

# **Implementation of the Biological Opinion**

## **Annual Progress Report Fiscal Year 2010**

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

**Implementation of the Biological Opinion  
Annual Progress Report for Fiscal Year 2010  
U.S. Army Corps of Engineers  
Mississippi Valley Division  
St. Louis District**

**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 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) and RPM.

**FY10 Activities:**

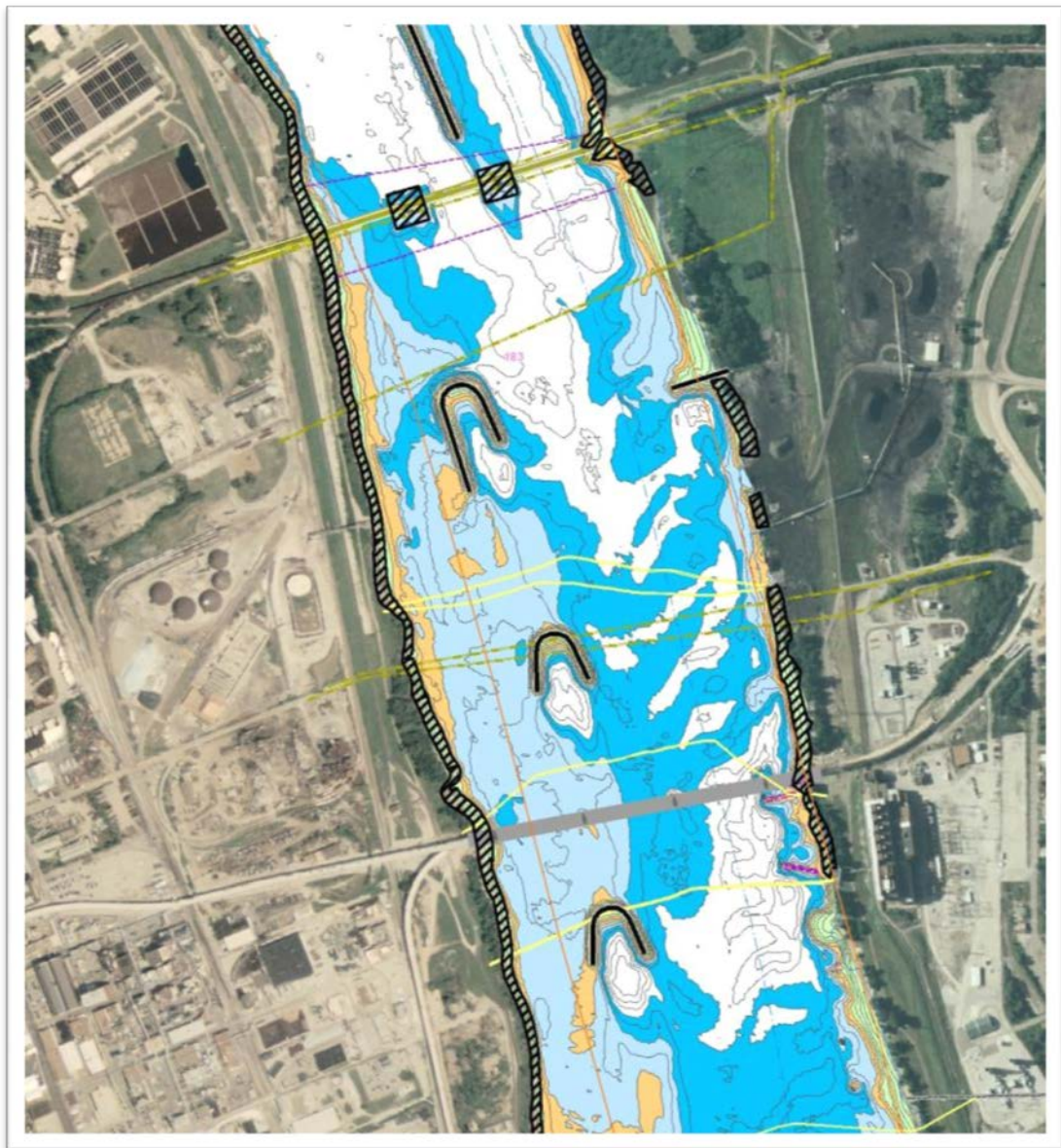
The following is an outline of St. Louis District activities for fiscal year 2010. This was the tenth year of implementation activities under the Biological Opinion. For the immediate future, funding and manpower requirements will continue to be addressed on a year by year basis. Our partners, in particular the states, have voiced 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 (RPA 2 & 4, Term and Condition 4, pallid sturgeon; Term and Condition 4, least tern).** The RRAT held a formal Executive Team meeting on 19 April 2010 at the District Office. Topics of discussion included: 1) review for approval the lists of priority projects provided by the RRAT Tech for the Lower Impounded and Open River Reaches 2) review the lists of

priority projects and select Tier 1 projects that represent the highest priority for implementation 3) selection of projects for plan formulation under NESP 4) review of Illinois River projects 5) mitigation planning under NESP 6) status of BiOp working groups 7) coordination of river training structure work, and 8) update on hydropower efforts at Mel Price.

