

Implementation of the Biological Opinion

Annual Progress Report Fiscal Year 2009

**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
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.

FY09 Activities:

The following is an outline of St. Louis District activities for fiscal year 2009. This was the ninth 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 (RRAT) - Executive Team (Pallid Sturgeon - RPA 2 & 4, Term and Condition 4; Least Tern - Term and Condition 4).** The RRAT held a formal Executive meeting on 5 March 2009 at the National Great Rivers Museum, Alton, IL. Topics of discussion included: 1) review of the eleven Reach Objectives developed by

the RRAT Tech at the meeting the day before – water quality issues and other minor wordsmithing were discussed; the objectives were adopted by the RRAT Exec., 2) re-examination of the RRAT charter, especially regarding the proposed Illinois River Work Group, water quality representation, and non-governmental organization participation, 3) Floodplain Restoration Task Group, and 4) adaptive management under NESP.

2. **River Resources Action Team – Technical Team (Pallid Sturgeon - RPA 2 & 4, Term and Condition 4; Least Tern – Term and Condition 4).** The RRAT held a formal Technical meeting on 4 March 2009 at the National Great rivers Museum, Alton, IL. Topics of discussion included: 1) FWS involvement with the Rockies Express pipeline project and its impacts to migratory birds, 2) The Conservation Fund’s role in working with the states on land acquisition from (potentially) available (mitigation) funds from Rockies Express, 3) Middle Mississippi Collaborative planning study and landscape level planning and the Hydrogeomorphic Methodology, 4) Interior Least Tern Floating Habitat Project, 5) Confluence State Park and Cora Island Restoration projects, 6) EMP funding, ongoing construction, status of Schenimann Chute, 7) NESP funding, projects ready for construction, changes to vertical team, 8) hydropower and hydrokinetic activities, fish passage, FERC licensing, 9) Missouri Department of Conservation monitoring of Schenimann Chute, Buffalo Island, and Establishment Island, Lake Sturgeon Capture Study and use of telemetry, statewide sturgeon monitoring program, 10) NESP reach objective setting and upcoming reports, 11) Dick Steinbach retirement, 12) status of Illinois River Planning Team, 13) Hydraulic Sediment Response modeling efforts by the Corps’ Applied River Engineering Center, 14) Dike and Revetment, Regulating Works, Avoid and Minimize, and Biological Opinion projects, and 15) Agency updates.
3. **Pallid Sturgeon Habitat, Life History, and Population Demographics work (Pallid Sturgeon - RPA 1).** The final version of the report “Current Status of the Pallid Sturgeon in the Middle Mississippi River: Habitat, Movement, and Demographics” was received from SIUC, MDC, and ERDC in May 2009 - See BiOp Annual Report from FY 2006 for a summary of findings.
4. **Pallid Sturgeon Conservation and Restoration Plan (Pallid Sturgeon - RPA 2).** The development of this plan continued in FY09 to the extent possible exclusive of the results of ongoing studies.
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).** Post-construction monitoring continued in FY09 at the St. Louis Harbor site. Three samples were taken at the chevron sites yielding 21 species. Brandon Schneider (St. Louis District biologist) gave a presentation on the status of the biological monitoring for the project at the *River Engineering Open House* aboard the Motor Vessel Mississippi at the St. Louis Riverfront in August 2009. Post-construction monitoring is planned to continue thru FY10.

Background: The St. Louis Harbor area has been experiencing a dredging problem for many years. An HSR model study was performed in 2003 for UMR miles 184.0-173.0 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 RM 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 07. Post-construction monitoring is planned to begin in mid FY08. Fish data collected over a number of years at chevrons in Pools 24-26 suggest that the scour holes that develop after the chevrons get over-topped become ideal fish habitat.

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).** During July and August of FY09, three chevrons were constructed at RM 160.3, 160.0, and 159.9(L) along with the shortening of three dikes at RM 160.0, 159.9, and 159.7(L). Additional dike modifications and chevron construction is scheduled for FY10.

