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## Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Pallid Sturgeon

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**SUPPLEMENTARY INFORMATION:****Background**

The pallid sturgeon was first described by S.A. Forbes and R.E. Richardson in 1905 from nine specimens collected from the Mississippi River near Grafton, Illinois, in June 1904 (Forbes and Richardson 1905). Known locally as the white sturgeon, they named it *Parascaphirhynchus albus* and suggested it be considered as its own genus. Later classifications, however, placed it in the genus *Scaphirhynchus* where it has remained (Bailey and Cross 1954).

The pallid sturgeon has a flattened, shovel-shaped snout; long, slender, and completely armored caudal peduncle; and lacks a spiracle (Smith 1979). The principal features distinguishing the pallid sturgeon from the darker shovelnose sturgeon are the absence of bony plates on the belly, 24 or more anal fin rays, 37 or more dorsal fin rays, and inner barbels under the snout that are much shorter than outer barbels with the inner barbels less than 6 times the length of the head (Pflieger 1975). As with other sturgeon, the mouth is toothless, protrusible, and far under the snout while the skeletal structure is primarily cartilaginous (Gilbraith et al. 1988). It is one of the largest fish found in the Missouri-Mississippi River drainage with specimens approaching 39 kilograms (85 pounds) being reported (Gilbraith et al. 1988).

Pallid sturgeons require large, turbid, free-flowing riverine habitat with rocky or sandy substrate (Gilbraith et al. 1988). They are well adapted to life on the bottom and inhabit areas of swifter water than does the related but smaller shovelnose sturgeon (Forbes and Richardson 1909; Carlson et al. 1985).

The range of the pallid sturgeon is primarily the Missouri River and the Mississippi River downstream of the junction with the Missouri River (Gilbraith et al. 1988). Sightings have been reported from the mouth of the Mississippi to the mouth of the Missouri (1,860 kilometers or 1,154 miles), from the mouth of the Missouri to Fort Benton, Montana (3,330 kilometers or 2,065 miles), and in the lower 320 kilometers (200 miles) of the Yellowstone River. Sightings have occasionally come from near the mouths of large tributaries to the Mississippi River (Big Sunflower River and the St. Francis River) and Missouri River (Kansas River and Platte River); however, these are rare and may be due to the fish utilizing unusual flow conditions (Cross 1967). The total length of its range is approximately 5,725 kilometers (3,550 miles) of river.

**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****50 CFR Part 17****RIN 1018-AB 31****Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Pallid Sturgeon****AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Final rule.

**SUMMARY:** The Service determines the pallid sturgeon (*Scaphirhynchus albus*) to be an endangered species under authority of the Endangered Species Act (Act) of 1973. Critical habitat is not being designated. The pallid sturgeon is a large fish known only to occur in the Missouri River, the Mississippi River downstream of the Missouri River, and the lower Yellowstone River. The species is threatened through habitat modification, apparent lack of natural reproduction, commercial harvest, and hybridization in parts of its range. This rule identifies the taxon as one in need of conservation, implements protective measures, and makes available recovery measures provided by the Act.

**EFFECTIVE DATE:** October 9, 1990.

**ADDRESSES:** The complete file for this rule is available for inspection, by appointment, during normal business hours in the office of the Missouri River Coordinator, Fish and Wildlife Enhancement, U.S. Fish and Wildlife Service, P.O. Box 986, Pierre, South Dakota 57501.

**FOR FURTHER INFORMATION CONTACT:** Dr. Kent D. Keenlyne, Missouri River Coordinator, at the above address, telephone (605) 224-8693.