2. **River Resources Action Team – Technical Team (RPA 2 & 4, Term and Condition 4, pallid sturgeon; Term and Condition 4, least tern).** The Technical Team considered the September 15-16, 2010 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 Lock and Dam 22 at Saverton, MO to the St. Louis District Service Base. 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 river training structure construction and modification projects, ecosystem restoration projects, Partner updates, dredging program and flexible dredge pipe update, HSR model efforts, A&M program status, NESP status, EMP status, L&D 25 expansion, systemic forest management plan, hydropower, BiOp program, bendway weirs study, physical effects of river training structures studies, Rivers Project Office updates, and shovelnose sturgeon similarity of appearance listing.
3. **Pallid Sturgeon Habitat, Life History, and Population Demographics work (RPA 1, pallid sturgeon).** Current efforts are being conducted to quantify young-of-year pallid sturgeon habitat associations in the MMR. Field work and laboratory analyses in FY10 were completed by Southern Illinois University at Carbondale and the Missouri Department of Conservation. Activities included mini-Missouri trawling for collection of age-0 sturgeon and echosounding and acoustic Doppler current profiling to characterize habitat associations. Genetic analysis is being conducted on all captured sturgeon in order to determine species. 1755 age-0 sturgeon were captured during 2010. Genetic analysis is ongoing, but to date, no pallid sturgeon have been found. A draft report will be submitted subsequent to completion of data analysis.
4. **Pallid Sturgeon Conservation and Restoration Plan (RPA 2, pallid sturgeon).** The development of this plan continued in FY10 to the extent possible exclusive of the results of ongoing studies. A draft plan is anticipated in FY12.
5. **St. Louis Harbor chevron construction, UMR River Miles (RM) 183.0-182.4(R) (RPA 3 & 4, Term and Condition 2, pallid sturgeon; RPM 1, Term and Condition 2, least tern).** Post-construction monitoring continued in FY10 at the St. Louis Harbor site. Two samples were taken at the chevron sites yielding 18 species from 10 families. The two samples were conducted on October 22 and 23, 2009 and February 16 and 17, 2010. Spring and summer samples could not be obtained due to high water. No formal presentations were given during FY10. Post-construction monitoring is planned to continue thru FY11 with a final report in FY12.

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 are 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 began in FY08. Fish data collected over a number of years at chevrons in Pools 24-26 suggest that the scour holes developed 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 FY10, construction was completed on chevron 162.4(L), dike 162.1(L), and shortening of dike 160.3(L). Construction was started on chevrons 162.6(L) and 162.5(L) and on shortening of dikes 162.6(L) and 162.3(L). Construction of these features is anticipated to be completed in FY11. Shortening of dike 163.0(L) and construction of chevron 162.8(L) is expected to occur in FY11. This would complete construction of features associated with this study.

*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 2011.

*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). 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. This structure was planned to be a chevron; however, construction difficulties necessitated the change to a rootless dike. This change was coordinated with all partners. This work is intended to eliminate the need to dredge and add environmental features. Recent data shows that the scour holes that develop when 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 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-distributional patterns.

