Interior Least Tern

Sterna antillarum athalassos

I. Species Summary

The endangered Interior least tern is a migratory shorebird that winters in South America, and nests on open habitats along rivers, salt flats, and other appropriate open habitats of the Interior Basin. The primary threats identified for listing the Interior least tern were the destruction of habitat and curtailment of range due to channel engineering practices on large rivers of the Interior Basin (i.e., damming, channelization, and channel stabilization), and low numbers of surviving birds throughout the summer nesting range (USFWS 1985; USFWS 1990). The status of this species has improved significantly over the past few decades, and the U.S. Fish and Wildlife Service (USFWS) has recommended delisting the species due to recovery (USFWS 2013). Although nesting habitat does not appear to be limited along the lower Mississippi River, nesting colonies may be negatively impacted by disturbance due to construction or recreational activities. Predation may also be increased by activities that result in increased connectivity of islands and sandbars with the shore. The USFWS species profile for the interior least tern can be found at http://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B07N.

II. Biological Information

Least terns are the smallest of the North American terns. Adults average 8 to 10 inches in length, with a 20 inch wingspan. Their narrow, pointed wings make them streamlined flyers. Males and females are similar in appearance. Breeding adults are gray above and white below, with a black cap, black nape and eye stripe, white forehead, yellow bill with a black or brown tip, and yellow to orange legs (USFWS 2014). Hatchlings are about the size of ping-pong balls and are yellow and buff with brown mottling (see Photo 1). Fledglings (young birds that have left the nest) are grayish brown and buff colored, with white heads, dark bills and eye stripes, and stubby tails. Young terns acquire adult plumage after their first molt at about 1 year, and do not breed until they are 2 to 3 years old.

Photo 1. *Adult Interior Least Tern with chicks (Audubon Society)*

The Interior least tern breeds within the active channels of large sand bed rivers, including the Missouri, Mississippi, Colorado, Arkansas, Red, and Rio Grande River systems (Lott *et al*. 2013). The listed Interior population of least tern is defined by USFWS in 1985 as those least terns nesting and breeding more than 50 miles (80 km) from the Gulf Coast.

Interior least terns arrive at breeding areas from early April to early June, and spend 3 to 5 months on the breeding grounds. Upon arrival, adult terns usually spend 2 to 3 weeks in noisy courtship. This includes finding a mate, selecting a nest site, and strengthening the pair bond. Courtship often includes the "fish flight", an aerial display involving aerobatics and pursuit, ending in a fish transfer on the ground between two displaying birds. Courtship behaviors also include nest preparation and a variety of postures and vocalizations.

Least terns nest in colonies, where nests can be as close as 10 feet but are often 30 feet or more apart. A single colony may harbor hundreds of nesting terns. The nest is a shallow depression in an open, sandy area, gravelly patch, or exposed flat (see Photo 2). Small twigs, pieces of wood, small stones or other debris might occur near the nest.

***Photo 2**. Least tern nest with eggs and chick, Lower Mississippi River (USFWS)*

Egg-laying begins in late May, with the female laying 2 to 3 eggs over a period of 3 to 5 days. The eggs are pale to olive buff and speckled or streaked with dark purplish brown, chocolate, or blue-gray markings. Both parents incubate the eggs, with incubation lasting about 20 to 22 days. The chicks hatch within one day of each other and remain in the nest for about a week. As they mature, they begin to wander from the nest, seeking shade and shelter in clumped vegetation and debris. Chicks are capable of flight within 3 weeks, but the parents continue to feed them until fall migration. Least terns will re-nest until late July if clutches or broods are lost.

The breeding season is usually complete by late August. Prior to migration, the terns gather at staging areas to rest and feed prior to the long flight to southern wintering grounds. Low, wet sand or gravel bars

at the mouths of tributary streams and floodplain wetlands are important staging areas. Interior least terns often return to the same breeding site, or one nearby, year after year.

