



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Marion Illinois Suboffice (ES)
8588 Route 148
Marion, IL 62959
(618) 997-3344

Log. No. 02-R3-MISO-1

May 30, 2002

Colonel Michael R. Morrow
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

ATTN: Mr. Thomas Keevin, CEMVS-PM-EA

Dear Colonel Morrow:

The U.S. Fish and Wildlife Service (Service) has reviewed the Tier II Biological Assessment: Emergency Dredging for Operation and Maintenance of the 9-Foot Navigation Channel on the Upper Mississippi River System. This document represents the Service's biological opinion on the effects of dredging during the April 12 to June 30 timeframe on the federally endangered pallid sturgeon (*Scaphirhynchus albus*) in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). As discussed in our March 11, 2002, letter pertaining to this consultation, the Fish and Wildlife Service Section 7 Consultation Handbook defines an "emergency" as "a situation involving an act of God, disasters, casualties, national defense or security emergencies, etc., and includes response activities that must be taken in order to prevent the imminent loss of human life or property". As such, it is our conclusion that "emergency" dredging during the April 12 to June 30 timeframe to maintain the 9-foot navigation channel would not constitute an "emergency" as defined in the Section 7 Handbook. To clarify, the term "emergency" is used in this biological opinion strictly in terms of the need for dredging during the April 12 to June 30 timeframe and not as the term is defined in the Service's Section 7 Handbook.

This biological opinion is based on information provided in the Service's April 2000 biological opinion for the operation and maintenance of the 9-foot navigation channel project, the Tier II Biological Assessment referenced above and other sources of information. A complete administrative record of this consultation is on file in the Service's Marion, Illinois, Ecological Services Sub-Office.

CONSULTATION HISTORY

In May of 1999, the Fish and Wildlife Service (Service) received a biological assessment from the U.S. Army Corps of Engineers (Corps) for operation and maintenance of the 9-foot channel navigation project on the Upper Mississippi River. Within that biological assessment, the Corps provided a conservation measure that states the St. Louis District will continue to conduct maintenance dredging outside the presumed "window" of pallid sturgeon reproduction of April 12 to June 30. According to the conservation measure, in cases where emergency dredging is required, the Service would be contacted.

The Service issued its final biological opinion for operation and maintenance of the 9-foot navigation channel project in April 2000. One of the terms and conditions for implementing the reasonable and prudent measures in the biological opinion stated that should it become necessary for the Corps to dredge during the presumed window of pallid sturgeon reproduction, reinitiation of formal Section 7 consultation will be necessary to address further incidental take of pallid sturgeon. A Tier II biological assessment would be required to evaluate the effects of dredging during this time frame on pallid sturgeon.

The Service received the Tier II biological assessment for dredging on the Upper Mississippi River during the presumed window of pallid sturgeon reproduction (12 April - 30 June) on October 1, 2001. Subsequent to review of the biological assessment and proposed conservation measures, we determined formal consultation was necessary.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Upper Mississippi River Navigation System includes the commercially navigable portions of the Mississippi, Illinois, Kaskaskia, Minnesota, St. Croix, and Black Rivers. The Corps is responsible for maintaining navigation by means of a series of 37 locks and dams, channel training structures, and dredging over 1,200 miles of navigable waterway. In required locations, dredging occurs with hydraulic cutterhead, mechanical or dustpan dredge. In accordance with the Federal Standard, dredged material placement sites are identified that represent the least costly alternative with sound engineering practices and meet environmental standards pursuant to the Clean Water Act. Placement of dredged material has occurred within the thalweg, shoreline, bottomland forests, agricultural fields and beneficial use sites (USACE 1999). In the Middle Mississippi River (MMR) the dustpan dredge is most commonly utilized with dredged material sidecast into the main channel border area.