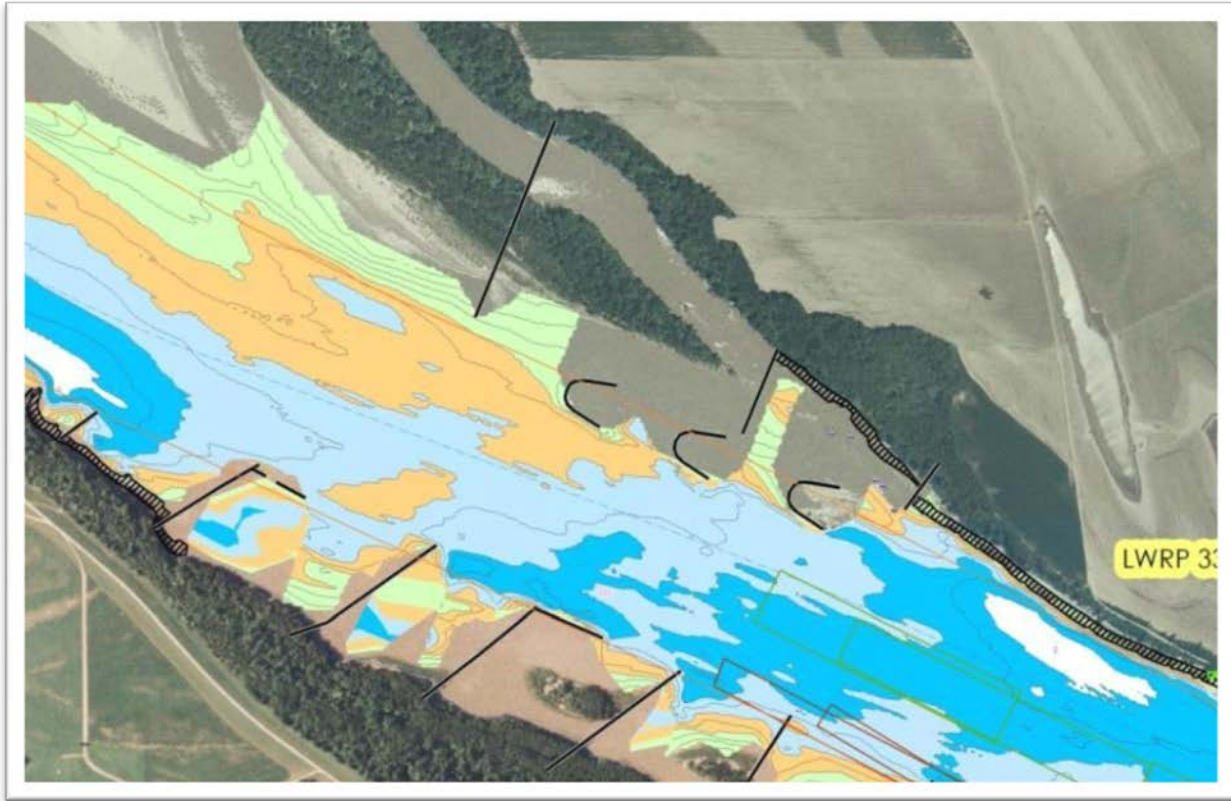
8. **Waters Landing HSR Study, RM 106.0-100.0 (Pallid Sturgeon - RPA 3 & 4, Term and Condition 2; Least Tern - RPM 1, Term and Condition 2).** This study was completed in January 2009. The recommended design includes removal of existing dike 104.4(R), construction of three chevrons at RM 104.4, 104.0, and 103.7(R), and extension and notching of dikes 104.0 and 103.5(R). Dikes 104.0 and 103.5(R) were extended and notched in FY10. Removal of dike 104.4(R) and construction of the three chevrons is scheduled for FY11.

*General Background:* The St. Louis District initiated this sedimentation improvement study of the Water's 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. notching, 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).**

*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. 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 entire MMR main channel conducted in FY10 did not adequately cover the area around the chevrons (see image below). Bathymetric data around the chevrons is scheduled to be collected in FY11.





10. **Mile 100 Islands study (RPA 1, pallid sturgeon).** Data analysis continued during FY10 for this study.

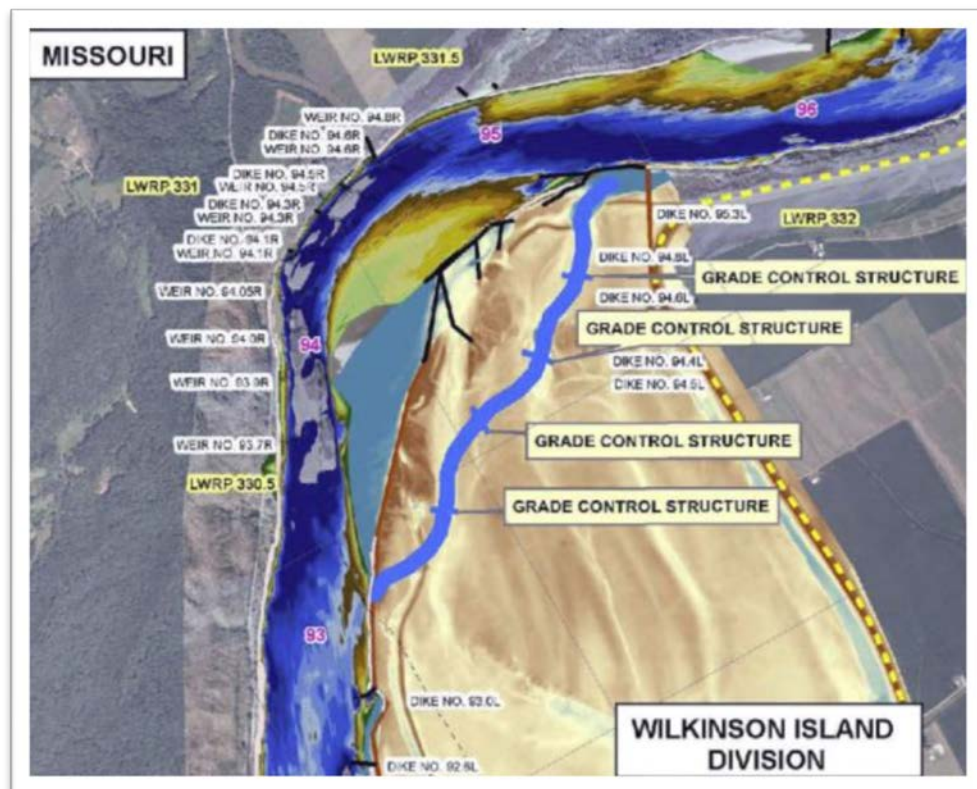
Background: Teri Allen (St. Louis District Corps biologist) conducted the study of fish assemblages at the Mile 100 dike field located along the right bank below Chester, Illinois between RM 100.1 and 98.9 until August 2006 when the benthic trawling, electrofishing, and mini-fyke net sampling was completed. The area consists of six notched dikes and five islands. The dikes were built in the early 1970's 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 was designed to compare the fish assemblages at the island sites to nearby "non-notched" or "reference" dikes (5 sites between river miles 100.4 and 107.4).

