Implementation of the Biological Opinion

Annual Progress Report September 2003

U.S. Army Corps of Engineers St. Louis District

Implementation of the Biological Opinion
St. Louis District – Mississippi Valley Division
Fiscal Year 2003 Progress Report

Background:

In April 1998, Region 3 of the U.S. Fish and Wildlife Service (FWS) and Mississippi Valley Division (MVD) of the Corps of Engineers 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 – Incidental take with no significant Reasonable and Prudent Measures (RPM)
Bald Eagle – Incidental take with no significant RPM
Indiana Bat – Incidental take with no significant RPM
Interior Least Tern – Incidental take with RPM
Pallid sturgeon – Jeopardy and incidental take with Reasonable and Prudent Alternatives (RPA) and RPM.

FY03 ACTIVITIES

The following is a synopsis of St. Louis District activities for fiscal year 2003. This was the third year of implementation activities under the Biological Opinion. Many of the activities undertaken are beginning to reflect a certain degree of maturity in the overall effort, and attention may begin to be focused on coordinated long range goals. Some activities, however, still remain in formative stages and we continue to work on improvements. 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 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 (RPA 2 & 4, pallid sturgeon: Term and Condition 4, pallid sturgeon: Term and Condition 4, least tern)**. The River Resources Action Team met in a scheduled formal Executive Session in November and in an unscheduled Executive Session in March of this fiscal year. Topics for the formal session included continuing discussion on improvements needed for dredging coordination, pool and reach plans, EMP fact sheet ranking processes, and required update of the A&M authorizing document. The Exec expressed their satisfaction with the improvements made in the Dike and Revetment and Regulating Works coordination. Topics for the unscheduled session included restatement of the EMP fact sheet ranking process, reinitiating pool plan efforts, possible expansion of the RRAT, and initiation of an internal critiquing process aimed at improving the RRAT and RRAT Exec. The next RRAT Executive Team meeting will be held in November, 2003.

2. **River Resources Action Team – Technical Team (RPA 2 & 4, pallid sturgeon: Term and Condition 4, pallid sturgeon: Term and Condition 4, least tern).** The Technical Team met two times during the fiscal year, during March and June. The March meeting was held at the Distance Learning Classroom at the Great Rivers Museum. In this meeting, each agency updated the RRAT on their management/research activities and updates on planning efforts as well as agency news. In addition, the following topics were discussed: EMP project fact sheets, HREP prioritization, pool plans, dredging activities, Regulating Works and Dike and Revetment O&M activities, A&M activities and goals for the year, goals of environmental pool regulation for the year, and updates on implementation activities to include the pallid habitat and demographics study and pallid restoration and conservation planning effort. Also discussed were O&M funding and EMP funding prospects for the current and next fiscal years.

   The topics for the June meeting, held on the Middle Mississippi River, included a discussion of dredging and the pilot projects for thalweg disposal and modification of dredge disposal to create ephemeral islands in a selected area. Dredging discussion also included proposals to improve real time coordination; mid-year update on implementation of the Biological Opinion to include efforts to broaden the range of Higgins Eye mussel near Crider Island (federally listed species) and proposed St. Louis District response; American Lands Conservancy gave an update on their present and immediate future activities; A&M update current and proposed future activities; current and future O&M Dike and Revetment and Regulating Works activities; Kaskaskia River Study and projected work; Kaskaskia Island and Establishment Chute fish study; UMR Navigation Study update; discussion of Lower Mississippi River Environmental Planning; EMP update and projects submitted for increased LTRMP funding; current and future micro-model study efforts, and a list of proposed projects (FY04 and beyond) was presented for prioritization by the RRAT.