Although dredging during the presumed window of pallid sturgeon reproduction is rare, there are times when dredging may be required during this timeframe. In preparing its biological

assessment, the Corps completed an analysis of historical dredging frequency and locations for the period between April 12 and June 30. The St. Louis District has 39 years of dredging records, dating back to 1963. During that 39 year period, dredging has occurred at 14 locations between April 12 and June 30. One of those dredging events began on June 30. Two of those events occurred during the last week of June. River stage appears to be the major factor responsible for dredging during this time frame. Nine of the 14 sites were dredged during major drought years (USACE 2001).

STATUS OF THE SPECIES

The species description, life history, population dynamics, status and distribution of the pallid sturgeon are fully described on pages 164-177 of the biological opinion for operation and maintenance of the 9-foot navigation channel project and are hereby incorporated by reference (USFWSa 2000). Since issuance of the BO, the Service has also issued a Biological Opinion for Operation and Maintenance of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System (USFWSb 2000). That biological opinion also concluded that the proposed action is likely to jeopardize the continued existence of the pallid sturgeon.

In addition to the above, in the last two years, a number of larval sturgeon (including pallid sturgeon) have been collected from the Lower Missouri River, Middle Mississippi River and Lower Mississippi River. In September 2001, 11 pallid sturgeon ranging in size from 203-785 mm were collected by trawling on the Lower Mississippi River in the vicinity of Vicksburg, Mississippi (Hartfield and Slack 2002). All sturgeon captures in the area have been associated with strong currents, depth (13-45 ft), sand or sand and gravel substrate, and structure (sand reefs, dunes, secondary channels), however, pallid sturgeon captures seem to be associated with greater depths (25-45 ft) (Hartfield and Slack 2002).

In April and May of 2001, the Missouri Department of Conservation (MoDOC) collected 40 larval sturgeon utilizing the Missouri benthic trawl in the Lower and Middle Mississippi River and the Lower Missouri River. Nearly all of these fish were collected at downstream island bar tips. A large amount of detritus was also taken with the larval fish. Larval sturgeons were also collected in the Missouri River in September of 2001 (Hrabik 2002a).

According to a recent MICRA report completed by Grady et al., (2001), the ratio of wild pallid sturgeon to all river sturgeon collected dropped from 1 in 398 collected by Carlson et al. (1985) to 1 in 647 in recent years in portions of the Lower Missouri River and Middle Mississippi River. However, wild and hatchery reared pallid sturgeon accounted for 1 in 247 of all river sturgeons (Grady et al. 2001). In the MICRA study, all but one of the pallid sturgeon were collected in deep holes associated with wing dikes. The remaining pallid sturgeon was collected in side channel border habitat (Grady et al. 2001).

ENVIRONMENTAL BASELINE

The Section 7 environmental baseline for this biological opinion is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat, and ecosystem, within the action area. Along with a discussion of the past, and present impacts associated with construction, operation and maintenance of the 9-foot channel project, the baseline includes the following: 1) State, local and private actions already affecting the species or that will occur contemporaneously with this consultation; 2) unrelated Federal actions affecting pallid sturgeon that have completed formal or informal consultations; and 3) Federal and other actions within the action area that may benefit pallid sturgeon. The environmental baseline for operation and maintenance of the 9-foot channel project was established and described in detail on pages 177-199 of the Service's April 2000 BO. That information is hereby incorporated by reference (USFWSa 2000). However, since issuance of the BO, the environmental baseline has changed.

Factors affecting the species environment within the action area

Channel Training Structures

Since completion of the BO the Corps has issued three new regulating works contracts for construction of new channel training structures. The impacts associated with channel training structures is discussed in detail in the April 2000 BO. The Chester Reach Phase III contract (UMR miles 120.0 to 103.0) included raising and extending existing dikes, constructing new bendway weirs, extending existing bendway weirs and bankline revetment. The contract also included construction of environmental notches in some dikes. The Devil's Island Reach Phase III contract (UMR miles 50.0 to 40.0) included raising and extending existing dikes and construction of new dikes. The Mosenthein/Ivory Landing contract (UMR miles 195.0 to 154.0) included new dike, revetment, hardpoint and bendway weir construction. It also included incorporation of environmental notches into some dikes. Some of the dike and revetment work associated with the contract involved construction necessary to complete the J.B. Bridge side channel creation project.

