

Implementation of the Biological Opinion

Annual Progress Report Fiscal Year 2007

**U.S. Army Corps of Engineers
Mississippi Valley Division
St. Louis District**

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Background

In April 1998, Region 3 of the U.S. Fish and Wildlife Service (FWS) and Mississippi Valley Division (MVD) of the U.S. Army Corps of Engineers (Corps) entered into formal Section 7 consultation under the Endangered Species Act. The consultation covered the continuation of operation and maintenance activities on the Upper Mississippi River Nine Foot Navigation Channel. Specifically addressed within the consultation were operation and maintenance direct effects, navigation traffic indirect effects, recreation indirect effects, and cumulative effects. The direct effects of operation and maintenance included navigation channel dredging, dike and revetment maintenance, water level management, and management of Corps' lands. A 1998 baseline was established for the effects and a fifty-year evaluation period (to 2048) was used.

Formal consultation was concluded in August 2000, when the MVD Commander sent a letter to the Director of Region 3 FWS setting forth an implementation plan for the Corps project that would accommodate the findings of the FWS's Biological Opinion. The species of concern covered in the biological opinion that are germane to the St. Louis District include:

- Decurrent False Aster – Likely to be adversely affected, but not jeopardized
- Bald Eagle – Impacts negligible or offset by management actions; No incidental take (delisted August 9, 2007)
- Indiana Bat – Impacts negligible or offset by management actions; No incidental take
- Interior Least Tern – Incidental take with Reasonable and Prudent Measures (RPM)
- Pallid Sturgeon – Jeopardy with Reasonable and Prudent Alternatives (RPA), incidental take, and RPMs.

FY07 Activities

The following is an outline of St. Louis District activities for fiscal year 2007. This was the seventh year of implementation activities under the Biological Opinion. For the immediate future, funding and manpower requirements will continue to be addressed on a year by year basis. Our partners, in particular the states, have voiced similar concerns with regard to funding and manpower constraints. With this in mind, we will continue to closely monitor the burden placed on their agencies as a result of meetings and planning efforts required under this Biological Opinion and will work with them to minimize impacts where possible.

1. **River Resources Action Team - Executive Team (Pallid Sturgeon - RPA 2 & 4, Term and Condition 4; Least Tern - Term and Condition 4).** The River Resources Action

Team (RRAT) met in a scheduled formal Executive Session on 19 June 07. Topics of discussion included: (1) Comprehensive Reach Planning, (2) Goal setting for the 12 geomorphic reaches, reach teams, and compatibility with NESP, (3) Potential EMP projects in the Middle Mississippi River and other new project proposals, (4) status of Illinois River Reach technical team, and (5) status of Sandy Slough and the LD 25 project.

2. **River Resources Action Team – Technical Team (Pallid Sturgeon - RPA 2 & 4, Term and Condition 4; Least Tern - Term and Condition 4).** The Technical Team considered the June 07 boat trip as its yearly meeting. The RRAT annual coordination boat trip was held aboard the Motor Vessel Strong from the Memphis District and a covered barge as they traveled from the St. Louis District Service Base to Cairo, Illinois. A number of potential or active main-channel, side-channel, island and backwater project sites were visited over the three day trip. Topics discussed included bank stabilization, island erosion, dike modifications, closing structures, dredged material disposal, chevron and multiple round point structure construction, chute restoration, land acquisitions, the Middle Mississippi River Collaborative Planning Project, revetment modifications, and hardpoints.
3. **Pallid Sturgeon Habitat, Life History, and Population Demographics work (Pallid Sturgeon - RPA 1).** Multiple articles were published in the Journal of Applied Ichthyology and Conservation Genetics in FY07.
4. **Pallid Sturgeon Conservation and Restoration Plan (Pallid Sturgeon - RPA 2).** In a letter dated 24 October 2006, the Corps requested from the FWS that the deadline for a draft conservation and restoration plan be delayed until the Corps and the Service can jointly participate in a review of the habitat, life history, and population demographics study results.
5. **St. Louis Harbor chevron construction, UMR River Miles (RM) 183.0-182.4(R) (Pallid Sturgeon - RPA 3 & 4, Term and Condition 2; Least Tern - RPM 1, Term and Condition 2).** The St. Louis Harbor area has been experiencing a dredging problem for many years. An HSR model study was performed in 2003 for RM 192.0-172.0 and an alternative was selected that uses non-traditional structures that reduce dredging requirements, improve navigation, and is intended to enhance aquatic habitat and diversity through the harbor. Part of the alternative included chevron construction between river miles 183.0-182.4(R). St. Louis District biologists are using electrofishing and benthic trawling to collect fish at the project area and at non-project or “control” areas. Eleven species were collected at the chevron sites over the six pre-construction samples taken between September 2006 and July 2007. Construction of the three chevrons began in August 2007 and was completed by November 2007. Post-construction monitoring is planned to begin in mid FY08. Fish data collected over a number of years at chevrons in Pools 24-26 shows that the scour holes that develop after the chevrons get over-topped are occupied by a number of fish species throughout the year.
6. **Cliff Cave – Kimmswick dike alteration and chevron construction site, RM 168-156.6 (Pallid Sturgeon - RPA 3 & 4, RPM 1, Terms and Conditions 2&4; Least Tern - RPM 1, Terms and Conditions 2&4).** An HSR model study for this reach was completed in