III. Suitable Habitat

On the Lower Mississippi River, Interior least tern nesting colonies are concentrated along approximately 700 river miles (1,100 km) between Cairo, Illinois, and Baton Rouge, Louisiana (see Appendix A). For nesting, Interior least terns require sparsely vegetated sand or gravel bars, remote from trees, and near an appropriate food source; they might also nest on artificial habitats such as sand or gravel pits, industrial sites, and dredge islands (Lott *et al*. 2013). Interior least terns forage for fish in rivers, streams, and lakes. In riverine colonies, terns usually forage in proximity to the colony; however, when nesting on artificial habitats they may travel as far as 2 miles (3.2 km) from the colony to fish (USFWS 1990).

No critical habitat has been designated for this species.

IV. Determination

The Effects Determination Key for the interior least tern can be found in Appendix B.

V. Potential Avoidance and Minimization Measures

Possible avoidance and minimization measures for the interior least tern can be found in Appendix C.

VI. GIS Data

None available.

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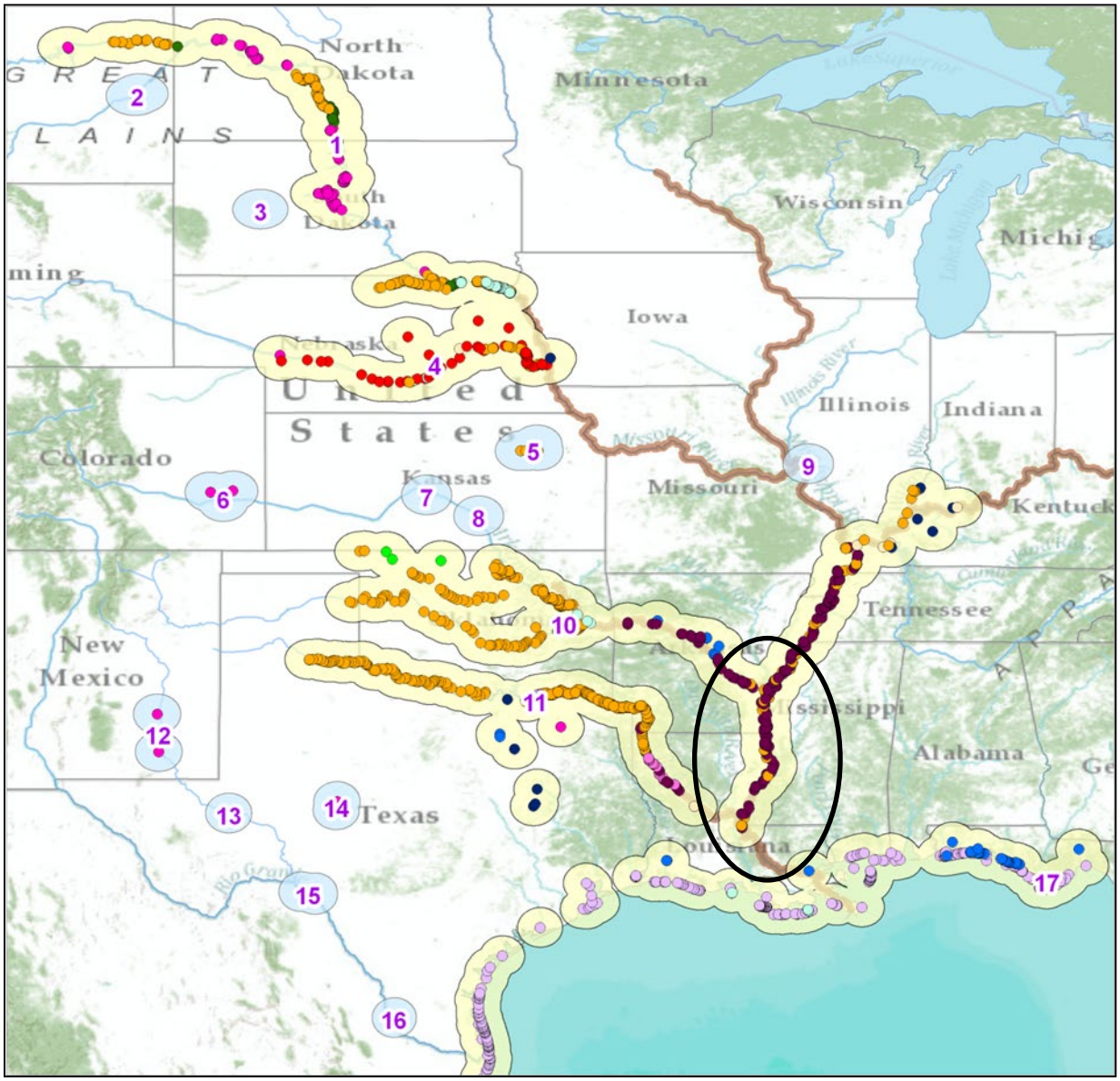
Appendix A – Interior Least Tern Nest Colonies along the Mississippi River from Memphis to Vicksburg*



