US Army Corps of Engineers
St. Louis District®

UMRS-EMP

POOLS 25 & 26 ISLANDS
PIKE, LINCOLN & ST. CHARLES COUNTIES
MISSOURI

Habitat Rehabilitation and Enhancement Project
Upper Mississippi River System
Environmental Management Program

PLANNING AND DESIGN ANALYSIS REPORT WITH ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

June 2008

DEPARTMENT OF THE ARMY
MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
P.O. BOX 80
VICKSBURG, MISSISSIPPI 39181-0080

REPLY TO
ATTENTION OF:

CEMVD-PD-SP

24 SEP 2008

MEMORANDUM FOR Commander, St. Louis District

SUBJECT: Upper Mississippi River Restoration (Formerly Upper Mississippi River System-Environmental Management Program); Final Planning Design Analysis Report, with Integrated Environmental Assessment and Technical Appendices, for the pools 25 & 26 Islands, Missouri, Habitat Rehabilitation and Enhancement Project (HREP)

1. Reference memorandum, CEMVS-PM-N, 26 June 2008, subject as above (encl 1).

2. Review of the subject report has determined that the document is compliant from technical, policy, and legal perspectives. However, future HREP documents submitted for approval need to address the comments provided in enclosure 2.

3. In accordance with EC 1165-2-502, 31 March 2007, subject: Delegation of Review and Approval Authority for Post-Authorization Decision Documents, and given the limited scope of the project ($999,000), CEMVD approves the Final Planning Design Analysis Report, with integrated Environmental Assessment and Technical Appendices, for the pools 25 & 26 Islands, Missouri, Habitat Rehabilitation and Enhancement Project (HREP). The Project Study Issue Checklist and Post-Authorization Decision Document Checklist are enclosed in support of this approval (encls 3 and4).

4. Questions should be addressed to Mr. Terry Smith, CEMVD-PD-SP, at (601) 634-5850.

4 Encls

MICHAEL J. WALSH
Brigadier General, USA
Commanding

CF (w/encls):
CECW-MVD
CEMVR-PM-M (Hubbell)

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PIKE, LINCOLN & ST. CHARLES COUNTIES, MISSOURI

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UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
SECTION 1103, WATER RESOURCES DEVELOPMENT ACT OF 1986

PLANNING AND DESIGN ANALYSIS REPORT
WITH ENVIRONMENTAL ASSESSMENT
AND FINDING OF NO SIGNIFICANT IMPACT

JUNE 2008

APPENDICES

Date: 23 June 2008
Division: Mississippi Valley
District: St. Louis

PROJECT FACT SHEET

1. PROJECT. Pools 25 and 26 Islands (PWI 4G7722)

Congressional District: MO-2, MO-9

Authority: Section 1103, Water Resources Development Act of 1986; Authorized purpose - Habitat Rehabilitation and Enhancement (Upper Mississippi River System Environmental Management Program Habitat Rehabilitation and Enhancement Projects)

2. LOCATION. The five islands addressed in this project are located in Upper Mississippi River Pools 25 and 26, and lie about 50 to 100 miles northwest of St. Louis, MO. Howard Island and an adjacent un-named island occur in Pool 25 near Annada, MO at river mile 261. Westport Island is located in Pool 25 near Elsberry, MO between river miles 258 and 254. Dardenne and Bolter Islands are located in Pool 26 near St. Peters, MO at river miles 228 and 224.

3. DESCRIPTION OF PROPOSED PROJECT. The proposed project consists of three components to improve terrestrial and aquatic habitats on several islands in Pools 25 and 26 of the Upper Mississippi River: 1) planting of tree and shrub seedlings to reforest portions of abandoned agricultural fields, 2) improving the connection between the river and island interior sloughs by removing sediments from small natural channels, and 3) improving water depth in interior sloughs by installing a water control structure and creating a deep hole. The project location and proposed features are displayed on separate drawings.

(1) Major Features.
Reforestation: A total of 110 acres of abandoned crop fields on Westport and Dardenne Islands (59 and 52 acres, respectively) would be reforested with seedlings of native species of trees and shrubs. Mast-bearing species such as pecan and various oaks would be planted on relatively high elevations in the abandoned crop fields. Site preparation would be limited to light to heavy clearing of undesirable woody vegetation that has encroached into some proposed planting sites.

Restoration of River-Island Slough Connections: A total of about 2,500 cubic yards of sediment deposited over time by periodic river floods would be mechanically dredged from a small natural channel at the lower end of Westport Island and Bolter Island. Removal of this sediment would restore the connection between the Mississippi River and interior sloughs located on each island (74 and 13 surface area acres, respectively). Dredging would occur in half of the 2,000 foot long channel on Westport Island, and in the entire 1,250 foot long channel on Bolter Island. Dredging would provide an

additional three feet of channel depth across a channel bottom width of five feet at both sites. Dredge material would be side cast within a disposal area sited along each channel.

Improvement of Island Slough Water Depth: On Westport Island a water control structure would be installed in the 5-foot wide natural channel to allow for periodic impoundment of about an extra foot of water in the 74-acre interior slough complex. At Bolter Island, a "deep hole" (0.5 acre at 8 feet deep) would be created in the 13-acre interior slough by excavation. In addition to the excavation, a horse-shoe shaped emergent rock dike structure would be constructed in the slough around the deep hole's upstream side. Periodic flood events that overtop the island would pass over the dike and scour the hole to maintain water depth in the future.

(2) Need For Proposed Action.

Reforestation: This proposed activity is to restore tree species diversity to these forested islands. The hard-mast component of the Upper Mississippi River's floodplain forests historically occurred on higher sites subject to less frequent flooding, and has been an important resource for many wildlife species, such as deer and turkey. Much of the river system's hard mast forest has been lost due to agricultural conversions, floodplain development, and alterations to river hydrology. Restoration of this forest component has been identified by Upper Mississippi River resource professionals as an important priority. Oaks and pecans on floodplain islands like Westport and Dardenne Islands are relatively scarce and scattered. Natural regeneration of hard mast tree species on these islands does not appear to be sufficient to maintain local populations. Without active planting, it is feared that they will eventually disappear.

Restoration of River-Island Slough Connections and Improvement of Island Slough Water Depth: Off-channel aquatic areas such backwaters, side channels, and island sloughs are important to various riverine fish as spawning, rearing, and overwintering habitat. The suitability of Upper Mississippi River aquatic habitats for riverine fish has declined since historic times due to development in the river and adjacent floodplain. The deposition of suspended sediments in off-channel habitats has degraded backwaters, side channels, and island sloughs by reducing water depths, leading to an overall decline in aquatic habitat diversity. Resource professionals believe that to maintain a sustainable aquatic ecosystem in the Upper Mississippi River, a number of actions are necessary, including the creation or restoration of temporarily isolated backwaters, like the island's sloughs. At normal pool, water depths in these sloughs average only two to three feet. Areas of greater water depth do not exist (optimal overwintering habitat for fish is 8 feet deep or greater). The bottom consists of soft sediment. Over the next fifty years, average water depth in these sloughs is expected to decrease by about 0.5 foot. These sloughs would function in the future less often than they currently do as suitable fish spawning, rearing, and overwintering habitat, and are expected to be more likely to experience winter and/or summer fish mortality due to oxygen depletion.

Planning objectives include 1) increasing the spatial extent of the oak-hickory community in floodplain forests, 2) restoring and maintaining connections between the river and

adjacent backwater habitats, 3) creating and maintaining deepwater habitat in backwater areas, and 4) maintaining islands.

(3) Expected Outputs.
Wildlife species with diets that include acorns and nuts such as deer, turkey, squirrels, and pileated woodpeckers are expected to benefit from the reforestation of Westport and Dardenne Islands with native hard-mast tree species. Others species expected to benefit from these foods include waterfowl such as the mallard and wood duck. These benefits would be measured indirectly by annual monitoring of percent survival of seedling plantings, age at which seedlings first produce an acorn or nut crop, and onset of natural regeneration.

Aquatic species, especially riverine fishes, are expected to benefit from the removal of sediments to reopen the natural channels connecting the Mississippi River with sloughs located on Westport and Bolter Islands. Fishes that are expected to spawn and rear young in these sloughs include such species as all members of the sunfish family (including sport fish such as bluegill, largemouth bass, white and black crappie) and gizzard shad. Periodic closure of the water control structure on Westport Island during the late spring and early summer once every two to three years would likely prevent fish in the river from accessing the island for spawning. However, perched slough conditions during closure would provide somewhat deeper water depths for spawning fish already in the slough complex as well as young of the year using this area as a nursery. Riverine fishes are also expected to benefit from the creation of one 0.5-acre deep hole on Bolter Island. Fish of all ages, including young of the year as well as juveniles and adults, would be expected to use this deep hole as a thermal refuge during stressful periods (hot summer, cold winters). Species known to use deep areas in backwaters for overwintering include sport species (such as black crappie, white crappie, white bass, bluegill) and commercial species (such as freshwater drum), as well as gizzard shad. In addition to reducing seasonal water temperature fluctuations, creation and establishment of the deep hole is expected to improve localized dissolved oxygen levels. These benefits would be measured by seasonal monitoring of water temperature and dissolved oxygen conditions, and assessment of fish communities in the slough and deep hole.

(4) Project Significance.
Backwaters and floodplain forests are recognized as significant natural resources by a variety of institutional, public, and technical or scientific sources.

Institutional Recognition. The aquatic and terrestrial resources in Pools 25 and 26 are of national and regional significance because they are part of the Upper Mississippi River System (UMRS), which includes the commercially navigable reaches of the Upper Mississippi and Illinois Rivers. The UMRS is the only inland waterway in the U.S. formally recognized by Congress (in 1986) as a nationally significant ecosystem and commercial navigation system. In 1986 Congress recognized the importance of protecting the UMRS by authorizing the Upper Mississippi River System Environmental Management Program, a major component of which includes the rehabilitation and enhancement of habitats in and along the river. The Upper Mississippi River System

Habitat Needs Assessment, prepared by the Corps of Engineers in 2000, was developed to help guide implementation of future habitat rehabilitation and enhancement projects on the UMRS. For the river reach encompassed by Pools 14-26, this plan calls for the creation or restoration of various riverine habitats, including isolated backwater habitat (5,000 acres). Recommendations for restoring UMRS floodplain forests appear in the report "Upper Mississippi and Illinois River Floodplain Forests: Desired Future and Recommended Actions", prepared by the Wildlife Technical Section of the Upper Mississippi River Conservation Committee in 2002, and call for expanding and adding diversity to the system's various floodplain tree communities, including the hard-mast component.

From a state perspective, the project area's islands are important because they are part of Missouri's Upper Mississippi Conservation Area, which is managed by the Missouri Department of Conservation to provide optimum habitat for wetland wildlife species. A portion of Westport Island is significant because it is designated as a State Natural Area.

Public Recognition. The Mississippi River is regarded as a significant resource from a public perspective. From a regional, state-wide and local point of view, recreational boaters and anglers enjoy riverine opportunities provided in Pools 25 and 26, as do some commercial fisherman. Hunters take advantage of migratory and resident waterfowl and small game that use backwaters and bottomland forests, including those found on islands.

Technical Recognition. From a state-wide and local point of view, the Upper Mississippi River System Habitat Needs Assessment has identified the projected loss of contiguous and isolated backwaters in Pools 25 and 26 as a major concern for the aquatic environment. This assessment states that resource managers working in these two pools believe that the proportion of all isolated backwaters that currently provide acceptable habitat for desirable species is 70% for Pool 25 and 5% for Pool 26. Because they foresee a further decline in overall aquatic habitat conditions over the next 50 years, these managers desire that the amount of existing isolated backwater habitat be increased in Pool 25 and Pool 26 by 450% and 150%, respectively. Adequate overwintering habitat in backwater areas has been identified by the Habitat Needs Assessment as a scarce resource, and is considered to be an ecological bottleneck for a number of UMRS fish species, including sport species such as the bluegill, largemouth bass, and white bass, and commercial species such as the smallmouth buffalo.

The forestry report prepared by the Wildlife Technical Section of the Upper Mississippi River Conservation Committee in 2002 emphasizes the importance of the hard-mast tree community within floodplain forests to wildlife, recognizes the substantial historic spatial forest loss and decrease in overall forest diversity, and recommends a number of management measures, including the identification of suitable planting sites to increase the abundance of the oak-hickory forest component.

(5) LEERD Statement.
With regard to lands, easements, rights of way and disposal sites, lands to be used for this proposed project are owned by the Federal Government and operated by Missouri

Department of Conservation under a general plan agreement. The construction and operation of this project will not require any additional real estate interests. A right-of-entry permit for access to Bolter Island in the vicinity of a transmission line will be obtained from Ameren UE.

(6) Relationship of Proposed Project to other Federal and Non-Federal Projects.
URMS-EMP HREP. The proposed project has been conducted under the authority of the Habitat Rehabilitation and Enhancement Project (HREP) component of the Upper Mississippi River System-Environmental Management Program. This program includes the Upper Mississippi River between the Twin Cities in Minnesota and the mouth of the Ohio River, the Illinois Waterway, and small portions of tributaries that have commercial navigation channels. The St. Louis District has completed seven habitat improvement projects: Clarksville, Dresser Island, Pharrs Island, Stag Island, and Cuivre Island in Missouri, and Stump Lake and Swan Lake in Illinois. Batchtown and Calhoun Point are nearly completed projects in Pools 25 and 26, and Angle Blackburn Island, Ted Shanks, and Sandy Slough are two planned projects in Pools 24 and 25. Additional projects are likely to be recommended in Pools 24-26 to address pool-wide habitat needs.

Avoid and Minimize. The Avoid and Minimize Program was established in 1992 by the St. Louis District to reduce possible environmental impacts associated with increased navigation traffic on the Upper Mississippi River System as a result of construction of a second lock at Melvin Price Locks and Dam near Alton, Illinois. The program focuses on Pools 24-26 as well as the open river reach south of St. Louis, and has examined ways to rehabilitate backwater and side channel areas and diversify aquatic habitat. The implementation program has been funded since 1996 through the Corps of Engineers operation and maintenance budget. Bullnose dikes have been constructed at Slim Island in Pool 25 and Peruque and Portage Islands in Pool 26 to create slackwater habitat and protect these islands from erosion. No other projects are currently planned for Pools 25 and 26.

St. Louis, Missouri, Watershed. Initiated in 2004, this planned (but yet unfunded) Corps of Engineer study will examine the cumulative effects of various types of past development in the large river floodplains within the greater St. Louis Metropolitan area., and will project the induced flooding effects associated with various types of potential future development. These findings could be invaluable to local and regional decision makers as well as to the Corps of Engineers and other Federal planners, such as the Federal Emergency Management Agency, in making decisions on the full costs, benefits, and impacts associated with various Federal, state, and local projects.

Upper Mississippi River System Navigation and Ecosystem Sustainability Program (NESP). Under this Corps of Engineer program, a series of small-scale navigation improvements and ecosystem restoration projects are recommended for construction throughout the Upper Mississippi River System to achieve the dual purposes of ensuring a sustainable natural ecosystem and navigation system. In February 2005, 34 projects entered the Preconstruction Engineering and Design phase, including: the initiation of design for small scale navigation improvements; mooring cells, buoys, and switchboats;

initiation of design for two new 1200' locks at Lock and Dam 25 and Lock and Dam 22; conducting environmental mitigation studies; supporting research into non-structural improvements and demand forecasting tools; developing plans for ecosystem restoration adaptive management; initiating design of fish passage projects at Lock and Dams 22 and 26; initiating planning for dam point control at Lock and Dam 25; and initiating design for several habitat restoration and floodplain restoration projects.

Upper Mississippi River Comprehensive Plan. Begun in 2002, the purpose of this Corps of Engineer project is development of a comprehensive plan for the Upper Mississippi and Illinois Rivers that addresses flood damage reduction, improving management of nutrients and sediment, flood damage reduction-related environmental stewardship and ecosystem restoration, and river-related recreation needs and opportunities. The planning effort assessed systemic, multipurpose flood damage reduction project alternatives that are consistent with environmental sustainability goals. Both structural and non-structural measures were fully considered. A draft report for public review was distributed in May 2006.

Mississippi River, Between Missouri River and Minneapolis, Minnesota (Upper River). This long-term Corps of Engineer operation and maintenance program for the upper Mississippi River within the St. Louis District extends from the mouth of the Missouri River at St. Louis upstream to Lock and Dam 22 tail water, and envelops 105 miles of river and 70,000 acres of public lands. The project provides a nine-foot navigation channel via a system of locks and dams including Locks and Dams 24, 25, and Melvin Price; regulating works; dike and revetment; dredging; and implementation of the U.S. Fish and Wildlife Service's Biological Opinion. The project has environmental stewardship responsibility as well as land- and water-based recreational opportunities.

(7) Alternatives.

Selection of Islands and Initial Development of Alternatives. The first fact sheet for the Pools 25 & 26 Islands project was developed in May 1988, and it describes proposed habitat improvements at four islands: Mozier and Westport in Pool 25, and Dardenne and Bolter in Pool 26. This fact sheet makes no mention of any screening process leading to the selection of a group of candidate islands or these particular four islands. Because implementation of the HREP program in the St. Louis District was in its very early stages at the time this fact sheet was developed, most likely the selection of these islands was based upon the professional judgment of resource managers most familiar with the resource needs of Pools 24-26.

In January 2001, the fact sheet was updated to include one additional island – Kickapoo, which is adjacent to Westport. Two more islands (Howard Island and an unnamed island) adjacent to Mozier were added by the project's interagency team of biologists after a site visit in April 2005. At the same time, the Missouri Department of Conservation and U.S. Fish and Wildlife Service no longer desired to keep Mozier in the plan (with its features of dredging interior sloughs, slough connecting ditches, deepwater holes, and mast tree plantings), so this island was dropped. Kickapoo was screened out after the St Louis District determined that abandoned cropland on this island was too low

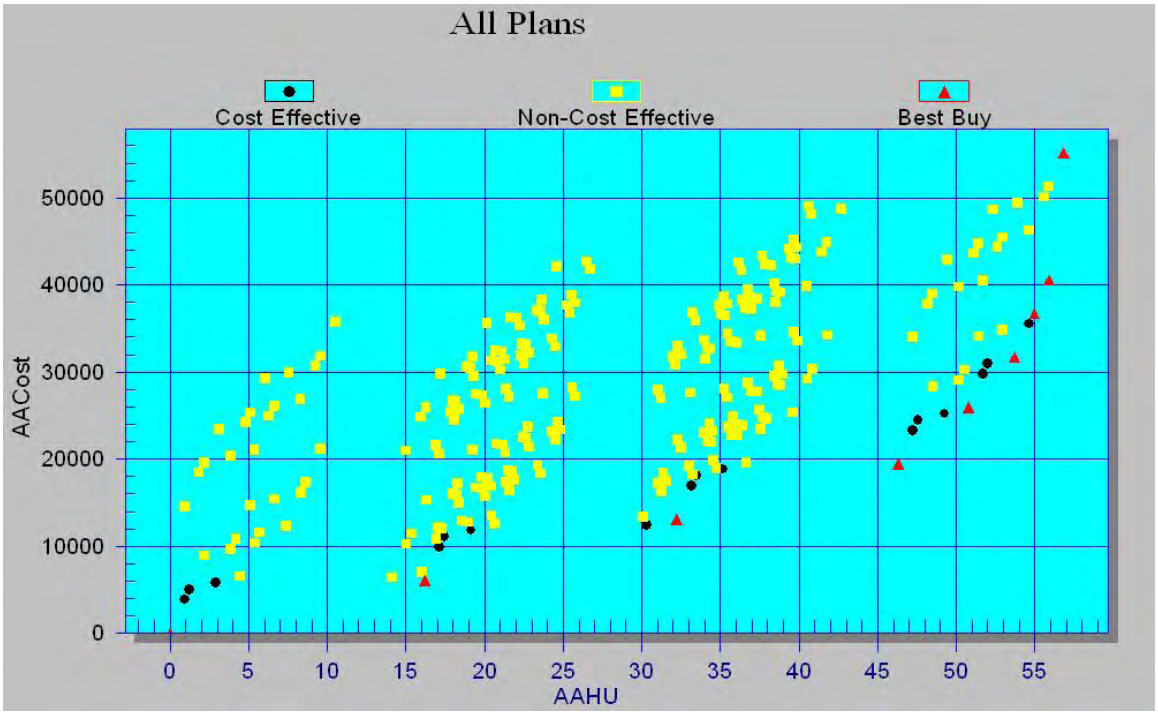
to be suitable for reforestation using hard-mast tree seedlings. The final selection of islands included Howard Island, an unnamed island adjacent to Howard Island, and Westport Island in Pool 25, and Dardenne and Bolter Islands in Pool 26.

A number of features or measures initially developed for this project were subsequently eliminated from consideration as alternatives. They were described in the 1988 and 2001 fact sheets and a value engineering function analysis report prepared in 2002. The eliminated features or measures include low level levees with drainage control structures, elevation of abandoned crop fields for tree planting using river dredged sands, deepening of entire island sloughs by dredging, dike notching in side channels adjacent to identified islands, and side channel closure structures.

Alternative Plans Considered. Eight measures were developed to address the problems identified on the islands. They include:

Measure	Location	Description of Measure
A	Westport Island	•plant oak-hickory tree seedlings in abandoned cropland at elevations where they naturally regenerate (440 feet NGVD)
B	Dardenne Island	•plant oak-hickory tree seedlings in abandoned cropland at elevations where they naturally regenerate (428 feet NGVD)
C	Bolter Island	•excavate/dredge an island channel to restore connection to river; •excavate/dredge a deep hole in slough; •build rock structure in slough that will use river's energy during floods to maintain deep hole
D	Dardenne Island	•excavate/dredge a deep hole in side channel; •build rock structure in side channel that will use the river's energy during floods to maintain deep hole
E	Westport Island	•excavate/dredge a deep hole in slough; •build rock structure in isolated slough that will use the river's energy during floods to maintain deep hole (structure #3)
F	Westport Island	•excavate a deep hole in abandoned cropland; •build rock structure in abandoned cropland that will use the river's energy during floods to maintain deep hole (structure #6)
G	Westport Island	•excavate/dredge an island channel to restore connection to river; •install water control structure in island channel to temporarily hold water in island's interior sloughs
H	Howard & unnamed island	•place bank revetment on upstream ends of islands to minimize erosion

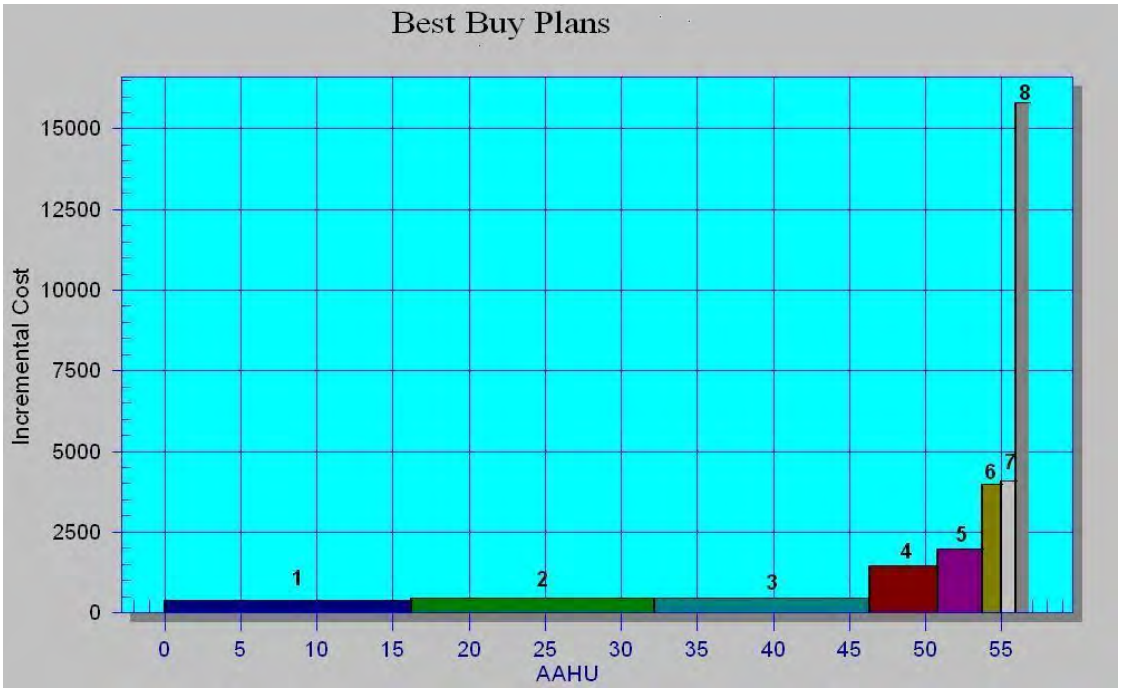
The following information summarizes the cost effectiveness analysis and incremental cost analysis, using the Corps IWR-Plan software. The graph below displays average annual costs (y-axis) and average annual habitat units (x-axis) for all 256 alternatives generated by IWR-Plan as unique combinations of the eight measures (A-H). The cost-effective plans (black) and best buy alternatives (red) are differentiated from the solutions that are not cost-effective (yellow).