Results Summary: Fish assemblages at five island and five non-island sites located within dike fields were studied over a two-year period. Habitat characteristics including velocity, water depth, water temperature, dissolved oxygen concentration, conductivity, turbidity, and pH were measured at each sample site. Fishes were collected using trawling, electrofishing, and mini fyke nets. Species richness was greater at islands than at reference sites. At habitat types, species richness was lowest at tip habitat, but similar among inside, outside, and reference. Fish assemblages differed significantly between islands and references sites for total standardized count and for adult standardized count. The fish communities differed significantly among each of the habitat types, with the exception of outside and reference habitat, for total

standardized count; and among the habitat types, with the exception of tip and reference sites, for adult standardized count. Additionally, average depth, conductivity, pH, velocity, water temperature, and Secchi visibility were significantly related to differences in fish community assemblages between islands and reference sites, and between habitat type and reference sites. These results demonstrate that created islands increase local habitat diversity by creating shallow backwater-like habitat, which is limited in the MMR, and support a fish assemblage which is distinct from that found in conventional dike fields.

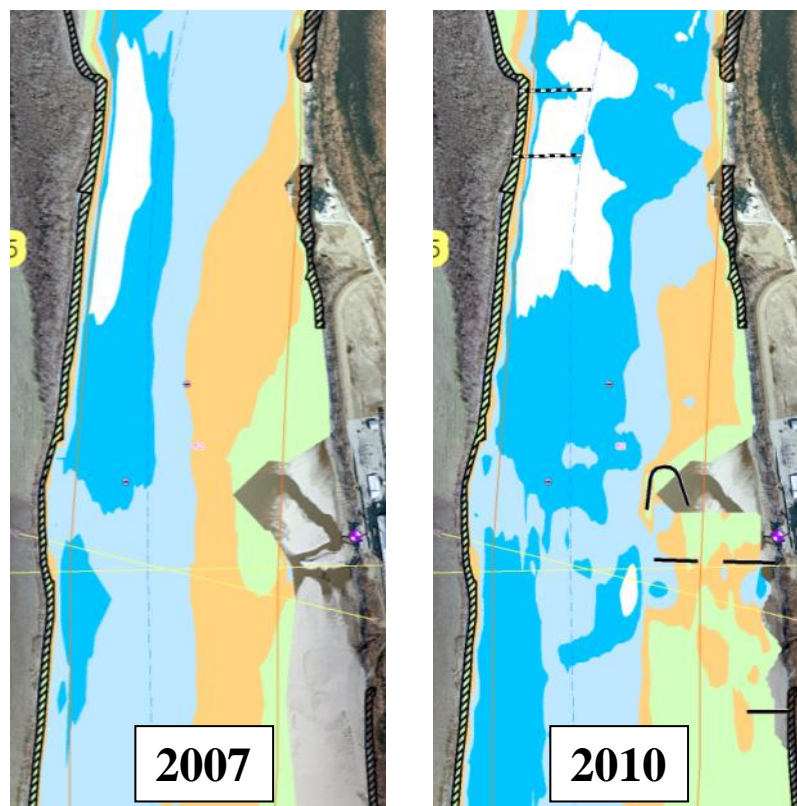
11. **Wilkinson Island HSR Study RM 98-90 (Pallid Sturgeon – RPA 3 & 4, RPM 1; Least Tern – RPM 1).** In FY09 the St. Louis District initiated a study of the Upper Mississippi River between RM 98.0 and 90.0. The final report was completed in August 2010.