*Mississippi colonies are within the black circle. (Lott *et al*. 2013)

US Army Corps of Engineers

Appendix B – Interior Least Tern Effects Determination Key

ORM2 Number _____ Date _____
Reference File: _____

1) Is the project located within the Mississippi River or between the main stem levees (i.e. batture lands)?
   a) Yes……go to 2
   b) No……No effect[1]

2) Would the project result in changes to river morphology (i.e., via construction of lock and dams, major waterbody diversions/withdrawal, etc.)?
   a) Yes……Consultation Required[3]
   b) No……go to 3

3) Is this an instream sand and/or gravel mining project?
   a) Yes……go to 4
   b) No ……go to 5

4) Will Appendix C Special Conditions be a requirement of the permit?
   a) Yes……NLAA[2] with Appendix C Special Conditions in Permit
   b) No……Consultation Required[3]

5) Would the project, including staging and work areas, directly impact suitable interior least tern nesting habitat (sparsely or non-vegetated portions of sand or gravel bars)?
   a) Yes……Consultation Required[3]
   b) No……go to 6

6) Would the project be conducted during the interior least tern breeding season (May 15 to August 31)?
   a) Yes……go to 7
   b) No…… No effect[1]

7) Would the work be conducted within 650 feet of suitable nesting habitat as defined above?
   a) Yes……go to 8
   b) No……NLAA[2]

8) Was the nesting area surveyed[4] by a qualified biologist for interior least tern during optimal conditions for detection (i.e., May 15-August 31)?
   a) Yes…… go to 9
   b) No……Consultation required[3]

9) Did survey results indicate the presence of nesting terns utilizing the suitable habitat?
   a) Yes……Consultation Required[3]
   b) No…… No effect[1] or NLAA[2] if discountable, insignificant, or completely beneficial

[1]No effect - The proposed project would result in no effect to this species and/or its federally-designated critical habitat (if applicable). Further consultation with the Mississippi Ecological Services Office is not necessary for the project as described.

[2]NLAA - The proposed project may affect, but is not likely to adversely affect this species and/or its designated critical habitat (if applicable . NLAA determinations for projects made pursuant to this key require no further consultation with the Mississippi

Ecological Services Office.

[3]Consultation required - Further consultation with the Mississippi Ecological Services Office is necessary in order to discern if the activity would result in a “no effect”, “not likely to adversely affect” or “likely to adversely affect” determination.

Additional Information

Appendix C -- Interior Least Tern Conditions for Instream Sand and/or Gravel Mining

1. A dredging plan shall be submitted to the Corps, Regulatory Branch, and the U.S. Fish and Wildlife Service (AR, LA, or MS Ecological Services), which includes proposed mapped boundary locations (latitude and longitude coordinates of polygon corners), dredging dates, type of material to be dredged, duration, and the amount of material to be dredged in cubic yards. The plan shall be submitted two weeks prior to beginning the dredging operation.