These analyses identified eight cost efficient and cost effective ("best-buy") action alternatives. The following table displays these "best buy" alternatives, their construction costs, annualized costs, net AAHUs, and incremental cost per incremental benefit. Total project costs were annualized based on the FY 2007 project discount rate of 4.875% and a 50-year period of evaluation. The recommended plan is alternative 4 (shaded).

Alt. #	Alternative Name	Construction Cost	Incremental Cost (annualized)	Incremental Output (net AAHUs)	Incremental Cost Per Output
(no action)	A0B0C0D0E0F0G0H0	$0.00	$0	0.00	$0.00
1	A0B0C0D0E0F0G1H0	$115,408.00	$5,909	16.20	$364.80
2	A1B0C0D0E0F0G1H0	$209,158.00	$6,804	16.01	$425.00
3	A1B1C0D0E0F0G1H0	$294,158.00	$6,203	14.11	$439.60
4	A1B1C1D0E0F0G1H0	$410,473.00	$6,249	4.45	$1,404.30
5	A1B1C1D0E0F1G1H0	$512,899.00	$5,559	2.94	$1,890.80
6	A1B1C1D0E1F1G1H0	$601,653.00	$4,836	1.26	$3,838.10
7	A1B1C1D1E1F1G1H0	$670,643.00	$3,706	0.94	$3,942.60
8	A1B1C1D1E1F1G1H1	$901,893.00	$14,081	0.92	$15,305.40

The following box graph displays all eight of these "best buy" alternatives. The recommended plan is represented by the dark red box (labeled "4"), for which an incremental gain of about 4.5 AAHUs is achieved with an additional cost of about $1,404 per AAHU.



The recommended plan was selected from the list of eight "best buy" alternatives. In the box graph above, there are significant breakpoints that assist in identifying the recommended plan. Significant breakpoints occur between alternatives 1-2-3 and alternatives 4-5, between alternatives 4-5 and alternatives 6-7, and between alternatives 6-7 and alternative 8. Alternative1, Alternative 2, and Alternative 3 are considered to be wise investments because each of them provides a relatively large environmental benefit at a low cost (below $500 per AAHU). Alternative 6 and Alternative 7 were not chosen as the recommended plan because their additional increments (as compared to Alternative 4 and Alternative 5) were viewed by the interagency team to be of minimal benefit to the aquatic ecosystem (creation of deepwater habitat in an isolated slough on Westport Island with no natural connection to the river, creation of deepwater habitat in a small side channel on Dardenne Island near a main channel border dike field already with deep holes). Similarly, alternative 8 was rejected (bank stabilization at Howard Island and an unnamed island) because of the small benefit to be gained, as well as the high incremental cost per incremental gain (over $15,000 per AAHU), which exceeds the typical average for HREP projects ($3,000 to $4,000 per AAHU).

The interagency team believed that creation and maintenance of deepwater habitat in an island's interior slough where that slough was naturally connected to the river would be beneficial to various riverine fishes, as in alternative 4. This alternative would restore optimal overwintering fisheries habitat to a type of aquatic habitat (isolated floodplain lake) where deep water is believed to be lacking in Pools 25 and 26. In the St. Louis District, creation and maintenance of deepwater habitat in an isolated floodplain lake has yet to be attempted, although deepwater habitat has been successfully created and maintained in main channel habitats using similar methods. For these reasons, alternative 4 was desirable, whereas alternative 5 was not. The additional increment of benefit provided by alternative 5 was not viewed by the team as valuable in terms of habitat

gained (creation of deepwater habitat in abandoned cropland on Westport Island that would not be connected to the river).

Therefore, alternative 4 was chosen as the recommended plan. It includes measures A, B, C, and G. These include reforestation of hard-mast tree species in abandoned cropland on Westport and Dardenne Islands (measures A and B, respectively), restoring the natural connection between the river and the isolated slough on Bolter Island, along with creation of deepwater habitat in this slough, and construction of a rock dike structure adjacent to the deep area to maintain water depth (measure C), and restoring the natural connection between the river and the interior slough complex on Westport Island, along with installation of a water control structure (measure G).

The recommended plan has been formulated in consideration of the four criteria described in the Principles and Guidelines (U.S. Water Resources Council, 1983): completeness, efficiency, effectiveness, and acceptability. The plan is complete because it provides and accounts for all necessary investments or other actions to ensure the realization of the planning objectives, including future operation and maintenance activities by the U.S. Fish and Wildlife Service and the Missouri Department of Conservation. The plan is effective in that it contributes to the achievement of three of the four planning objectives (increase the spatial extent of the oak-hickory community in floodplain forests, restore and maintain connections between the river and adjacent backwater habitats, and create and maintain deepwater habitat in backwater areas). It is efficient because it is one of the eight most cost effective ("best-buy") alternatives identified by the cost-effectiveness and incremental cost analyses. The recommended plan is acceptable because it is supported by the U.S. Fish and Wildlife Service and Missouri Department of Conservation, land managers of the project area's islands, and it complies with all applicable laws, regulations and public policies.

(8) Study Methodologies.
Project outputs were generated for all action and the no-action alternatives using average annual habitat units as the unit of measurement. This particular unit of measurement is frequently used for Corps ecosystem restoration project planning, including the EMP-HREP program. Average annual habitat units were obtained by multiplying area of affected habitat (habitat quantity, expressed in acres) by habitat suitability (habitat quality, expressed as a habitat suitability index). Habitat suitability indices were generated by applying the Wildlife Habitat Appraisal Guide (WHAG) for terrestrial habitats and the Aquatic Habitat Appraisal Guide (AHAG) for aquatic habitats. These two methodologies are often used by the St. Louis District for EMP-HREP projects. The ecological models employed by the WHAG and AHAG characterize habitat suitability by assessing habitat conditions believed to be important to the well being of a range of animal species.

4. VIEWS OF SPONSOR. The non-Federal sponsor for this project is the Missouri Department of Conservation (MDC). MDC has been in agreement with and supports the effort made to optimize the design leading to the recommended plan configuration. The

sponsor has been a participant in all phases of the plan formulation process. MDC has expressed acceptance of the project in a "letter of intent" dated 23 June 2008.

5. VIEWS OF FEDERAL, STATE, AND REGIONAL AGENCIES. As land manager of the project area's islands, the Missouri Department of Conservation supports the recommended plan. The U.S. Fish and Wildlife Service expressed support for the project in its Final Fish and Wildlife Coordination Act Report by stating "The proposed project will be beneficial to the Mississippi River and biota dependent upon the river by improving habitat quality in this portion of river." That agency requested that work in sloughs on Westport and Bolter Islands be restricted from occurring during the period from mid-March to early June to avoid impacts during the main fish spawning season. The Osage Nation Tribal Historic Preservation Office stated that the proposal "will not adversely affect properties of cultural or sacred significance to the Osage Nation." That office also requested that if during project construction any artifacts or human remains are discovered, work would immediately cease and the Office be contacted. A separate Summary of Public Involvement describes comments received during the public review process and District responses.

6. ENVIRONMENTAL COMPLIANCE REQUIREMENTS. An Environmental Assessment (EA) was distributed to Federal, State, and regional agencies and the general public on 18 December 2007 as part of the public review process. The USFWS "concurred that with implementation of the conservation measures discussed in the [Section 404(b)(1) Evaluation] report, the project is not likely to adversely affect any known federally listed threatened or endangered species." Section 401 water quality certification was issued by the Missouri Department of Natural Resources on 2 June 2008. The District's 404(b)(1) Evaluation was signed on 25 June 2008. Authorization under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act was granted by the St. Louis District on 25 June 2008. A Finding of No Significant Impact was signed for the project on 25 June 2008. The Missouri State Historic Preservation Office was included in the public review distribution of the Environmental Assessment and Public Notice, but did not respond in writing. The Osage Nation Tribal Historic Preservation Office expressed the opinion that the District complied with the National Historic Preservation Act by consulting with that office.

7. COSTS AND BENEFITS.

(1) Outputs. Benefits expected from the recommended plan (alternative #4, A1B1C1G1) are represented by a total of 50.77 average annual habitat units (AAHU). This total is the sum of 30.12 AAHU for terrestrial wildlife habitat gains and 20.65 AAHU for aquatic fisheries habitat improvements. The terrestrial benefits derive from reforestation of 110 acres of abandoned crop fields on Westport and Dardenne Islands with hard-mast tree species. The aquatic benefits accrue from improving fisheries habitat in the 73-acre interior slough complex on Westport Island and a 13-acre slough on Bolter Island, by making these habitats more accessible to riverine fishes and by improving water depth in the sloughs.

The WHAG assessment of tree planting shows that improvements in habitat quality for most evaluation species will be attained once the production of nuts and acorns begins, which would be in the first half of the 50-year project life. In qualitative terms, quality of the abandoned crop fields as forest habitat currently varies from poor to fair, and under future without conditions of natural succession, would vary from poor to good. With hard mast tree plantings, quality would improve over the future without condition slightly for six evaluation species, but would change from fair to good or good to excellent for the other four species (white-tailed deer, turkey, pileated woodpecker, fox squirrel), all of which include nuts and acorns in their diet.

The AHAG assessment forecasts gains in aquatic habitat suitability for all evaluation fish species. For most evaluation species, existing habitat quality is either fair or good, and under future without conditions it remains unchanged. With the project, the islands' interior sloughs are expected to improve for all fish species, more so as spawning and rearing habitat than as overwintering habitat. This is because the existing sloughs are already rather shallow, and the creation of deepwater overwintering habitat is proposed at only one of the two affected islands.

(2) Costs. All project costs related to planning and construction are 100% Federal. The contract construction cost estimate for the recommended plan is $998,475.78, and it was prepared using MII software in April 2008. This cost estimate is displayed in TABLE 1 by feature at each island.

(3) Future OMRR&R Requirements. As the non-Federal sponsor, the Missouri Department of Conservation (MDC) would be responsible for all future operation, maintenance, and replacement of project features. No other entity would be involved in these activities. MDC would be responsible for all costs associated with these OMRR&R requirements. Total future OMRR&R costs of the recommended plan are estimated to be $5,859 each year over the 50-year project life; this figure is expressed in current dollars and is based on May 2008 price levels. These requirements include maintenance and replacement costs for reforestation at Westport and Dardenne Islands, operation, maintenance, and replacement costs for aquatic features at Westport Island, and maintenance and replacement costs for aquatic features at Bolter Island. Detailed OMRR&R costs appear in TABLE 2. The recommended plan includes an access road on Westport and Bolter Islands. A similar feature is not needed on Dardenne Island.

8. SCHEDULE.
Study Process and Draft Report Preparation: January 2005 – November 2007
Public Review Process: December 2007 – February 2008
Final Report Preparation: May – June 2008
MVD Approval: July – August 2008
Plans and Specifications: October 2008 – September 2009
Contract Award: January 2010
Construction: April 2010 – November 2011

Implementation of "aquatic" work (excavation of the natural channels and deep hole, construction of the rock structure) is dependent on normal river stages. Dredging activities on Westport and Bolter Islands will be restricted from occurring during the period from mid-March to early June to avoid adverse impacts during the main fish spawning season. Planting of tree and shrub seedlings is preferable in the fall.

Removal of a few scattered large trees associated with channel excavation on Westport and Bolter Islands will be restricted to the colder months when maternity roosting of the Federally endangered Indiana bat (*Myotis sodalis*) is not known to occur (October 1 through March 31). With this restriction on construction, the recommended plan is unlikely to affect this bat. Therefore, removal of these few large trees could occur as early as April 2010 or as late as October-November 2010. With regard to the delisted bald eagle, the National Bald Eagle Management Guidelines will be applied if bald eagle use should change in the project area, to minimize potential project impacts that may constitute "disturbance" to this species.

9. SUPPLEMENTAL INFORMATION.
The recommended plan reflects geotechnical assumptions related to sediment removal from the natural channels on Bolter and Westport Islands. Based on an analysis of soil samples taken from these channels, deepening of these channels by up to five feet is not expected to result in the loss of channel water to any subsurface permeable layer, nor would water flowing through these channels (to the river or into the sloughs) be expected to cause erosion of the channel banks or bottom. Similarly, the proposed channels after mechanical excavation were designed relatively narrow and deep to promote sediment transport through the system, thereby reducing the amount of deposition in the channel. No maintenance of the channel on Bolter Island is expected, whereas periodic closure of the proposed water control structure in the channel on Westport Island is expected to result in some siltation, and the need for periodic sediment removal.

Post-construction monitoring and evaluation is proposed, and includes periodic tree seedling survival surveys, sedimentation surveys in the deep hole and dredged channels, water quality monitoring in these aquatic sites, and hydroacoustic fish sampling in the Bolter Island slough, over the 50-year project life. The approximate annual cost of this monitoring is $11,000. Monitoring will not be accomplished as part of the recommended plan, but as part of a separate program for pre- and post-project monitoring of all EMP-HREP projects in the St. Louis District.

10. FINANCIAL DATA. Economic and financial data for the recommended plan are displayed in TABLE 3.

11. FEDERAL ALLOCATIONS TO DATE.
Planning and Design Analysis: $ 754,000
Finalize Plans & Specifications: $ 77,000
Construction: $ 0

TABLE 1. Project Cost Estimate

Print Date Mon 12 May 2008
Eff. Date 4/29/2008

U.S. Army Corps of Engineers
Project : EMP-POOLS 25/26 HABITAT
Pools 25 & 26 - EMP Habitat

Time 11:07:09
Summary-Level2 Page 2

Description	Quantity	UOM	CostToPrime	JOOH_PRM	HOOH_PRM	MiscContract_PRM	Profit_PRM	Bond_PRM	ContractCost	Contingency	ProjectCost
Summary-Level2			**683,144.98**	**76,600.00**	**13,303.36**	**2,793.71**	**45,396.84**	**4,574.45**	**825,813.33**	**172,662.44**	**998,475.78**
06 FISH AND WILDLIFE FACILITIES	**1**	**LS**	**469,144.98**	**76,600.00**	**13,303.36**	**2,793.71**	**45,396.84**	**4,574.45**	**611,813.33**	**151,262.44**	**763,075.78**
			116,780.97	*16.33%*	*5.55%*	*1.17%*	*9.94%*	*1.91%*	*157,526.77*	*23.93%*	*195,217.58*
061 BOLTERS ISLAND - POOL 26	**1**	**EA**	**116,780.97**	**19,067.50**	**6,479.53**	**1,360.70**	**11,610.05**	**2,228.03**	**157,526.77**	**37,690.80**	**195,217.58**
			2,130.31	*16.33%*	*0.00%*	*0.00%*	*9.40%*	*0.00%*	*2,678.37*	*25.00%*	*3,347.96*
062 DARDENNE ISLAND - TREE PLANTING	**52**	**ACR**	**110,776.02**	**18,087.04**	**0.00**	**0.00**	**10,412.13**	**0.00**	**139,275.19**	**34,818.80**	**174,093.98**
			2,106.22	*16.33%*	*0.00%*	*0.00%*	*9.40%*	*0.00%*	*2,648.08*	*25.00%*	*3,310.10*
063 WESTPORT ISLAND - TREE PLANTING	**59**	**ACR**	**124,266.97**	**20,289.78**	**0.00**	**0.00**	**11,680.19**	**0.00**	**156,236.94**	**39,059.23**	**195,296.17**
			117,321.02	*16.33%*	*5.82%*	*1.22%*	*9.97%*	*2.00%*	*158,774.43*	*25.00%*	*198,468.04*
064 WESTPORT ISLAND # 5 - POOL 25	**1**	**EA**	**117,321.02**	**19,155.68**	**6,823.84**	**1,433.01**	**11,694.47**	**2,346.42**	**158,774.43**	**39,693.61**	**198,468.04**
30 PLANNING, ENGINEERING & DESIGN	**1**	**LS**	**140,000.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**140,000.00**	**14,000.00**	**154,000.00**
301 PLANNING, ENGINEERING & DESIGN	**1**	**LS**	**140,000.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**140,000.00**	**14,000.00**	**154,000.00**
31 CONSTRUCTION MANAGEMENT	**1**	**LS**	**74,000.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**74,000.00**	**7,400.00**	**81,400.00**
311 CONSTRUCTION MANAGEMENT	**1**	**LS**	**74,000.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**74,000.00**	**7,400.00**	**81,400.00**

Labor ID: Pools25/26 EQ ID: EP03R05

Currency in US dollars

TRACES MII Version 3.0

TABLE 2. Estimate of Future OMRR&R Requirements.

OPERATION, MAINTENANCE, REPLACEMENT AND REHAB COST						Sheet 1 of 1
POOLS 25/26 ISLANDS OMR&R COST					DATE: 27 MAY 2008	
	FREQUENCY	QUANTITY	UNIT	UNIT COST	COST	
OPERATION:						
Westport Island #5 - Water Control Structure	Annual	2	EACH	$600.00	$1,200.00	
MAINTENANCE:						
Westport Island #5 - Water Control Structure	Annual	1	EACH	1,200.00	1,200.00	
Dardenne Island-Tree Maintenance, Cut undesirable trees in vicinity of planted trees. 25 Trees/Ac @ $12/tree = $300/Acre	10 Years	52	ACRE	300.00	15,600.00	
Westport Island-Tree Maintenance, Cut undesirable trees in vicinity of planted trees. 25 Trees/Ac @ $12/tree = $300/Acre	10 Years	59	ACRE	300.00	17,700.00	
REPLACEMENT COST						
Dardenne Island - Tree replacement at Year 5 replace 5% of all seedlings at year 5 only	At Year 5	3	ACRE	2,500.00	7,500.00	
Westport Island - Tree replacement at Year 5 replace 5% of all seedlings at year 5 only	At Year 5	3	ACRE	2,500.00	7,500.00	
REHABILITATION COST						
Westport Island #5 - Water Control Structure	25 Years	1	EACH	20,000.00	20,000.00	

TABLE 3

ECONOMIC AND FINANCIAL DATA
RECOMMENDED PLAN
(All costs in thousands of dollars)

a. Estimated Implementation Costs:
(May-08 price level)

Federal	$998,476
Non-Federal	
LEERD	$0
Cash	$0
Total	$998,476

b. Economic Data:
(4-7/8%, 50 year life)

Annual Charges	$59,499
(Includes $5,859 OM&R; Fed OM&R = $ 0)	
Annual Benefits:	50.8 AAHU
BCR:	N/A

d. Allocations to Date:	Federal	Non-Federal
Planning and Design Analysis	$754,000	$0

e. Remaining Requirements:

Planning and Design Analysis	$0	$0
Finalize Plans and Specifications	$77,000	$0
Construction	$998,476	$0
Total	$1,075,476	$0

f. Total Allocations:	$1,829,476	$0

US Army Corps
of Engineers®
St. Louis District

Pools 25 and 26 Islands
Mississppi River Navigation Pools 25 and 25
St. Charles, Lincoln, and Pike Counties, Missouri

Habitat Rehabilitation and Enhancement Project, Upper Mississippi River System-Environmental Management Program

Environmental Assessment with Draft Finding of No Significant Impact and Section 404(b)(1) Evaluation Report

December 2007

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Environmental Assessment with Draft Finding of No Significant Impact

Pools 25 and 26 Islands
Mississippi River Navigation Pools 25 and 26
St. Charles, Lincoln, and Pike Counties, Missouri

Habitat Rehabilitation and Enhancement Project
Upper Mississippi River System-Environmental Management Program

I. Introduction

This Environmental Assessment (EA) has been prepared by the St. Louis District in accordance with the National Environmental Policy Act. This document describes potential environmental, economic, and social impacts associated with the proposed recommended plan and other alternatives considered for the Pools 25 & 26 Islands Habitat Rehabilitation and Enhancement Project. This EA also includes a Biological Assessment prepared in accordance with the Endangered Species Act.

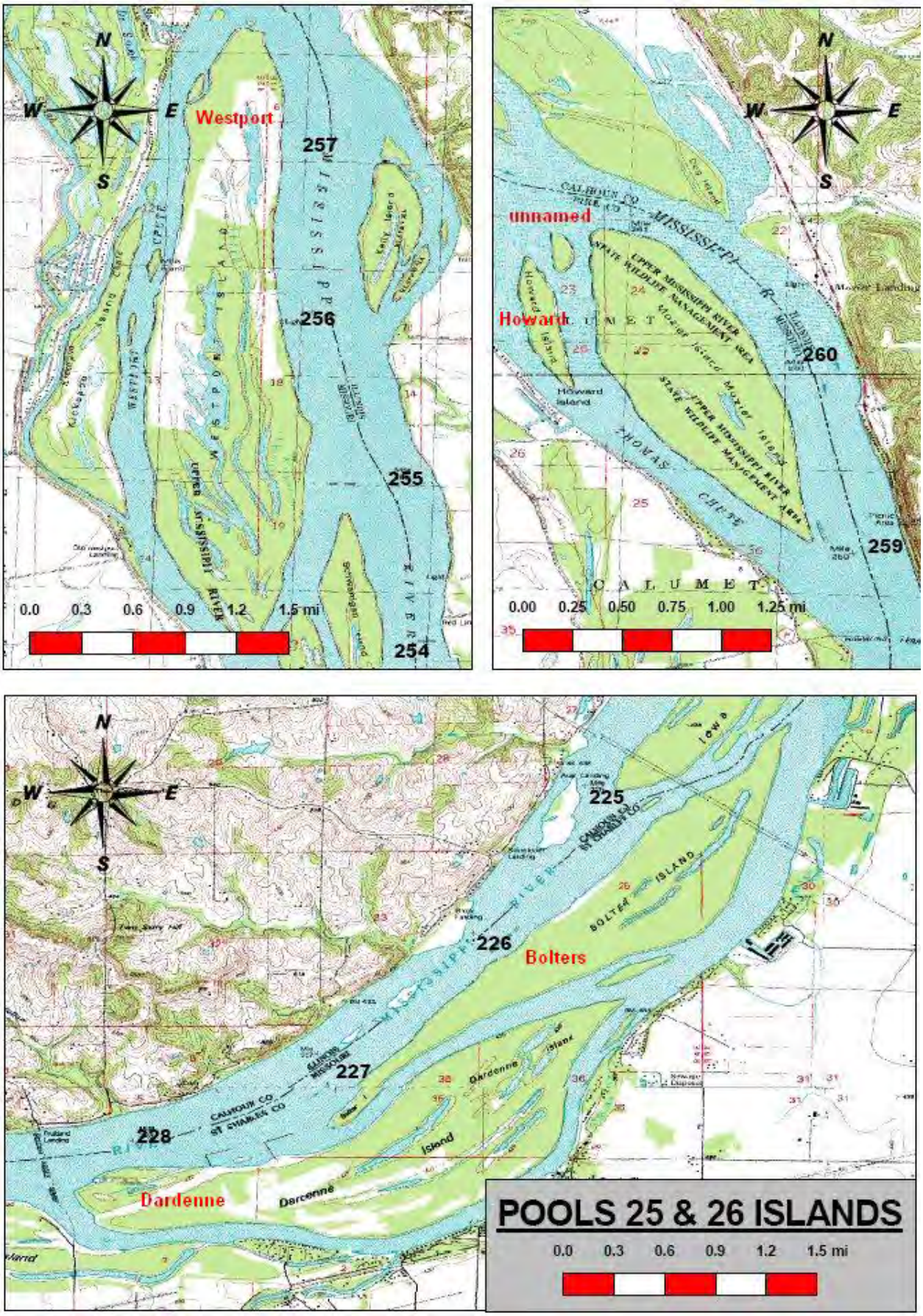
A. Project Location Five islands comprise this project area (Howard, an unnamed island next to Howard, Westport, Dardenne, and Bolter), and they are located in Mississippi River Pools 25 and 26 between river miles 224 and 261. The islands are owned by the Corps of Engineers and managed for fish and wildlife purposes by the Missouri Department of Conservation through a cooperative agreement. Howard Island and the unnamed island next to it are in Pool 25 in Pike County, Missouri, and they are about four miles east of Annada. Westport Island, also in Pool 25, is in Lincoln County, Missouri, and it is about five miles east of Elsberry. Dardenne and Bolter Islands are located to the south in Pool 26 in St. Charles County, Missouri, and these two islands are about five miles north of St. Peters (FIGURE EA-1 and FIGURE EA-2).