*General Background:* The purpose of the study was to evaluate potential side channel alignments to be excavated on the Wilkinson Island Division of the Middle Mississippi River National Wildlife Refuge. The goal of the study was to design a side channel with diverse bathymetry closely mirroring natural fluvial processes without negatively affecting the existing depths in the navigation channel. Additionally, the side channel was to be of a sustainable design, limiting future operational requirements. The recommended side channel alternative was alignment SC-G (see image below). This alignment fulfilled all of the study criteria including not having any negative impact to the navigation channel. Side channel alignment SC-G also successfully addressed all of the concerns of the study partners. There is currently no tentative schedule for construction due to the Wilkinson Island project being on hold.





12. **Grand Tower HSR Study RM 84.0-79.0 (Pallid Sturgeon – RPA 4).** Based on this study, chevron 82.0(L), weirs 82.5(R) and 82.4(R), and dikes 81.85(L) and 81.65(L) were constructed during FY09 (see pre- and post-construction bathymetry below). This HSR study was conducted in 2004 to evaluate and propose design modification 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.

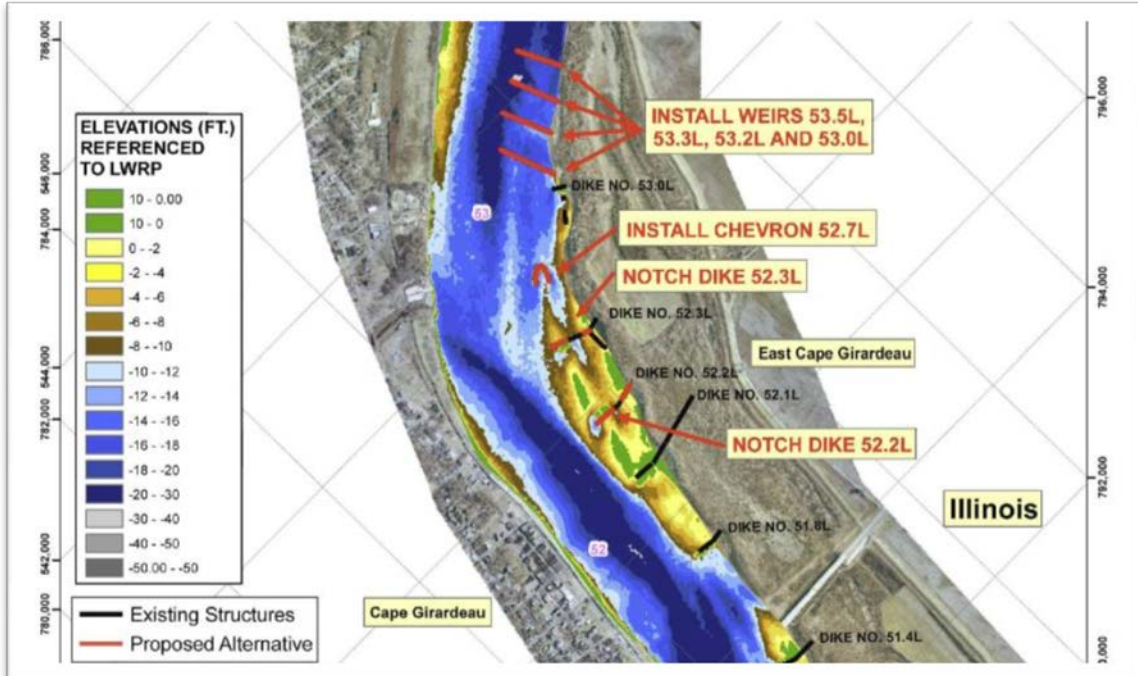


13. **Dike modifications at Big Muddy River confluence, RM 75.5(L) (Pallid Sturgeon - RPA 4, RPM 1; Least Tern RPM 1).** An extension of dike 75.3(L) was initiated in FY10 and is scheduled for completion in FY11.
- General Background:* The purpose of this project was to modify three dikes (RM 75.5, 75.3, 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. A second dike was notched during FY09 at RM 75.2(L).

14. **Cape Rock HSR Study RM 57-50.** 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 scheduled to be completed in FY11.

*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. The recommended alternative that came out of the HSR study included weir construction, chevron construction, and dike notching (see image below). However, there was concern from river engineers and industry representatives that the weirs included in the recommended plan had potential to cause unsafe navigation conditions. Accordingly, the weirs were dropped from the recommended plan pending further analysis. However, river engineers believe that the remaining features, chevron construction and dike notching, will still provide benefits without weir construction. Accordingly, the recommended plan is to construct a chevron at RM 52.7(L) and notch dikes 52.3(L) and 52.2(L).