2. No dredging operations shall take place within 1,500 feet of the shoreline of a sandbar during interior least tern nesting season (May 15th and August 1st of each year) unless the permittee/contractor submits a biological survey conducted by a qualified biologist stating there is no evidence of interior least tern nesting on the sandbar. No dredging shall take place within 200 feet of sandbars at any time.

3. The permittee shall instruct dredge crews that under no circumstances (other than emergencies) are persons, vessels, or equipment permitted on an active interior least tern nesting island between May 15 and August 1 or until the young have fledged (whichever is later).

Appendix D– Potential Conservation, Avoidance, and Minimization Measures

1. Protect nesting interior least tern habitat to the extent possible
   a) Do not disturb foraging or nesting least terns to the maximum extent practicable. The project area (i.e., operational site, access points, travel corridors, staging areas, etc.) should be surveyed by a qualified biologist for the presence of interior lease terns or suitable habitat features. Educate personnel on avoiding those areas being utilized by the birds.
   b) Avoid the known or presumed occupied nesting area by designating a 650 foot "no construction" buffer around the area during active nesting. For pipeline activities, avoidance measures may include, but are not limited to, re-routing of pipeline and appurtenance facilities, boring or drilling, and/or implementation of a timing restriction on construction activities to avoid active nesting (i.e., no surface disturbing activities within 650 feet around the active nest until young have fledged or the nest is no longer being used). The timing restriction is May 15 to August 31 or until the young have fledged or the nest is no longer being used.
   c) Dredging or revetment work should also be restricted to outside the 650 foot buffer zone around nesting terns during the nesting season (May 15 to August 31).
   d) When least terns are identified, vehicle traffic should not occur within 650 feet of an active nest (even when birds are not present) – walk these areas or visually inspect from the closest existing feature (e.g., existing access road). The recommended buffers should be maintained for the duration of the work activities even if the birds depart or relocate. Personnel and vehicles should follow existing/established travel and access corridors and maintain slow speeds to avoid disturbing birds.

2. Reduce or limit least tern harassment through education and restrictions
   a) Do not use suitable habitat for staging areas. Staging areas should be located to avoid sandbars, sandy shorelines, or islands along and within the Mississippi River.
   b) Install new or replacement pipelines and utility lines under the river bottom using horizontal directional drilling (HDD) rather than open trenching. Drilling should be carefully undertaken and a plan should be in place to minimize and address the risk of habitat disturbance due to frac-outs and the appropriate distance of the staging area from interior least tern nesting habitat. Proximity of the HDD noise producing equipment should be placed at least 650 feet from the known or presumed occupied nest location (and preferably as far as possible from the nest as practical given the design of the drill).
   c) Avoid driving up and down the shoreline to the maximum extent practicable to minimize disturbance to birds and beach topographic alterations. Keep all personnel, vehicles, and equipment within the designated work area/project footprint and access corridors. Abandon pipelines in place to avoid suitable nesting habitat disturbance that would result from pipeline removal.
   d) Maintain a clean worksite and remove all trash and work-related debris on a daily basis.

Pallid Sturgeon

Scaphirhynchus albus

I. Species Summary

Pallid sturgeon, listed as 'endangered' (USFWS 1990), can be found in the Missouri and Mississippi Rivers from Montana to Louisiana. Pallid sturgeons have a unique dinosaur-like appearance and in the northern portion of their range can weigh up to and reach lengths of 6 feet. The U.S. Fish and Wildlife Service (USFWS) species profile for the pallid sturgeon can be found at https://ecos.fws.gov/species_profile/SpeciesProfile?spcode=E06X. The pallid sturgeon Recovery Plan prepared by the USFWS provides a summary of the ecology of the species (USFWS 2014a).