A number of operation and maintenance contracts have been issued since completion of the BO. One of those contracts includes construction of a chevron dike structure between UMR miles 103.0 to 102.0. This project should create a side channel/island complex which will increase habitat diversity in the area, benefitting the pallid sturgeon. A separate operation and maintenance contract incorporated completion of the construction of hard points in Santa Fe Chute. This effort will increase depth diversity and sinuosity in this side channel, also contributing to habitat diversity in the MMR.

Dredging/Disposal

In 2000, approximately 8.0 million cubic yards of material was dredged in the MMR. This amount declined to approximately 2.0 million cubic yards in 2001. This material was primarily dredged with the dustpan dredge and sidecast into the main channel border area.

Commercial and Sport Fishing for Sturgeon

To date, commercial fishing for sturgeon continues in the MMR. Recent information provided by the MoDOC indicates that the shovelnose sturgeon population in the MMR has declined dramatically since 1997 (Hrabik 2002b).

Fleeting

Since 2000, the Corps has issued two new permits for fleeting in the MMR. Both permits were issued to AmerenUE for fleeting activities associated with their Rush Island (UMR mile 140.3R) and Meramec River (UMR miles 161.9 to 160.0R) facilities. AmerenUE adjusted their fleeting areas to minimize impacts to aquatic resources. However, the impact of fleeting activities on pallid sturgeon and aquatic resources is difficult to quantify. As mitigation for unavoidable adverse impacts to aquatic resources in the MMR, AmerenUE has agreed to participate in monitoring activities associated with future side channel restoration and enhancement at Salt Lake Chute (UMR miles 139.3 to 137.0L)

In addition to the above, the Corps is considering a permit application by Holcim, Inc., (formerly Holnam, Inc.) to build a harbor and fleeting area at approximate river miles 139.0 to 138.0L. Pallid sturgeon are known to occur in this reach of the MMR. The permit decision on this activity is still pending.

Missouri River Impoundments

In its 2002 Biological Opinion for the Missouri River, the Service developed a Reasonable and Prudent Alternative that specified flow changes on the Missouri River to restore a more natural hydrograph. Such changes would benefit the endangered pallid sturgeon and least tern and the threatened piping plover. However, there are concerns that flow changes on the Missouri River may have adverse impacts to aquatic habitats on the MMR. In August 2001, the Corps issued a Revised Draft Environmental Impact Statement for the Missouri River Master Water Control Manual. This document was prepared to evaluate the environmental impact of various water control plans. As part of this effort, the Corps is continuing to evaluate the impact of the various flow alternatives on the MMR.

Effects of the Action

Dredging during the pallid sturgeon spawning period creates two areas of concern with regard to the species. The first concern involves entrainment of eggs/larvae/juveniles during dredging. The second concern involves disposal of material on spawning habitat, larvae/juvenile habitat or feeding habitat.

Entrainment of pallid sturgeon eggs

Pallid sturgeon are thought to spawn over rock, cobble, or gravel substrates (USFWS 1993). Dredging occurs in depositional areas to maintain the 9-foot navigation channel. As such, it is not expected that dredging will impact any spawning areas because gravel bars are not usually found in depositional areas (USACE 2001).

Entrainment of larval/juvenile pallid sturgeon

Based on the literature review by Reine and Clarke (1998), it appears that there is a potential for entrainment of larval and juvenile pallid sturgeon. The sac-fry larvae drift downstream for a period of up to 8 to 13 days. It is possible that larval fish could be entrained into the dredged material out of the water column (USACE 2001). Juvenile sturgeon may also be entrained by dredging activities. Buell (1992) reported the overall rate of entrainment for sturgeon at 0.015 fish/cy, which is comparable to rates reported for other species. However, within that study, although substantial numbers of juvenile white sturgeon were entrained, (size class 300 to 500 mm), these were attributed to entrainment at one location referred to as the local "sturgeon hole" (Reine and Clarke 1998). Other studies of entrainment of sport and commercial fishes have found that both small and large fish were entrained in similar proportions; therefore, it was concluded that large fish did not avoid the dredge any more effectively than smaller fish (Armstrong, et al. 1982, Reine and Clarke 1998).