FY06. The Biological Assessment for this contract has been completed. Construction is scheduled for FY08.

General Background: This project was selected from the Corps' 2002 Stone Dike Alteration Project Report. The purpose of the HSR study was to design structural modifications to the existing dike fields to enhance the aquatic habitat diversity and flow dynamics within the reach. The study was performed to address two separate sediment transport goals. The first goal was to create island and side channel aquatic habitat within the dike field. The second goal was to maintain current depths in the navigation channel to assure the need for additional dredging would not arise. A team participation meeting was held at the Applied River Engineering Center in St. Louis, Missouri prior to the testing of alternatives to outline objectives and concerns in the study reach. It was brought to the team's attention that the bar on the right descending bank between RM 165.0-164.0(R) contained unique Pallid Sturgeon habitat. It was recommended that, if at all possible, no structures detrimental to this habitat be used in the final design. At this meeting the team decided on two areas of emphasis. These two areas were along the left descending bank (LDB) downstream of dike 163.0(L) and on the LDB downstream of Dike 160.9(L). Alternative design analysis concluded that at Cliff Cave the Corps should notch a number of existing dikes and construct four chevrons, and at Kimmswick, three chevrons should be constructed.

7. **Fort Chartres/Establishment Island new chevrons and rootless dike between RM 132.5-129.5(R) (Pallid Sturgeon - RPA 3 & 4, Term and Condition 2; Least Tern - RPM 1, Term and Condition 2).** Construction of a rootless dike at RM 130.2(R) was completed in FY07. The latter structure was planned to be a chevron; however, construction difficulties necessitated the change to a rootless dike. This change was coordinated with all partners.

General Background: This reach of the river has been experiencing a dredging problem for many years. This contract was awarded in FY06 and five of six structures were completed. The two blunt-nosed chevrons were constructed at RM 130.05 and 129.9(R). The spur dikes and rootless dike were constructed between RM 132.0(R) and 132.5(R). This work is intended to eliminate the need to dredge and add environmental features. Recent data shows that the scour holes that develop after the chevrons get over-topped are occupied by a number of fish species throughout the year. Pre-construction monitoring (biological & physical) was conducted by the Missouri Department of Conservation between 2002 and 2004 and a final report has been submitted to the Corps. Preliminary results show that despite some environmental variation, there are some consistencies in species/habitat use at island complexes, setting the stage for post-construction evaluation at Establishment Island. It was also suggested that further analyses (ordination) may be needed to better explain the distribution and habitat use by fish species and guilds when comparing pre- and post-distributional patterns. Post-construction monitoring is planned to begin during FY08.

8. **Kaskaskia Bend RM 125.0-112.0.** This reach of the river has been experiencing a dredging problem for many years. This contract was scheduled for an FY07 award;

however the work has been postponed and scheduled for an FY08 award. This work is intended to eliminate the need to dredge, improve navigation, and add environmental features. There is a series of five existing dikes. Three will be raised and notched, another will be notched and the fifth is an existing pile dike that will be extended. The Biological Assessment for this contract has been completed.

9. **Chevron construction at RM 100.1-99.9(L)** (bottom of Liberty Chute). During July and August of 2007 three chevrons were constructed at UMR miles 100.1, 100.0 and 99.9(L). These chevrons were constructed as part of the Red Rock Landing – Phase 5, Mile 103.0-90.0 General Plan. The primary purpose was to address dredging concerns of the main channel just south of Liberty Chute. The location of the chevrons was coordinated with agency and stakeholder partners to address concerns of increased siltation at the downstream end of Liberty Chute where pallid sturgeon have been captured. Bathymetric surveys of the area will be forthcoming to see if the chevrons performed as expected.

10. **Mile 100(R) Islands study (Pallid Sturgeon - RPA 1)**. Data analysis continued during FY07 for this study.