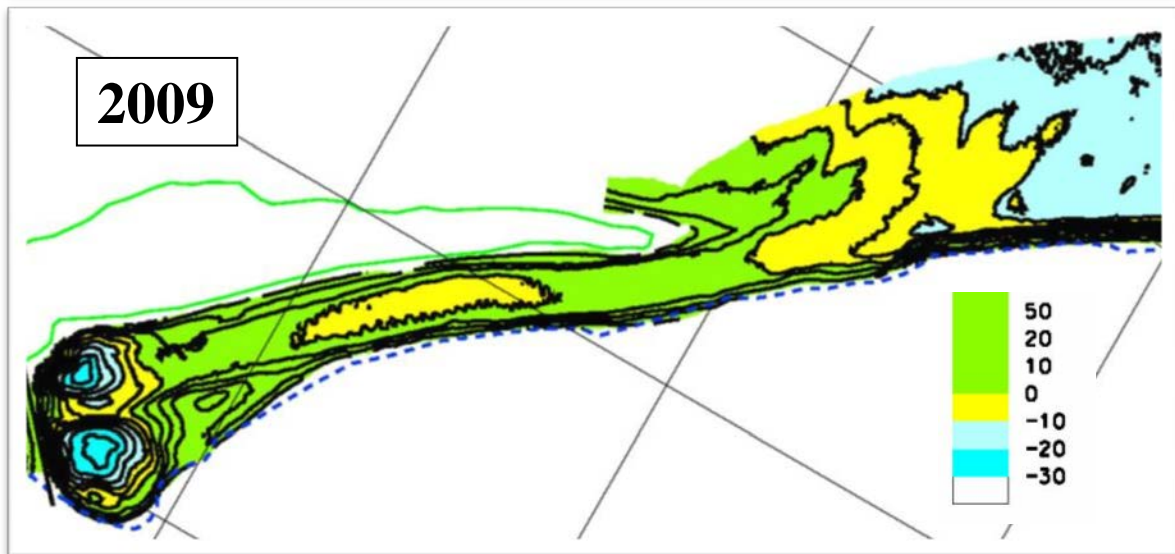
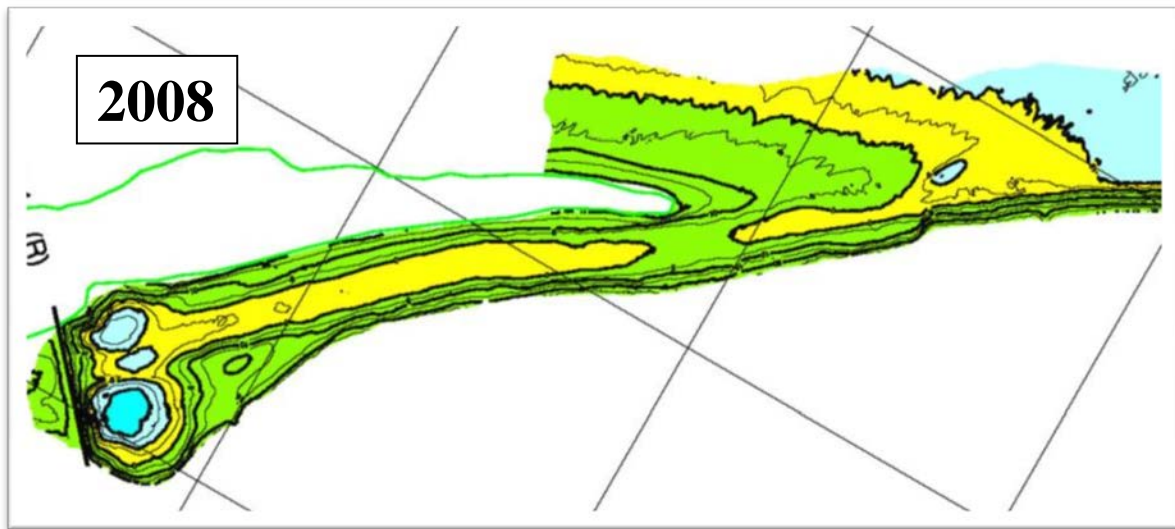
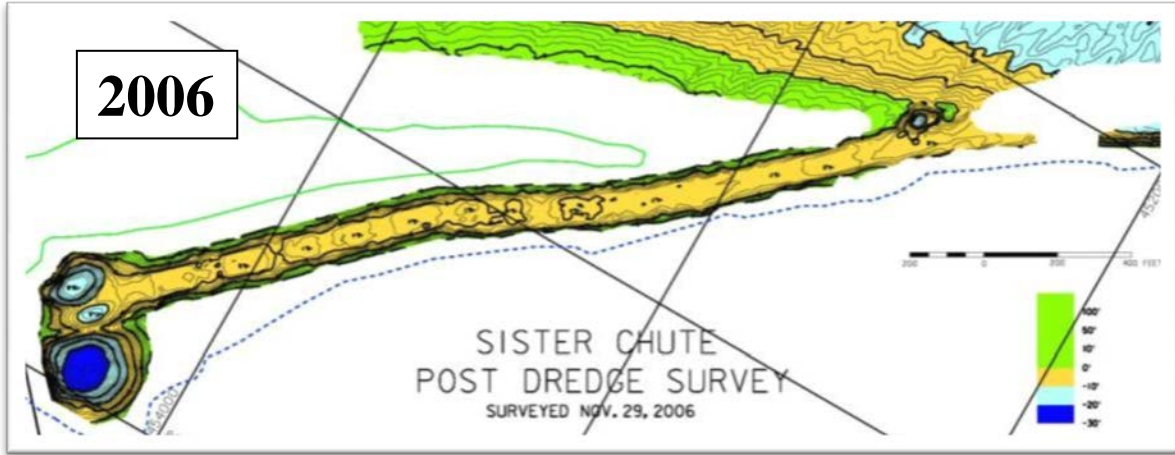
15. **Thebes Reach HSR Study RM 46-36 (Pallid Sturgeon – RPA 3 & 4, RPM 1; Least Tern – RPM 1).** In FY07 the St. Louis District initiated a study of the Upper Mississippi