II. Biological Information

The pallid sturgeon is closely related to the relatively common shovelnose sturgeon (*Scaphirhyncus platorhynchus*), but grows to a larger size. The species has a flattened shovel-shaped snout; a long slender tail and are armored with lengthwise rows of bony plates instead of scales; and lack a spiracle (small openings found on each side of the head that passes water over the gills). In the Lower Mississippi River, pallid sturgeon may exceed 36 inches (100 cm), and 20 pounds (10 kg). Their mouth is toothless and positioned under the snout for sucking small fishes and invertebrates from the river bottom. As with all sturgeon, pallid sturgeon lack the scales and bones found in more modern species of fish. Instead, they have cartilaginous skeletons with five rows of thick bony plates (scutes) that extend along their sides, undersides and backs, as well as over most of the head. These scutes are covered by the skin and serve as a protective armor (see Photo 1). Scutes also extend along the backside, from the dorsal fin to the tail. The back and sides of pallid sturgeons are grayish-white (USFWS 2015). The pallid sturgeon is slow to mature (7-15 years), spawns infrequently, and might live for up to a century (USFWS 1993). Because of life history characteristics, including lengthy spawning migrations and larval drift distances, pallid sturgeon are particularly vulnerable to habitat fragmentation.

Photo 1. *Top view of a pallid sturgeon (USFWS)*

III. Suitable Habitat

Pallid sturgeon are primarily found on the bottoms of large rivers with moderate to swift river currents (see Photo 2). They also prefer turbid waterways, depths between 3 and 25 feet (0.91 and 7.6 m), and sand or gravel substrates.

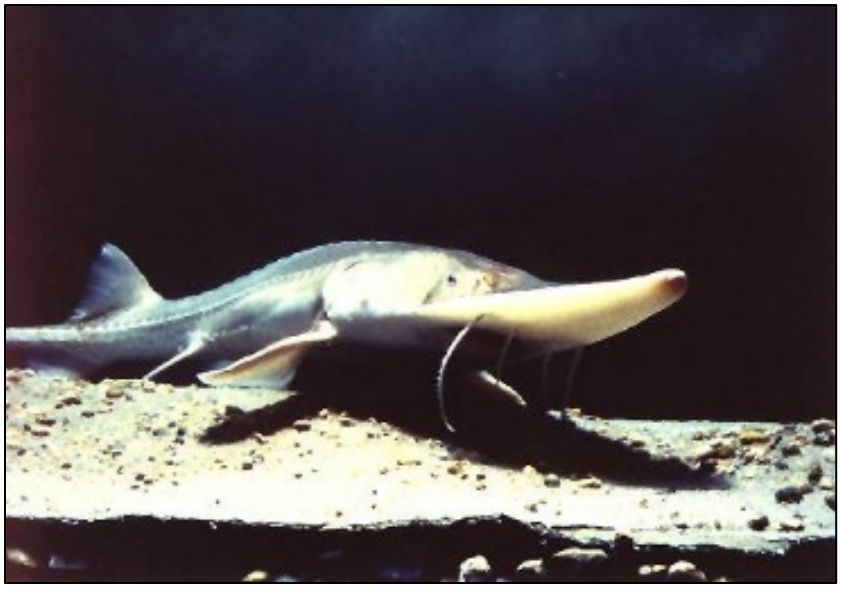


Photo 2. *Pallid Sturgeon on the bottom of their riverine habitat (USFWS)*

In the Mississippi River, the range extends from just above Saint Louis, south to New Orleans, and includes the Atchafalaya River from the Old River Control Complex to below Morgan City (see Appendix A). In the Lower Mississippi River, pallid sturgeon have been collected from main channel habitats including island margins and tips, secondary channels, sand bars, dike tips, and natural and engineered banks (Herrala et al. 2014). Islands and secondary channels are associated with, and important to pallid sturgeon larval recruitment (Hartfield *et al.* 2013).

Table A-1 in Appendix A provides a list of Subwatersheds (HUC12) included in the pallid sturgeon consultation zone.

No critical habitat has been designated for this species.