3. **Pallid Restoration and Conservation Planning Team/Workgroup (RPA 2 & 4, pallid sturgeon)**. The Pallid Restoration and Conservation Planning workgroup has been formed. This group has met twice this FY to consider planning efforts focusing on a micro model of the Red Rock – Tower Rock reach in the MMR. This model effort resulted in a plan of action which may be the initial project under phased implementation of the Pallid Conservation and Restoration Plan. This effort was originally scheduled for completion in FY05, but current plans for completion would extend this deadline to FY06 in order to gain maximum benefit from the Habitat and Demographics Study and the pilot project monitoring information, as well as permitting additional opportunity for increased technical review. The request for extension has been coordinated with FWS.
   Ongoing or recently completed study, inventory or research efforts which will directly advance the plan include the habitat and demographics study, pilot projects and monitoring of those projects, ongoing data collection by Open River Field Station, level II inventory data as it relates to riverbank and riparian zone, gravel bar survey efforts, creel census data, commercial harvest data, micro-model results, and historical geo-morphological mapping of the MMR. Completed or on-going planning documents which directly advance this plan include the side channel vision document, stone dike alteration study/plan for the MMR, Pallid Stocking Feasibility Report, MMR habitat map, and side channel connectivity at various hydrographs for the MMR.

4. **Pallid Habitat and Population Demographics Study (RPA 1, pallid sturgeon)**. The Pallid Habitat and Population Demographics study was initiated in FY02 and efforts concentrated on capture methods, gear, locations within habitat type and initial sampling. Dr. Killgore is heading the effort with SIU-C and MDC (open river station) as sub-contractors. The following is a summary of activities thus far. A total of 41 pallid and 3,636 shovelnose sturgeon have been captured, tagged, and released over a 16-month sampling period in the Middle Mississippi River. The ratio of pallid to shovelnose sturgeon is 1:89. Total effort for all gears (gill nets, trawls, trotlines) and agencies (Missouri Department of Conservation, Southern Illinois University-Carbondale, and Corps of Engineers Waterways Experiment Station) combined is 15,452 hours, which is equivalent to 644 days of sampling. Sampling confirmed known areas where sturgeon are seasonally abundant: Chain of Rocks low water dam, Modoc, and RM 70 near Neely Creek. Recaptured sturgeon provided evidence that shovelnose move from the Middle Mississippi River upstream to pooled reaches of the Upper Mississippi River and the lower reach of the Missouri River during winter/spring. Pallid recaptures indicated no substantial movement during summer months; one pallid was recaptured twice at the same location (Chain of Rocks) during summer 2003.

   Other activities included the telemetry and genetics study, both being conducted by SIU. During Year 1, 16 pallid sturgeon were fitted with transmitters and tracked throughout the 200-mile reach. As of May 2003, SIU had 136 pallid sturgeon relocations, covering a total of 1,290 river miles. In addition to boat tracking, remote receivers will be used during Year 2 and coordinated with pallid

sturgeon researchers in the lower Missouri River to the extent possible. Genetics study indicated strong differentiation between pallid and shovelnose sturgeons using microsatellite DNA techniques, suggesting that that pallid, shovelnose, and "intermediate" sturgeon can be identified genetically within 1-2 years.

Summer 2003 sampling has been completed with only 3 pallid sturgeon collected during the warmwater period. However, higher catches are anticipated for the remainder of Year 2 sampling (i.e., through May 2004) as water temperatures decline. Age and diet of pallid sturgeon will continue to be investigated, both of which will require coordinated meetings to agree on final methodologies and results.

Total sturgeon sampling effort in the Middle Mississippi River from May 2002 through Summer 2003 by MDC, SIU-C, and CEWES

Gear	Sample Number	Hours Fished	Number of Shovelnose	Number of Pallid
Gillnets	905	10,114	2498	18
Trawls	454	31	418	3
Trotlines	281	5,307	720	20

5. **Shovelnose Sturgeon Fin Clip Swim Test (RPA 1, pallid sturgeon)**. Although previously unplanned, this study was necessary to gain permission to use this technique in order to be able to achieve information that FWS has specified and the Corps expects to obtain through the Pallid Habitat and Population Demographics study. The final report, which concluded no noticeable effect, was supplied to the FWS under a separate cover in FY02. This study was published in FY03.