A review of the literature shows a sharp decline in pallid sturgeon observations over the range of the species and especially so in the Missouri River from Gavins Point Dam to the headwaters. In the 1960's, 500 observations were made (i.e., an average of 50 per year); in the 1970's, 209 observations (i.e., an average of 21 per year); and in the 1980's, 65 observations (i.e., an average of about 7 per year) over the entire 5,725 kilometers (3,550 miles) of range. The decline of the species appears to correspond with expanded commercial harvest while, during the same time, recruitment began to fail. The decline, however, also follows the extensive developments of the 1950's and 1960's of the Missouri and Mississippi rivers. Deacon et al. (1979), Kallemeyn (1983), and Gilbraith et al. (1988) all attribute the decline, either directly or indirectly, to habitat modification. Factors include physical blocking of normal movement patterns of the fish by construction of the big dams; alteration of water quality and temperature; alteration of flows which may affect reproduction, timing of reproduction, or food sources; alteration of previous spawning habitats; reduction of habitat diversity; and reduced productivity of the river systems.

Dr. Michael D. Zagata, on behalf of the National Audubon Society, petitioned the Service to list the pallid sturgeon as "threatened" in an April 17, 1978 letter. The Service responded that the petitioner did not supply sufficient substantial evidence of the threats to permit it to move directly on the petition and informed the petitioner that it was gathering status data on this and several other species. On December 30, 1982, the Service included the pallid sturgeon in a notice of review published in the *Federal Register* (47 FR 58456). This notice addressed vertebrate species that were currently under review for listing as endangered or threatened, and indicated that substantial information was available to support the biological appropriateness of proposing to list this species as endangered or threatened. On June 16, 1988, a petition was received by the Service from Peter Carrels on behalf of the Dakota Chapter of the Sierra Club requesting that the pallid sturgeon be listed as an endangered species throughout its range. A positive finding on this petition was made in September 1988 and subsequently published by the Service in the February 23, 1989, *Federal Register* (54 FR 7813). On August 30, 1989 (54 FR 35901), the Service provided notification that the petition was warranted and proposed to list the pallid sturgeon as endangered

throughout its range and asked for information relevant to a final determination. On November 8, 1989, the Service extended the comment period on the proposed rule from October 30, 1989 to November 30, 1989 (*Federal Register* 54 FR 46596).

#### Summary of Comments and Recommendations

In the February 23, 1989, *Federal Register* (54 FR 7813) notice of finding on the petition to list the pallid sturgeon and in the August 30, 1989, proposed rule (54 FR 35901), and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a proposed and final rule. Appropriate State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. A newspaper notice was published in the Omaha World Herald (NE) on September 18, 1989; the Kansas City Star and Times (MO) on September 19, 1989; the Southeast Missourian (MO), the Sioux Falls Argus Leader (SD), and the Bismarck Tribune (ND) on September 20, 1989; the Daily Capitol Journal (SD) and the Williston Daily Herald (ND) on September 21, 1989; the Billings Gazette (MT), the Helena Independent Record (MT), the Great Falls Tribune (MT), and the Rapid City Journal (SD) on September 22, 1989; the Forum (ND) on September 25, 1989; the State Times (LA), the Sunday Advocate/Morning Advocate (LA), and the Arkansas Gazette (AR) on September 27, 1989; the Randolph County Herald Tribune (IL) and the Arkansas Democrat (AR) on September 28, 1989; the Courier-Journal (KY) on September 29, 1989; the Times Pacayune/States Item (LA) on September 30, 1989; and the Clarion Ledger (MS) on October 5, 1989, all of which invited general public comment. An extension of the comment period to November 30, 1989, was published in the *Federal Register* on November 8, 1989 (54 FR 46596). The notification of the extension of the comment period also was published in the aforementioned newspapers in November.

During the comment period on the proposed rule, totaling approximately 3 months, 46 comments on listing were received. Of the comments received, 19 (41 percent) supported listing, 24 (52 percent) were neutral, and 3 (7 percent) were opposed. These comments and the concerns raised following the notice of petition finding are discussed below.

Support for the listing proposal was voiced by two Governors, eight State game and fish agencies, two Federal

agencies or divisions, one nonwildlife State agency, and six conservation organizations (or branches thereof).

