTON
ESCAMBIA
East Bay
Choctawhatchee Bay
Pensacola Bay
Gulf of Mexico
Critical Habitat
Rivers
State line
County line
Dam
Critical Habitat - See Map 3.2
N
10 0 10 20 30 Kilometers
10 0 10 20 30 Miles
This map is provided only for illustrative purposes of Gulf Sturgeon critical habitat. For the precise legal definition of critical habitat, please refer to the narrative unit descriptions.