General Background: Teri Allen (St. Louis District Corps biologist) conducted the study of fish assemblages at the Mile 100 dike field located along the right bank below Chester, Illinois between RM 100.1 and 98.9 until August 2006 when the benthic trawling, electrofishing, and mini-fyke net sampling was completed. Data analysis continued in FY07. The area consists of six notched dikes and five islands. The dikes were built in the early 1970s for the expressed purpose of sediment management and channel improvement. Notches were designed in the dikes at the time of construction with the intent of creating a scour pattern that would eventually form a secondary channel and associated islands. The study is designed to compare the fish assemblages at the island sites to nearby “non-notched” or “control” dikes (5 sites between river miles 100.4 and 107.4(R)). Teri will be looking at spatial and temporal differences in such parameters as fish species diversity and composition, habitat variation, and water quality. The study is intended to examine the benefits of notched dikes and island creation to fish communities.

11. **Upper and Lower Jones Chute, between RM 98.4 and 95.0 (Pallid Sturgeon - RPA 3 & 4, Term and Condition 2)**. Continued pre-construction water quality monitoring that included, among other things, total suspended solids, dissolved oxygen, nitrates, and phosphates. Construction is scheduled for FY08.

General Background: The HSR model study for this reach was completed in FY06. The main purpose of the study was to evaluate environmental design alternatives in Upper and Lower Jones chutes in order to diversify aquatic habitat by modifying present dike structures, developing new side channels and bar formations while maintaining the integrity of the navigation channel. Upper and Lower Jones Chutes can lose their connectivity with the main channel and become dry during low water periods. Therefore, alternatives primarily focused on restoring connectivity between side channel and main channel aquatic habitat for extended periods of the year, thus re-establishing more access to off channel habitat for aquatic organisms. Side

channel habitats provide refuge from the swift currents of the thalweg and may be particularly beneficial as spawning, rearing, food production, feeding, and seasonal refuge areas for several species of fishes.

12. **Red Rock/Tower Rock project RM 93.0-86.0 (Pallid Sturgeon - RPA 3 & 4, Term and Condition 2; Least Tern - RPM 1, Term and Condition 2).** No further construction took place at this reach during FY07. The remaining two chevrons are scheduled for construction in FY08.

General Background: One chevron was constructed during early FY06 at RM 89.5(L). This chevron was the second of five structures (three chevrons and two dikes) to be constructed as part of the accepted alternative from the Red Rock to Tower Rock HSR study (RM 93.0-86.0) completed in 2002. Each alternative was tested with the intention of using innovative and traditional structures to create new island, side channel, and deep scour hole aquatic habitat within the dike fields of the study reach while maintaining the integrity of the navigation channel. Importantly, in March of 2006 MDOC captured two pallid sturgeon near the center of the chevron legs and another off the main channel side leg – this was the chevron at river mile 90.4 R that was built in 2005. This reach of the river was one of the top three reaches ranked for modification from the Corps Stone Dike Alteration Project Report.

13. **Dike modifications at Big Muddy River confluence, RM 75.5(L) (Pallid Sturgeon - RPA 4, RPM 2; Least Tern - RPM 1).** The purpose of this project was to modify three dikes (RM 75.5, 75.3, and 75.2[L]) to improve habitat diversity at the confluence of the Big Muddy and Mississippi rivers. The project included restoring and/or modifying these dikes to initiate a split flow condition that would develop/create a side channel complex. In FY07, the dike at RM 75.5(L) was notched. This dike is located at Union Point/Wilson Landing just below the mouth of the Big Muddy River. Modification of the remaining two dikes is scheduled for FY08.
14. **Cape Rock HSR Study RM 57-50 (Pallid Sturgeon - RPA 3 & 4, RPM 1; Least Tern – RPM 1).** In FY07 the St. Louis District initiated a study of the Middle Mississippi River between RM 57.0 and 50.0 near Cape Girardeau, Missouri. The purpose of the study was to evaluate environmental design alternatives for the development of side channel and island habitat, utilizing an existing dike field on the Mississippi River. This study was funded as part of the Biological Opinion Program of the U. S. Army Corps of Engineers, St. Louis District. The primary goal of this study was to diversify aquatic habitat by modifying present dike structures and developing new side channels and bar formations while maintaining the integrity of the navigation channel. A final report with recommendations is forthcoming.
15. **Thebes Reach HSR Study RM 46-36 (Pallid Sturgeon - RPA 3 & 4, RPM 1; Least Tern – RPM 1).** In FY07 the St. Louis District initiated a study of the Upper Mississippi River between RM 43.0 and 35.0, approximately nine miles downstream of Cape Girardeau, Missouri. The study's main purpose was to evaluate design alternatives to the existing stone dike configurations in this reach of the river with intent to improve environmental

habitat. Within the model is Santa Fe Chute. The challenges are the rock bottom in the river and the structures enclosing the entrance to Santa Fe Chute. A final report with recommendations is forthcoming.