6. **Emergency Dredging Biological Assessment (Term and Condition 5, pallid sturgeon)**. In FY02, the Corps received a Biological Opinion which 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 during FY03. During FY03, the SLD Dredging Project Manager made contact with the Water Ways Experiment Station (WES) to discuss the study requirements of this separate biological opinion. The study effort would be necessary during the initial operations during the closed season should it become operationally necessary to dredge in the MMR. It was ascertained through these initial conversations that WES would be amenable to carrying out the necessary work and would begin to put together a rough preliminary study design for review and refinement.

7. **MMR Stone Dike Alteration Plan (RPA 3 & 4, pallid sturgeon, RPM 1 pallid sturgeon: RPM 1, least tern)** Work continues on the effort which includes a complete inventory of existing stone dikes in the MMR, with photographs and attributes on each dike. The MMR has been divided into reaches, substantially represented by dike fields, and each reach has been prioritized on the basis of opportunity. While not yet complete, this study, in conjunction with the Side Channel Vision document, is already being used to prioritize micro-model study reaches within the MMR. The study is available at the following ftp site: ftp://ftp.mvs.usace.army.mil/arec/stonedike/ and the complete data base for the stone dike structures of the MMR is located at: http://www.mvs.usace.army.mil/engr/river/DikeInv/index.html.

8. **Modification of Dredge Disposal Techniques – ephemeral island creation (RPM 2, pallid sturgeon: RPM 2, least tern).** In a pilot project, an angled spill pipe for the Dredge Potter was modified to yield greater capability of directing dredge material in order to create small ephemeral islands. FWS and IDNR supplied possible locations for this pilot project and at least one will be chosen based on need for dredging and adequate material available. This pilot project will be completed in early FY04, prior to close out of the current dredge season. Evaluation and adjustments will commence in FY04.

9. **Modification of Dredge Disposal Techniques – thalweg disposal (RPM 2, pallid sturgeon: RPM 2, least tern).** In a pilot effort, thalweg disposal in the MMR will be attempted at Prices Bend (RM 31 – 28). This site was chosen by the RRAT in the March meeting. Several other potential sites were proposed by the Corps, but were rejected by individual natural resource agencies due to site specific biological concerns. Bathymetric, velocity, and hydroacoustic fisheries surveys will be conducted both prior to and following disposal to ascertain physical response of the action. Biological monitoring, while desirable, is not practicable at this time due to the extreme conditions and state of technology available. This effort will be completed in early FY04, prior to close out of the current dredge season.

10. **Habitat Map of the MMR (Term and Condition 3, pallid sturgeon: Term and Condition 3, least tern)**. The habitat map of the MMR is complete and is available as an electronic file in ArcInfo format and on the following ftp site: \\mvsfs02gis\gis\gis\arcdata\AquaticHabitats\. In addition, a collection of side channel connectivity maps at various hydrographic stages have been developed and are available at the following ftp site: <\\Mvsfs02gis\GIS\Gis\Reegis\DGN\Aquatic_Habitats_2001\>
The uses of these products continue to evolve. Produced primarily for quantifying habitat changes as required in the Opinion, they are now proving very important in the pallid habitat and demographics study. These products continue to be refined.

11. **Gravel Survey of MMR for Habitat Map (Term and Condition 3, pallid sturgeon: Term and Condition 3, least tern).** MDC Staff Biologists Dave Herzog and Dave Ostendorf, and Corps Biologist Eric Laux evaluated the extent of visible gravel, cobble, or rock (excluding rip-rap) substrates from aerial survey. The investigation was conducted between river miles 0.0 and 195.0. Real-time differentially corrected GPS data was collected at each site from the air. Over the entire MMR, a total of 1740.7 acres of target substrates (gravel-rock) was encountered, with 514.2 acres of coarse gravel making up the greatest portion of the total, followed by rock (449.0 acres), pea gravel (348.8 acres), fine gravel (233.0 acres), and cobble (195.8 acres). The majority of the coarser substrates, such as rock, cobble and course gravel, were found in the lower eighty miles of the MMR. The vast majority of the finer gravels was found in the upper forty miles. Detailed results of this effort will be furnished under separate cover and the data will be entered into the MMR Habitat Map data base.