The number of larval and juvenile pallid sturgeon entrained by dredging is likely affected by a number of factors, including the dredging location and relative constriction of the river at that location (Reine and Clarke 1998). However, based on the suspected low number of females occurring in the MMR, the fact that females do not spawn every year, the small fraction of water entrained and the infrequency of dredging during the spawning window, it is anticipated that the number would be small (USACE 2001). In addition, the survival rate of larval fish is extremely small and the equivalent adults lost would be at least three to four orders of magnitude smaller than the number of larval fish entrained (USACE 2001).

Dredge Material Disposal on Spawning Habitat

Pallid sturgeon are thought to spawn over rock, cobble, or gravel substrates (USFWS 1993). Disposal on these areas or upstream of these types of habitats may destroy spawning habitat and/or smother eggs. To avoid these types of impacts, the Corps will utilize the gravel bar survey, pre-dredging surveys and river potomology information to make every effort to avoid placing dredged material on gravel/cobble/rock outcrops and areas immediately upstream of these habitats. As such, no impacts to spawning habitats are anticipated (USACE 2001).

Dredge Material Disposal on Larval Rearing Habitat

Hrabik et al. (2001) provided the best information to date on larval pallid sturgeon rearing habitat:

"In general, the collection sites were below extensive areas of rock, cobble, or gravel. Nearly all samples were taken in areas that included "quite" patches of water e.g., eddy pools, which incidentally contained large quantities of detritus."

Many of these collection sites were near side-channels or downstream island tips. Disposal of dredge material in these sites or in areas upstream of these sites may destroy rearing habitat and/or smother larval fish. To avoid these types of impacts, the Corps proposes to coordinate dredge disposal operations with the Service and to make every effort to avoid disposing on gravel bars, eddy pools or on island tips. Although every effort will be taken by the Corps to avoid these areas, there may be rare situations when these sensitive habitat areas can not be avoided. Should this be the case, this action will be coordinated with the Service. As such, impacts to rearing habitat are anticipated to be minor or non-existent (USACE 2001).

Dredge Material Disposal on Larval/Juvenile Feeding Habitat

It is anticipated that feeding habitat and rearing habitats are essentially the same. As such, impacts to larval/juvenile feeding habitats are anticipated to be minor or non-existent (USACE 2001).

To minimize impacts to larval/juvenile pallid sturgeon, the Corps has proposed the following conservation measures:

1. Every effort will be made by the St. Louis District to dredge outside the April 12 - June 30 pallid sturgeon spawning window. For example, 3 of 14 (21%) historic dredging events occurred during the last week of June (June 23, 1988; June 26, 1988; June 30, 1989), and possibly could have been postponed to avoid the spawning window.
2. Emergency dredging (April 12 - June 30) locations and disposal areas will be coordinated with the U.S. Fish and Wildlife Service prior to initiation of dredging.

3. Based on coordination with the U.S. Fish and Wildlife Service (Conservation Measure #2), the District's gravel bar data base (Laux 2000), and pre-dredge surveys, the St. Louis District will make every effort to avoid placing dredged material on gravel bars or rock outcrops that could serve as pallid sturgeon spawning habitat.
4. Based on coordination with the U.S. Fish and Wildlife Service (Conservation Measure #2), and pre-dredge surveys, the St. Louis District will make every effort to avoid placing dredged material in eddy pools that could serve as larval sturgeon rearing areas.
5. Based on coordination with the U.S. Fish and Wildlife Service (Conservation Measure #2) and pre-dredge surveys, the St. Louis District will make every effort to avoid placing dredged material on island tips.