General Background: An HSR model study for this reach was completed in FY06. The Biological Assessment for this contract has been completed. 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).** Post-construction monitoring by the Missouri Department of Conservation began in February of FY09 and is scheduled to continue thru 2010.

General Background: No further construction is planned for this phase of the project after construction of a rootless dike at RM 130.2(R) was completed in FY07. The structure was originally designed to be a chevron; however, construction difficulties necessitated the change to a rootless dike. This change was coordinated with all

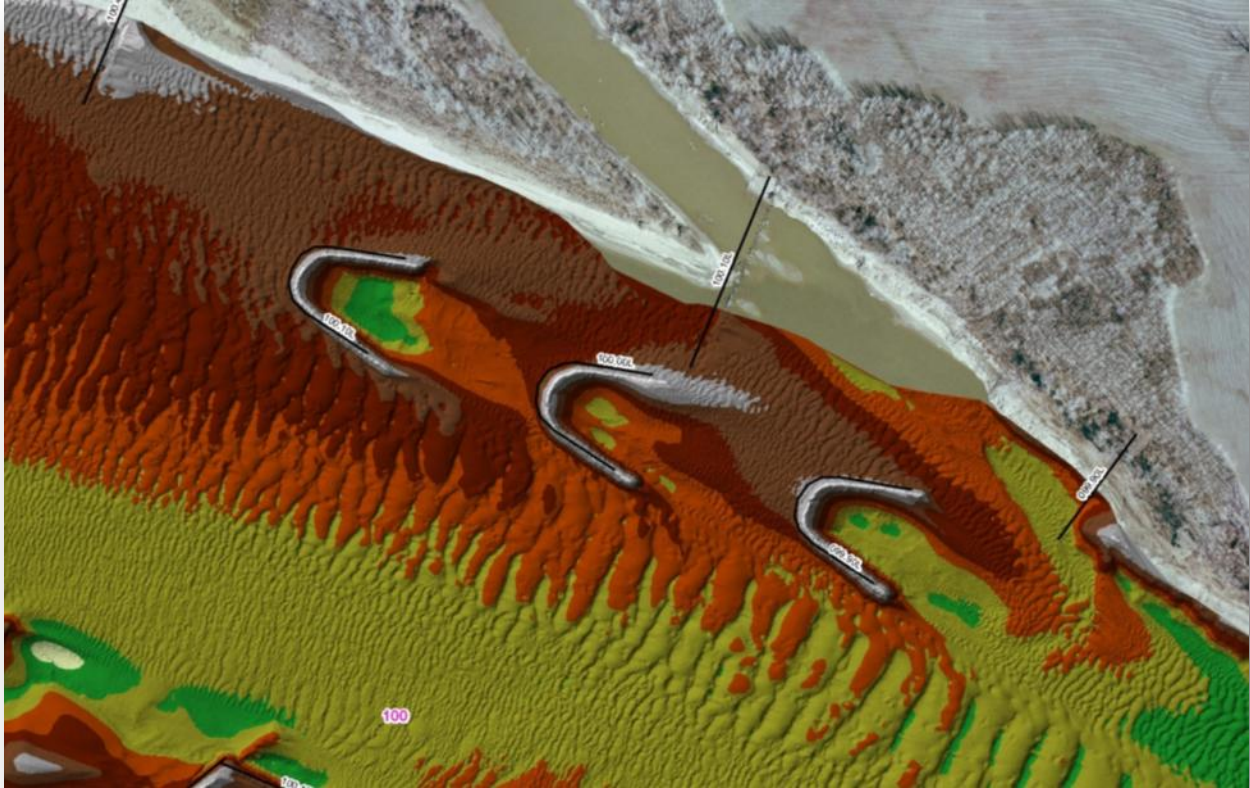
partners. This reach of the river has been experiencing a dredging problem for many years. This contract was awarded in FY06 and five of six structures were completed. The two blunt-nosed chevrons were constructed at RM 130.05 and 129.9(R). The spur dikes and rootless dike were constructed between RM 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 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 was submitted to the Corps in 2007. 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-construction patterns.