12. **Pallid Sturgeon Flume Study (RPA 4, pallid sturgeon)**
    The study was designed to investigate the influence of water velocity, substrate type, water depth, and morphology on the habitat selection of juvenile pallid (*Scaphirhynchus albus*) and shovelnose (*Scaphirhynchus platorynchus*) sturgeon. Data collection was completed in FY03. Experiments in FY03 included observing habitat selection in individuals as well as intra- and inter-specific groups in relation to depth, substrate, morphology, light and differing velocities.

    Data analysis is currently underway. For response data having a normal distribution, regression models containing combinations of fixed and random effects will be used. For count data with a binary response (e.g. a single habitat which is either occupied or not occupied) cluster-correlated logistic regression will be used. The methods used for binary responses will be extended to the type of data of concern here, count data from a multi-nominal distribution. The data will be analyzed using an extension of logistic regression that uses generalized estimating equations (GEE) rather than normal distribution theory.

    It is anticipated that this study will be useful in predicting distributions, as well as potential impacts of riverine habitat modification and restoration, and will assist us in our capture effort for the Pallid Habitat and Population Demographics study.

13. **Historical Comparative Geomorphologic Mapping of the MMR (RPA 2, pallid sturgeon)**. This effort was completed in FY03. In FY02, it was advanced by the Pallid Recovery and Conservation Planning workgroup as necessary to understand the dynamics of the river and to assess the possibility of habitat work in selected reaches. Briefly, the effort contained the following step: Historical survey maps were scanned, warped and geo-referenced into the computer; comparative computations were made on various physical river parameters and the river of today was compared to the river of the past, starting in the early 1800s and progressing to today. In order to assure accuracy, a cadastral analysis of the surveys was accomplished. Adjustments required, as determined by this analysis,

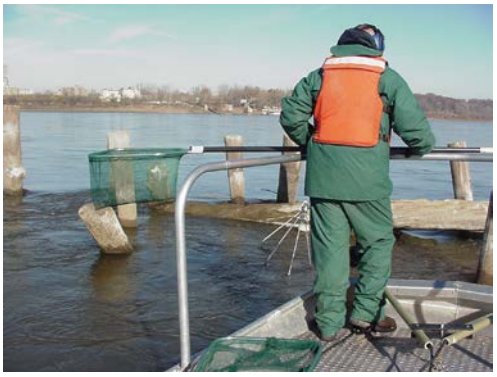
were completed. The final product and a presentation of all findings were presented to the RRAT in FY03.

14. **Prepare Pallid Sturgeon Stocking Feasibility Report (RPA 2&4 pallid sturgeon, Conservation Recommendation 3, pallid sturgeon).** A draft Pallid Sturgeon Stocking Feasibility Report has been prepared and circulated to FWS, MVD and WES for initial review. A revised rendition of this report will be shared with the Pallid Conservation and Restoration Planning workgroup and an expanded MVD and FWS group for review and comment during FY04. Following this review, the report will be incorporated via appendix to the Pallid Conservation and Restoration Plan.

15. **Micro Model Effort on Red Rock Reach of MMR (RPA 2&4, pallid sturgeon, RPM 1, pallid sturgeon: RPM 1, least tern).** The micro modeling effort for the Red Rock reach (RM 86.0-93.0) is complete. The study reach lies within an area that was identified in the Side Channel Vision document as an area lacking habitat diversity. This reach was chosen for enhancement due to the large number of un-notched dikes, the very minimal dredging that occurs, and the location of the right descending bank firmly against the rock bluff line, which would minimize impacts to the bankline. The Pallid Restoration and Conservation Planning team was involved in the study from the outset and has chosen an alternative which will result in improved pallid sturgeon habitat for this reach of the river. This plan will serve as the initial project in the phased implementation of the Pallid Conservation and Restoration Plan for the MMR. It is anticipated that this project will be accomplished over two budget years. The initial work will be included in the FY06 budget submission with the remainder to follow in the FY07 budget submission.