CONCLUSION

After reviewing the historic dredging analysis, the current status of the pallid sturgeon, the environmental baseline for the action area, the effects of the proposed dredging during the pallid sturgeon spawning period, the conservation measures and the cumulative effects, it is the Service's biological opinion that this action is not likely to jeopardize the continued existence of the pallid sturgeon. No critical habitat has been designated for this species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

The Service anticipates that the proposed dredging during the presumed window of pallid sturgeon spawning will result in incidental take of pallid sturgeon. This incidental take exceeds that incidental take provided in the programmatic BO. The Service has developed the following incidental take statement based on the premise that the reasonable and prudent alternative and reasonable and prudent measures in the programmatic BO will be implemented.

Amount or Extent of Take

According to historic dredging information provided by the Corps, dredging during the pallid sturgeon spawning period averaged 200,000 cubic yards (cy) for the eight years data is available. This ranged from a low of 6,600 cy in 1966 to a maximum of 544,800 cy in 1976. Studies conducted by Buell (1992) in the Columbia River provide an estimate of sturgeon entrainment of 0.015 fish/cy. Utilizing the maximum amount of material dredged per year historically, this equates to an estimated entrainment of 8172 sturgeon/year (544,800 cy/yr X 0.015 fish/cy). Utilizing the minimum amount of material dredged per year historically, this equates to an estimated entrainment of 99 sturgeon/year (6,600 cy/yr X 0.015 fish/cy). The average would be an estimated 3000 sturgeon/year (200,000 cy/yr X 0.015 fish/cy). A recent report issued by

MICRA indicates that wild and hatchery raised pallid sturgeon account for 1 in 247 of all river sturgeons collected in the Lower Missouri and Middle Mississippi Rivers (Grady et al. 2001). Utilizing this ratio, the amount of entrainment for pallid sturgeon as a result of emergency dredging during the pallid sturgeon spawning period is anticipated to range from a maximum of approximately 33 fish/year to a minimum of 1 fish/year. The average is approximately 12.0 fish/year. According to Buell (1992) approximately 4% of entrained white sturgeon suffered direct mortality and approximately 6% of entrained sturgeon suffered serious, but not fatal, injuries. Therefore, the amount of take pallid sturgeon is estimated to be 10% of the pallid sturgeon entrained by dredging operations. Given this, the amount of take for pallid sturgeon is anticipated to range from a maximum of 4 fish/year to a minimum of 1 fish per year. The average is approximately 2.0 fish/year.

Effect of the Take

In the accompanying biological opinion, the Service determined that incidental take of pallid sturgeon as a result of emergency dredging during the pallid sturgeon spawning period is not likely to result in jeopardy to the pallid sturgeon or result in destruction or adverse modification of critical habitat. With implementation of the Reasonable and Prudent Measures presented below, incidental take is not expected to exceed 10 pallid sturgeon in a 10 year period (1.5 million cy/yr X 0.015 fish/cy ÷ 247 X 10%). Take of more than 10 pallid sturgeon in a 10 year period is considered to be an adverse effect which will require reevaluation of this incidental take statement and discussion of the need for reinitiation of consultation.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of incidental take of pallid sturgeon.

1. Emergency dredging should not exceed 500,000 cy of material in any given year. Should this amount be exceeded, consultation must be reinitiated with the Service. The Service will complete this consultation utilizing streamlined procedures.
2. Emergency dredging should not exceed 1.5 million cy of material in a 10 year period. Should this amount be exceeded, consultation must be reinitiated with the Service. The Service will complete this consultation utilizing streamlined procedures.
3. All dredge material disposal options (including upland disposal) will be considered and utilized as appropriate in coordination with the Service, to avoid disposal of dredge material in habitats utilized by pallid sturgeon.

4. An evaluation process will be developed to monitor fish entrainment rates as a result of dustpan and cutterhead dredging in the MMR. This process will be implemented should it become necessary to dredge during the April 12 to June 30 timeframe.