Opposition to listing was voiced from two farm organizations and one State legislative official. A number of State and Federal agencies and organizations submitted comments regarding the possible effects that listing and, particularly, designation of critical habitat, might have on planned activities and development. Comments obtained during the comment periods are combined in the following discussion. Comments or questions about the rule were grouped into a number of general issues, depending on content. These issues and the Service's response to each are listed below.

**Issue 1:** One commenter questioned whether adequate information was available to document a decline in pallid sturgeon numbers. Another questioned whether sightings were a reliable indicator of abundance, and another suggested that future work will be necessary to better define the causes of the decline.

**Response:** One of the problems experienced 12 years ago, when the species was first petitioned for listing, was the inability to document population declines through scientific studies that had been directed specifically at the pallid sturgeon. Since that time, the work by Kallemeyn (1983) and Gilbraith et al. (1988), summarized much of the existing information on population status available through printed reports and personal contact with appropriate State and Federal agencies for data. Both works concluded that populations had declined and were declining. In our efforts, we reviewed comparable catch-per-effort data (particularly in the Upper Missouri River System) which fairly clearly indicated that pallid populations had declined considerably over the last 10 to 20 years. In some areas, particularly in the reservoir systems, populations had declined dramatically or had even been extirpated. The sighting records referred to are a valid indicator of population numbers since these were gathered from scientific reports, State and Federal resource agency field data reports, or public reports (e.g., fishermen) which were verified by State or Federal resource personnel. Reports from the last 10 to 15 years are unlikely to understate abundance, for sophistication in collecting equipment, more effective study techniques, and generally increased intensity of sampling within the range in recent years should have located this relatively large fish, if present in any kind of

abundance. We are confident that the fish has suffered dramatic declines throughout its range. During the comment period, 9 of the fish and wildlife agencies within the 13-State range of the species supported listing of the species as endangered. The other four States did not submit comments but already have the fish listed as rare or endangered in their own State program. Studies have begun and will continue in attempts to determine specific reasons for population declines and what can be done to remedy further declines.

**Issue 2:** One commenter observed that regulatory mechanisms are available within the States to limit harvest; another suggested that education of State agencies was needed to protect the species; and another offered that stiff State penalties might be more effective than listing to protect the fish.

**Response:** Most States within the species range have developed prohibitions against keeping pallid sturgeon that are caught. However, not all States presently have such provisions nor are the penalties for taking as substantial as they would be if the fish were listed under the Endangered Species Act (Act). The present plight is not so much that overharvest is occurring but, rather, that any harvest now further depletes a population that is not replenishing itself. There is an ongoing effort among some of the States to coordinate their rules regarding protection for the fish. While strong rules prohibiting harvest are an important tool for slowing the process, enforcement alone will not correct habitat problems affecting reproduction and other life requisite needs. Enforcement can play an important role in slowing the loss of pallid sturgeon within its range, and we have every confidence that each of the States involved will do their best, from the regulatory standpoint, to assist in insuring that the species will survive.

**Issue 3:** Two commenters questioned whether Federal listing could correct the plight of the pallid sturgeon; another mentioned that there is little Federal land along the lower Mississippi, which would limit the effectiveness of consultation; and another questioned whether consultation could improve the welfare of the species.

**Response:** The observation is correct that Federal listing, in itself, does not correct the problems. However, Federal listing triggers the protections of the Act, such as section 7 consultation on Federal activities. The entire present range of this species is classified as navigable waters of the United States and, as a result, is subject to several Federal permit review processes which

may require consultation. Nearly all the range is operated as either a Federal multiuse water project or is maintained by the Federal Government as a navigation project which allows the opportunity for consultation. Listing mandates Federal consultation on any adverse effects to insure that any action authorized, funded, or carried out by the Federal agency is not likely to jeopardize the continued existence of a listed species. Furthermore, the Act specifies that all Federal agencies shall utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of listed species.

**Issue 4:** One commenter indicated that there has never been documentation of any pallid sturgeon spawning; and another offered that man cannot control whether or not they will reproduce naturally.