16. **Environmental dredging at Sister Chute RM 14.5-12.0(R) (Pallid Sturgeon - RPA 3 & 4, Term and Condition 4; Least Tern - Term and Condition 4).** Dredging at the lower end of Sister Chute, RM 12.0(R), was completed in FY07 (October 2006). Post-construction bathymetric surveys began at the end of November 2006. Additional surveys are planned for FY08.

General Background: After initial coordination and evaluation with state and federal stakeholders, it was decided to dredge the lower end of Sister Chute with the primary purpose of creating overwintering fish habitat. The project is also being conducted to specifically benefit the pallid sturgeon by providing backwater habitat that is anticipated to provide an improved food base. Also, the mouths of chutes appear to be important habitat for larval sturgeon in general. In FY05, the Corps prepared an EA and Tier II BA for this effort and secured the necessary section 401 and 404 permits (Clean Water Act). The dredge cut will create a channel to connect the open river area at the lower end of the chute to the deep water hole for better connectivity throughout critical over wintering timeframes. The dredge cut will also provide other aquatic species with greater potential use of the side channel for resting, spawning and feeding opportunities. Restoration of side-channels is one of the seven types of habitat restoration suggested by the FWS in the Biological Opinion. In addition, side channel restoration has been a priority of the natural resource agencies in Illinois and Missouri. Implementation of this environmental dredging project maintains the St. Louis District's commitment to comply with the ESA.

17. **MVS River Reach Plans (Pallid Sturgeon - RPA 2 & 4).** River reach planning efforts in FY07 included the completion of data tabulation forms for the St. Louis (RM 200-160), Harlow (RM 160-120), Crains (RM 120-80), Hamburg (RM 80-40), and Dogtooth (RM 40-0) reaches of the Mississippi River. Each reach has been subdivided into a number of subareas. For each subarea, the following information is being gathered: site related problems, ecosystem goals and objectives, available ecosystem restoration measures, applicable agency programs, existing management activities, existing management plans, federal and state T&E species of concern, available prior reports and scientific literature, a general site characterization, additional data needs, modeling needs, monitoring needs, potential ecosystem restoration projects, potential conservation partners, maps, and miscellaneous other notes. This information is important for future reach planning efforts especially regarding NESP and the Middle Mississippi River Partnership. In addition, a hydrogeomorphic study for the Middle Mississippi River was initiated. This study will be used to help determine what ecosystems existed along the Middle Mississippi River before European settlement and also how to restore these ecosystems.
18. **Special issue of the Journal of Applied Ichthyology (Pallid Sturgeon - RPA 1 & 2).** Dr. Tom Keevin co-edited a special issue of the *Journal of Applied Ichthyology* entitled "Evolution, Ecology, and Management of *Scaphirhynchus*" (Volume 23[4], 289-538). The

journal contains 29 professional papers and was published in August 2007. These papers are a result of the *Scaphirhynchus* 2005 Conference hosted by the St. Louis District.

19. **Interior Least Tern (Least Tern - Term and Condition 3).** Coordination with the Interior Least Tern Working Group continued and expansion of the nesting and usage survey effort was investigated. Maintenance on Least Tern Habitat Island (RM 201.6[R]) was completed. This included herbicide application to remove and control perennial vegetation and light disking/harrowing. Random monitoring for least terns within the Riverlands Migratory Bird Sanctuary (RMBS) continued through partnership with the St. Louis Audubon Society. An informal partnership with the University of Illinois and Illinois Department of Natural Resources was developed to place least tern decoys and a mechanical call box on Least Tern Habitat Island (Ellis Bay, RMBS) in an attempt to lure terns to use the island for foraging and nesting. The decoys and call box were monitored randomly and no increased use was noted as a result of the luring methods. The process to acquire a surplus floating pontoon barge to be utilized as potential temporary artificial breeding/nesting structure in Ellis Bay, RMBS was initiated.
20. **Emergency Dredging Biological Assessment (Pallid Sturgeon - Term and Condition 5).** The FY02 Biological Opinion contains an Incidental Take statement with Reasonable and Prudent Measures and Terms and Conditions to be implemented should dredging become necessary during the 12 April through 30 June timeframe. No dredging was required during this time frame for FY 07.

Projected FY08 Activities

Based on current projections of FY08 funding in the St. Louis District, we anticipate proceeding with the following work. However, these are projections only, and may require adjustment in the event adequate funding cannot be maintained. Not all of these items will be completed in the next FY as some of them are multi-year continuing efforts and others may require extensive outside coordination.