B. Project Authority This project has been conducted under the authority of the Habitat Rehabilitation and Enhancement Project (HREP) component of the Upper Mississippi River System-Environmental Management Program. Initial authorization and appropriations for the Environmental Management Program were provided on August 15, 1985 by the Supplemental Appropriations Bill (PL 99-88). A more comprehensive authorization was provided by Section 1103 of the Water Resources Development Act (WRDA) of 1986 (PL 99-662). Subsequent WRDA language of 1992, 1996, and 1999 further modified the authorization.

C. Need for Proposed Action, Project Purpose and Objectives Habitats of the Upper Mississippi River System have declined over the last two centuries. Floodplain forests have been substantially reduced in spatial extent and suffered losses in tree species diversity. Aquatic and riverine habitats have also declined due to river and floodplain development, and alteration of natural hydrological regimes, flow patterns, and disturbance dynamics. The purpose of the proposed work is to improve conditions of aquatic and terrestrial habitats on islands in Pools 25 and 26 of the Upper Mississippi River. Planning objectives include 1) increasing the spatial extent of the oak-hickory community in floodplain forests, 2) restoring and maintaining connections between the river and adjacent backwater habitats, 3) creating and maintaining deepwater habitat in backwater areas, and 4) maintaining islands.

FIGURE EA- 1. Project Vicinity

FIGURE EA- 2. Project Area's Islands



II. Project Measures, Alternatives, and Recommended Plan

A team of biologists from the U.S. Fish and Wildlife Service, Missouri Department of Conservation, and St. Louis District developed a total of eight features or measures to address the habitat objectives (TABLE EA-1). Nine separate alternatives were evaluated in detail, and they consist of unique combinations of these eight measures (TABLE EA-2). A no-action alternative was included in the evaluation, under which no improvements would be made to terrestrial and aquatic habitats of the targeted islands.

TABLE EA- 1. Description of proposed measures.

Measure	Island	Objective Addressed	Description of Measure
A	Westport	1	• plant oak-hickory tree seedlings in abandoned cropland at elevations where they naturally regenerate (440 feet NGVD)
B	Dardenne	1	• plant oak-hickory tree seedlings in abandoned cropland at elevations where they naturally regenerate (428 feet NGVD)
C	Bolter	2, 3	• excavate/dredge an island channel to restore connection to river; • excavate/dredge a deep hole in slough; • build rock structure in slough that will use river's energy during floods to maintain deep hole
D	Dardenne	3	• excavate/dredge a deep hole in side channel; • build rock structure in side channel that will use the river's energy during floods to maintain deep hole
E	Westport	3	• excavate/dredge a deep hole in slough; • build rock structure in isolated slough that will use the river's energy during floods to maintain deep hole (structure #3)
F	Westport	3	• excavate a deep hole in abandoned cropland; • build rock structure in abandoned cropland that will use the river's energy during floods to maintain deep hole (structure #6)
G	Westport	2	• excavate/dredge an island channel to restore connection to river; • install water control structure in island channel to temporarily hold water in island's interior sloughs
H	Howard & unnamed	4	• place bank revetment on upstream ends of islands to minimize erosion

TABLE EA- 2. Measures included in Recommended Plan (shaded) and other Evaluated Alternatives.

Measure	Island	Alternatives								
		No Action	1	2	3	4	5	6	7	8
A	Westport			✓	✓	✓	✓	✓	✓	✓
B	Dardenne				✓	✓	✓	✓	✓	✓
C	Bolter					✓	✓	✓	✓	✓
D	Dardenne								✓	✓
E	Westport							✓	✓	✓
F	Westport						✓	✓	✓	✓
G	Westport		✓	✓	✓	✓	✓	✓	✓	✓
H	Howard & unnamed									✓

A. Summary of Recommended Plan (Alternative 4) The recommended plan, shown in TABLE EA- 2 as Alternative 4, is summarized below and consists of making several habitat improvements at three islands. A more detailed description follows.

Westport Island (Pool 25) - Reforesting 59 acres of abandoned crop fields; removing sediments from an existing channel to improve the connection between the river and an interior slough complex; installing a water control structure in the channel;

Dardenne Island (Pool 26) - Reforesting 52 acres of abandoned crop fields;

Bolter Island(Pool 26) - Removing sediments from an existing channel to improve the connection between the river and an interior slough; creating a 0.5-acre area of deep water; constructing a rock dike structure adjacent to the deep hole.

B. Detailed Description of Recommended Plan (Alternative 4) The recommended plan is featured on drawings appended to this document. (For the digital version of this document available at http://www.mvs.usace.army.mil/pm/pm-reports.html, the maps are separate files.)

Westport Island (Pool 25)

Planting of native tree and shrub seedlings. Reforestation of 59 acres of abandoned cropland at sites with ground elevations exceeding 440 feet NGVD is proposed on this 625-acre island. Tree seedlings to be planted would consist of hard mast species such as pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), bur oak (*Quercus macrocarpa*), pecan (*Carya illinoensis*), and Schuette oak (*Quercus x schuettii*, a hybrid between swamp white and bur oak). Native shrub species such as deciduous holly (*Ilex decidua*) and green hawthorne (*Crataegus viridis*) would be planted also. Plant materials would consist of seedlings produced using a root-pruned method, placed on a 30 by 30 foot spacing (49 per acre). [Drawings G-5, C-3, and C-4]

Removal of sediment from island channel. Mechanical dredging of sediment is proposed in a portion of an existing 2,000-foot-long natural channel at the lower end of Westport Island. Sediments totaling 1,535 cubic yards would be removed from 1,000 feet of the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.7-acre disposal area (30 feet wide by 1,000 feet long) sited along the existing channel. [Drawings G-5 and C-2]

Placement of water control structure in island channel. A water control structure consisting of stop logs would be installed in the excavated channel. It is expected that this structure would be constructed off-site. [Drawings G-5 and C-2]

Permanent access road. A 1,265-foot long would be constructed to provide access to the water control structure from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric. [Drawings G-5 and C-2]

Dardenne Island (Pool 26)

Planting of native tree and shrub seedlings. Planting of tree and shrub seedlings at Dardenne Island would follow the same procedure to be used at Westport Island, except that planting sites in abandoned cropland would be in areas above 428 feet NGVD. Fifty-two acres of plantings are proposed on this 790-acre island. [Drawings G-4, C-3, and C-4]

Bolter Island (Pool 26)

Removal of sediment from island channel. Similar to Westport Island, mechanical dredging of sediment from an existing 1,250-foot-long natural channel at the lower end of Bolter Island (560 acres) is proposed. Sediments totaling 1,900 cubic yards would be removed from the channel to provide an additional

three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.85-acre disposal area (30 feet wide by 1,250 feet) sited along the existing channel. [Drawings G-3 and C-1]

Construction of rock dike structure and excavation of deep hole in island slough. A rock dike structure is proposed to be constructed in an interior slough at the lower end of the island, and a deep hole is proposed to be excavated immediately adjacent to the dike. The rock dike structure would be U-shaped and would consist of 165 tons of graded B stone. Sediments totaling 2,900 cubic yards would be mechanically excavated to a depth of eight feet in a 0.5 acre U-shaped area having a 13-foot wide bottom. Excavated sediments would be placed along either bank of the slough in two disposal areas measuring about 200 by 300 feet each. [Drawings G-3 and C-1]

Temporary access road. A 515-foot long road would be constructed to provide access to the natural channel and interior slough from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric. [Drawings G-3 and C-1]

III. Description of Existing Environment

A. Topography and Soils The project area's islands lie in the Mississippi River floodplain. These islands are all low, vegetated sedimentary islands. The following table displays the area and ground elevations of the five islands within the project area. Normal elevation of Pool 25 is 434 feet NGVD. Normal elevation of Pool 26 is 419 feet NGVD. The islands exhibit ridge and swale topography. Most of the natural slopes on these islands are less than two percent. The soil surveys for Pike, Lincoln, and St. Charles Counties describe the soils on these islands as alluvial materials consisting of silty clay loams. Howard Island and the unnamed island between it and Mozier Island in Pool 25 are currently experiencing bankline erosion at the upstream end of these islands. This wind-wave erosion is a natural process. Such erosion has not been observed at the other islands in the project area.

Pool	Name of Island	Area (acres)	Range of Ground Elevation (feet NGVD)
25	Howard	43	435 – 440
25	(unnamed)	8	435 – 440
25	Westport	625	435 – 445
26	Dardenne	790	420 – 430
26	Bolter	560	420 – 430

B. Land Cover Forest is the dominant land cover on these islands. Old agricultural fields and water are the other notable types.

C. Socioeconomic Resources The only socioeconomic resource that exists on these islands is a power transmission line that crosses the lower end of Bolter Island. A relatively small amount of commercial fishing occurs in Pools 25 and 26 in the vicinity of the project area's islands. The navigation channel of the Mississippi River supports the navigation industry. Businesses such as recreational marinas and boat clubs that are related to small-boat recreation on Pools 25 and 26 are located along the river's edge in the general vicinity of the project area's islands, as are some private residences.

D. Prime Farmland No farmland currently exists on these islands. Prior to 1993, some lands on Westport and Dardenne Islands (189 and 118 acres, respectively) were cropped by the Missouri Department of Conservation for wildlife purposes, but this activity was terminated after the flood of that year.

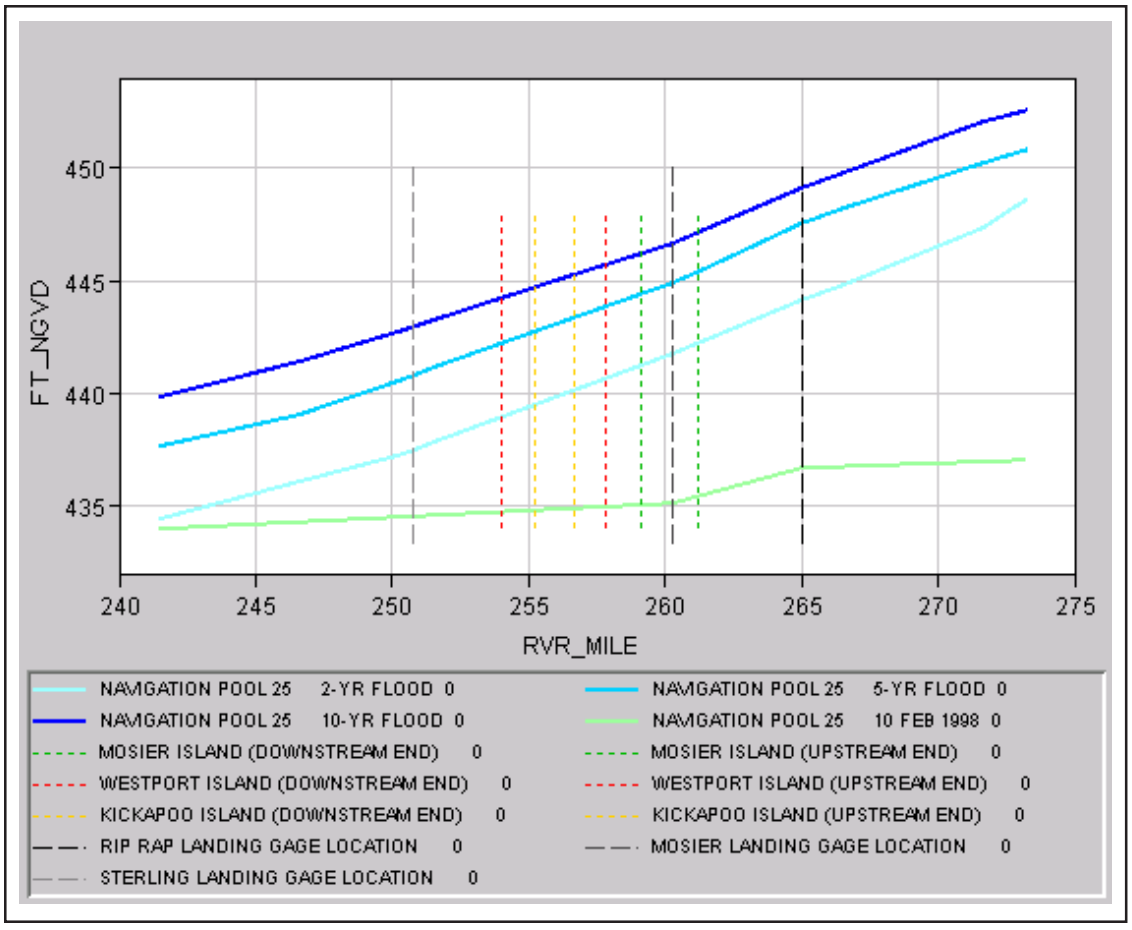
E. Hydrologic Conditions Pools 25 and 26 are part of the navigation system of the Mississippi River. The navigation dams within the St. Louis District are regulated for the purpose of creating pools to provide a

nine-foot depth navigation channel. Land subject to inundation as the result of operation of the navigation dams (such as the project area's islands) was purchased by the Federal government before project operation began. Lock & Dam 25 is located between Mississippi River miles 241 and 242, measured upstream of the mouth of the Ohio River. The drainage area upstream of this structure is about 142,000 square miles. Locks & Dam 26, also known as Melvin Price Locks & Dam, is located between Mississippi River miles 200 and 201, and the drainage area upstream of this structure is about 171,500 square miles.

The mid-pool control point method is used to regulate the navigation pools within the District. The river stage at the mid-pool control point is maintained within the hydraulic regulation limits specified in the water control plan, which is a detailed set of rules and guidelines by which the body of water formed by a hydraulic structure is regulated. In order to maintain the stage at the mid-pool control point within the hydraulic regulation limits, the water-surface elevation at the dam is varied by adjusting the gate openings in response to changes in the flow rate in the river. Medium- to high-flow conditions necessitate low water-surface elevations at the dam. Low-flow conditions necessitate high elevations at the dam. Maintaining the stage at the mid-pool control point within the hydraulic regulation limits assures that adequate navigation depths are maintained throughout the pool (assuming that the river bed has been maintained adequately), and assures that water is only on land purchased for the navigation pools. When flow conditions are such that the nine-foot depth occurs naturally throughout the pool, the gates are taken out of the water. When the gates are out of the water, open-river conditions exist.

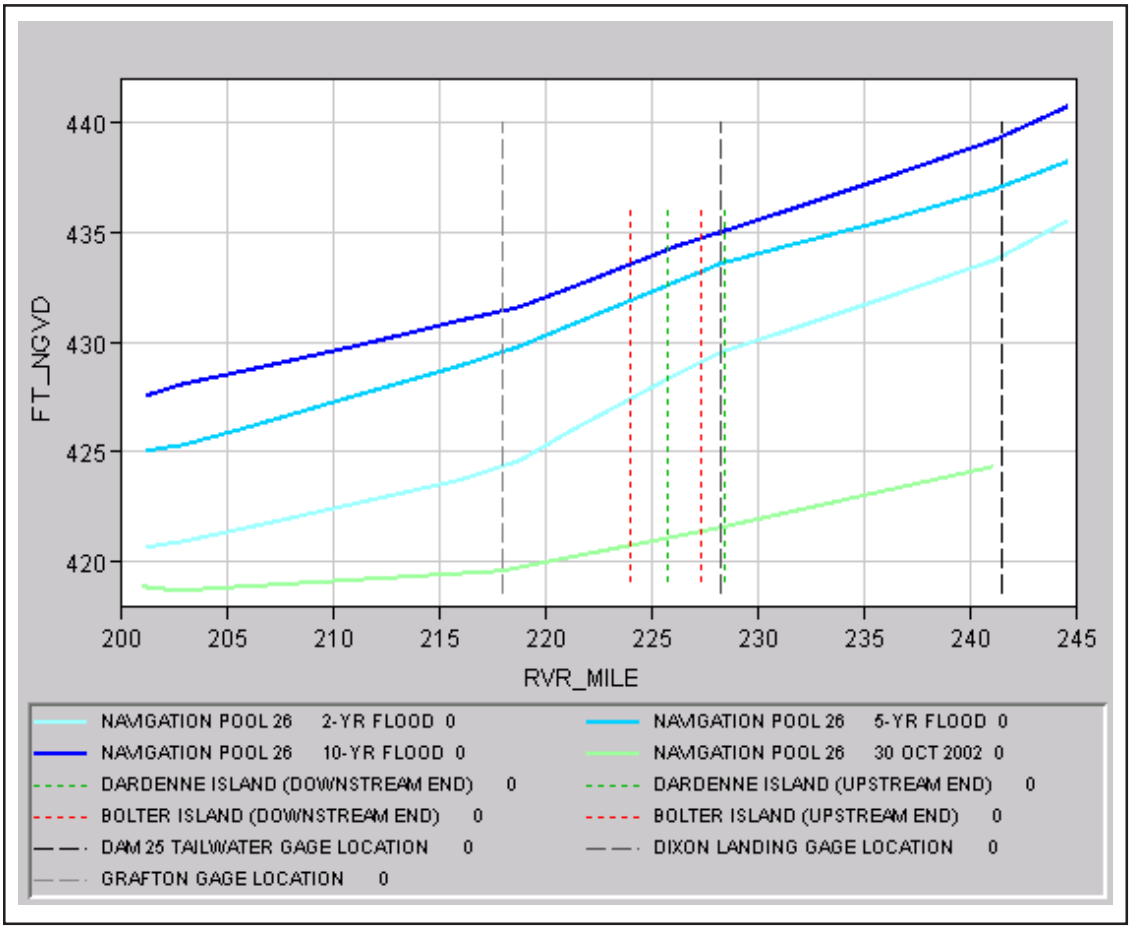
Water-surface profiles for the 2-, 5-, and 10-year frequency flood events in Pool 25 in the vicinity of Mozier and Westport Islands are given in FIGURE EA-3. Hydraulic data for these profiles were taken from USACE (2004a). If or when any of these three frequency flood events would occur, open-river conditions would be in existence at Lock & Dam 25.

FIGURE EA- 3. Pool 25 Hydraulic, Island and Gage Data



Water-surface profiles for the 2-, 5-, and 10-year frequency flood events from Pool 26 in the vicinity of Dardenne and Bolter Islands are given in FIGURE EA-4. Hydraulic data for these profiles were taken from the same U.S. Army Corps of Engineers report cited previously. If or when any of these three frequency flood events would occur, open-river conditions would be in existence at Melvin Price Locks & Dam.

FIGURE EA- 4. Pool 26 Hydraulic, Island and Gage Data



F. Surface Water Resources The major surface water resource in the vicinity of the project area is the Mississippi River. On the islands, the primary surface water resource is sloughs or lake-like bodies of water located on the larger islands. These sloughs would be considered as “water” in terms of a landcover type. Westport Island has about 86 acres of sloughs, including a 74-acre complex of interconnected sloughs located at the lower end of the island. Dardenne Island has several sloughs totaling about 20 acres, Bolter Island has a single slough with a surface area of about 13 acres, and these waterbodies occur on the lower half of these islands.

G. Ground Water Resources Given that the project area’s islands are surrounded by the Mississippi River, ground water occurs on these islands not far below the ground surface. Ground water levels fluctuate with daily and seasonal changes in the river’s elevation. Perched ground water tables are likely to occur in the vicinity of the islands’ sloughs. Ground water on these islands is not used for any purpose.

H. Hazardous, Toxic, and Radioactive Waste An environmental baseline study of the project area’s islands was conducted by the St. Louis District in April 2006 to determine if any hazardous, toxic, or radioactive waste was ever stored, released or disposed of on these properties. A site visit, interviews, and record review did not reveal any evidence of such wastes.

I. Biological Resources The following information about the project area's biological resources is presented under these topics: terrestrial and aquatic habitats, wetlands, refuges, and fish and wildlife species.

1. Terrestrial and Aquatic Habitats The diversity of habitat types on the project area's islands is not high. The main habitat types include bottomland forest and interior sloughs surrounded by this forest. The floodplain forest is composed mainly of soft-seeded tree species such as silver maple, willow, cottonwood, elm, green ash, and hackberry. As a group, these tree species are regenerating successfully. Hard mast tree species such as oaks and hickories are not common, although they once were typical of higher elevations on this and other large Mississippi River islands. Because of the ridge and swale topography common to these islands, stands of hard mast species are usually relatively narrow and linear. Scattered pecans and pin oaks can be found on Westport and Dardenne Islands at higher elevations (440 feet NGVD on Westport, 428 feet NGVD on Dardenne, as determined from site surveys), but at low densities.

Natural regeneration of hard-mast tree species on Westport and Dardenne Islands does not appear to be sufficient to maintain local populations. Besides low numbers of individuals serving as a seed source, other factors related to difficulty in hard-mast tree regeneration include intense competition with fast-growing light-seeded tree species and herbaceous ground cover, slow growth of hard mast seedlings, and flooding and deer herbivory. The flood of 1993 completely inundated the project area's islands for several months, and caused extensive mortality to many tree species. Since then, silver maple has become much more abundant in many floodplain areas, especially at lower elevations.

Erosion occurring at the upstream ends of Howard Island and the unnamed island between it and Mozier Island in Pool 25 is leading to a slow loss of these two islands, with a resulting decrease in mature light-seeded bottomland forest.

The sloughs are classified as "isolated floodplain lake – abandoned channel lake" aquatic habitats (Wilcox 1996), indicating that they normally are not connected to the Mississippi River, except during elevated river stages. These sloughs are usually long and linear and support no aquatic or emergent herbaceous vegetation. At normal pool, water depths average only two to three feet. Areas of greater water depth do not exist. Some sloughs are permanent, whereas a few others dry up during the summer. Water surface elevation in some sloughs appears to be dependent on river stage. The bottom consists of soft sediment. The prolonged flood of 1993 apparently deposited a significant amount of sediment in these sloughs (as well as surrounding forests). Along the margins of these sloughs where the water is shallow, shrub swamps comprised principally of buttonbush (*Cephalanthus occidentalis*) often occur.

Minor terrestrial habitats on these islands include old crop fields on Westport and Dardenne Islands, which were abandoned after the flood of 1993. Since then these crop fields have experienced encroachment by light-seeded tree species, and the process of natural succession to bottomland forest is underway. To counteract this process, the Missouri Department of Conservation (MDC) has attempted to prevent the establishment of woody growth by periodic mowing. In these same areas MDC has also tried to establish a grassy groundcover, with the intent that these old fields would eventually be planted with more desirable species for reforestation. Another minor terrestrial habitat is a forest clearing across Bolter Island along a right of way for a power transmission line, where herbaceous and brushy vegetation occurs. Among minor aquatic habitats are a small side channel ("tertiary side channel"; Wilcox, 1996) at the upstream end of Dardenne Island, much of which has filled in with sediments. A second minor aquatic habitat is a narrow natural channel within the forest on both Westport and Bolter Islands that periodically connects interior sloughs with the river. A portion of each of these natural channels has become choked with accumulated sediments.