**Response:** It is obvious that pallids must have reproduced naturally at one time if specimens exist today. At present, there are no documented pallid sturgeon spawning locations. One problem is that no identification keys presently exist to distinguish pallid sturgeon fry or to separate them from its close relative, the shovelnose sturgeon. Collections made in 1989 from shovelnose spawned in captivity will allow shovelnose fry to be described at various stages of development in order that they can be differentiated from young pallids. A lack of youthful specimens in the wild in recent years may be an indication that they are not reproducing today making sampling for eggs or fry fruitless; or it could mean that some spawning is occurring, but the young fish are disappearing for some reason (predation, contaminants, etc.) before they are old enough to be distinguished as pallid sturgeon. Studies are underway to determine reproduction requirements of the species, and, once known, we may have the opportunity to rectify or create situations where natural reproduction and recruitment can occur.

**Issue 5:** One commenter observed that the hybridization problem with the shovelnose sturgeon may be caused by an overlap of reproductive periods; another offered that human intervention will not control hybridization; and another observed that, perhaps this is nature's way of filling in a presumably vacated niche if the pallid becomes extinct.

**Response:** It is obvious that the two species utilize similar spawning habitat (if not the same) in order to hybridize. It also is obvious that the two species were separated by time or other parameters different enough in the past,

if using the same area, to maintain themselves as distinct species. The literature suggests that the pallid may have normally spawned later than the shovelnose (as the first commenter infers) or was more prone to utilize faster waters or more main channel substrates for spawning than the shovelnose. Schmulbach (1974), who has worked extensively with sturgeon and other species on the Missouri River, indicates that hybridization is a phenomenon that occurs in association with a modified (or "hybridized") habitat. In his early 1970's studies, he concluded that the increased incidence of hybridization in the Missouri is associated with the hybridization of the habitat. In contacting Doug Carlson, Missouri Conservation Department (pers. comm. 1989), who did much of the sturgeon work in Missouri where significant hybridization was reported, it was learned that pallid hybrids were spawned in the late 1960's and early 1970's. This time period corresponds either with or immediately after much of the final channelization work that was accomplished on the Missouri downstream of the lowermost dam. Human intervention by habitat alteration likely was responsible for the significant amount of hybridization noted by forcing both species to jointly utilize a greatly diminished suitable spawning area, while temperature regimes also were altered sufficiently to interrupt the normal spacing of spawning, so that more overlap occurred resulting in hybridization. Man's intervention likely led to the problem and, presumably, could be utilized to reverse that situation as well. The hybrids were found to be infertile (Carlson, pers. comm. 1989), which means they will compete for food with the pure strain but will not be able to contribute to the support of this or other sturgeon populations.

**Issue 6:** Two commenters identified a need to resolve identification problems between the pallid and shovelnose sturgeons, and one expressed concern about the possible need to list the shovelnose sturgeon as "threatened due to similarity of appearance" due to its close resemblance to the pallid.

**Response:** The two species have a strong resemblance in body shape and both have a flattened, shovel-like nose. However, there are a number of characteristics that can be used to distinguish between the two species (see description in "Background" section). For the lay person, the lighter color and larger size of the pallid are signals that the fish is not the more common shovelnose. Some notice that it is not as

rough as the proportionately higher scaled (scuted) shovelnose. Some readily notice that the nose appears longer in the pallid sturgeon, and some notice differences in the barbel lengths between the two. Perhaps the easiest and most reliable characteristic to distinguish the two is to examine the barbels. The pallid has its fleshy barbels located about one-third of the distance from the mouth to the end of its nose, while the barbels of the shovelnose are nearly an equal distance between mouth and nose. The inner barbels of the pallid are often slightly ahead of the outer barbels and only about half as long, while the shovelnose has barbels in a nearly straight line with all approximately the same length. We believe that, with assistance from the respective State agencies, those relatively few fishermen that fish for sturgeon will be able to readily distinguish between the two species.