1. Continue coordination with the **RRAT Technical Team** and **RRAT Executive Team**. Continue work on refining coordination efforts through the RRAT framework.
2. The **Pallid Sturgeon Conservation and Restoration Plan** effort will continue in cooperation with MDOC, IDNR and FWS.
3. Continue **pallid sturgeon** work (ERDC/SIU-C). Initiate larval/juvenile fish study.
4. **St. Louis Harbor chevron construction RM 183.0-182.4(R)**. Post construction monitoring included bathymetry, ADCP, water quality, and fish data will continue during FY08.
5. **Cliff Cave – Kimmswick dike alteration and chevron construction site, RM 168.0-156.6**. Construction is scheduled for FY08.

6. **Fort Chartres/Establishment Island new chevrons and rootless dike between RM 132.5-129.5(R).** Post construction monitoring to begin in FY09.
7. **Initiate Establishment Chute HSR model study, RM 133-129.**
8. **Kaskaskia Bend, RM 125.0-112.0.** This contract was scheduled for an FY07 award; however the work has been postponed and scheduled for an FY08 award.
9. **Initiate Waters Landing HSR model study, RM 106-100.**
10. **Chevron construction at RM 100.1-99.9(L) – (bottom of Liberty Chute).** Follow up with bathymetry to be determined.
11. **Mile 100(R) Islands study.** Continue data analysis.
12. **Jones Chute project area, RM 98.5-95.0(R).** Construction is scheduled for FY08.
13. **Red Rock/Tower Rock project RM 93.0-86.0.** Complete construction of the alternatives from the Red Rock to Tower Rock HSR study and perform post-construction monitoring using bathymetry/ADCP.
14. **Grand Tower RM 90.0-67.0,** scheduled for FY08 award although further coordination will be required because of stakeholder concerns regarding the location of the weirs, dikes, and chevron.
15. **Owl Creek UMR miles 85.0-83.0(R).** Potential FY08 construction to “beef up” the hardpoints to isolate the sandbar from the shoreline because of least terns and erosion. This will take the hardpoints back to their original condition.
16. **Dike modifications at Big Muddy River confluence, RM 75.5-75.2(L).** Construction on remaining two dikes is planned for FY09.
17. **Complete Cape Rock HSR model study, RM 57-50.**
18. **Coordinate Thebes, from HSR model study, RM 46.0-36.0.** Coordinate alternatives and schedule for FY09 construction.
19. **Perform bathymetric post-dredge monitoring surveys at Sister Chute, RM 14.5-12.0(R).**
20. **Dogtooth Bend – Phase 3, RM 40.0-20.0.** This reach of the river has been experiencing a dredging problem for many years. This work can eliminate the need to dredge, improve navigation, and add environmental features at this site. The contract is scheduled for an FY08 award. The work will be coordinated with FWS, IDNR, MDOC, and RIAC.

21. **Eliza Point / Greenfield Bend – Phase 2, RM 20-0.** This reach of the river has been experiencing a dredging problem for many years. This work can eliminate the need to dredge, improve navigation, and add environmental features at this site. The contract is scheduled for an FY08 award. This work will be coordinated with FWS, IDNR, MDOC, and RIAC.
22. Perform pre-dredge monitoring of **Angelo Chute, RM 4.7 – 1.6(L).** Monitoring will include physical habitat characteristics, overwintering fish, and physicochemical parameters (e.g., temp., DO). This will be the second environmental dredging project. Dredging is scheduled for FY09.
23. **River reach plans RM 300-0.** Continued work on data, maps, and other information toward completion of the final report for the St. Louis (RM 200-160), Harlow (RM 160-120), Crains (RM 120-80), Hamburg (RM 80-40), and Dogtooth (RM 40-0) reaches of the Mississippi River.
24. **Purchase flexible/floating pipe for dredging.** Plans are to acquire 2100 feet of flexible pipeline for the Dredge Potter. The existing pipe is 800 feet of straight pipeline and leaves the dredged material in windrows.
25. Continue coordination with the **Interior Least Tern** Working Group and investigate expanding the nesting and usage survey effort. Continue random monitoring for least tern within the RMBS through partnership with St. Louis Audubon Society. Acquire surplus floating pontoon barge to be utilized as potential temporary artificial breeding/nesting structure to be placed in Ellis Bay, RMBS.
26. Continue coordination and work on effort to address *Boltonia decurrens* listing question and associated future management strategies with the FWS Recovery Team and Team Leader. Write five-year update.