IV. Determination

The Effects Determination Key for the pallid sturgeon can be found in Appendix B.

V. Potential Avoidance and Minimization Measures

Possible avoidance and minimization measures for the pallid sturgeon can be found in Appendix C.

VI. GIS Data

GIS data is not available.

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Appendix A – Pallid Sturgeon Range

Map of prominent rivers in the Mississippi River Basin. Bold line approximates historical range of Pallid Sturgeon (Coker 1929; Bailey and Cross 1954; Brown 1955; Carlson and Pflieger 1981; Kallemeyn 1983; Keenlyne 1995).

Table A-1. Pallid Sturgeon Subwatersheds (HUC12) Consultation Zone

HUC 12	Subwatershed Name
080101000704	Cow Island Bend-Mississippi River
080201000102	Tunica Lake-Mississippi River
080201000200	Unnamed (HUC8 Lower Mississippi-Helena)
080201000301	Deep Bayou
080201000302	Lake Beulah-Mississippi River
080301000100	Unnamed (HUC8 Lower Mississippi-Greenville)
080301000200	Unnamed (HUC8 Lower Mississippi-Greenville)
080301000300	Unnamed (HUC8 Lower Mississippi-Greenville)
080302071900	Unnamed (HUC8 Lower Mississippi-Greenville)
080302090600	Unnamed (HUC8 Lower Mississippi-Greenville)
080601000200	Unnamed (HUC8 Lower Mississippi-Natchez)
080601000302	Rodney Lake-Mississippi River
080601000502	Glasscock Cutoff-Mississippi River
080601000600	Unnamed (HUC8 Lower Mississippi-Natchez)
080701000102	Morganza Floodway

Source: USFWS 2018

US Army Corps of Engineers

Appendix B – Pallid Sturgeon Effects Determination Key

ORM2 Number _____ Date _____
Reference File: _____

1) Will the project impact the Mississippi River or its secondary channels?
   a) Yes .....go to 2
   b) No..... No effect[1]

2) Would the project result in a riverine or secondary channel pathway obstruction (i.e., construction of dams, hydropower plants, etc.)?
   a) Yes.....Consultation Required[3]
   b) No.....go to 3

3) Does the project involve addition of or modifications to water intake structures?
   a) Yes.....go to 4
   b) No.....go to 5

4) Can all the following conditions be met? Water intakes are screened with a ¼-inch (6.35 mm) or smaller mesh and have an intake velocity of less than ½ ft/sec (15.24 cm/sec), and be placed at water depths greater than 15 feet (4.575 m).
   a) Yes.....NLAA[2] with above conditions
   b) No.....Consultation Required[3]

5) Does the project involve modifications to existing or construction of new diversion structures or turbines?
   a) Yes .....Consultation Required[3]
   b) No.....go to 6

6) Is this an instream sand and/or gravel mining project?
   a) Yes.....go to 7
   b) No.....go to 8

7) Will Appendix C Special Conditions be a requirement of the permit?
   a) Yes.....NLAA[2] with Appendix C Special Conditions in Permit
   b) No.....Consultation Required[3]

8) Does the project involve bucket dredging and/or non-dredging activities (i.e. maintenance repair, or replacement of existing structures; new pile-supported structures, navigational markers, etc.), will disturb less than 100 feet of shoreline (i.e. boat ramps, bank stabilization, rip-rap, etc.), and increase sediment loads for no more than 48 hours?
   a) Yes..... No effect[1] (if no route of effect) or NLAA[2] (if the effects are expected to be discountable, insignificant, or completely beneficial)
   b) No.....go to 9

9) Does the project involve hydraulic (cutterhead, suction, etc.) dredging?
   a) Yes..... go to 10
   b) No.....Consultation Required[3]

10) Can the following **conditions** be met? 1) The pumping rates should be reduced to the slowest speed feasible while the cutterhead is descending to the channel bottom. 2) The cutterhead shall remain completely buried in the bottom material during dredging operations. If pumping water through the cutterhead is necessary to dislodge material or to clean the pumps or cutterhead, etc., the pumping rate should be reduced to the lowest rate possible until the cutterhead is at mid-depth, where the pumping rate can then be increased.
    a) Yes…… NLAA[2] with above conditions
    b) No……Consultation Required[3]

[1]No effect - The proposed project would result in no effect to this species and/or its federally-designated critical habitat (if applicable). Further consultation with the Mississippi Ecological Services Office is not necessary for the project as described.