River between RM 43.0 and 35.0, approximately nine miles downstream of Cape Girardeau, Missouri. The final report was completed in April 2010.

*General Background:* The purpose of the study was to evaluate stone dike design alternatives for increasing habitat diversity within the study area while maintaining the integrity of the navigation channel. While two alternatives did produce some environmental benefit without negatively impacting the navigation channel, neither alternative is currently recommended for construction. The habitat benefits gained were small when compared to construction costs, and several river training structures are currently slated for construction within the study area and may impact the results of the study. Future construction plans from the model may be warranted subsequent to monitoring of new structures.

16. **Dogtooth Bend – Phase 3, RM 40.0-20.0.** During FY10, construction of chevrons 36.7(L), 36.5(L), 36.2(L), 35.9(L), 32.8(R), 32.6(R), and 32.4(R) took place. This reach of the river has been experiencing a dredging problem for many years. This work is expected to improve navigation, add environmental features, and eliminate the need to dredge at this site.
17. **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 2006, 2008, and 2009 (see images below). 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 created a channel to connect the open river area at the lower end of the chute to the deep water hole below dike 12.4(R) for better connectivity throughout critical over wintering timeframes. The dredge cut is also anticipated to 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.



Post-dredging bathymetric surveys in the lower end of Sister Chute.

18. **Eliza Point / Greenfield Bend – Phase 2, RM 20-0.** During FY10, construction of W dike 4.2(L) and multiple roundpoint structure 4.0(L) took place. This reach of the river has been experiencing a dredging problem for many years. This work is expected to improve navigation, add environmental features, and reduce the need to dredge at this site.
19. **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 organization involved in the Middle Mississippi River Partnership.  
*General Background:* Each reach was subdivided into a number of subareas. For each subarea, the following information was 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. As part of this effort, a hydrogeomorphic study for the Middle Mississippi River was conducted. This study identified what ecosystems existed along the Middle Mississippi River before European settlement, evaluated differences between pre-European settlement and current conditions, and identified restoration and management approaches for successful ecosystem restoration.
20. ***Boltonia decurrens* (Decurrent False Aster).** Annual *B. decurrens* inventory surveys continued in FY10. The inventory was conducted in October 2009 by Southern Illinois University Edwardsville personnel assisted by St. Louis District personnel. The objectives were to survey areas in Mason and Menard Counties, IL, near the lower Sangamon River and to survey, from the river, the banks of the lower Illinois River for the presence of decurrent false aster. Only one site in Mason and Menard counties out of the 18 sites where it was previously recorded had existing *B. decurrens* populations. It is not clear why the majority of the populations found in 2006 were not extant in 2009, given the disturbances created by extensive overbank and groundwater flooding, which provided open, moist-soil habitat. However, water levels were known to be high during much of the year, and *B. decurrens* is negatively affected by late-season flooding. If seeds germinated in the spring or early summer, seedlings may have been washed out before becoming established.

During the river survey, no plants were found. Two factors may help explain the inability to locate any *Boltonia decurrens* populations during our survey:

1. At these sites, the species may have finished blooming a few weeks earlier, as time of flowering varies greatly from site to site; and



2. The distribution of the species has become patchy, with populations occurring in disjunct areas along the river. Although there has recently been an extant population at Gilbert Lake, Jersey County, many fewer populations occur in the Melvin Price Pool than in the LaGrange and Peoria Pools further upstream.

Future plans include a summary report of ten years of inventory surveys.