*Issue 7:* One commenter wondered whether viable pallid sturgeon populations still exist; and another wondered whether the species' decline may be a natural evolutionary process eventually leading to extinction.

*Response:* The question of whether any viable pallid populations still remain is one we ask ourselves. Last year, efforts were begun to develop techniques to artificially propagate and raise its closest relative, the shovelnose sturgeon, as a surrogate species for developing propagation techniques for the pallid. Biologists, for 2 years, have been developing techniques to better locate and capture the pallid sturgeon in anticipation of success in possibly artificially propagating the species. Since the species has persisted for literally thousands of years, and no broad climatic conditions or other significant natural changes have occurred throughout the range of the species, it is highly unlikely that the recent, relatively rapid decline in the species is a natural phenomenon.

*Issue 8:* One commenter asked about additional observations in the St. Francis River, Arkansas; and two others provided information about possible sightings in the upper Mississippi and lower Ohio rivers.

*Response:* Over the years there have been several reports of pallid sturgeons observed off the mainstem Missouri and Mississippi rivers. One report occurred in 1966 on the lower St. Francis River in Arkansas, one report in 1987 from 12 miles northwest of Sattartia in the Big Sunflower River in Mississippi, five reports from the lower 40 miles of the Kansas River in 1952, and one report about 21 miles up the Platte River in 1979. One commenter indicated that

there have been unsubstantiated reports in the lower Ohio River close to the Mississippi; and another reported a possible 1982 observation by a commercial fisherman near the town of Louisiana, Missouri, on the Mississippi, about 70 miles upriver of the mouth of the Missouri. Most of these offstream reports have occurred under special circumstances of high flow conditions. Each of the locations noted, however, does have access to one of the two large rivers which are considered the usual habitat for the species. This listing will protect the species throughout its 13-State range, wherever found.

*Issue 9:* Seven commenters expressed concern about what impact listing may have on various activities. Concerns included a possible impact on power generation, pesticide labeling restrictions by the Environmental Protection Agency, water management, beneficial uses of water, impacts to irrigation water use or returns, impacts to mining activities, and possible impacts to future powerplant sitings.

*Response:* Although these comments are not relevant to the determination of whether the species is, indeed, threatened or endangered and, thus, should or should not be listed, the Service duly notes these concerns. It is premature at this time to discuss what changes may need to be made, if any, to these activities to protect the pallid sturgeon; they will be addressed if and when consultation is initiated on a Federal action.

*Issue 10:* One commenter suggested that alteration of habitat for navigation has been more devastating to the species than alterations for hydropower. Another disagreed that the lower Mississippi has been channelized.

*Response:* In our evaluation, no attempt was made to evaluate which of the habitat alterations had the greatest adverse effect on the species. Rather, our assessment was to determine if habitat alterations, whether by themselves or in combination, had adversely affected the species to the extent that its existence was threatened. Virtually all of the pallid sturgeon range has been altered in one form or another to the detriment of the species' survival. Future work will have to focus on those specific factors that are adversely impacting the species in order to recover the species.

*Issue 11:* Two commenters pointed out additional threats not mentioned in the proposed rule. One suggested that additional diversions and planned interbasin transfers are future threats to the species. Another suggested that continuing scouring and siltation set in

motion by the past habitat alterations are threats to the remnant spawning and nursery areas that remain for the pallid.

*Response:* We do not disagree and appreciate these potential threats being pointed out to us. These comments have been included in the discussion of Factor "A".

*Issue 12:* One commenter suggested that the location of each fishery harvest advisory area be noted as it related to a potential pollution threat to the species.

*Response:* Over the years, a number of fish consumption advisories have been posted on certain reaches of the lower Missouri and middle and lower Mississippi rivers. For the purpose of determining whether a pollution threat may exist, it is sufficient to identify what those threats may be rather than the exact location of each possible threat. In the case of the pallid, which is relatively long lived and which may move extensively in the unobstructed reaches of the lower Missouri and the Mississippi during its lifetime, it may enter several fishery consumption advisory areas throughout its life and be exposed to several toxic substances. It would be of no particular value to identify specific areas at this time. More important to note is the nature of the various advisories, which usually are for persistent industrial chemicals or toxic metals or metal compounds.