2. Wetlands The Corps of Engineers methodology to define and delineate wetlands requires positive indicators for wetland vegetation, soils, and hydrology (USACE-EL 1987). Wetlands subject to Section 404 of the Clean Water Act include essentially all of Howard Island, the unnamed island between Howard and Mozier Islands, Dardenne Island, and Bolter Island. This includes essentially all forest on these islands as

well as all sloughs. On Westport Island, much of the bottomland forest is not considered wetlands because most of the soil identified there by the Natural Resources Conservation Service is classified as not hydric soil. However, there are some low areas of bottomland forest on Westport Island that are supported by hydric soils, and these are wetlands, as are the sloughs.

3. Refuges Westport Island Natural Area envelops about 480 acres of the lower half of Westport Island, and was established in 1984 to protect a large undisturbed area of old-growth wet and wet-mesic bottomland forest along with sloughs and shrub swamps. Only minimal man-made alterations are allowed in the natural area.

4. Fish and Wildlife Species The project area's islands are located in the Upper Mississippi Conservation Area, a management unit designated by the Missouri Department of Conservation (MDC) that extends from La Grange (Pool 21) to Alton (Pool 26). They are owned by the Corps of Engineers and leased to MDC by the U.S. Fish and Wildlife Service. The principle objective of the Upper Mississippi Conservation Area is to provide optimum habitat for wetland wildlife species. Numerous wildlife species representing birds, mammals, reptiles, and amphibians use the bottomland forests and interior sloughs on these islands as their habitats, either as year round residents or seasonal migrants.

The Mississippi River and floodplain is the center of one of the major flight corridors in North America for migrating birds. Numerous ducks and geese stop during fall and spring to rest, feed and seek sanctuary in wetlands, deepwater habitats and the adjacent floodplain of Pools 25 and 26 (Havera, 1985). In addition to waterfowl, shorebirds, herons, egrets, song birds, and hawks also use these islands as migratory or nesting habitat. The most common game birds, in addition to waterfowl, are the wild turkey, mourning dove, bobwhite quail, American woodcock and crow. Mammals that most likely use the islands include opossum, raccoon, muskrat, mink, fox, beaver, squirrel, cottontail rabbit, white-tailed deer and a variety of bats and mice. These islands are also home to a variety of turtles, snakes, skinks, frogs and toads. Bottomland forest serves as habitat for many of these wildlife species. The hard-mast or nut bearing tree component of these forests provides an important food source to animals such as the white-tailed deer, turkey, squirrels, wood duck, mallard, and pileated woodpecker.

A diverse fish fauna comprised of about 100 species is found in Pools 25 and 26 (Colbert et al., 1975; Sheehan et al., 1990). The five most diverse families are minnows, suckers, sunfishes, perches and darters, and catfishes. Fish obtained commercially include buffalo, channel catfish, carp, flathead catfish, freshwater drum, blue catfish, and carpsucker. Many of these fishes prefer to spawn in backwater or side channel habitats where the current is slow and bottom is muddy or silty. Sunfishes generally prefer to spawn in backwaters and use these areas as general habitat. Some species of fish, such as channel catfish and largemouth bass, are unable to tolerate the cold water temperatures and currents of channel habitats. This is especially true of young-of-the-year fish of these two species and is true to some degree for young-of-the-year fishes of nearly all species that inhabit the river (Sheehan et al., 1990). Backwaters can provide a refuge from harsh winter conditions because they generally have warmer water and little or no current. However, wintering conditions for fish in backwaters can deteriorate rapidly if ice and snow cover is of long duration. During hot summers, deep areas in backwaters can serve as thermal refuges.

Few backwaters in Pools 25 and 26 appear to be optimally suitable as overwintering habitat (Sheehan et al., 1990). The sloughs on the project area's islands are of moderate quality as spawning, rearing, and overwintering habitat for a variety of fish species. However, because of shallow water depths, the suitability of these sloughs as habitat declines in relation to the severity of seasonal extremes (hot summers, cold winters). Agency fisheries biologists recommend that a minimum of eight feet of depth is necessary to safely overwinter fish without a danger of oxygen depletion and the subsequent loss of fish life. In addition to shallow water depths, the amount of time these sloughs are connected to the Mississippi River during the year influences their value as habitat. Because sediments have accumulated in natural channels

that connect many of these sloughs to the river, such sloughs are accessible less frequently than they would be if there were no blockages.

J. Recreation Popular recreational activities in and along Pools 25 and 26 include hunting, fishing, and boating. As part of the Upper Mississippi Conservation Area, the project area's islands are managed by the Missouri Department of Conservation (MDC) to provide quality outdoor recreation experiences to as many people as possible without detrimental effects to them and the surrounding river. Hunting, trapping, fishing, camping, hiking, bird watching, and nature study are encouraged on the conservation area's lands and waters by MDC. These islands are only accessible by boat. No recreational facilities are located on any of them.

K. Aesthetics The project area's islands and the surrounding Mississippi River floodplain are generally rural in nature. Forest is a conspicuous feature on the river's islands, along many reaches of the river's banks, and on the adjacent floodplain. Some existing residential and light commercial development (marinas) is situated on cleared areas along the river's banks in both Missouri and Illinois. Much of this development is scattered, and appears to be experiencing little to no growth. Agriculture is the predominant activity on the adjacent floodplain.

L. Historic Properties The proposed project area includes a total of five islands whose ground surface may be characterized as poorly drained, low–lying floodplain. After rainfall events, much of the ground surface can be covered with ponded or perched water. Inspection of soil series maps revealed that virtually the entire project area is comprised of heavy, lacustrian clays. Prior to the construction of the Mississippi River navigation pools during the first half of the twentieth century, this area consisted of a series of low natural levees separated by numerous water-filled shallow swales. The wet, poorly drained natural of these area would have been less than ideal conditions for prehistoric or early historic period occupations. Ground cover across the natural levees consisted of flood plain forests. Following completion of the Mississippi River Pools, sedimentation gradually filled in the former swales and deposited a thick layer (in excess of 1 meter) of this material across the floor of the terrestrial forests. It is unlikely that any presently unknown, potentially significant archaeological remains are located within the limits of the project area. However, in the unlikely event that such remains are present, those remains would be deeply buried beneath at least 1 meter of recently deposited sediment.

M. Air Quality Of the six criteria pollutants addressed in the National Ambient Air Quality Standards, the St. Louis metropolitan region is currently in attainment for sulfur dioxide, carbon monoxide, lead, and nitrogen dioxide, but not for particulate matter or ozone. The St. Louis area is currently designated by the U.S. Environmental Protection Agency (USEPA) as not meeting the fine particle standard (PM-2.5), and this includes St. Charles County (USEPA 2006a). The St. Louis area is also designated by the USEPA as not meeting the eight-hour ozone standard, and levels of this pollutant are classified as moderate; the nonattainment area includes St. Charles County (USEPA 2006b). Pike and Lincoln Counties in Missouri are in compliance with all of the six criteria pollutants.

N. Noise As the project area's islands are located either at a distance or on the periphery of the St. Louis metropolitan area in a rural setting, noise is comparatively minimal. The main source of noise comes from watercraft on the river, including the towing industry and recreational vessels. Compared to watercraft, land-based transportation noise from railroads, major highways, and secondary roads is very minimal.

IV. Future Without Project (No Action)

The Corps consideration of the future requires the forecasting of conditions without any project. A 50-year planning horizon was used. A number of assumptions were made about what the project area and vicinity would be like 50 years in the future without any project. One chief assumption was that water levels in Pools 25 and 26 would continue to be managed at the locks and dams as they are now, and that there would be no change in normal pool elevation.

Floodplain forests along the Mississippi and Illinois Rivers of the Upper Mississippi River System (UMRS) are currently declining in spatial extent and in species diversity (Urich et al. 2002). As of 1989, UMRS floodplain forests consisted of a variety of major community types, including mixed-silver maple (about 80%), oak-hickory (10%), willow and cottonwood (5% combined), and shrub, plantation, and swamp cypress (5% combined) (USGS 1999). The oak-hickory communities have experienced significant system-wide spatial losses since settlement (USGS 1999, Urich et al. 2002). These hard-mast dominated forests are not distributed evenly along the floodplain from north to south. In Pool 26, they represent about 10% (roughly 2,000 acres) of the total forest, whereas in Pool 25, oak-hickory communities are not found (USGS 1999). Planting of mast tree species in suitable sites is recommended to sustain this important natural resource (Urich et al. 2002).

Without active planting at suitable elevations, existing mast tree populations on the project area's islands are not expected to sustain themselves in the long term. A variety of light-seeded tree species such as silver maple, cottonwood and willow are expected to reforest areas of abandoned cropland over the next 50 years, including sites of suitable elevation for hard-mast plantings.

Aquatic habitats of the UMRS have also changed since historic times due to construction of the locks and dams as well as levees, regulation of water levels in the pools, maintenance of the navigation channel, and development of the floodplain. The deposition of suspended sediments in off-channel habitats has degraded backwaters and side channels by reducing water depths, and this has led to an overall decline in aquatic habitat diversity (USGS 1999). To maintain a sustainable aquatic ecosystem, habitat needs have been identified for the reach of the Mississippi River that includes Pools 25 and 26. These needs include, among other items, the creation or restoration of backwaters, specifically 5,000 acres of isolated backwater habitat in Pools 14-26 (USACE, 2000a), much like the sloughs on the project area's islands. USACE (2000a) also calls for the creation or restoration of 3,000 acres of island habitat in this same river reach.

Recent sedimentation rates in backwater areas of Pools 25 and 26 are estimated to be about 0.3 centimeters per year (about 0.1 inch) (WEST Consultants, Inc. 2000a). Assuming this rate over the next 50 years, about 15 centimeters (six inches) of additional sediments are expected to accumulate in the sloughs of the project area's islands. Average water depth in these sloughs would decline to about 1.5 to 2.5 feet. These sloughs would function in the future less often as suitable fish spawning, rearing, and overwintering habitat, and would be expected to be more likely to experience winter and/or summer fish mortality due to oxygen depletion.

Wind and wave erosion of the unstable islands in the project area (Howard Island and the unnamed island) is expected to continue. The net change in area of these islands projected over the next 50 years is estimated to be a loss of one percent. Estimates of overall island area change for Pools 25 and 26 are +2% and 0%, respectively (WEST Consultants, Inc. 2000a).

V. Environmental Effects of the Alternatives Considered and Recommended Plan

The probable environmental, social, and economic effects of the recommended plan and other action alternatives that were considered in detail are described below, and summarized in TABLE EA-3. The table also reflects the effect of the no-action alternative (doing nothing). These effects are forecasts of conditions over the next 50 years.

A. Topography and Soils None of the action alternatives would create significant changes to topography or soils on the project area's islands. The recommended plan (Alternative 4) would create a 0.5-acre deep hole in the slough on Bolter Island, and Alternatives 5-8 would create one to three additional deep holes of similar size on Westport and Dardenne Islands. Erosion control measures would be implemented to stabilize mechanically dredged sediments removed from the natural channels on Westport and Bolter Islands, and from the sloughs and small sidechannel on Westport and Dardenne Islands. These measures would consist of seeding of stockpiled sediments with quick-germinating grasses, and placement of silt fences around the

TABLE EA-3. Summary of probable impacts of the No Action and eight Action Alternatives. Recommended plan (shaded), 0 no change, + beneficial effect, - adverse effect, * temporary effect

Impacts	ALTERNATIVES								
	NO ACTION	1	2	3	4	5	6	7	8
ENVIRONMENTAL									
Terrestrial Resources	0	0	+	++	++	++	++	++	+++
Wetland Resources	0	+	+	++	+++	+++	+++	+++	+++
Aquatic Resources	0	+	+	+	++	++	++	+++	+++
T & E Species	0	0	0	0	0	0	0	0	0
Topography and Soils	0	0	0	0	0	0	0	0	0
Hydrology	0	+	+	+	++	++	++	++	++
Water Quality	0	-*	-*	-*	--*	--*	--*	--*	---*
Climate	0	0	0	0	0	0	0	0	0
Erosion and Sedimentation	0	0	0	0	0	0	0	0	+
Air Quality	0	-*	-*	-*	--*	--*	--*	--*	---*
Noise	0	-*	-*	-*	--*	--*	--*	--*	---*
Hazardous and Toxic Materials	0	0	0	0	0	0	0	0	0
Agricultural Resources	0	0	0	0	0	0	0	0	0
SOCIAL									
Land Use	0	0	0	0	0	0	0	0	0
Cultural Resources	0	0	0	0	0	0	0	0	0
Environmental Justice	0	0	0	0	0	0	0	0	0
Flood Damage Reduction	0	0	0	0	0	0	0	0	0
Aesthetics	0	-*	-*	-*	--*	--*	--*	--*	---*
Public Facilities	0	0	0	0	0	0	0	0	0
Public Services	0	0	0	0	0	0	0	0	0
Safety	0	0	0	0	0	0	0	0	0
Recreation	0	0	+	+	++	++	++	+++	+++
ECONOMIC									
Employment	0	+*	+*	+*	++*	++*	++*	++*	+++*
Tax Values	0	0	0	0	0	0	0	0	0
Property Values	0	0	0	0	0	0	0	0	0
Community Cohesion	0	0	0	0	0	0	0	0	0
Displacement of People	0	0	0	0	0	0	0	0	0
Displacement of Businesses	0	0	0	0	0	0	0	0	0
Disrupt of Comm. Growth	0	0	0	0	0	0	0	0	0
Disrupt of Regional Growth	0	0	0	0	0	0	0	0	0
Operations and Maintenance	0	-	--	--	---	---	---	---	---

perimeter of disposal sites. Areas where barren ground surfaces are created would be seeded with a mixture of grasses and returned to pre-project conditions.

B. Land Cover No significant changes to land cover on the project area's islands are expected. Without any project, the 307 acres of abandoned cropland on Westport and Dardenne Islands are expected to undergo natural succession and become forest. Alternatives 2-8 would facilitate this process by planting hard mast tree species on higher elevations. Alternatives 1-8 would involve relatively small amounts of tree clearing (up to about 10 acres) to facilitate construction. The recommended plan (Alternative 4) would require about 5 acres of tree clearing.

C. Socioeconomic Resources The recommended plan and other alternatives would not adversely affect any local socioeconomic resources, including land use, public facilities or services, private property, or nearby communities or businesses. Temporary benefits in employment would be expected because of the short-term construction activities associated with Alternatives 1-8. Operations and maintenance activities are associated with each of the action alternatives, including the recommended plan. These activities require funding and would be needed over the 50-year life of the project. They include items such as periodic operation of the water control structure on Westport Island, periodic removal of competing vegetation from the immediate vicinity of planted seedlings, periodic removal of woody debris from sloughs at the junction with natural channels that connect them to the river, and eventual replacement of the water control structure on Westport Island. These costs would be the responsibility of the project's non-Federal sponsor, the Missouri Department of Conservation.

D. Prime Farmland No prime farmland would be affected by the recommended plan or any of the other alternatives that were considered.

E. Hydrologic Conditions None of the action alternatives would adversely affect hydrologic conditions in Pools 25 and 26. Alternatives 1-8 would improve the natural hydrologic connection between the Mississippi River and the slough complex on Westport Island by removing accumulated sediments from the connecting channel, and Alternatives 4-8 would also improve the connection between the river and single slough on Bolter Island. During sediment removal from these connections, the affected area would be reshaped to form a narrow channel designed to convey flow to and from the slough at velocities high enough to minimize redeposition of sediments. With regard to the water control structure on Westport Island (Alternatives 1-8), this structure would be kept open most of the time, but would be closed periodically when the river is elevated (below a 5-year event) to hold water in the island's slough complex once the river recedes. With this structure closed, maximum ponding elevation for this slough complex would be about 435 feet NGVD. The rock dike structures of Alternatives 4-8, proposed at Westport Island or Bolter Island to maintain depth in the deep hole, are designed to be overtopped by about a 5-year event on the Mississippi River.

F. Surface Water Resources All of the action alternatives propose to make changes to one or more surface water resources on the project area's islands. Mechanical dredging of sediments from natural channels to improve the hydrologic connection between the Mississippi River and the slough complex on Westport Island and the single slough on Bolter Island is not expected to lead to a lowering of the water surface of these sloughs, because normal surface elevation of these waterbodies is about equal to the normal pool (river) elevation. For the same reason, creation of a deep hole in the single slough on Westport Island or Bolter Island is not expected to establish a more direct connection with groundwater, which could potentially lead to a lowering of the surface elevation of these waterbodies.

G. Ground Water Resources No ground water resources will be affected by any of the considered alternatives.

H. Hazardous, Toxic, and Radioactive Waste Because no HTRW sites have been identified on the project area's islands, it is unlikely that there is a potential for construction activities associated with any of the proposed action alternatives to disturb any such wastes. Mechanically dredged sediments to be removed from sloughs and natural channels are unlikely to consist of any HTRW materials, because these sediments have been deposited over time by reoccurring Mississippi River floods.

I. Biological Resources The following information about the project area's biological resources is presented under these topics: terrestrial and aquatic habitats, wetlands, refuges, and fish and wildlife species.

1. Terrestrial and Aquatic Habitats Alternatives 2-8 would improve terrestrial habitat on the project area's islands by reforesting 110 of the 307 acres of abandoned cropland on Westport and Dardenne Islands with various hard-mast tree species. A few species of native shrub species would also be planted to add diversity to the restored forest community. All available high ground occurring in these abandoned crop

fields would be planted. Elevations at these planting sites correspond to those where scattered remnant hard-mast trees exist in adjacent forest. Seedlings to be planted, produced in a nursery by a root-pruned method, are capable of bearing nuts in the field when they reach 5 to 10 years of age. These plantings would be vital in restoring the important oak-hickory communities currently lacking in the floodplain forest on these islands, and which are also underrepresented in Pools 25 and 26. Tree species diversity would be restored, which otherwise would not occur through natural succession.

Prior to planting, minor clearing of woody encroachment by light-seeded tree saplings is expected at some planting sites. Also, some tree clearing would be necessary for other construction activities associated with Alternatives 1-8, and this would affect forested wetlands. These impacts are described below under the heading for wetlands. These tree clearing impacts are not reflected in TABLE EA-3.

Alternative 8 (only) would halt the terrestrial erosion and loss of land at Howard Island and the unnamed island near it. Protection to the island afforded by bank stabilization activities would preserve an estimated 0.5 acre of floodplain forest over the next 50 years. Access to Bolter Island (Alternatives 4-8) would involve construction of a temporary crushed stone road in the existing forest clearing under the power transmission line.

Alternatives 1-8 would counteract the effects of continuing sedimentation in aquatic habitats on Westport or Bolter Islands by enhancing the connectivity of island sloughs with the Mississippi River, or by creating 0.5-acre deep holes on Westport, Dardenne, or Bolter Islands. Periodic operation (closure) of the water control structure on Westport Island (Alternatives 1-8) would hold the water level in the 72-acre slough complex in a perched condition while the river is falling. Closure of this structure by the Missouri Department of Conservation would likely take place in the late spring or early summer once every two to three years, and the structure would likely be reopened no later than late summer. When the structure would be closed, perched water levels in the sloughs could be about one to two feet higher than the adjacent river, depending on pool stage and the rate of river fall.

2. Wetlands The wetland impacts summarized in TABLE EA-3 for all alternatives are long-term effects, and do not reflect adverse impacts due to construction activities. Long-term effects on wetlands are expected to be beneficial, and include reforestation of 52 acres of wetlands (abandoned cropland) on Dardenne Island (Alternatives 3-8), and increased hydrologic connectivity between the Mississippi River and interior sloughs on Westport (Alternatives 1-8) and Bolter Islands (Alternatives 4-8). Abandoned cropland on Westport Island proposed for hard-mast tree planting is not considered wetland because of the absence of hydric soils in these areas.

The recommended plan (Alternative 4) is expected to adversely affect about 5.25 acres of forested wetlands. Disposal sites for mechanically dredged sediments would affect about 4.3 acres of wetlands, and access roads would affect an additional 0.85 acres. Wetlands used for disposal of dredge material would either remain forested (with material placed in between trees), or would be cleared for disposal, and trees would be allowed to grow back on the stockpiled material (which would range in depth from about 0.65 to 1.5 feet). Tree clearing for crushed stone access roads would be minimal; the road on Westport Island would be permanent, whereas the other on Bolter Island would be temporary. The planting of 52 acres of tree and shrub seedlings in wetlands (abandoned cropland) on Dardenne Island is expected to offset the temporary and permanent impacts associated with construction activities affecting these wetlands.

Additional adverse effects on wetlands are expected for Alternatives 5-8, including creation of additional dredge disposal areas in wetlands on Westport Island (probably low-lying abandoned cropland) for sediments obtained from creating a deep hole in additional sloughs as well as cropland. These adverse effects would probably involve several additional acres of wetlands.

3. Refuges Alternatives 1-8 all involve the same construction activities within the Westport Island Natural Area. These include the proposed mechanical excavation of sediments from the natural channel

linking the river with the island's interior slough complex, placement of a water control structure in this natural channel, and construction of a permanent stone access road from the river through bottomland forest to the water control structure. According to the Missouri Department of Conservation, these activities are allowable in this natural area. The proposed tree planting on Westport Island is outside of the natural area.

4. Fish and Wildlife Species Wildlife species expected to benefit from the hard-mast tree plantings once they mature on Westport (Alternatives 2-8) and Dardenne (Alternatives 3-8) Islands include those whose diet includes the acorns and nuts of various native oaks and hickories, such as deer, turkey, squirrels, and pileated woodpeckers. Waterfowl such as mallards and wood ducks are expected to occasionally feed in these planted areas also.

Aquatic species, especially riverine fishes, are expected to benefit from the removal of sediments to reopen the natural channels connecting the Mississippi River with sloughs located on Westport (Alternatives 1-8) and Bolter (Alternatives 4-8) Islands. Fishes that are expected to spawn and rear young in these sloughs include such species as all members of the sunfish family (including sport fish such as bluegill, largemouth bass, white and black crappie) and gizzard shad. Periodic closure of the water control structure on Westport Island (Alternatives 1-8) by the Missouri Department of Conservation during the late spring and early summer once every two to three years would likely prevent fish in the river from accessing the island for spawning. However, perched slough conditions during closure would provide somewhat deeper water depths for spawning fish already in the slough complex as well as young of the year using this area as a nursery.

Riverine fishes are also expected to benefit from the creation of 0.5-acre deep holes on Bolter Island (Alternatives 4-8), Westport Island (Alternatives 5-8), and Dardenne Island (Alternatives 7-8). Fish of all ages, including young of the year as well as juveniles and adults, would be expected to use these deep holes as thermal refuges during stressful periods (hot summer, cold winters). Species known to use deep areas in backwaters for overwintering include sport species (such as black crappie, white crappie, white bass, bluegill) and commercial species (such as freshwater drum), as well as gizzard shad (Sheehan et al., 1990).

K. Recreation Recreational opportunities on the project area's islands are expected to improve under Alternatives 2-8. Improved opportunities are expected in the future for hunting on Westport and Dardenne Islands (concurrent with eventual nut production from hard-mast tree plantings), and for fishing on Dardenne and Bolter Islands in the vicinity of the deep holes.