8. **Waters Landing HSR Study, RM 106.0-100.0 (Pallid Sturgeon - RPA 3 & 4, Term and Condition 2; Least Tern - RPM 1, Term and Condition 2).** This study was completed in January 2009. The recommended design includes removal of existing dike 104.4(R), construction of three chevrons at RM 104.4, 104.0, and 103.7(R), and extension and notching of dikes 104.0 and 103.5(R). Construction is scheduled for FY10.

General Background: The St. Louis District initiated this sedimentation improvement study of the Waters Landing reach of the Middle Mississippi River between RM 106.0 and 100.0 near Chester, Illinois, in May 2008. This study reach was selected from the Stone Dike Alterations Project Report and funded by the Biological Opinion Program. The main objective of the study was to develop and evaluate design alternatives that would enhance the environmental diversity within the dike fields, in particular around RM 104.0 – 102.5(R). A number of fish species use deep pools, slow, shallow channels, and bar formations to fulfill various life history requirements. This type of habitat can be cultivated by altering existing dikes (i.e. by notching or increasing or decreasing length and/or height) or by adding new structures (i.e. dikes, chevrons, weirs) or by using a combination of alterations and new structures. Along with the primary objective, a secondary goal was to alleviate repetitive channel maintenance dredging.

9. **Chevron construction at RM 100.1-99.9(L)** – (bottom of Liberty Chute). Multi-beam bathymetric surveys of the chevrons and surrounding area were conducted in FY09 (see image below).

General Background: 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.



10. **Mile 100 Islands study (Pallid Sturgeon - RPA 1).** Data analysis continued during FY09 for this study.

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 FY09. 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. **Grand Tower HSR Study RM 84.0-79.0 (Pallid Sturgeon – RPA 4).** Based on this study a chevron was constructed at RM 82.0(L) during FY09. This HSR study was conducted in 2004 to evaluate and propose design modifications to existing stone dike and/or weir structures and the introduction of new structures for the purpose of improving navigation conditions and reducing dredging through the Grand Tower area. An

alternative that included the construction of two weirs, notching of an existing dike, construction of three new dikes and construction of one chevron was recommended. This alternative created the most environmental benefits with the possible creation of a secondary channel that has both upstream and downstream connectivity with the main channel. This work has been coordinated annually since completion of the HSR study as partners had expressed concerns with some aspects of the recommended plan.

12. **Dike modifications at Big Muddy River confluence, RM 75.5(L) (Pallid Sturgeon - RPA 4, RPM 1; Least Tern - RPM 1).** A second dike was notched during FY09 at RM 75.2(L). An extension of dike 75.3(L) is scheduled for FY10.

General Background: 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 river mile 75.5(L) was notched. This dike is located at Union Point/Wilson Landing just below the mouth of the Big Muddy River.

13. **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. This study was completed in January 2009 and a final report is forthcoming.

General Background: 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, developing new side channels and bar formations while maintaining the integrity of the navigation channel.

14. **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. This study continued thru FY09. 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.

15. **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 took place in November 2006, March 2008, and May 2009. Another survey is scheduled for 2011 and a final report is forthcoming.

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 (CWA). 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.

16. **Dogtooth Bend – Phase 3, RM 40.0-20.0.** No construction took place in FY09 due to funding and further coordination. 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. This contract is scheduled for an FY10 award. This work will be coordinated with the FWS, IDNR, MDOC, and RIAC.
17. **Eliza Point / Greenfield Bend – Phase 2, RM 20-0.** No construction took place in FY09 due to funding and further coordination. 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. This contract is scheduled for an FY10 award. This work will be coordinated with the FWS, IDNR, MDOC, and RIAC.
18. **MVS River Reach Plans (Pallid Sturgeon - RPA 2 & 4).** River reach planning efforts were concluded in FY09 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. The final report entitled, "*Middle Mississippi River Regional Corridor Reach Reports,*" was developed and made available by the Southwestern Illinois Resource Conservation and Development (RC&D) under an agreement with the Corps. The report contains data, maps, and information developed by the Corps (St. Louis District) and many of the other agencies and organizations involved in the Middle Mississippi River Partnership.