*Issue 13:* The greatest number of comments received were in relation to the determination of critical habitat. Three agreed that no critical habitat should be declared at this time; one observed that portions of the Missouri River were already declared critical habitat under State law; and one was concerned about determination of critical habitat on the Missouri River as it may impact operation of the system. One commenter contended that the lower Mississippi River already has all the favorable habitat conditions for pallid sturgeon life requisites, while another requested that the Service reserve water rights necessary for maintenance of important pallid sturgeon habitat in the Upper Missouri Basin. One commenter formally requested that the Service declare the entire range of the species to be critical habitat, at a minimum designating the Yellowstone River and Missouri River downstream to Lake Oahe, the Missouri River from Fort Randall Dam to just above St. Louis, and the Mississippi River from its junction with the Ohio River downstream to Baton Rouge. This commenter contended that listing these areas of critical habitat will benefit the species and help alert Federal, State, and local planners to potential conflicts.

*Response:* Certainly one of the major advantages of designating critical habitat is to alert planners to the critical importance of the noted area to the species involved. Whether critical habitat has been declared under State law has no bearing on critical habitat being designated under the authority of the Act. Though we agree that some of the areas identified are likely to be very important to the species, we are unable, at this time, to adequately demonstrate any specific areas as critical to its survival. This is not to say that, once additional information is obtained regarding the species that demonstrates the critical nature of certain areas to the survival or recovery of the species, critical habitat would not be declared through appropriate processes. This subject is discussed further in the Critical Habitat section of this rule.

*Issue 14:* One commenter suggested that not enough is known about the pallid sturgeon to develop a meaningful recovery plan.

*Response:* Following final listing, the Service will begin the recovery planning process for this species as quickly as possible. It is likely that the recovery plan will have a strong research component that will guide recovery efforts.

*Issue 15:* One commenter indicated that there is a need to launch new efforts for habitat restoration for the species.

*Response:* We appreciate the concern of the commenter and agree that some habitat restoration may be necessary to insure natural survival of the species. One of the benefits of listing is that it provides a vehicle for new efforts to be launched in recovery or restoration of suitable habitat, in accordance with the species' recovery plan.

#### Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that the pallid sturgeon should be classified as an endangered species. Procedures found at section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 et seq.) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the pallid sturgeon (*Scaphirhynchus albus*) are as follows:

*A. The present or threatened destruction, modification, or curtailment of its habitat or range.* Alteration of

habitat through river channelization, impoundment, and altered flow regimes has been a major factor in the decline of this species (Kallemeyn 1983, Gilbraith et al. 1986, and Williams et al. 1989). Approximately 51 percent of its range has been channelized, 28 percent impounded, and the remaining 21 percent affected by upstream impoundments and altered flow regimes. These factors have adversely affected the fish by blocking movements of fish to spawning and/or feeding areas, destroying spawning areas, altering conditions or flows of potential remaining spawning areas, reducing food sources or the ability to obtain food, or altering remaining substrates and conditions necessary for the fish's survival. Of the approximately 5,725 Kilometers (3,550 miles) of former habitat for the pallid, virtually all of it has been drastically modified in one manner or another.

Interbasin transfer of water from the basin, or other future water depletions, also could adversely affect the species. Continued scouring and siltation set in motion by past and present alterations may pose a threat to remaining suitable sturgeon spawning or nursery areas.