L. Aesthetics Temporary adverse effects on aesthetics are expected in the vicinity of the project area's islands under all action alternatives. The presence of land-based or water-based heavy construction equipment on the islands or adjacent river is expected to adversely affect aesthetics. The clearing of relatively small areas of trees is also expected to be an adverse effect. These effects are expected to be temporary, and last as long as equipment is onsite, or trees have grown back on dredge material disposal sites. The long-term presence of a rock dike structure on Westport, Dardenne, and Bolter Islands is expected to have a minimal adverse effect; herbaceous and woody vegetation is expected to take root on these structures and hide or screen them from view. Bank stabilization materials placed at the upstream ends of Howard Island and the unnamed islands would be very similar to those currently existing on adjacent islands, such as Mozier.

M. Historic Properties Construction activities associated with the proposed restoration and re-introduction of historically documented, native forest tree cover is unlikely to have any effect upon potentially significant archaeological remains. The highest elevations above the existing navigation normal pool level within the project area reveal that the water table will be within 1 meter of the existing modern ground surface. Previous investigations suggest that any presently unknown, potentially significant archaeological remains are buried at least 1 meter below the present ground surface. The root systems of the proposed deciduous trees (to be re-introduced across the project area) generally do not permeate saturated sediment zones.

In addition to tree planting, proposed project improvements also include removal of recent sediment from several swales to facilitate the restoration of annual wet-dry river stage cycles – required by a host of wetland vegetation species. Both the recommended tree planting and drainage improvements will require the use of heavy machinery. Despite the fact that virtually all of the proposed disturbance and staging activities will occur within the "recent deposition" levels of the project area, such earthmoving activities will be monitored on-site by a professional archaeologist to insure that no potentially significant archaeological remains are inadvertently disturbed by these activities. Therefore, it has been determined that the proposed environmental plantings should have no effect upon any potentially significant archaeological remains.

N. Air Quality All considered alternatives would have temporary adverse impacts to air quality due to construction activities. The effects would be restricted to exhaust and dust from construction activities. These impacts would cease once construction was completed. Cleared trees would be disposed of onsite rather than burned to minimize air quality impacts.

O. Noise The considered alternatives and recommended plan are not expected to significantly affect the noise levels in the study area. Noise impacts would be temporary and caused by construction activities and machinery.

VI. Relationship of the Proposed Project to Land-Use Plans

The recommended plan (Alternative 4) is consistent with the St. Louis District's Rivers Project Master Plan (dated July 2001) that addresses management of the natural, cultural and recreation resources on Federal lands and waters associated with Mississippi River Navigation Pools 25 and 26. It is also consistent with the Missouri Department of Conservation's management plans for the Upper Mississippi Conservation Area.

VII. Adverse Effect Which Cannot Be Avoided

A minor effect is the clearing of about five acres of trees to create space for the disposal of dredged sediments. Other unavoidable impacts include temporary generation of noise, dust, and exhaust by construction equipment, and temporary aesthetic impacts due to tree clearing and the presence of construction equipment.

VIII. Short-Term Use Versus Long-Term Productivity

The recommended plan's short-term use of the environment is small compared to the long-term productivity expected to be gained after implementation.

IX. Irreversible or Irretrievable Resource Commitments

Aside from the commitment of funds and labor for the formulation of alternatives and selection of a recommended plan, there would be no irreversible or irretrievable resource commitments.

X. Cumulative Impacts

The effects of the recommended plan are to be considered in light of the effects of other activities and development in the project area. The Council on Environmental Quality defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time" (40 Code of Federal Regulations, Section 1508.7).

This cumulative impacts analysis considers those past, present, and reasonably foreseeable future actions that have a similar or related purpose to that of the recommended plan (i.e. habitat restoration), or that have effects on the same resource (i.e., backwaters and hard-mast component of floodplain forest).

A. Past Actions Past actions include all development activities that have affected the Mississippi River and its floodplain in the area of Pools 25 and 26 since European settlement about two centuries ago. These activities are numerous, but the most significant actions are the construction of the navigation system, including Locks and Dams 25 and 26 in the late 1930s, and subsequent maintenance of the 9-foot channel project. Today's river environment reflects a degraded condition, and unlike the historic condition, the system has a limited ability to recreate new backwater areas, most of which are subjected to sedimentation. Over the last century large areas of floodplain forest have been cleared for agriculture and development, especially higher areas supporting hard-mast tree communities. Many remaining areas of hard mast trees have suffered from altered hydrology due to creation of the navigation pools. Cumulative environmental effects of past actions have been discussed by USGS (1999) and WEST Consultants, Inc. (2000a, 2000b). EMP-HREP projects that have been completed by the St. Louis District include Stag Island (1999, river miles 248-249.5) in Pool 25, and Dresser Island (1991, river miles 205.5-209) and Cuivre Island (1999, river miles 235-238) in Pool 26. Creation of overwintering backwater habitat was a primary purpose at Stag Island and a secondary one at Cuivre Island. Planting of hard-mast tree species was a primary objective at Cuivre Island.

B. Present Actions Batchtown and Calhoun Point are two additional EMP-HREP projects that are nearly completed. The former, located in Pool 25 (river mile 242.5-246), and the latter, in Pool 26 (219.5-223.5), will both protect backwater habitat, and creation of deepwater overwintering habitat is a focus at Calhoun Point. Planting of hard-mast tree species is an objective at both project sites.

C. Reasonably Foreseeable Future Actions Sandy Slough is a candidate EMP-HREP project in Pool 25 (river mile 241.5-245) that would restore spawning and rearing habitat in an off-channel area. Although interagency plans addressing specific localized habitat needs for fish and wildlife have yet to be developed for navigation pools 24-26, it is likely that additional future projects will be deemed necessary to address backwater degradation and the need for floodplain forest restoration in the system.

The recommended plan for the Pools 25 and 26 Islands EMP-HREP project would provide long-term benefits to a variety of riverine fishes and terrestrial wildlife using Westport, Dardenne, and Bolter Islands and environs. This plan is expected to complement similar projects at other areas in Pools 25 and 26. From a systemic approach, the recommended plan represents an incremental step in achieving pool-wide habitat needs for fish and wildlife of the Upper Mississippi River.

XI. Federally Listed Species - Biological Assessment

In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the St. Louis District requested that the U. S. Fish and Wildlife Service (USFWS) provide a listing of Federally threatened or endangered species, currently classified or proposed for classification, that may occur in the vicinity of the Pools 25 and 26 Islands project. The USFWS provided the following list of species (personal communication, Mike Thomas, Marion Illinois suboffice, March 7, 2006). The USFWS also indicated that there is no designated critical habitat in the project area at this time.

Lincoln County (Pool 25, Howard and unnamed Islands, and Westport Island):

Bald eagle *(Haliaeetus leucocephalus)* - threatened

Indiana bat *(Myotis sodalis)* - endangered

Spectaclecase mussel *(Cumberlandia monodonta)* - candidate

*S*t. Charles (Pool 26, Dardenne and Bolter Islands):

Bald eagle *(Haliaeetus leucocephalus)* - threatened

Indiana bat *(Myotis sodalis)* -endangered

Eastern massasaugu*a (Sistrurus catenatus catenatus)* - candidate

Pallid sturgeon *(Scaphirhynchus albus)* - endangered

Decurrent false aster *(Boltonia decurrens)* - *t*hreatened

Running buffalo clover *(Trifolium stoloniferum)* – endangered

Bald eagle: Bald eagles winter along the major rivers of Illinois and Missouri, and at scattered locations some remain throughout the year to breed. Perching and feeding occurs along the edge of open water, from which eagles obtain dead fish. The pooled portion of the Upper Mississippi River, including pools 25 and 26, can receive high eagle use, specifically in the vicinity of locks and dams during cold winters where the river is relatively ice free. No nesting is known to occur in the vicinity of the islands on which work is proposed.

Removal of small trees from the abandoned cropland areas for tree planting preparation, and removal of a few scattered large trees associated with channel excavation on Westport and Bolter Islands, will not affect any perching, feeding, or roosting habitat. Therefore, the project is unlikely to affect this species.

Indiana bat: Indiana bats winter in caves or mines, but none of these features occur on the islands proposed for work. Females use trees in floodplains and upland areas in the summer months as nursery roosts, and forage for insects in the tree canopy. Trees preferred for maternity roosting have included dead individuals of species having shaggy or loose bark; diameters at breast height of such trees are often greater than 10 inches. Live trees with loose bark or possessing cavities are used less often. Males have also been known to roost in similar trees.

Clearing of small trees for tree planting preparation in abandoned agricultural fields will not affect any roosting habitat. Removal of a few scattered large trees associated with channel excavation on Westport and Bolter Islands will be restricted to the colder months when maternity roosting is not known to occur (September 1 through April 30). With this restriction, the proposed project is unlikely to affect this bat.

Spectaclecase. The spectaclecase is a large mussel attaining 9 to 10 inches in length. Habitats are found in medium to large rivers with low to high gradients, and include shoals (areas of shallow water) and riffles with slow to swift currents over coarse sand and gravel. Substrates sometimes consist of mud, cobble, and boulders. The range for this species includes the middle and upper Mississippi River (Cummings and Mayer, 1992). Oesch (1995) displayed two records from the Mississippi River near Clarksville. In an assessment of the status of population viability at known locations of occurrence across its range, USFWS (undated) considered all spectaclecase populations in the Mississippi River in Illinois and Missouri to be either extirpated or “non-viable or unknown”; none were classified as having “some evidence of viability”. Habitat destruction and degradation are the chief causes of imperilment, including reservoir construction, channelization, chemical contaminants, mining, and sedimentation.

The interior slough on Bolter Island and the natural channels on Bolter and Westport Islands do not provide suitable habitat for this species. The proposed channel excavation and creation of a deep hole are not likely to adversely affect the spectaclecase mussel.

Eastern massasauga rattlesnake. This snake is recorded as occurring from St. Charles County, Missouri, on the floodplain between the river and uplands. The massasauga or swamp rattler historically lived in prairies of the Midwest, apparently in the wetter areas, and today inhabits old fields, floodplain forests, marshlands, and bogs. It

is active from April through October, and often suns on clumps of grass, in branches of small shrubs, or near crayfish burrows. It feeds on small rodents. The snake can withstand submersion in water for brief periods of time. Massasaugas breed in spring, and four to 20 young are born in late summer or early autumn.

Although suitable habitat for this snake is available, this snake is not known to occur on Bolter and Westport Islands. Therefore the proposed activities are not likely to adversely affect this species.

Pallid sturgeon: This fish is found in the Mississippi River downstream of its confluence with the Missouri River. USACE (2004b) considers its range to extend upstream to the tailwaters of the Mel Price Lock and Dam. The entire stretch of river below Mel Price Lock and Dam is considered potential habitat. Little is known of its habitat preferences. Pallid sturgeon are most frequently caught over a sand bottom, which is the predominant bottom substrate within the species' range on the Mississippi River. Pallid sturgeons have been found in water 1.2 to 7.6 meters deep with velocities of 0.33 to 90 centimeters per second (USFWS, 1993). Recent tag returns have also shown that the species may be using a range of habitats in off-channel areas, including tributaries, of the Mississippi River.

Because the pallid sturgeon is not known from Pools 25 and 26, the proposed work is unlikely to affect this species.

Decurrent false aster: The decurrent false aster is presently known from scattered localities on the floodplains of the Illinois River, and Mississippi River from its confluence with the Missouri River south to Madison County, Illinois. Its natural habitat was the shores of lakes and the banks of streams. It appears to require abundant light. Populations presently grow on stream banks and lake shores, but are more common in disturbed lowland areas where they appear to be dependent on human activity for survival (USFWS, 1990).

Because this species is not known from either Bolter or Westport Islands, the proposed project is unlikely to affect this species.

Running buffalo clover. This plant, a native clover of Missouri, is believed to have originally inhabited the ecotone between open forest and prairie in the eastern and central U.S. The species apparently depended on grazing and disturbance by large animals such as the buffalo for population viability, and partial shading also appears to have been an important component of its original habitat. Current habitats include disturbed bottomland meadows and areas with rich moist soils that are subjected to mowing, trampling, or grazing, especially disturbed areas in woodlands. Running buffalo clover is known from 24 counties in Missouri.

Because running buffalo clover is a terrestrial species, the proposed excavation in the Mississippi River is not likely to adversely affect this species. The proposed tree planting is also not likely to adversely affect this species.

Summary: Based on our evaluation, it is the St. Louis District's opinion that the proposed project will not adversely impact any of the five threatened or endangered species or two candidate species, provided that tree felling is restricted to the time of the year (September 1 through March 31) when Indiana bat maternity colonies are not present. Likewise, the action will not affect any critical habitat of these species. The USFWS will be given an opportunity to review this EA and comment on this Biological Assessment.

XII. Relationship of Plans to Environmental Laws and Regulations

Federal Laws and Policies	Compliance
Bald Eagle Protection Act, 42 USC 4151-4157	Full
Clean Air Act, 42 USC 7401-7542	Full
Clean Water Act, 33 USC 1251-1375	Partial 1/
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	Full
Endangered Species Act, 16 USC 1531-1543	Full
Farmland Protection Policy Act, 7 USC 4201-4208	Not applicable
Fish and Wildlife Coordination Act, 16 USC 661-666c	Full
Food Security Act of 1985, 7 USC varies	Full
Land and Water Conservation Fund Act, 16 USC 460d-4601	Full
National Environmental Policy Act, 42 USC 4321- 4347	Full
National Historic Preservation Act, 16 USC 470 et seq.	Partial 2/
Native American Graves Protection and Repatriation Act, 25 USC 3001 et seq.	Partial 2/
Noise Pollution and Abatement Act, 42 USC 7691-7642	Full
Resource, Conservation, and Rehabilitation Act, 42 USC 6901-6987	Full
Rivers and Harbors Appropriation Act, 33 USC 401-413	Full
Water Resources Development Acts of 1986 and 1990	Full
Floodplain Management (EO 11988 as amended by EO 12148)	Full
Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities (EO 11282 as amended by EO's 11288 and 11507)	Full
Protection and Enhancement of Environmental Quality (EO 11991)	Full
Protection and Enhancement of the Cultural Environment (EO 11593)	Full
Protection of Wetlands (EO 11990 as amended by EO 12608)	Full

Full compliance: Having met all requirements of the statute for the current stage of planning
Not applicable: Compliance with the statute not required
1/ The project requires an individual Section 404 permit and water quality certification from the Missouri Department of Natural Resources, which will be sought during review of EA.
2/ Full compliance to be achieved with the State Historic Preservation Officer's concurrence in the District's EA conclusions. If human remains are found, all laws will be followed.

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XIV. Coordination, Public Views, and Responses

Prior to the preparation of this Environmental Assessment, the proposed Pools 25 and 26 Islands project has been coordinated with the Missouri Department of Conservation, U.S. Fish and Wildlife Service (USFWS), and 21 Native American tribes, by meetings, telephone, and written correspondence. The USFWS prepared a draft Fish and Wildlife Coordination Act Report on May 12, 2006.

This Environmental Assessment and Draft Unsigned Finding of No Significant Impact are being sent to the following elected officials, agencies, organizations and individuals for review and comment. All responses will be filed with this document. To assure compliance with the National Environmental Policy Act, Endangered Species Act and other applicable environmental laws and regulations, coordination with these agencies will continue as required throughout the planning and construction phases of the proposed project.

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XV. Preparers of Environmental Assessment

Staff members of the St. Louis District responsible for preparing or contributing to this document include:

Mr. Tim George, Ecologist
Role: Plan Formulation, Habitat Evaluation, Incremental Cost Analysis, Environmental Impact Analysis, Endangered Species Assessment, 404(b)(1) assessment

Dr. Terry Norris, Archaeologist
Role: Archaeology/Historic Properties Sites Evaluation

Mr. Kip Runyon, Fisheries Biologist
Role: Plan Formulation, Habitat Evaluation, Incremental Cost Analysis, Environmental Impact Analysis

Mr. Ray Kopsky, Hydraulic Engineer
Role: Hydrology and Hydraulics

Mr. Richard Archeski, Environmental Engineer
Role: Hazardous, Toxic, and Radioactive Waste Assessment

XVI. Draft (unsigned) Finding of No Significant Impact (FONSI)

A. I have reviewed and evaluated the Environmental Assessment and other documents concerning proposed habitat rehabilitation and enhancement for the Pools 25 and 26 Islands project, conducted under the Upper Mississippi River System-Environmental Management Program. The project area's islands are located in Navigation Pools 25 and 26, St. Charles, Lincoln, and Pike Counties, Missouri.

B. As part of this evaluation, I have considered:

1. Existing resources and the no-action alternative.
2. Impacts to existing resources with all formulated plans, including the recommended plan.

C. The possible consequences of these alternatives have been studied for physical, environmental, cultural, social and economic effects, and engineering feasibility. My evaluation of significant factors has contributed to my finding:

1. The recommended action will increase the spatial extent of the oak-hickory community of floodplain forests on Westport and Dardenne Islands, will restore the natural connections between the Mississippi River and interior backwater habitats on Westport and Bolter Islands, and will create and maintain deepwater habitat in the interior slough on Bolter Island.
2. There would be no significant effects to the geology, groundwater, or topography of the project area.
3. Inducement of development in the flood plain would not result from this recommended action.
4. No impacts are expected to the floodway of the Mississippi River.
5. Federally listed endangered, threatened, or candidate species would not be adversely impacted.
6. There would be no adverse impacts to cultural resources.
7. There would be no effect to farmland, nor any conversions of land to nonagricultural use.
8. There would be no appreciable degradation to the physical environment (e.g., noise, air quality, and water quality) due directly to the recommended action.
9. No significant adverse impacts to the aesthetic value, social, or recreational resources would result.
10. The proposed project would not result in the net loss of any wetlands.

D. Based on the disclosure of impacts contained within this Environmental Assessment, I find no significant impacts to the human environment are likely to occur as a result of the proposed action. The proposed action has been coordinated with the appropriate resource agencies and the public, and there are no significant unresolved issues. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with the recommended plan for the Pools 25 and 26 Islands project.

_____ _____

Date

Lewis F. Setliff III
Colonel, Corps of Engineers
District Engineer

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Section 404(b)(1) Evaluation Report on the Effects of the Discharge of Dredged or Fill Material Into Waters of the United States

Pools 25 & 26 Islands
Habitat Rehabilitation And Enhancement Project
Pools 25 And 26, Mississippi River,
Pike, Lincoln And St. Charles Counties, Missouri

Upper Mississippi River System
Environmental Management Program

I. Purpose of this Evaluation

This document presents a Section 404(b)(1) Guideline evaluation for the Pools 25 & 26 Islands project. This evaluation is based on the regulations found at 40 CFR 230, Section 404(b)(1): Guidelines for Specification of Disposal Sites for Dredged or Fill Material.

The purpose of these Guidelines is to restore and maintain the chemical, physical, and biological integrity of waters of the United States through the control of discharges of dredged or fill material. Fundamental to these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern. From a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines. The guiding principle should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources.

These Guidelines have been developed by the Administrator of the Environmental Protection Agency in conjunction with the Secretary of the Army acting through the Chief of Engineers under section 404(b)(1) of the Clean Water Act (33 U.S.C. 1344). The Guidelines are applicable to the specification of disposal sites for discharges of dredged or fill material into waters of the United States.

II. Project Description

A. Location. The proposed project involves three islands. Westport Island, located in Pool 25 of the Mississippi River, lies in Lincoln County, Missouri, between river miles 257.5 and 254.0. This island is about five miles east of Elsberry. Dardenne and Bolters Islands are located about 20 miles to the south in Pool 26 of the Mississippi River in St. Charles County, Missouri, between river miles 228.0 and 224.5. These two islands are about five miles north of St. Peters.

B. General Description

1. Area Subject to Section 404 Jurisdiction. Essentially all of the project area is considered to be a water of the United States, and therefore subject to Section 404 review requirements. This is because these three islands are either below the plane of ordinary high water of the Mississippi River, or portions of these islands are considered to meet the definition of wetlands according to the Corps' wetlands delineation manual [U.S. Army Corps of Engineers-Environmental Laboratory (USACE-EL). (1987). "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1 (on-line manual), U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.]

At Westport Island, the plane of ordinary high water (OHW) at river mile 255.5 is 443.5 feet NGVD. At Dardenne Island, OHW at river mile 226.5 is at 428.5 feet NGVD. According to two-foot contour mapping obtained by the St. Louis District for these two islands, each of these islands is essentially below their respective OHW elevations.

According to USACE (1987), wetlands subject to Section 404 must exhibit positive indicators for hydric soils, wetland vegetation, and wetland hydrology. In summary, a small portion of Westport Island is considered wetlands, and nearly all of Dardenne and Bolters Islands are considered wetlands. Although wetland vegetation is present on all three islands, the soils of Dardenne and Bolters Islands are hydric because they exhibit a water table at a depth of one foot or less during the growing season, whereas the soils at Westport Island are not hydric because they are more permeable and consequently the water table is lower in the ground.

With regard to soils, Westport Island in Lincoln County is mapped as "Dockery silty clay loam, frequently flooded" (1,022 acres) and "water" (74 acres, http://ims.missouri.edu/moims/step1.AOI/countylist.asp?STATUS=new). The Dockery soil series is not classified by the Natural Resources Conservation Service as hydric, but inclusions of Carlow silty clay loam can occur within the Dockery series and they are classified as hydric or wetland soils (http://efotg.nrcs.usda.gov/). Carlow inclusions make up about 5 percent of the Dockery mapping unit, and they meet the hydric criterion because of the presence of a water table at a depth of one foot or less during the growing season (criterion 2B3). In St. Charles County, Dardenne Island is mapped as "Carlow silty clay loam, occasionally flooded" (762 acres) and "water" (9 acres). Bolters Island is also mapped as "Carlow silty clay loam, occasionally flooded" (527 acres) and "water" (14 acres). As mentioned above, the Carlow series is classified as hydric, and about 90 percent of the Carlow mapping unit is considered hydric.

Except for some abandoned cropland, the islands consist of predominantly forest. Bottomland forest is comprised of mostly facultative wetland plants (usually occur in wetlands, but also occur in nonwetlands), but also includes some obligate wetland species as well as facultative wet species (occur often in both wetlands and nonwetlands). Abandoned cropland consists of a variety of mainly herbaceous species but some small woody species.

Each of the islands is subject to flooding from the Mississippi River. The plane of ordinary high water is equivalent to a flood event having a return interval of about once in every two years.

2. Proposed Project Features for Recommended Plan. Proposed features at the three islands address the following objectives: expansion of floodplain forest, restoration of river-backwater connections, and creation and maintenance of deepwater habitat in backwater areas.

Westport Island (Pool 25)

a. Planting of native tree and shrub seedlings. Reforestation of 59 acres of abandoned cropland at sites with ground elevations exceeding 440 feet NGVD is proposed on this 625-acre island. Tree seedlings to be planted would consist of hard mast species such as pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), bur oak (*Quercus macrocarpa*), pecan (*Carya illinoensis*), and Schuette oak (*Quercus x schuettii*, a hybrid between swamp white and bur oak). Native shrub species such as deciduous holly (*Ilex decidua*) and green hawthorne (*Crataegus viridis*) would be planted also. Plant materials would consist of seedlings produced using a root-pruned method, placed on a 30 by 30 foot spacing (49 per acre).

b. Removal of sediment from island channel. Mechanical dredging of sediment is proposed in a portion of an existing 2,000-foot-long natural channel at the lower end of Westport Island. Sediments totaling 1,535 cubic yards would be removed from 1,000 feet of the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.7-acre disposal area (30 feet wide by 1,000 feet long) sited along the existing channel.

c. Placement of water control structure in island channel. A water control structure consisting of stop logs would be installed in the excavated channel. It is expected that this structure would be constructed off-site.

d. Permanent access road. A 1,265-foot long road would be constructed to provide access to the water control structure from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric.

Dardenne Island (Pool 26)

a. Planting of native tree and shrub seedlings. Planting of tree and shrub seedlings at Dardenne Island would follow the same procedure to be used at Westport Island, except that planting sites in abandoned cropland would be in areas above 428 feet NGVD. Fifty-two acres of plantings are proposed on this 790-acre island.