21. **Interior Least Tern (Term and Condition 3, least tern).** Random monitoring within the Riverlands Migratory Bird Sanctuary (RMBS) continued through partnership with the St. Louis Audubon Society. Due to its success, the Least Tern Floating Habitat Project continued during summer 2010. Breeding season 2010 initially showed signs of success, with up to 46 adults and 56 eggs in 21 nests at its peak. Least terns first arrived on May 11th of 2010. Least terns were suspected of nesting beginning June 1st and confirmed by boat on June 3rd, where 8 nests with 13 eggs were observed. Peak number of nests and eggs were observed on June 16th, 2010 with 21 nests containing 56 eggs. By July 6th, 2010, 19 chicks were hatched and ready to be banded. Predation by a great blue heron (*Ardea herodias*) on July 9th, 2010 caused the least terns to abandon the colony. Additional anti-predation measures have been installed on the barges to increase success for the FY11 breeding season.
22. **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 for FY 10.
23. **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. In order to prioritize locations where this technique might be used for shallow sandbar and island habitat creation, St. Louis District personnel met with agency stakeholders in June and August 2010. Elk Point, Buffalo Island, and Burnham Island were determined to be the best potential locations for a pilot project given dredging, habitat benefit, and compatibility with river training structures considerations. An initial pilot project was not executed in FY10 due to lack of a spill barge needed for elevation of the discharge pipe and due to other logistical difficulties. The pilot project is anticipated to occur in FY11.
24. **Indiana Bat Survey.** In FY10 the Rivers Project Office contracted an assessment of bat fauna on Rivers Project lands in Madison and Calhoun counties in Illinois. The study was conducted to provide baseline data on the presence or absence of Indiana bats (*Myotis sodalis*) and other bat species. Mist-netting and Anabat detection were utilized for the survey. The mist-netting survey was conducted between 17 May and 11 June 2010. Four species of bats have previously been documented in Madison and/or Calhoun counties; however, several others were expected to be present. Big brown bats, red bats, and evening

bats were captured during the 2010 survey. No federally endangered Indiana bats were captured during this survey. The Anabat monitoring survey was conducted between 10 and 14 June 2010. Seven species were detected throughout the Rivers Project Lands during the Anabat sampling period including the big brown bat, silver-haired bat, red bat, hoary bat, little brown bat, Indiana bat and eastern pipistrelle. Management recommendations include continuation of bat surveys to monitor the status of the population, netting of the Dog Island Complex to try to physically document the presence of Indiana bats, and protection of potential maternity roosting and foraging areas.

### **Projected FY11 Activities:**

Based on current projections of FY11 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, water levels are not in the range needed for construction, etc. 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 Habitat Conservation and Restoration planning** effort will continue in cooperation with MDOC, IDNR and FWS.
3. Continue **Pallid Sturgeon Habitat, Life History, and Population Demographics work** (ERDC/SIU-C).
4. **St. Louis Harbor chevron construction RM 183.0-182.4(R)**. Post construction monitoring including bathymetry, ADCP, water quality, and fish data will be completed during FY11.
5. **Cliff Cave – Kimmswick dike alteration and chevron construction site, RM 168.0-156.6**. Construction was started on chevrons 162.6(L) and 162.5(L) and on shortening of dikes 162.6(L) and 162.3(L) in FY10. Construction of these features is anticipated to be completed in FY11. Shortening of dike 163.0(L) and construction of chevron 162.8(L) is expected to occur in FY11. This would complete construction of features associated with this study.
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 began in February of FY09 and is scheduled to continue thru 2011.
7. **Waters Landing HSR model study, RM 106-100**. Removal of dike 104.4(R) and construction of the three chevrons is scheduled for FY11.
8. **Chevron construction at RM 100.1-99.9(L) – (bottom of Liberty Chute)**. Bathymetric data around the chevrons is scheduled to be collected in FY11.

9. **Mile 100(R) Islands study.** Data analysis has been completed. No further analysis is scheduled.
10. **Wilkinson Island HSR model study, RM 98-90.0.** Final report completed. No further analysis scheduled. Project on hold.
11. **Grand Tower RM 90.0-67.0.** No further construction based on this study is anticipated.
12. **Dike modifications at Big Muddy River confluence, RM 75.5-75.2(L).** Extension of dike 75.3 is scheduled for completion in FY11.
13. **Cape Rock HSR model study, RM 57-50.** The final report is scheduled for completion in FY11.
14. **Thebes Reach HSR model study, RM 46.0-36.0.** Final report completed. No construction planned.
15. **Environmental dredging at Sister Chute RM 14.5-12.0(R).** Another survey is scheduled for 2011 and a final report is forthcoming.
16. **Dogtooth Bend – Phase 3, RM 40.0-20.0.** Dates for further construction in this reach have not been determined. This work will be coordinated with the FWS, IDNR, MDOC, and RIAC.
17. **Eliza Point / Greenfield Bend – Phase 2, RM 20-0.** Dates for further construction in this reach have not been determined. This work will be coordinated with the FWS, IDNR, MDOC, and RIAC.
18. **Flexible/floating pipe for dredging.** An initial pilot project is anticipated for FY11.
19. **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.
20. ***Boltonia decurrens* (Decurrent False Aster).** Plans include a summary report of ten years of inventory surveys.