*B. Overutilization for commercial, recreational, scientific, or educational purposes.* Since it was not described as a separate species until 1905, many of the early reports of sturgeon catches during the heyday of commercial fishing in the late 1800's, during which time many of the sturgeon populations were severely reduced, likely grouped the pallid sturgeon with the lake or shovelnose sturgeon. During the early years of the upper Missouri reservoirs (1950's and 1960's), pallid sturgeon were relatively common and were harvested commercially in both South Dakota (Gasaway 1970) and North Dakota (Carufel 1953) where they were locally called "lake" sturgeon. During this same period, however, researchers began to notice that they were unable to find evidence of reproduction of the species, even though large adults were still present (Beckman and Elrod 1971, June 1976, and Walburg 1977). By 1988, 11 of the 13 States which represent its range had classified it as a species of concern under their various programs (Gilbraith et al. 1988).

The pallid sturgeon is considered a fine eating fish, and the roe is suitable for caviar. Its large size makes it a desirable trophy sport fish (Gilbraith et al. 1988).

*C. Disease or predation.* No information is available regarding diseases of the pallid sturgeon. We are not aware of specific disease or predation problems.

*D. The inadequacy of existing regulatory mechanisms.* Adequate regulatory mechanisms do not presently exist to protect the fish. This is especially so considering that most of its range constitutes interjurisdictional waters or is connected to inter-State waters. The species is presently not classified under the State listing programs in Arkansas or Mississippi and presumably may be harvested. Kentucky still allows harvest of the species. Sturgeon over 16 pounds (presumed to be a pallid sturgeon if over that weight) must be released in Montana. Weight provisions, however, do not protect young or smaller pallid sturgeons. Cooperative studies are now underway in Montana, North Dakota, and South Dakota to better distinguish physical differences between the pallid and the shovelnose sturgeon. Pallid sturgeons must be released in Iowa, Kansas, Missouri, Nebraska, and South Dakota (Gilbraith et al. 1988). All sturgeons must be released in North Dakota.

*E. Other natural or manmade factors affecting its continued existence.* Although more information is needed, pollution could be a likely threat to the species over portions of its range. Various fish harvest and consumption advisories exist or have existed as a result of manmade pollution from near Kansas City, Missouri, to the mouth of the Mississippi. Most of the advisories represent industrial pollutant concerns downriver of industrial areas. Like other sturgeons, the pallid sturgeon is an opportunistic feeder that feeds on aquatic insects, crustaceans, mollusks, annelids, eggs of other fish, and sometimes other fish. Although utilizing aquatic insects, the pallid is noted as having a high incidence of fish in its diet (Cross 1967, Kallemeyn 1983, and Carlson et al. 1985). Being a bottom feeder of aquatic forms, one would expect it to be exposed to any persistent pollutants susceptible to uptake in the food chain.

Inability to document pallid sturgeon reproduction in recent years has been previously noted. Gilbraith et al. (1988) indicate that there has been no documented reproduction in a decade. If reproduction is occurring, survival of the young is not, thus leading to the conclusion that reduction or alteration of suitable spawning or nursery areas is such that predation of eggs or young is complete, that the young fish can no longer satisfactorily compete for foods or other necessary life requisites, or that some other unknown factor (such as contaminants) is causing them to perish.

In extensive sturgeon studies in the late 1970's, Carlson et al. (1985) found that hybridization had occurred between the pallid sturgeon in Missouri and the much more abundant shovelnose sturgeon. In 2 years of study (1978 and 1979), only 11 pallid sturgeon and 12 hybrids were found. The study area comprised approximately 25 percent of the entire range of the pallid sturgeon. The small number of pallids found, the low frequency or lack of reproduction, and the apparent lack of recruitment in the species, plus the high rate of hybridization over a significant portion of its range, portends serious problems for the fish in the area studied, and in other areas as well if the same phenomenon has or is occurring elsewhere.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule final. Based on this evaluation, the preferred action is to list the pallid sturgeon as an endangered species. Endangered status, which means that the species is in danger of extinction throughout all, or a significant portion of its range is appropriate because *Scaphirhynchus albus* is in danger of extinction throughout its range due to the apparent lack of recruitment of the species for over 15 years, and current habitat threats which have brought the species to this low level are not likely to be modified to avoid jeopardy to the species without protection under the Act. The habitat of the species has been altered through damming, channelization, altered and/or degraded water quality, and altered flow regimes to the detriment of the fish. Past harvest for commercial purposes may have surpassed replenishment capability. Commercial harvest of pallid sturgeon may still pose a threat in certain areas of its range. Existing regulations are inadequate to protect the species from further decline. Industrial or residential pollution may be a serious threat over a significant portion of its range, and hybridization is a known threat. For reasons given below, critical habitat is not proposed.

#### Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time a species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not presently determinable or prudent for this species. Though it is likely that there are areas very important to the

species, we are unable to adequately demonstrate any specific areas as critical to its survival. Information on critical areas is lacking because very little is known about the species. There have been no significant studies done to obtain information on the needs of the species at different life stages or on its habitat requirements. Past spawning or nursery areas were not identified in the literature, and lack of recent reproduction has prevented researchers from identifying these crucial areas for the species. Cooperative State and Federal studies, now underway on the upper Missouri River, have not identified any of these crucial areas. Even if critical habitat could be identified, it may not be prudent to identify it to the public. As noted in Factor "B" of the "Summary of Factors Affecting the Species," the pallid sturgeon is a large sturgeon and might be sought by sport fishermen as a trophy specimen. Furthermore, sturgeon roe may be harvested as caviar. Publication of critical habitat maps and descriptions in the **Federal Register** could negatively impact the species by stimulating interest in the pallid sturgeon, making it more vulnerable to take, and increasing enforcement problems. Protection of this species' habitat will be addressed through the recovery process and through the section 7 jeopardy standard. Therefore, the Service does not propose to determine critical habitat for the pallid sturgeon at this time.

#### Available Conservation Measures

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

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(2) requires Federal

agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or destroy or adversely modify its critical habitat. If a Federal action may adversely affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Since the pallid sturgeon is found primarily in navigable waters of the United States and in areas of considerable Federal land ownership interests, consultation procedures could play a significant role in improving its welfare. A variety of Federal agencies have jurisdiction and responsibilities within pallid sturgeon habitat, and section 7 consultation might be required in a number of instances. Known proposals that could require consultation include: Actions with regard to the operation of the Missouri River dams (Army Corps of Engineers (Corps) and Bureau of Reclamation), rehabilitation of Fort Peck penstocks (Corps), actions with regard to the operation and maintenance of the navigation channel on the Missouri and Mississippi Rivers (Corps), and actions with regard to the operation of Wild and Scenic River segments on the Missouri River (National Park Service and U.S. Forest Service).

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

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. In some instances, permits may be issued for a specified period of time to relieve undue economic hardship that would be



suffered if such relief were not available. With respect to *Scaphirhynchus albus*, it is anticipated that few, if any, trade permits would ever be sought or issued, since the species is not common in the wild and is not cultivated for roe.

#### National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the *Federal Register* on October 25, 1983 [48 FR 49244].

#### References Cited

A complete list of all references cited herein is available upon request from the Service's Pierre State Office (see **ADDRESSES** above).

#### Author

The primary author of this final rule is Dr. Kent D. Keenlyne, Missouri River Coordinator (see **ADDRESSES** section).

#### List of Subjects in 50 CFR Part 17

Endangered and threatened species, Export, Imports, Reporting, and record-keeping requirements, Transportation.

#### Regulation Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal

Regulations, is amended as set forth below:

#### 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. 1531-1543; 16 U.S.C. 4201-4245.

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

§ 17.11 Endangered and threatened wildlife.

\* \* \* \* \*

(h) \* \* \*

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rule
Common name	Scientific name						
Fishes							
Pallid sturgeon	<i>Scaphirhynchus albus</i>	U.S.A. (AR, IA, IL, KS, KY, LA, MO, MS, MT, ND, NE, SD, TN).	Entire	E	399	NA	NA

Dated: August 26, 1990.

Constance B. Harriman,  
Assistant Secretary for Fish and Wildlife and  
Parks.

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