Bolters Island (Pool 26)

a. Removal of sediment from island channel. Similar to Westport Island, mechanical dredging of sediment from an existing 1,250-foot-long natural channel at the lower end of Bolters Island (560 acres) is proposed. Sediments totaling 1,900 cubic yards would be removed from the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.85-acre disposal area (30 feet wide by 1,250 feet) sited along the existing channel.

b. Construction of rock dike structure and excavation of deep hole in island slough. A rock dike structure is proposed to be constructed in an interior slough at the lower end of the island, and a deep hole is proposed to be excavated immediately adjacent to the dike. The rock dike structure would be U-shaped and would consist of 165 tons of graded B stone. Sediments totaling 2,900 cubic yards would be mechanically excavated to a depth of eight feet in a 0.5 acre U-shaped area having a 13-foot wide bottom. Excavated sediments would be placed along either bank of the slough in two disposal areas measuring about 200 by 300 feet each.

c. Temporary access road. A 515-foot long road would be constructed to provide access to the natural channel and interior slough from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric.

C. Authority and Purpose. This project has been conducted under the authority of the Habitat Rehabilitation and Enhancement Project (HREP) component of the Upper Mississippi River System-Environmental Management Program. Initial authorization and appropriations for the Environmental Management Program were provided on August 15, 1985, by the Supplemental Appropriations Bill (PL 99-88). A more comprehensive authorization was provided by Section 1103 of the Water Resources Development Act (WRDA) of 1986 (PL 99-662). Subsequent WRDA language of 1992, 1996, and 1999 further modified the authorization.

D. General Description of Dredged or Fill Material

1. General Characteristics of Material (grain size, soil type)

a. Fill Material. Fill materials include rock (quarry run limestone consisting of graded B stone, 12" crushed stone) and earthen material (on-site sediments consisting of silts and clays).

b. Dredged Material. Dredged material, defined as material that is either dredged or excavated from waters of the United States, will consist of sediments (alluvial silts and clays) to be mechanically dredged or excavated from natural channels and sloughs.

2. Quantity of Material. The following quantities of materials will be handled:

Westport Island

Sediments (mechanical dredging, natural channel)	1,535	cubic yard
Backfill (earthen material, water control structure)	<1	cubic yard
12" crushed stone (permanent access road)	2,163	ton
Earthen material (excavated to make planting holes)	105	cubic yard

Dardenne Island

Earthen material (excavated to make planting holes)	95	cubic yard

Bolters Island

Sediments (mechanical dredging, natural channel)	1,900	cubic yard
Graded B stone (rock dike structure in slough)	165	ton
Sediments (mechanical dredging, slough)	2,900	cubic yard
12" crushed stone (temporary access road)	1,482	ton

3. Source of Material. Stone used for the project will be obtained from commercial stone quarries in the vicinity of the project area. Earthen material will be obtained from onsite.

E. Description of the Proposed Discharge Sites

1. Location. The location of the proposed features and work is displayed in the project's Environmental Assessment and associated drawings. These discharge sites are located on islands of the Mississippi River.

2. Size (acres) and Types of Habitat. The proposed discharge sites at all three islands total about 5.25 acres.

Westport Island

<0.1 acre	Tree planting over 59 acres	Abandoned cropland
0.7 acre	Disposal area, sediment from natural channel	Forested wetland
<0.1 acre	Water control structure, backfil	Natural channel
0.6 acre	Permanent access road	Forested wetland

Dardenne Island

<0.1 acre	Tree planting over 52 acres	Abandoned cropland

Bolters Island

0.85 acre	Disposal area, sediment from natural channel	Forested wetland
2.75 acre	Disposal area, sediment from slough	Forested wetland
0.1 acre	Disposal area, rock dike structure	Slough
0.25 acre	Temporary access road	Herb. & forested wetland

Excavation to remove sediments will affect about 0.4 acres of natural channel habitat on Westport Island, and on Bolters Island about 0.5 acres of natural channel habitat and about 0.5 acres of slough habitat.

3. Type of Site (confined, unconfined, open water)

a. Permanent Deposits of Dredged and Fill Material. All disposal sites are for permanent deposits of dredged and fill materials, except for the temporary access road on Bolters Island. These disposal sites will be unconfined.

b. Temporary Deposits of Fill Materials. The access road on Bolters Island is the only temporary disposal site. It will be unconfined.

4. Timing and Duration of Discharge. Work to be performed will need to be accomplished during normal (nonflood) pool conditions. Depending on local weather and flooding conditions, the estimated duration of the construction period is about nine months. Actual duration of discharges will only be a fraction of that time.

F. Description of Disposal Method (hydraulic, drag line, etc.). Sediment removed from the natural channels on Westport and Bolters Islands will be dredged mechanically, as will the sediment from the slough on Bolters Island to create the deep hole. Heavy equipment such as a backhoe is expected to be used to excavate these sites. This piece of equipment is expected to be capable of placing excavated sediments into the proposed disposal sites. Trucks will haul graded B stone to the site of the rock dike structure on Bolters Island, and 12" crushed stone to the sites of the access roads on Westport and Bolters Islands.

III. Factual Determinations

A. Physical Substrate Determinations

1. Substrate Elevation and Slope. On Westport Island, ground elevations range from about 435 to 445 feet NGVD. On Dardenne and Bolters Islands, ground elevations range from about 420 to 430 feet NGVD. Most of the natural slopes within the project area are less than two percent.

2. Sediment Type (grain size). The digital soil survey for Lincoln and St. Charles Counties describes the soils within the project area as alluvial materials consisting of silty clay loams. Material on the bottom of the slough on Bolters Island and in the natural channels on Westport and Bolters Islands probably consists of finer grained materials.

3. Dredged/Fill Material Movement. Dredged and fill materials will be subject to the forces of flood flows. As none of the disposal sites will be confined, all materials will have the potential to migrate downhill.

4. Physical Effects on Benthos (burial, changes in sediment type, etc.). Benthos (organisms that live on the bottom of water bodies) are found in the aquatic portions of the project area, which include the natural channels on Westport and Bolters Islands, and the interior slough on Bolters Island. Benthos present in these areas, which total about 1.5 acres, will be destroyed by either excavation or burial.

5. Other Effects. No other effects are expected.

6. Actions Taken to Minimize Impacts. The primary actions taken to avoid adverse effects on the substrate are designing stable slopes on structures, use of stone large enough to resist erosive forces, placement of silt fences or hay bales to arrest the migration of material, and revegetation measures to minimize erosion (lateral movement) of fill or dredged materials.

B. Water Circulation, Fluctuation and Salinity Determinations

1. Water

a. Salinity. Not applicable.

b. Water Chemistry. No changes in water chemistry are anticipated.

c. Clarity. Water clarity within the interior slough on Bolters Island is expected to experience temporarily elevated turbidity levels during placement of the rock dike structure and excavation of the deep hole.

d. Color. No change is expected.

e. Odor. The recommended plan is not expected to have an impact on water odors.

f. Taste. The project is not expected to impact water taste; no surface waters within the project area serve as public water supplies.

g. Dissolved Gas Levels. Construction activities associated with the project will have no significant adverse impact on dissolved gas levels.

h. Nutrients. Nutrients are not expected to be released to wetland or aquatic areas during the construction process.

i. Eutrophication. The project is not expected to contribute toward eutrophication of the water column in aquatic areas.

j. Water Temperature. Temperatures are not expected to change, except for those in the deep hole to be excavated in the interior slough on Bolters Island, where greater water depth is expected to attenuate extremes in winter and summer to some degree.

2. Current Patterns and Circulation

a. Current Patterns and Flow. The hydraulic connection between the Mississippi River and interior sloughs on Westport and Bolters Islands is expected to become more frequent with the removal of accumulated sediments from these channels. The rock dike structure to be placed in the interior slough on Bolters Island is designed to concentrate erosive forces of overtopping river flows into the area of the deep hole. At low river levels, this structure is expected to act as a barrier within the slough, and may retard the circulation of the upper water column due to wind action. The water control structure to be placed in the natural channel at Westport Island is designed to stop or retard the exchange of water between the island's interior slough complex and the river. Other than these anticipated changes, no other changes to patterns or circulation are expected.

b. Velocity. Increases in velocity are expected in the interior slough on Bolters Island at the rock dike structure when the river is high and overtops the island, and in the natural channel on Westport Island at the location of the water control structure, when velocity will decrease when the structure is closed. Reductions in velocity are expected in the areas of tree planting when the river overtops the island, due to the roughness presented by the vegetation as it grows.

c. Stratification. Stratification is expected to occur only in the deep hole to be created in the interior slough on Bolters Island.

d. Hydrologic Regime. The project will not alter the seasonal or annual hydrologic regime of Pools 25 or 26. The hydrologic regime of the interior sloughs on Westport and Bolters Islands will become more dynamic due to the removal of sediments within the natural channels that connect these sloughs with the Mississippi River. The water control structure on Westport Island will be left open most of the time, but once every two to three years, it is expected to be closed temporarily by the Missouri Department of Conservation to hold water in the interior slough complex while the river is falling.

3. Normal Water Level Fluctuations (tides, river stage, etc.). The project will not affect normal fluctuations in the elevation of Pools 25 and 26.

4. Salinity Gradients . Not applicable.

5. Actions Taken to Minimize Impacts. The water control structure to be placed in the natural channel on Westport Island will be designed in such a manner that when in the open position, it will not impede movement of water to and from the river.

C. Suspended Particulate/Turbidity Determinations

1. Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. Increases in suspended particulates and turbidity due to construction activities are expected to be the greatest in the vicinity of the rock dike structure and adjacent deep hole in the interior slough on Bolters Island. These increases are expected to be of relatively short duration after construction is completed. Minor temporary increases in levels of particulates and turbidity levels may occur on

Bolters Island at the junction of the Mississippi River and the natural channel to be cleaned out of sediment. Elsewhere construction activities are to be conducted "in the dry" when river levels are low, and such changes are not expected.

2. Effects (degree and duration) on Chemical and Physical Properties of the Water Column. The natural channels on Westport and Bolters Islands are shallow and at low river levels have little water in them. The interior sloughs on these islands are permanent and deeper (average depth 2 to 3 feet).

a. Light Penetration. Because of the shallow depth of Bolters Island's slough, a decrease in light penetration is unlikely.

b. Dissolved Oxygen. The only expected change in dissolved oxygen levels is in the deep hole to be excavated in the slough on Bolters Island; levels in summer are expected to be somewhat higher after the project is completed than in the rest of the slough.

c. Toxic Metals and Organics. No toxic metals or organics are known to occur at any proposed disposal site of fill or dredged material.

d. Pathogens. There is no reason to believe any pathogens exist in any of the proposed areas of construction.

e. Aesthetics. Aesthetics of work sites are likely to be temporarily adversely affected during construction, but are expected to improve with the establishment of vegetation after construction.

f. Water Temperature. No changes in water temperatures are expected to occur, except at the deep hole, where temperature extremes during winter and summer occurring in the rest of the slough are expected to be attenuated by the greater water depth.

3. Effects on Biota

a. Primary Production, Photosynthesis. No impacts to primary production and photosynthetic processes are expected to occur.

b. Suspension/Filter Feeders. A temporary reduction in benthos production is expected only in the slough on Bolters Island in the vicinity of the rock dike structure and deep hole.

c. Sight Feeders. Temporary impacts to sight-feeders are expected in the Bolters Island slough in the vicinity of the rock dike structure and deep hole.

4. Actions taken to Minimize Impacts. Actions to minimize impacts associated with suspended particulates and turbidity include placement of silt curtains in the Bolters Island slough upstream and downstream of the work site, seeding of disposal sites to minimize erosion, and design of adequate sideslopes in channel cleanout areas to prevent erosion.

D. Contaminant Determinations. No toxic metals or organics are known to occur at any proposed disposal site of fill or dredged material.

E. Aquatic Ecosystem and Organism Determinations

1. Effects on Plankton. No impacts on phytoplankton production are expected.

2. Effects on Benthos. Benthic organisms in Bolters Island slough in the vicinity of the rock dike structure and deep hole are expected to be lost due to burial or excavation, as well as in the natural channels to be cleaned of sediments on Westport and Bolters Islands. These sites are expected to become recolonized after construction is completed.

3. Effects on Nekton. The term "nekton" refers basically to larger, free swimming aquatic organisms, such as fishes. Adverse impacts on sight-feeding fish are expected to be limited to Bolters Island slough, and would be temporary.

4. Effects on Aquatic Food Web. Construction activities are not expected to disrupt the aquatic food chain.

5. Effects on Special Aquatic Sites

a. Sanctuaries and Refuges. Westport Island Natural Area envelops about 480 acres of the lower half of Westport Island, and was established in 1984 to protect a large undisturbed area of old-growth bottomland forest along with sloughs and shrub swamps. Only minimal man-made alterations are allowed in the natural area. The proposed mechanical excavation of sediments from the natural channel, placement of the water control structure, and construction of the permanent access road are located in this natural area.

b. Wetlands. Construction activities are expected to impact about 5.25 acres of wetlands. (In addition to these wetland impacts, about 0.9 acres of natural channels will be affected by mechanical dredging.) Of the wetland impacts, disposal sites for mechanically dredged sediments will affect about 4.3 acres, and access roads will affect about 0.85 acres. Sediments taken from the natural channels will be placed in 1.55 acres of forested wetland disposal sites at an average depth of about 1.5 feet. Tree clearing at these disposal sites will be minimal. Sediments obtained from the Bolters Island slough will be placed in 2.55 acres of forested wetland disposal sites at an average depth of 0.65 feet (about 8 inches). At these disposal sites, tree clearing is expected to be more extensive. Crushed rock for access roads will be placed in 0.85 acres of forested and herbaceous wetlands at an average depth of 12 inches. Tree clearing for access roads will also be minimal. Tree planting sites in abandoned cropland on Westport Island are not considered wetlands (because of the absence of hydric soils), whereas on Dardenne Island, tree planting sites in abandoned cropland are considered wetlands (because of the presence of wetland soils).

The planting of 52 acres of tree and shrub seedlings in wetlands (abandoned cropland) on Dardenne Island is expected to offset the temporary and permanent impacts associated with construction activities affecting about 5.25 of forested (and a little herbaceous) wetlands.

c. Mud Flats. No mud flat-like conditions exist within any proposed discharge site.

d. Vegetated Shallows. No vegetated shallows occur at any proposed disposal sites.

e. Coral Reefs. Not applicable.

f. Riffle and Pool Complexes. There are no riffle and pool complexes in the project area.

6. Threatened and Endangered Species. In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the St. Louis District received from the U. S. Fish and Wildlife Service the following list of federally threatened or endangered species, currently classified or proposed for classification that may occur in the vicinity of the Pools 25 and 26 Islands project.

Lincoln County (pool 25, Westport Island):

Bald eagle (*Haliaeetus leucocephalus)* - threatened

Indiana bat (*Myotis sodalis)* - endangered

Spectaclecase mussel (*Cumberlandia monodonta)* - candidate

St. Charles (pool 26, Dardenne and Bolter Islands):

Bald eagle (*Haliaeetus leucocephalus)* - threatened

Indiana bat (*Myotis sodalis)* -endangered

Eastern massasaugua (*Sistrurus catenatus catenatus*) - candidate

Pallid sturgeon (*Scaphirhynchus albus)* - endangered

Decurrent false aster (*Boltonia decurrens)* - threatened

Running buffalo clover (*Trifolium stoloniferum)* – endangered

Based on our evaluation, it is the St. Louis District's opinion that the proposed project will not adversely impact any of the five threatened or endangered species or two candidate species, provided that tree felling is restricted to the time of the year (September 1 through March 31) when Indiana bat maternity colonies are not present. Likewise, the action will not affect any critical habitat of these species.

7. Other Fish and Wildlife. Sloughs on islands that are connected periodically to the Mississippi River through natural connections serve as spawning, rearing, and overwintering habitat for riverine fishes. Shallow water depths in these sloughs have limited the value of these areas as overwintering habitat. Creation of the deep hole in the interior slough on Bolters Island and construction of the rock structure to maintain its depth are expected to provide about 0.3 acres of overwintering habitat. Sedimentation in the natural channels that form temporary connections with the river reduces the amount of time these connections occur. Excavation of the channels on Bolters and Westport Islands will increase the amount of time they can perform this function. Since the combination of deep hole excavation with a scouring rock structure on Bolters Island is novel, this portion of the project is considered experimental.

Reforestation of abandoned cropland using various species of oak-hickory tree seedlings on Westport and Dardenne Islands is expected to benefit wildlife species that forage for mast. Such tree species are underrepresented on the Mississippi River floodplain following land clearing for agriculture and the flood of 1993. The Missouri Department of Conservation manages these islands for river-associated wildlife species including mammals, waterfowl and other birds, reptiles, and amphibians.

Waterfowl would benefit once the trees begin producing a mast food source and from the thermoregulatory benefits the trees would provide by acting as a windbreak. A mast crop can be expected from some species in three to five years. The planted area is expected to be used for food and shelter by such species as bobwhite quail, turkey, deer, squirrels, various species of waterfowl, and other migratory birds that feed on insects found in oaks. These benefits would increase progressively as the stand matures. The establishment of larger blocks of continuous forest by planting abandoned cropland would also benefit area sensitive species such as the pileated woodpecker. Without the tree planting proposed by this project, the forest habitat component on these islands would continue to degrade. The improvement in connections between the river and interior sloughs on Bolters and Westport Islands is also expected to benefit a variety of mammals, birds, amphibians, and reptiles that use these open-water wetlands as either feeding areas or for reproduction.

8. Actions to Minimize Impacts. More intrusive habitat improvements on Westport Island that would be located within the natural area have been eliminated from further consideration. Adverse impacts to 5.25 acres of wetlands on Westport and Bolters Islands are not expected to be significant, given the proposed tree planting in 52 acres of wetlands (abandoned cropland) on Dardenne Island**.**

F. Proposed Disposal Site Determinations

1. Mixing Zone Determination. The discharges of fill and dredged material will largely occur in areas without permanent water (such as forested and herbaceous wetland). Discharges in areas of permanent water are limited to less than one acre of the 13-acre slough on Bolters Island. The concentration of resuspended material in this slough is not expected to be high enough to require a mixing zone.

2. Determination of Compliance with Applicable Water Quality Standards. Section 401 water quality certification will be required from the Missouri Department of Natural Resources.

3. Potential Effects on Human Use Characteristics.

a. Municipal and Private Water Supply. No municipal water supply will be adversely impacted by project construction.

b. Recreational and Commercial Fisheries. Commercial fisheries are present in Pools 25 and 26. Recreational fishing is also present, and the recommended plan is expected to benefit fishing opportunities.

c. Water Related Recreation. Water-related recreation is an important activity in Pools 25 and 26 of the Mississippi River. The recommended plan is not expected to impact this kind of recreation.

d. Aesthetics. Construction activities will have minor impacts on the aesthetic quality of the project area during the duration of the work. Noise and exhaust will be generated by heavy equipment during the construction process.

e. Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The project will not impact any of these resources.

f. Determination of Cumulative Effects on the Aquatic Ecosystem. Past, present, and reasonably foreseeable future Corps activities in Pools 25 and 26 of the Mississippi River include 1) the navigation project, 2) channel maintenance work including maintenance dredging and dikes and revetments, 3) other existing EMP-HREP projects (Batchtown, Stag Island, Cuivre Island, Calhoun Point, Dresser Island), 4) existing bullnose dikes at Slim, Peruque, and Portage Islands (constructed under the Avoid and Minimize Program), 5) and activities under the Navigation and Environmental Sustainability Program, including a dam point control study for Pool 25, design of lock expansion at Lock and Dam 25, and a fish passage study at Lock and Dam 26. Between these projects, there are no significant cumulative impacts on the aquatic ecosystem.

g. Determination of Secondary Effects on the Aquatic Ecosystem. No significant secondary impacts to the aquatic ecosystem have been identified.

IV. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

A. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation.

In this evaluation of discharges proposed as part of the Pools 25 & 26 Islands EMP-HREP project, the Environmental Protection Agency's Section 404(b)(1) Guidelines of 24 December 1980 were applied without significant adaptation.

B. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem.

No practicable alternatives exist which meet the study objectives and do not involve discharge of fill into waters of the United States. As ground elevations on all islands are below the plane of ordinary high, there are no sites considered to be upland and not subject to the Clean Water Act. Hauling mechanically dredged sediments to disposal sites off these islands was not considered.

C. Compliance with Applicable State Water Quality Standards.

Water quality certification under Section 401 of the Clean Water Act will be required from the Missouri Department of Natural Resources. The certification's conditions will be incorporated into the project's plans and specifications. Coordination of the proposed plan with this agency will be accomplished.

D. Compliance with Applicable Toxic Effluent Standard or Prohibition under Section 307 of the Clean Water Act.

The proposed activities are not expected to violate the toxic effluent standards of Section 307 of the Clean Water Act.

E. Compliance with Endangered Species Act of 1973.

The recommended plan is not expected to adversely affect any of the seven federally listed endangered, threatened, or candidate species or their critical habitat, provided that a restriction on tree felling is imposed during the warm months when Indiana bats are assumed to be present.

F. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972.

Not applicable.

G. Findings of Significant Degradation of the Waters of the United States.

The proposed project will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Life stages of aquatic organisms and other wildlife would not be adversely affected in a significant manner. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values would not occur.

H. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem.

All appropriate and practicable measures have been taken through application of procedures contained in Subpart H of the Guidelines to insure minimal adverse effects of the proposed discharges. Actions to minimize impacts associated with suspended particulates and turbidity include placement of silt curtains in the Bolters Island slough upstream and downstream of the work site, seeding of disposal sites to minimize erosion, and design of adequate side slopes in channel cleanout areas to prevent erosion.

I. On the Basis of the Guidelines the Proposed Disposal Sites for the Discharge of Dredged and Fill Material.

Based on this evaluation, the proposed Pools 25 & 26 Island EMP-HREP project is specified as complying with the requirements of these guidelines with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

Prepared by:

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Mr. Timothy K. George, Ecologist Environmental Branch; Planning, Programs, and Project Management Division

Approved by:

_____

Dr. Thomas M. Keevin, Chief Environmental Branch; Planning, Programs, and Project Management Division

_____ _____

Date

Lewis F. Setliff III
Colonel, Corps of Engineers
District Engineer

To be signed following the review of comments received during the public comment period.