16. **Woody Structure in the MMR (RPA 4, pallid sturgeon)** The construction phase of this pilot project was initiated in FY01 and completed in FY02. Focus was shifted in FY03 to include physical and biological evaluation of this pilot effort. Initial biological invertebrate response findings are very encouraging, including the collection of several wood obligate species. Fisheries sampling, as expected, has proven difficult but has resulted in 28 species of fish being collected around the woody structures. . Field observations indicate that considerable amounts of floating woody debris are hanging up in the pile structures and it appears that substrates associated with the woody structures varies greatly by flow conditions, ranging from fine silt to coarse gravel. Bathymetric and velocity surveys were conducted around the woody structure to begin to assess the physical habitat changes caused by the structures. The physical response of the habitat to these structures appears to be localized, however, this was to be expected as these early attempts were focused on feasibility and methods to incorporate woody structure. Future pilot projects will strive to achieve both biological and physical responses. A complete report of this monitoring effort will be supplied under a separate cover.






17. **Incorporation of Woody Debris in Stone Work (RPA 4 and RPM 1, pallid sturgeon):** The St. Louis District placed driftwood into on bank revetments at the Maple Island chute. This pilot project, if successful, may offer a viable tool to be used in bank protection where the adjoining riparian habitat is in private ownership. In addition, woody structure will be placed in the chute next fiscal year. The wood bundles were constructed this FY and will be placed next fiscal year. This will mark the first time where both woody structure and woody debris in shore protection have been used in conjunction with one another. This action was previously coordinated with IDNR and FWS personnel. This effort will be monitored for effectiveness in achieving the desired result.

18. **Incorporation of Notches in Dikes (RPA 4 and RPM 1, pallid sturgeon)**: During FY03, several dikes were notched in the MMR. It is expected that these notches will supply additional flows to side channels to help maintain the aquatic habitats while still maintaining adequate flows to the navigation channel. The following dikes were notched:
    1. **51.0(L)** Starting 200 feet from the head of the dike and extending towards the riverend, the dike was notched to form a 100 foot wide trapezoidal notch down to elevation 315 NGVD.
    2. **50.6(L)** Starting 25 feet from the head of the dike and extending towards the riverend, the dike was notched to form a 50 foot wide trapezoidal notch down to elevation 320 NGVD.
    3. **39.6 (L)** In a small side channel that starts upstream at R.M. 40.4(L), the middle of the dike was notched to form a 100 foot wide trapezoidal notch with invert at elevation 311 NGVD.

    These pilot projects will be monitored to assess the general navigational and environmental effectiveness. The monitoring results will be shared with the Pallid Restoration and Conservation workgroup.

19. **Modification of Traditional Structures/Protections (RPA 4 and RPM 1, pallid sturgeon):** The St. Louis District began testing different solutions to protect roundouts below dikes on the MMR. At R.M. 38.0 (L) revetment placed on a 300 foot roundout below the dikehead had driftwood incorporated into the protection. At R.M. 26.9 (L) overlapping toe dikes were constructed across a 400 foot roundout below the dikehead. These pilot projects are designed to yield added environmental benefits where the adjacent riparian corridor is in private ownership and must be protected. These will be monitored and evaluated for effectiveness and achievement of desired results.