Terms and Conditions

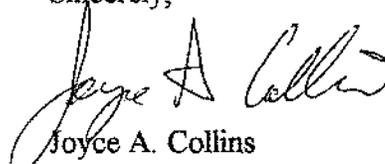
In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act of 1973, as amended, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. In each year in which emergency dredging is necessary, a summary report must be provided to the Service which summarizes the amount of material dredged from April 12 to June 30, the results of sediment size analyses, the dredging/disposal locations and the disposal method.
2. Within 2 years, provide a plan of study to the Service which outlines the process developed to monitor fish entrainment rates as a result of dustpan and cutterhead dredging in the MMR during the April 12 to June 30 timeframe.
3. Within 1 year of each dredging event during the April 12 to June 30 timeframe, a report will be provided to the Service which details the results of fish entrainment monitoring from dustpan and/or cutterhead dredging operations.

The Service believes that no more than 10 pallid sturgeon will be incidentally taken as a result of the proposed action within a 10 year period. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If during the course of emergency dredging operations, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Corps of Engineers must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

We appreciate your continued efforts to implement the biological opinion for continued operation and maintenance of the 9-foot channel navigation project. If you have any questions regarding this biological opinion or if you need additional information, please contact me at 618/997-3344, ext. 340.

Sincerely,



Joyce A. Collins
Assistant Field Supervisor

cc: IDNR (Kruse, Stuewe, Atwood)
MoDOC (Christoff, Boone, Brown, Hrabik)
USFWS (Steinbach, Surprenant)

LITERATURE CITED

- Armstrong, D., B. Stevens, and J. Hoeman. 1982. Distribution and abundance of Dungeness crab and Crangon shrimp, and dredged-related mortality of invertebrates and fish in Grays Harbor, Washington. Technical Report. School of Fisheries, University of Washington, Washington Department of Fisheries, and the U.S. Army Engineer District, Seattle.
- Buell, J. 1992. Fish entrainment monitoring of the Western-Pacific Dredge *R.W. Lofgren* during operations outside the preferred work period. Prepared for the Western-Pacific Dredging Company by Buell and Associates, Inc., Portland, Oregon.
- Grady, J., J. Milligan, C. Gemming, D. Herzog, G. Mestl, L. Miller, D. Herning, K. Hurley, P. Wills, and R. Sheehan. 2001. Pallid and Shovelnose Sturgeon in the Lower Missouri and Middle Mississippi Rivers. Final Report prepared for MICRA.
- Hartfield, P., and T. Slack. 2002. Sturgeon Survey in the Lower Mississippi River. In. R. Wilson, ed., Pallid Sturgeon Recovery Update, Issue No. 12.
- Hrabik, R.A. 2002a. Missouri Department of Conservation, Fisheries Research, Assessment, and Monitoring Section. In. R. Wilson, ed. Pallid Sturgeon Recovery Update, Issue No. 12.
- Hrabik, R.A. 2002b. Open River Field Station Report for January 2002. Missouri Department of Conservation, Cape Girardeau, Missouri.
- Reine, K., and D. Clarke. 1998. Entrainment by hydraulic dredges - A review of potential impacts. Technical Note DOER-E1. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

U.S. Army Corps of Engineers. 1999. Tier I Biological Assessment for the Operations and Maintenance of the Upper Mississippi River Navigation Project within the St. Paul, Rock Island, and St. Louis District.

U.S. Army Corps of Engineers. 2001. Tier II Biological Assessment: Emergency Dredging, Operation and Maintenance of the 9-ft Navigation Channel on the Upper Mississippi River System. St. Louis District.

U.S. Fish and Wildlife Service. 1993. Pallid sturgeon recovery plan. U.S. Fish and Wildlife Service, Bismarck, North Dakota. 55pp.

U.S. Fish and Wildlife Service. 2000a. Final Biological Opinion for the Operation and Maintenance of the 9-Foot Navigation Channel Project on the Upper Mississippi River System. Prepared by the U.S. Fish and Wildlife Service, Region 3.

U.S. Fish and Wildlife Service. 2000b. U.S. Fish and Wildlife Service Biological Opinion on the Operation and Maintenance of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project and Operation of the Kansas River Reservoir System. Prepared by the U.S. Fish and Wildlife Service, Region 6 and Region 3.