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Drawing Number	Title
G – 1	Abbreviation List, Legend and Drawing Index
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G – 3	General Site Plan – Bolter Island
G – 4	General Site Plan – Dardenne Island
G – 5	General Site Plan – Westport Island
C – 1	Plan & Details – Bolter Island – Rock Structure & Deep Hole
C – 2	Plan & Details – Westport Island
C – 3	Details – Agricultural Field Planting
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S – 1	Water Control Structure Plan, Sections and General Notes
H – 1	Lock & Dam No. 25 Pool and Tailwater Stage Hydrograph, 1984 to 1998
H – 2	Lock & Dam No. 25 Pool and Tailwater Stage Hydrograph, 1999 to Present
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H – 4	Lock & Dam No. 25 Pool and Tailwater Stage Hydrograph, 2005 to Present

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POOLS 25/26 HABITAT REHABILITATION AND ENHANCEMENT PROJECT

MISSISSIPPI RIVER
PIKE, LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

HABITAT REHABILITATION

SOLICITATION NO. DACW43-03-R-XXXX

US Army Corps of Engineers®
St. Louis District

Gateway To Excellence

JANUARY 2008

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LIST OF ABBREVIATIONS:

BOT.	BOTTOM
BRG.	BRIDGE
C/C	CENTER TO CENTER
CIRC.	CIRCULAR
℄	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO.	COUNTY
COL.	COLUMN
CONC.	CONCRETE
CONSTR.	CONSTRUCTION
DIA.	DIAMETER
DIM.	DIMENSION
DWG.	DRAWING
E	EAST
EA.	EACH
E.F.	EACH FACE
EL.	ELEVATION
ELEV.	ELEVATION
EMBED.	EMBEDMENT
E.W.	EACH WAY
ETC.	ET CETERA
EXP.	EXPANSION
FL.	FLOOR
FRP	FIBER REINFORCED POLYMER
FT.	FOOT
GALV.	GALVANIZED
H.S.	HIGH STRENGTH
HWL	HIGH WATER LEVEL
I.E.	INVERT ELEVATION
IN.	INCH
INV.	INVERT
K.S.I.	KIPS PER SQUARE INCH
LBS.	POUNDS
LIN.	LINEAR
L.R.	LOW RELAXATION
LT.	LEFT
LWL	LOW WATER LEVEL
MAX.	MAXIMUM
MFR.	MANUFACTURER
MIN.	MINIMUM
MUTCD	MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
N	NORTH
NO.	NUMBER
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OPNG.	OPENING
P.C.	POINT OF CURVE
P.I.	POINT OF INTERSECTION
PL.	PLATE
P.O.C.	POINT ON CURVE
P.O.T.	POINT ON TANGENT
PROP.	PROPOSED
P.S.I.	POUNDS PER SQUARE INCH
P.S.F.	POUNDS PER SQUARE FOOT
P.T.	POINT OF TANGENCY
P.V.C.	POINT OF VERTICAL CURVE
P.V.I.	POINT OF VERTICAL INTERSECTION
P.V.T.	POINT OF VERTICAL TANGENCY
R.C.B.	REINFORCED CONCRETE BOX
R.C.P.	REINFORCED CONCRETE PIPE
RD.	ROAD
RECT.	RECTANGLE
RT.	RIGHT
SIM.	SIMILAR
S.	SOUTH
SP.	SPACE
SQ.	SQUARE
S.R.	STRESS RELIEVED
STA.	STATION
STD.	STANDARD
THK.	THICK
T.O.S.	TOP OF STEEL
TYP.	TYPICAL
U.A.C.	USE AS CONSTRUCTED
VERT.	VERTICAL
W.	WEST
W/	WITH
WT.	WEIGHT

US Army Corps of Engineers St. Louis District

Symbol	Description	Date	Appr.

Revisions

Designed by: DARREN MULFORD, P.E.
Drawn by: Witt L Shields
Ckd by: Mulford J. Henrie
Reviewed by: James E. Worts
APPROVED: Thomas J. Quigley P.E. Chief, Design Branch
Date: JANUARY 2008
SUBMITTED: Michael R. Rector P.E. Chief, Civil Spec Section
File name: $$$DESIGNSFILE$SPECIFICATION$$$
Plot date: $$$DATE-TIME$$$$
Plot scale:
SOL. NO. W912P9-04-B-0209

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT

ABBREVIATION LIST, LEGEND AND DRAWING INDEX

M-EMP-6

G-1

DRAWING NUMBER

VICINITY MAP

N

US Army Corps of Engineers St. Louis District

Symbol	Descriptions	Date	Appr.

Revisions

Designed by: DARREN MULFORD, P.E.	Date: JANUARY 2008
Drawn by: Witt / Ckd by: Mulford	SUBMITTED:
Reviewed by:	File name: $$$DESIGN$FILE$SPECIFICATION$$$
APPROVED: Thomas J. Quigley P.E. Chief, Design Branch	Plot date: $$$$DATE-TIME$$$$ Plot scale: SOL. NO. W912P9-04-B-0209

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT

VICINITY MAP

M-EMP-6

G-2

DRAWING NUMBER

MEMP6-G02.dgn 11/29/2007 9:08:04 AM

US Army Corps
of Engineers
St. Louis District

Symbol	Description	Date	Appr.

Revisions

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
LINCOLN AND ST. CHARLES COUNTIES,
MISSOURI

Designed by:
DARREN MULFORD, P.E.

Drawn by: Witt

Ckd by: Mulford

Reviewed by:

APPROVED:
Thomas J. Quigley P.E.
Chief, Design Branch

Date:
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UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT

GENERAL SITE PLAN - BOLTERS ISLAND

M-EMP-6

G-3

DRAWING
NUMBER

SCI PROJECT NO: 14574.04.00 R0

$$$$$$$$$$$FILENAME$$$$$$$$$$$$$

MEMP6-G03.dgn 11/29/2007 9:10:34 AM

US Army Corps
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St. Louis District

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Designed by: DARREN MULFORD, P.E.		Date: JANUARY 2008
Drawn by: Witt	Ckd by: Mulford	SUBMITTED:
Reviewed by:		File name: $$$DESIGN$FILE$SPECIFICATION$$$
APPROVED: Thomas J. Quigley P.E. Chief, Design Branch		Plot date: $$$$DATE-TIME$$$$ Plot scale: SOL. NO. W912P9-04-B-0209

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
LINCOLN AND ST. CHARLES COUNTIES,
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UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT
GENERAL SITE PLAN - DARDENNE ISLAND

M-EMP-6
G-4
DRAWING NUMBER

MEMP6-G04.dgn 11/29/2007 2:00:33 PM

US Army Corps of Engineers St. Louis District

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Revisions			

Designed by: DARREN MULFORD, P.E.
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Ckd by: Mulford
SUBMITTED:
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APPROVED: Thomas J. Quigley P.E. Chief, Design Branch
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U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

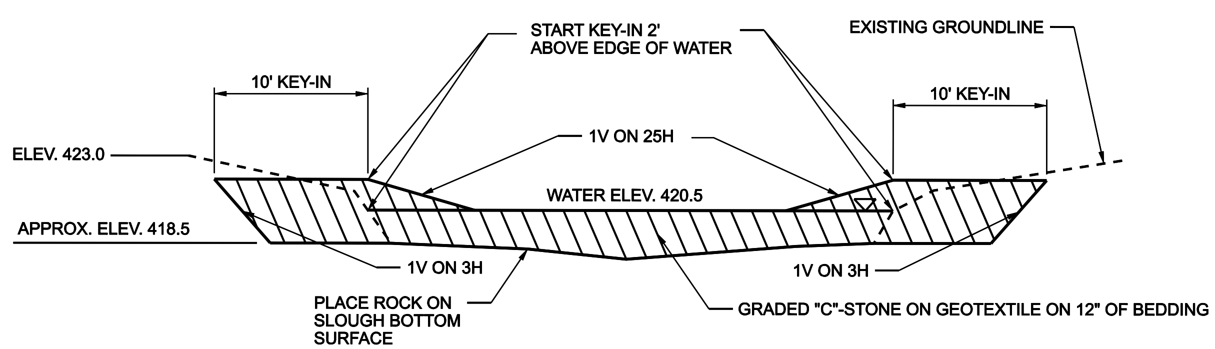
UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT
GENERAL SITE PLAN - WESTPORT ISLAND

M-EMP-6
G-5
DRAWING NUMBER

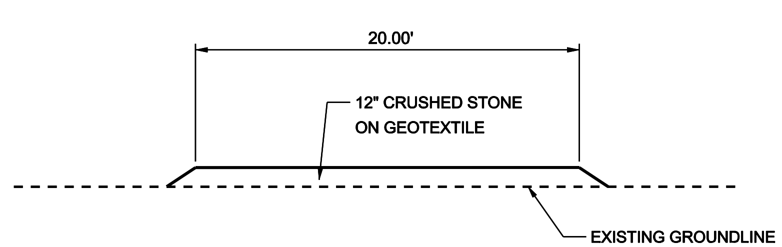
MEMP6-G05.dgn 11/29/2007 9:15:17 AM

PLAN



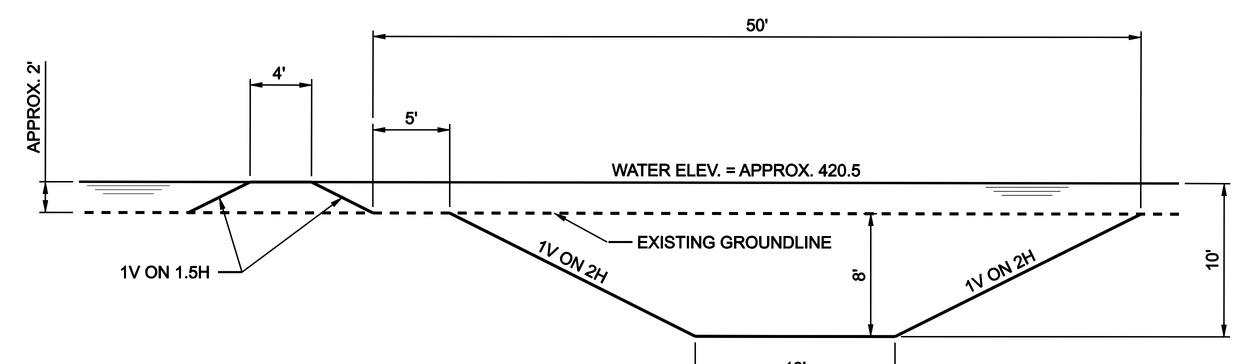
ROCK STRUCTURE PROFILE

NOT TO SCALE



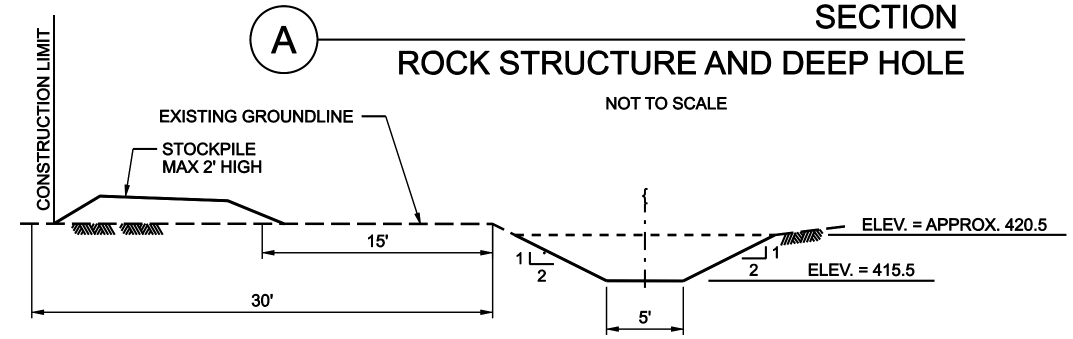
HAUL ROAD

NOT TO SCALE



A SECTION ROCK STRUCTURE AND DEEP HOLE

NOT TO SCALE



B SECTION MECHANICAL DREDGE DETAIL

NOT TO SCALE

US Army Corps of Engineers St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

Designed by: DARREN MULFORD, P.E.
Drawn by: Witt
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Date: JANUARY 2008
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Plot date: $$$$DATE-TIME$$$$
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U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

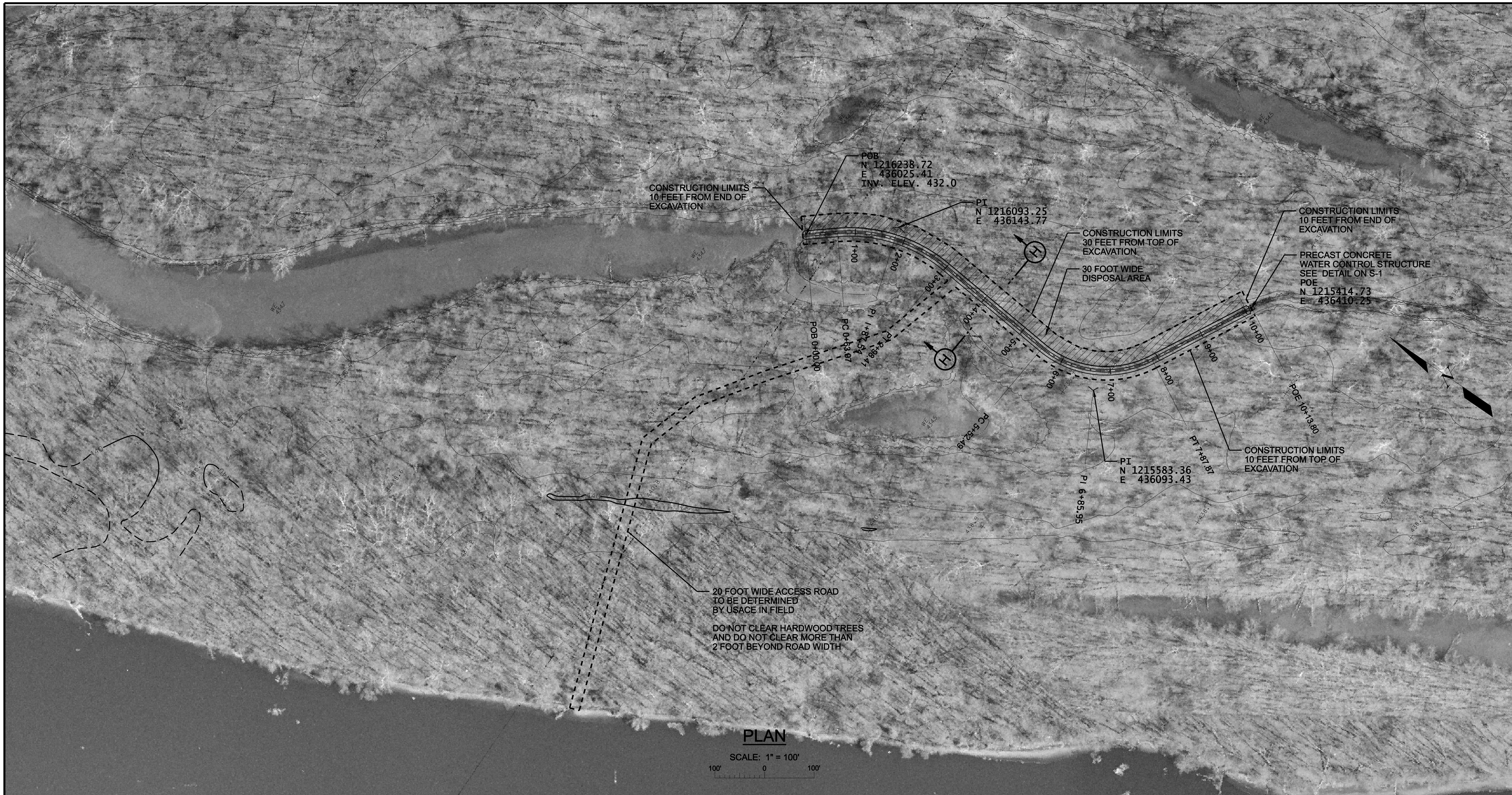
UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT

PLAN & DETAILS
BOLTERS ISLAND
ROCK STRUCTURE #1 & DEEP HOLE

M-EMP-6
C-1
DRAWING NUMBER

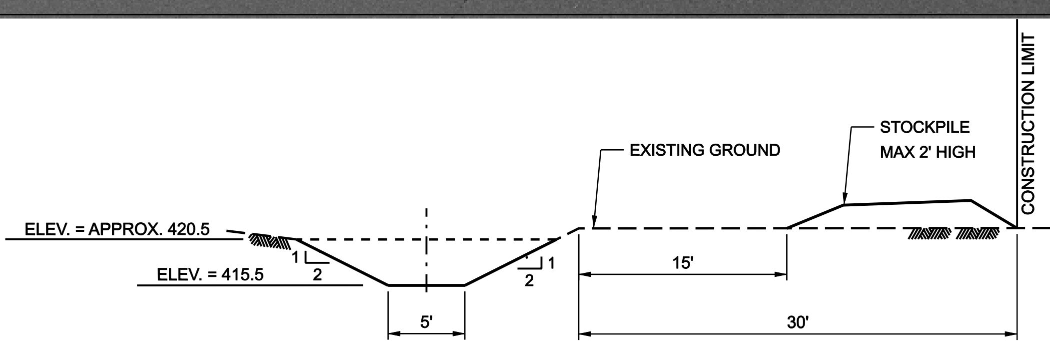
MEMP6-C01.dgn 11/29/2007 1:59:26 PM


CONSTRUCTION LIMITS 10 FEET FROM END OF EXCAVATION
POB N 1216238.72 E 436025.41 INV. ELEV. 432.0
PI N 1216093.25 E 436143.77
CONSTRUCTION LIMITS 30 FEET FROM TOP OF EXCAVATION
30 FOOT WIDE DISPOSAL AREA
CONSTRUCTION LIMITS 10 FEET FROM END OF EXCAVATION
PRECAST CONCRETE WATER CONTROL STRUCTURE SEE DETAIL ON S-1
POE N 1215414.73 E 436410.25
POB 0+00.00
PC 0+83.87
PT 2+38.41
PI 1+61.54
PC 5+52.49
PI 6+85.95
PT 7+87.87
POE 10+13.80
PI N 1215583.36 E 436093.43
CONSTRUCTION LIMITS 10 FEET FROM TOP OF EXCAVATION
20 FOOT WIDE ACCESS ROAD TO BE DETERMINED BY USACE IN FIELD
DO NOT CLEAR HARDWOOD TREES AND DO NOT CLEAR MORE THAN 2 FOOT BEYOND ROAD WIDTH
H
H

PLAN

SCALE: 1" = 100'

100' 0 100'

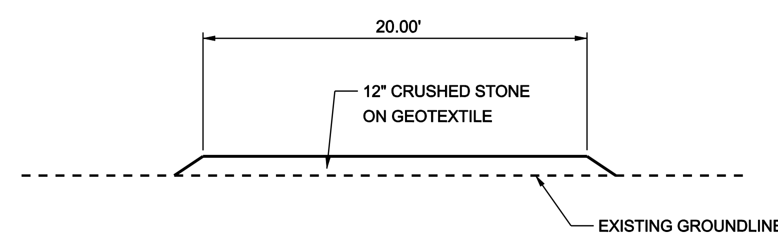


H

SECTION

MECHANICAL DREDGE DETAIL

NOT TO SCALE



HAUL ROAD

NOT TO SCALE

US Army Corps of Engineers St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

Designed by: | Drawn by: Witt | Ckd by: Mulford | Reviewed by: | APPROVED: Thomas J. Quigley P.E. Chief, Design Branch

Date: JANUARY 2008 | SUBMITTED:

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM POOLS 25 / 26 HABITAT REHABILITATION AND ENHANCEMENT

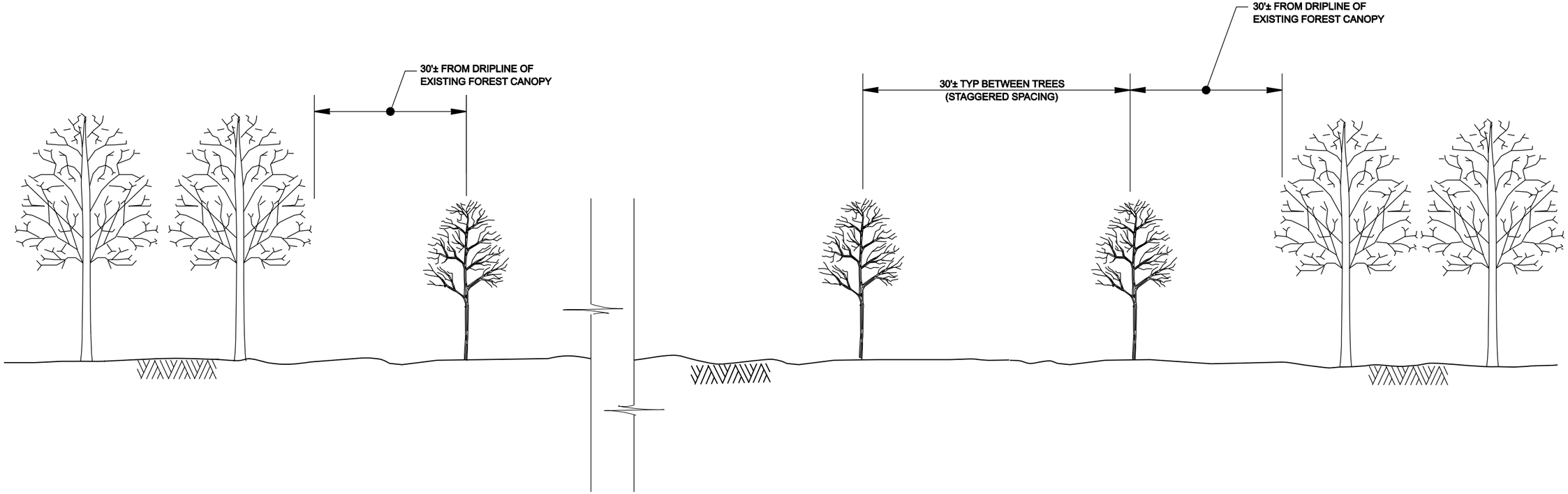
PLAN & DETAILS WESTPORT ISLAND

M-EMP-6

C-2

DRAWING NUMBER

MEMP6-C02.dgn 11/29/2007 9:17:51 AM



TYPICAL AGRICULTURAL FIELD AREA

NO SCALE

NOTES:

1. PLANT TREES ON STAGGERED SPACING. 30'± TYPICAL SPACING BETWEEN TREES.
2. CLEAR UNWANTED WOODY ENCROACHMENT AND SEED CLEARED AREAS ONLY.
3. FOR AGRICULTURAL FIELD PLANTING DETAILS, SEE SHEET C-5.

US Army Corps
of Engineers
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
LINCOLN AND ST. CHARLES COUNTIES,
MISSOURI

Designed by:
DARREN MULFORD, P.E.
Drawn by: Witt
Ckd by: Mulford
Reviewed by:
APPROVED:
Thomas J. Quigley P.E.
Chief, Design Branch

Date:
JANUARY 2008
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File name: $$$DESIGN$FILE$SPECIFICATION$$$
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UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT

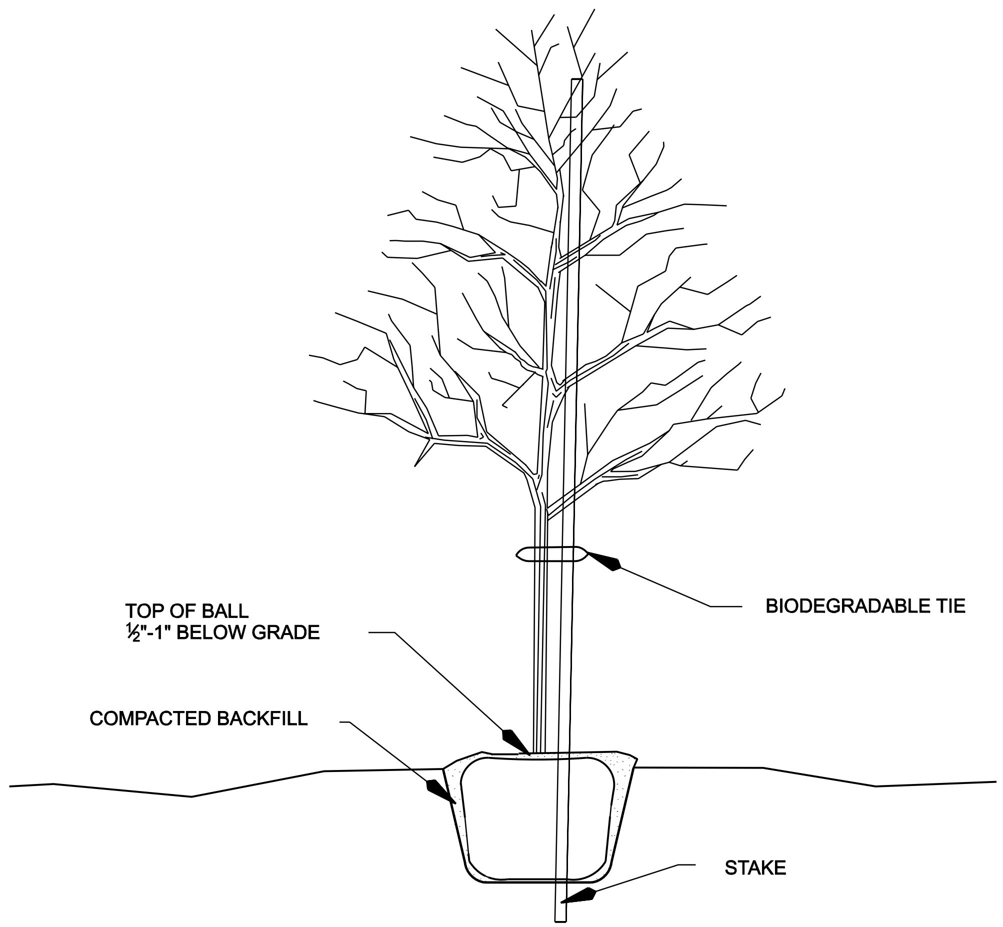
DETAILS
AG FIELD PLANTING

M-EMP-6
C-3
DRAWING
NUMBER

SCI PROJECT NO: 14574.04.00 R0

$$$$$$$$$$$FILENAME$$$$$$$$$$$$$

PLANTING AREAS						TREES					SHRUBS		TOTAL
LOCATION	APPROXIMATE AG FIELD AREAS ABOVE MIN. ELEV. (ACRES)	PLANTING ELEVATION	APPROXIMATE AREA TO BE CLEARED (ACRES)	APPROXIMATE AREA TO BE SEEDED (ACRES)	PLANTING DENSITY (STEMS/ACRE)	PIN OAK (QUERCUS PALUSTRIS)	SWAMP WHITE OAK (QUERCUS BICOLOR)	BUR OAK (QUERCUS MACROCARPA)	PECAN (CARYA ILLINOENSIS)	SCHUETTE OAK (QUERCUS X SCHUETTEI)	DECIDUOUS HOLLY (LLEX DECIDUA)	GREEN HAWTHORNE (CRATAEGUS VIRIDIS)	NO. OF TREES AND SHRUBS (APPROX. 30' x 30' SPACING)
WESTPORT ISLAND	59	ABOVE 440 FEET NGVD	59	59	49	542	542	241	542	542	241	241	2891
DARDENNE ISLAND	52	ABOVE 428 FEET NGVD	52	52	49	487	487	212	487	487	212	212	2548
TOTAL	111		111	111		1020	1020	453	1020	1020	453	453	5439



NOTE:

PIT MAY BE DUG THE SAME SIZE AS ROOT BALL OR JUST SLIGHTLY LARGER. (THIS WILL REDUCE TIPOVER DURING FLOODING)

TYPICAL CONTAINER TREE PLANTING DETAIL- AGRICULTURAL FIELD AREAS

NO SCALE

US Army Corps of Engineers St. Louis District

Symbol | Description | Revisions | Date | Appr.