20. **Use of Innovative Structures (RPA 4 and RPM1, pallid sturgeon):** A chevron structure was constructed in the MMR during FY03. The structure is located at R.M. 103.4 (R) and was constructed with a 6 foot crown to elevation 353 NGVD. It is anticipated that this structure will react similarly to those placed in the pooled portions in that a plunge pool will form immediately behind the head of the structure and a sandbar will eventually form in its shadow. It is anticipated that

this plunge pool will offer deep water habitat to sturgeon while the downstream tip of the sandbar will act as an island tip which appears to be important pallid habitat. As an added benefit, the top of the isolated sandbar may prove to be useful for least tern habitat. This pilot project will be monitored for performance and achievement of desired results.

21. **Pilot Project Santa Fe Chute (RPA 4, pallid sturgeon):** In FY03, eight of nine existing dikes were raised to high bank elevation. This work is described in the Side Channel Vision Document. It is anticipated that the result will be a side channel with much improved diversity, in particular, increased depth diversity and re-enforcement of a developing meandering channel. The remaining work will be accomplished in FY04. The side channel will be monitored to assure achievement of desired habitat results and to ascertain gross biological response.

22. **Other Efforts:** In addition to the above, the MVS PM attended meetings with the Middle and Lower Basin Pallid Recovery Workgroups as well as the MVD E-Action annual meeting. At these meetings, past and current activities, future challenges, and opportunities to collaborate were discussed. In response to requests from these meetings, St. Louis District has taken initial steps in organizing and hosting a range wide Scaphirhynchus conference to be held in 2004. St. Louis District, in cooperation with MVD and Region 3 FWS, developed a plan of action that would enable St. Louis District participation in the Higgins' Eye mussel relocation/stocking effort while assuring adequate time and preservation of resources required to address pressing Pallid Sturgeon mandated actions. Also, members of the St. Louis District Biological Implementation Team have been appointed to various Corps committees/teams to address individual threatened/endangered species on a range wide basis as well as to address larger ESA/Biological Opinion implementation and management issues.

PROJECTED FY 04 EFFORTS

Based on current projection of FY04 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 can not 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.

a. The Pallid Sturgeon Habitat and Population Demographics study will continue and monitoring for progress and quality control will likewise continue. (second full year – of a 3 year effort)
b. The pallid restoration and conservation planning effort will begin to pick up intensity in cooperation with states and Service. It is projected that this effort will be completed in FY06 in order to gain the most benefit from the Pallid Sturgeon Habitat and Population Demographics study as well as other inter-related efforts such as the Stone Dike Alteration Plan, the pallid genetics work, pallid stocking feasibility report and recommendations, various micro modeling efforts in the MMR, construction and monitoring of pilot projects, the Historical Comparative Geomorphologic Mapping of the MMR effort, and the first update of the MMR habitat map which will indicate aquatic habitat changes on a macro level over a five year interval.
c. Coordinate with the FWS and the FWS Pallid Recovery Team on pallid recovery and conservation planning efforts, and other issues as they arise.
d. Continue coordination with the RRAT Technical Team and RRAT Executive Team. Continue work on refining coordination efforts through the RRAT framework.
e. Continue to modify and improve the MMR habitat map and associated GIS database. Include pallid information in a secure data layer and evaluate the requirement for additional data layers as appropriate.
f. Monitor pilot efforts. In particular, begin looking at biological and physical responses on a macro scale within the innovative structure pilot projects. Within the framework of the Audubon partnership continue monitoring the least tern pilot project, concentrating on nesting and usage survey data.
g. Pilot Projects – complete Santa Fe Chute. Continue woody structure pilot projects and incorporation of notches and addition of driftwood in dikes.
h. Continue synthesis of terrestrial inventory for lands managed by the Corps. This information to be made available to pallid restoration and conservation planning team.
i. Address future *Boltonia decurrens* management activities with the Service.
j. In partnership with Region 3 FWS, organize and host a range wide Scaphirhynchus conference to be held in St. Louis in July 2004. Proceedings to be used in the development of the Pallid Conservation and Restoration Plan.
k. Increase coordination efforts with the Interagency Mussel Coordination Team.