[2]NLAA - The proposed project may affect, but is not likely to adversely affect this species and/or its designated critical habitat (if applicable). NLAA determinations for projects made pursuant to this key require no further consultation with the Mississippi Ecological Services Office.

[3]Consultation required - Further consultation with the Mississippi Ecological Services Office is necessary in order to discern if the activity would result in a "no effect", "not likely to adversely affect" or "likely to adversely affect" determination.

Additional Information _____

Appendix C - Pallid Sturgeon Conditions for Instream Sand and/or Gravel Mining

1. A dredging plan shall be submitted to the Corps and the U.S. Fish and Wildlife Service's Mississippi Field Office, including dredging locations (GPS coordinates), proposed dates, type of material to be dredged, and the amount of material to be dredged in cubic yards. The plan shall be submitted and approved two weeks prior to beginning the dredging operation.

2. The permittee shall be prohibited from dredging on gravel bars (particles > 0.3 in (8 mm) diameter) during the pallid sturgeon spawning season (April 1 through June 30 of each year).

3. The permittee would be prohibited from dredging within a secondary channel, or within 500 feet of the entrance or exit of a secondary channel.

Appendix D – Potential Avoidance and Mitigation Measures

Project Recommendations for Intake Structures to Protect Trust Resources

The following is a list of various intake specifications for both lake and stream environments. Different options are available that could be implemented to protect trust fish and wildlife resources depending on the size and type of stream/river. (Note: these recommendations were developed for large water withdrawals such as those associated with power plants; however, recommendations for agriculture and fracking [see Intake Requirements and Maintaining Adequate Water Flows/Depths] withdrawals are also included.)

1. **Endangered Pallid Sturgeon Recovery Plan Requirements.** New point-source water intakes serving industry, irrigation, and public water supply that may affect pallid sturgeon recruitment must be screened with a ¼-inch (6.35 mm) mesh and have an intake velocity of less than $^1/_2$ ft/sec (15.24 cm/sec), **or** be placed at water depths greater than 15 feet (4.575 m) to protect against entrainment or impingement of pallid sturgeon larvae or fingerlings. Existing intakes found to be adversely affecting pallid sturgeon populations should be redesigned as needed to reduce adverse effects on this species (USFWS 1993).

2. **Intake Structures.** The following is a list of various intake specifications for both lake and stream environments. Different options are available that could be implemented to protect trust fish and wildlife resources depending on the size and type of stream/river. (Note: these recommendations were developed for large water withdrawals such as those associated with power plants; however, recommendations for agriculture and fracking [see Intake Requirements and Maintaining Adequate Water Flows/Depths] withdrawals are also included.)
   a) General
      i. Once-through circulation systems should not be employed.
      ii. If feasible, dry cooling systems, or a combination of dry and wet cooling systems should be used to reduce the amount of water withdrawn for cooling purposes. It should be noted that dry cooling systems require a larger land area that could lead to greater wetland or other habitat impacts.
      iii. Variable speed intake pumps should be utilized to reduce water intakes during low demand periods.
      iv. Any repairs to the cooling system that would require the heated discharge to be discontinued should be conducted during summer months. Cessation of heated discharge during cold weather can result in the death of fishes due to the sudden change in water temperature (USFWS 1978, EPA 1976).
      v. Water intakes shall not be located in identified primary spawning and/or nursery areas or mussel beds.
      vi. Reduced water intake during cooler water periods is recommended to avoid any unnecessary impacts to aquatic species by entrainment or impingement (EPA 1976).
      vii. An inspection/monitoring and maintenance plan for intakes is required to ensure proper operation (NMFS 1996).
      viii. Intake screens should be equipped with a reliable automatic cleaning system that utilizes proven technology (NMFS 1996).