General Background: 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, work continues on the hydrogeomorphic study for the

Middle Mississippi River that was initiated in 2007. 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.

19. **Interior Least Tern (Least Tern - Term and Condition 3).** Random monitoring within the Riverlands Migratory Bird Sanctuary (RMBS) continued through partnership with the St. Louis Audubon Society. In partnership with the University of Illinois, Illinois Department of Natural Resources, and Audubon Missouri, a floating island with artificial breeding/nesting habitat was created using two surplus dredge pontoon barges. The habitat was placed in Ellis Bay (RM 201.6[R]), RMBS. A call box that intermittently played least tern calls and 20 decoys were placed on the barge to attract breeding adults. Monitoring was completed through the National Great Rivers Research and Education Center. The barge was a success and an estimated 32-36 adults utilized the area for breeding/nesting. Sixteen nests and approximately 26 fledged young were recorded. Twenty chicks were also banded in cooperation with the Illinois Department of Natural Resources.
20. **Emergency Dredging Biological Assessment (Pallid Sturgeon - Term and Condition 5).** 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 for FY 09.
21. **Purchase flexible/floating pipe for dredging.** 2400 feet of flexible pipeline for the Dredge Potter was purchased in FY09. The floating flexible pipe can be used to create islands and/or sandbars near shore or behind chevrons and generally gives more options for placing dredged material for ecological benefits. Coordination needs to be conducted with agency stakeholders and dredge personnel to determine the best locations, timeframes, methods, etc. for use of the flexible pipeline.

Projected FY10 Activities:

Based on current projections of FY10 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). Continue larval/juvenile sampling in FY10.
4. **St. Louis Harbor chevron construction RM 183.0-182.4(R)**. Post-construction monitoring including bathymetry, ADCP, water quality, and fish data will continue during FY10.
5. **Cliff Cave – Kimmswick dike alteration and chevron construction site, RM 168.0-156.6**. Further construction is scheduled for FY10.
6. **Fort Chartres/Establishment Island new chevrons and rootless dike between RM 132.5-129.5(R)**. Post-construction monitoring by the Missouri Department of Conservation is scheduled to continue in FY10.
7. **Initiate Establishment Chute HSR model study, RM 133-129**.
8. **Waters Landing HSR model study, RM 106-100**. Begin construction in FY10.
9. **Chevron construction at RM 100.1-99.9(L) – (bottom of Liberty Chute)**. Follow-up bathymetry at a to-be-determined date.
10. **Mile 100(R) Islands study**. Continue data analysis.
11. **Wilkinson Island HSR model study, RM 98-90.0**. Complete final report.
12. **Grand Tower RM 90.0-67.0**. Further coordination may be required because of stakeholder concerns regarding the location of the weirs, dikes, and chevron.
13. **Dike modifications at Big Muddy River confluence, RM 75.5-75.2(L)**. Extension of dike 75.3(L) scheduled for FY10.
14. **Cape Rock HSR model study, RM 57-50**. Complete final report.

15. **Thebes HSR model study, RM 46.0-36.0.** Complete final report.
16. **Perform bathymetric post-dredge monitoring surveys at Sister Chute, RM 14.5-12.0.**
17. **Dogtooth Bend – Phase 3, RM 40.0-20.0.** This contract is scheduled for an FY10 award. This work will be coordinated with the FWS, IDNR, MDOC, and RIAC.
18. **Eliza Point / Greenfield Bend – Phase 2, RM 20-0.** This contract is scheduled for an FY10 award. This work will be coordinated with the FWS, IDNR, MDOC, and RIAC.
19. **Flexible/floating pipe for dredging.** Coordinate with agency stakeholders and dredge personnel to determine the best locations, timeframes, methods, etc. for use of the flexible pipeline.
20. **Least Tern.** Continue random monitoring within the RMBS through partnership with St. Louis Audubon Society. Monitor the floating island and test anti-predation measures on half of each barge.
21. 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.