   b) Intake Requirements
      i. Intake velocities at the screen should not exceed ½ ft/sec (USFWS 1993).

ii. Mesh size at intake screens should have a maximum mesh opening of ¼ inch to reduce the size of aquatic organisms that can be entrained (EPA 1976, USFWS 1993).
iii. A Johnson (or Johnson-type) screen/intake, with ⅛-inch mesh or less, should be used if feasible.

c) Existing Intakes
i. If a vertical opening intake is used, a velocity cap should be installed to substantially reduce the number of organisms drawn into pumps and cooling systems (Richards 1977).
ii. Moveable screens should be used to minimize impacts to impinged organisms (USWFS 1978, EPA 1976).
iii. Use of continuous rotating screens is recommended, when feasible; otherwise, the time duration between screen rotations should not exceed two hours (King et al. 1978, Tatham 1978).
iv. Use of a low-pressure wash system (maximum spray pressure of 50 pounds per square inch) prior to a high-pressure wash should be utilized to increases the survival of fish removed from screens (EPA 1976, King et al. 1978).
v. A minimum of 2 inches of water should be maintained in discharge troughs to prevent fish escape and re-impingement from occurring (EPA 1976).
vi. Fish removed from the discharge troughs should be quickly returned a sufficient distance (downstream, if applicable) from the intake to prevent re-impingement (EPA 1976).
vii. Discharge conduits should be designed to minimize undue stress and physical injury (e.g., no closure valves, smooth joint design, smooth interior surface, and bends should have large radius of curvature (> 5)) while returning fish to the water body from which they were removed (NMFS 1995).
viii. Discharge conduits shall not have water pumps and fish shall not be allowed to free fall at any time (NMFS 1995).
ix. If side walls protrude into the stream (or other flowing water body), openings that provide for fish passage should be constructed.

d) Intake Location
i. The Service recommends that cooling water discharges be located downstream of the cooling water intakes to avoid impacting fish that may be attracted to the cooling water discharge during the colder months.

e) Streams and Rivers
i. Avoid locating intakes in known locations of eddies.
ii. Placing the intake on the cut or higher velocity bank has been shown to reduce the amount of organisms impinged or entrained (EPA 1976).
iii. Intakes that are within streams should be placed away from the shoreline and no closer than 2 feet from the bottom (USFWS 1978, EPA 1976).
iv. Intakes that are not located within stream should be as flush to the bank as possible, with the intake screens at the bank line (EPA 1976).

f) Agricultural Recommendations
i. If Johnson (or Johnson-type) screens are utilized then maximum mesh openings should be ⅛ inch.
ii. Pumping plant sound levels shall not exceed 75DB at 50 feet.
iii. Water intake structures shall be elevated 2 to 4 feet off the bottom and placed at least

twenty vertical feet below the water level existing on June 1st of that irrigation season. If twenty feet is not attainable, the intake shall be placed at the maximum attainable depth and the intake velocity shall not exceed ¼ ft/sec.

iv. A floating intake system may be used and should be located over deep water (20 feet or greater, if attainable). If water depths at the irrigation intake site fall below 10 feet during the irrigation season, the intake shall be moved to deeper water or shut down.

g) Maintaining Adequate Water Flows/Depths

i. Based upon previously conducted flow studies, an appropriate monthly minimum instantaneous flow rate for the survival of aquatic species is 40 percent of the annual average flow for October through March and 60 percent of the annual average flow for April through September (Stalnaker 1976).

ii. Intake flow must be no more than either the lower 5 percent of the source water body mean annual flow or 25 percent of the source water 7Q10.

iii. Existing monthly 7Q10 must be maintained.

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