Designed by: DARREN MULFORD, P.E.
Drawn by: WB | Ckd by: Mulford
Reviewed by:
APPROVED: Thomas J. Quigley, P.E. Chief, Design Branch
Date: JANUARY 2008
SUBMITTED:

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

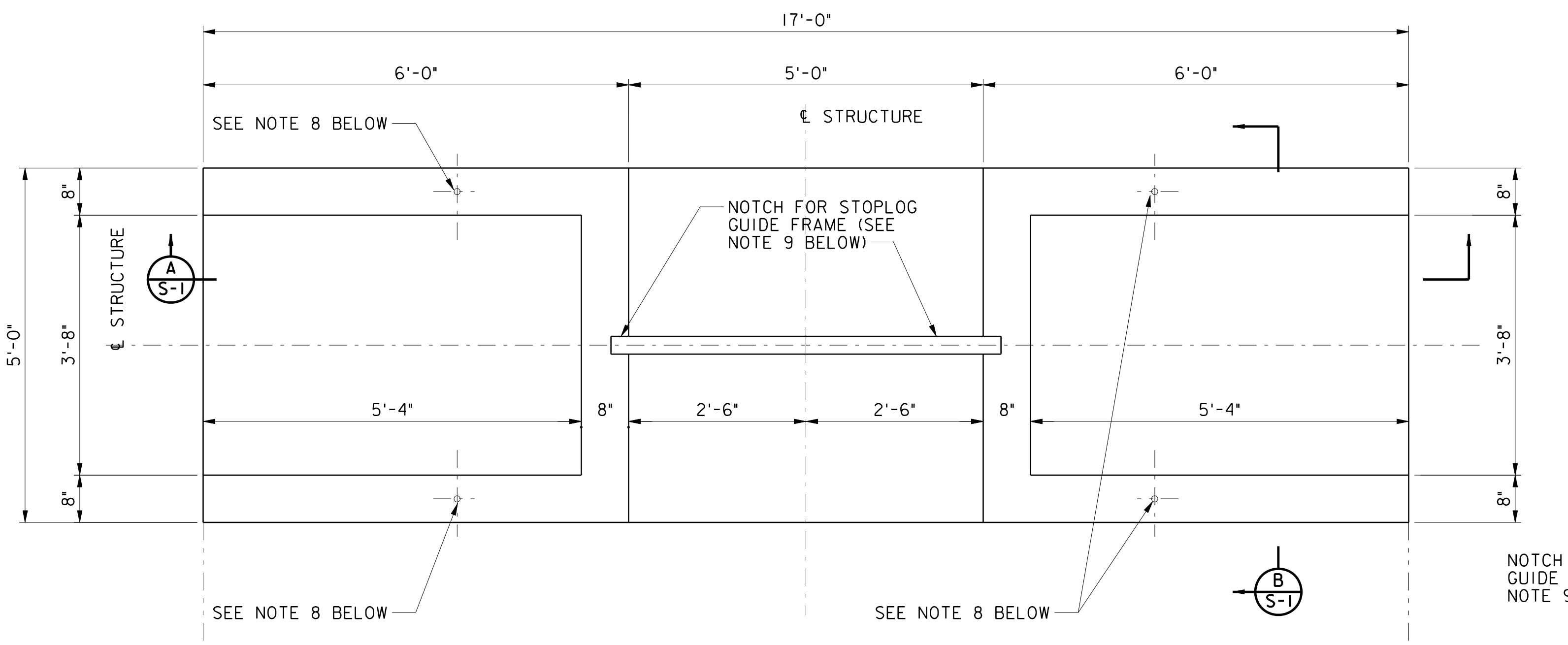
UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM POOLS 25 / 26 HABITAT REHABILITATION AND ENHANCEMENT

TREE PLANTING SCHEDULE AND DETAILS

M-EMP-6

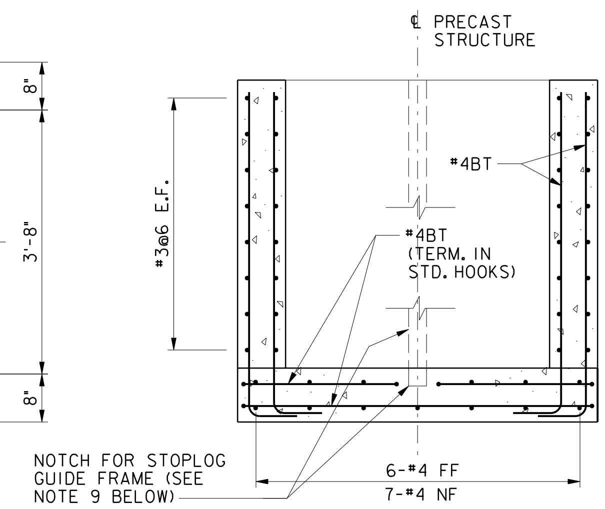
C-4

DRAWING NUMBER



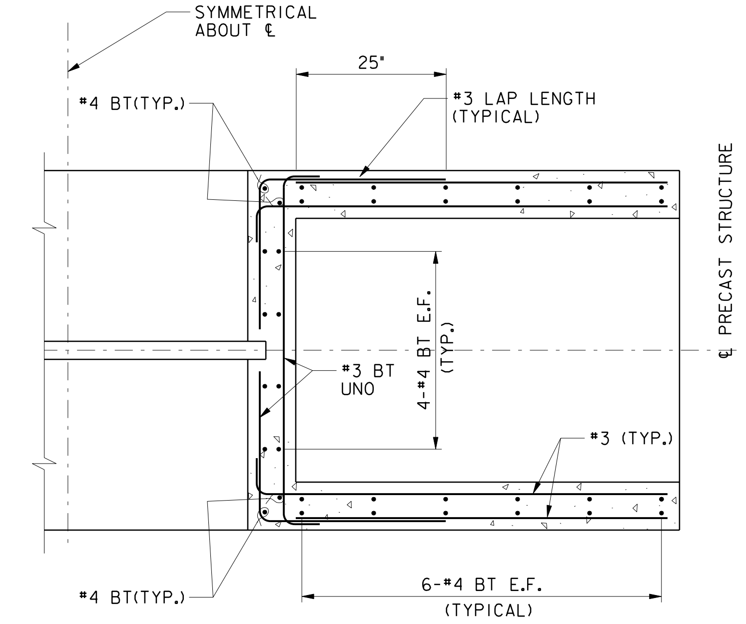
PLAN

SCALE: 3/4" = 1'-0"



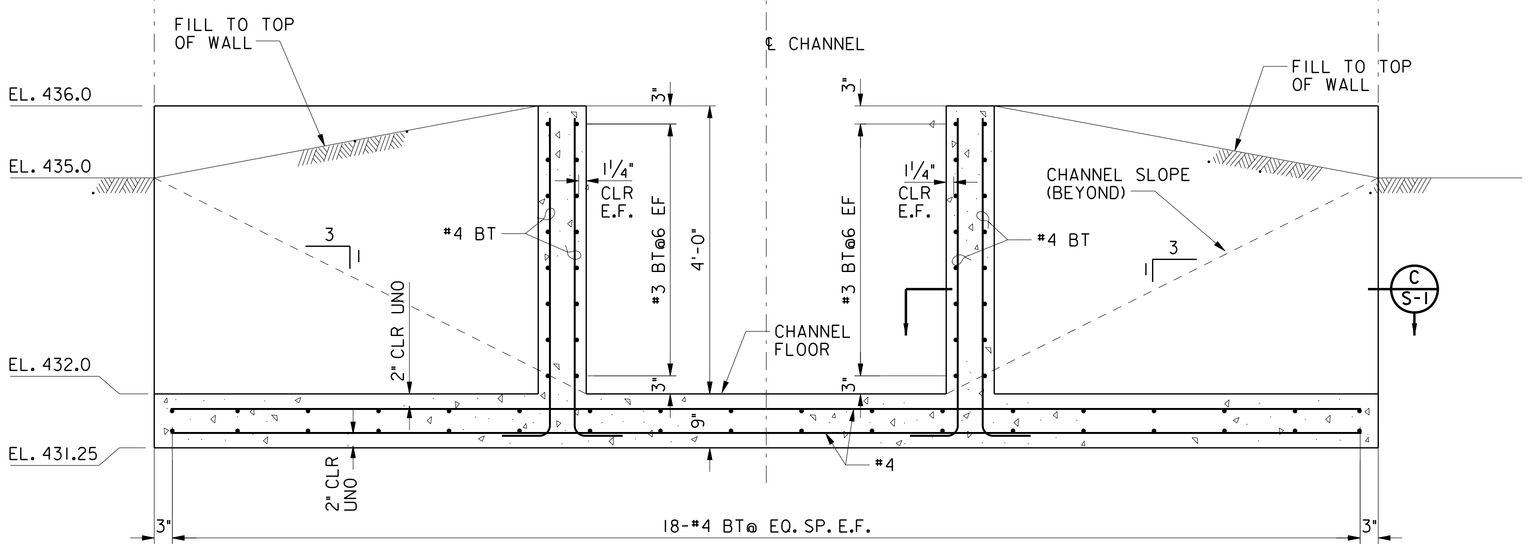
(B) SECTION S-1

SCALE: 3/4" = 1'-0"



(C) SECTION S-1

SCALE: 3/4" = 1'-0"



(A) SECTION S-1

SCALE: 3/4" = 1'-0"

GENERAL NOTES

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSION STRENGTH OF 4000 PSI AT MAXIMUM OF 28 DAYS AND A MINIMUM DENSITY OF 145 PSI. SEE SPECIFICATIONS FOR SPECIFIC STRENGTH REQUIREMENTS.
2. ALL REINFORCING, UNLESS OTHERWISE INDICATED, SHALL HAVE A CONCRETE COVER AS SHOWN.
3. REBAR HOOKS AND BENDS NOT DIMENSIONED SHALL CONFORM TO A.C.I. RECOMMENDED SIZES.
4. ALL EXPOSED EDGES OF CONCRETE SHALL HAVE 1" CHAMFER, U.N.O..
5. REINFORCING BARS SHALL CONFORM TO A.S.T.M. A-615, GRADE 60.
6. LAP SPLICES SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE, UNLESS NOTED OTHERWISE ON DRAWINGS.

   SPLICE TABLE FOR f'c = 4000 PSI, Fy = 60,000, CONCRETE DENSITY > 145 PSI

   REINFORCING SPLICES (INCHES)

BAR SIZE	TOP BAR	OTHER BARS
#3	25	19
#4	33	25

7. A 'TOP BAR' IS ANY HORIZONTAL BAR WITH MORE THAT 12" OF FRESH CONCRETE CAST BELOW THE BOTTOM OF THE BAR.
8. PICKUP POINTS TO BE DETERMINED BY FABRICATOR. REINFORCING SHOWN FOR SERVICE LOADS. SEE SPECIFICATIONS SECTION 03410 FOR ADDITIONAL REQUIREMENTS
9. STOPLOGS AND GUIDE FRAME TO BE BY PLASTI-FAB, INC. OR APPROVED EQUAL. WORK GUIDE REINFORCING LAYOUT WITH GUIDE FRAME DIMENSIONS AND EMBEDMENT DETAILS.

ABBREVIATIONS AND SYMBOLS:

BT	BENT
EA	EACH
EF	EACH FACE
EL	ELEVATION
EQ. SP.	EQUALLY SPACED
FS	FAR SIDE
NS	NEAR SIDE
TYP.	TYPICAL
UNO	UNLESS NOTED OTHERWISE
℄	CENTER LINE
@	AT

US Army Corps of Engineers St. Louis District

Designed by: DARREN MULFORD, P.E.
Date: JANUARY 2008
Drawn by: Will
Ckd by: Mulford
APPROVED: Thomas J. Quigley, P.E. Chief, Design Branch

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN MISSISSIPPI RIVER LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM POOLS 25 / 26 HABITAT REHABILITATION AND ENHANCEMENT

WATER CONTROL STRUCTURE PLAN, SECTIONS AND GENERAL NOTES

M-EMP-6

S-1

DRAWING NUMBER

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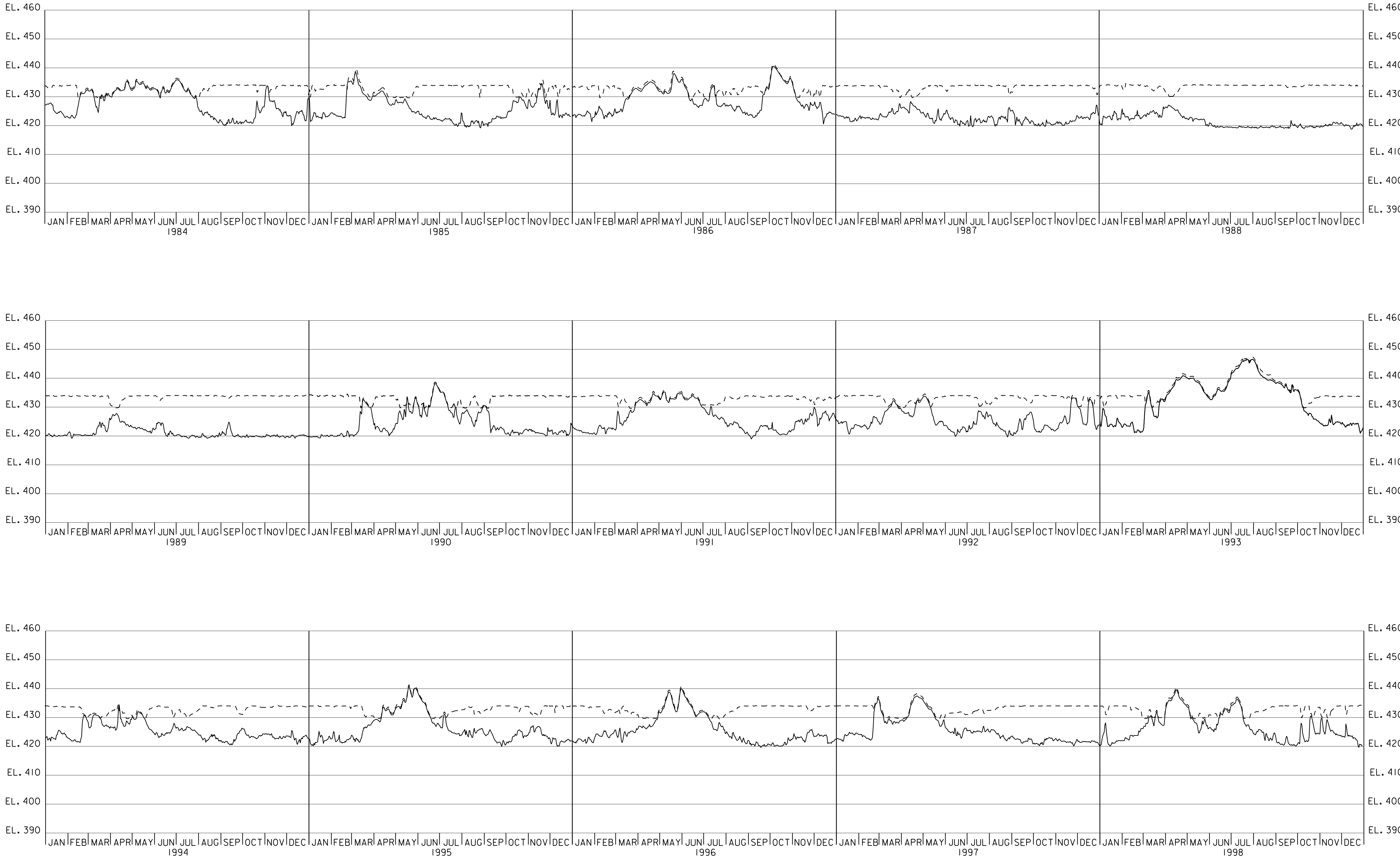

LEGEND:
---- POOL STAGE
—— TAILWATER STAGE

US Army Corps of Engineers
St. Louis District

U.S. ARMY ENGINEER DIVISION
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ST. LOUIS, MISSOURI

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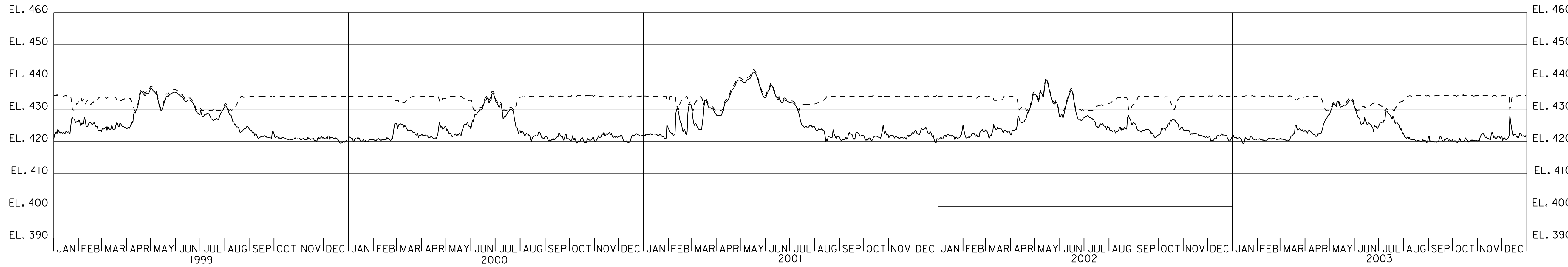
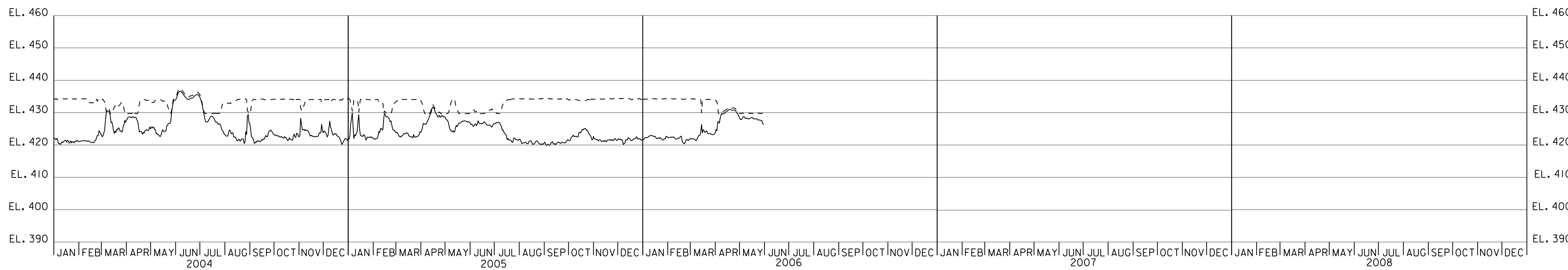
UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT

LOCK & DAM NO. 25 POOL
AND TAILWATER STAGE HYDROGRAPH
1984 TO 1998

M-EMP-6
H-1
DRAWING NUMBER





LEGEND:

---- POOL STAGE

—— TAILWATER STAGE

US Army Corps of Engineers
St. Louis District

Symbol	Description	Date	Appr.

Revisions

Designed by:
Drawn by: Witt
Ckd by: Mulford
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APPROVED:
Thomas J. Quigley P.E.
Chief, Design Branch

Date:
JANUARY 2008
SUBMITTED:

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U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN
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LINCOLN AND ST. CHARLES COUNTIES,
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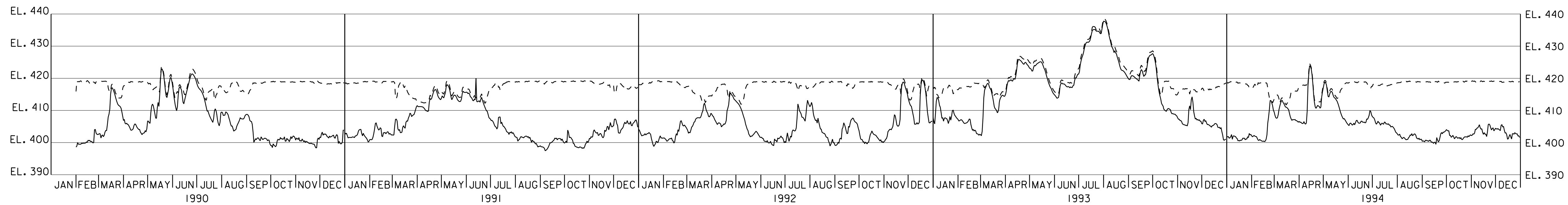
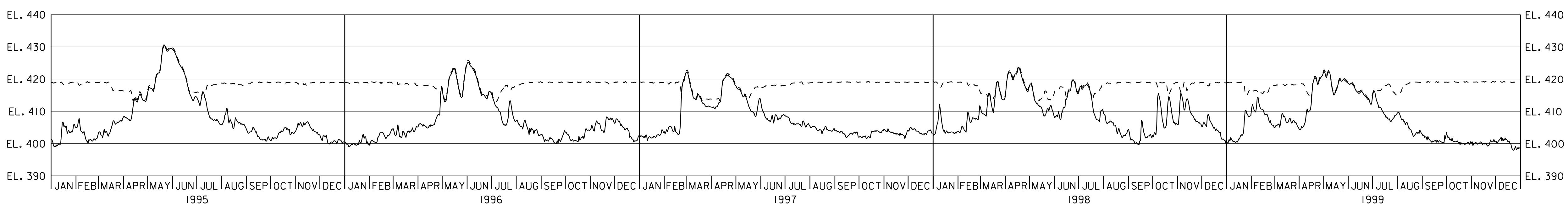
UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT

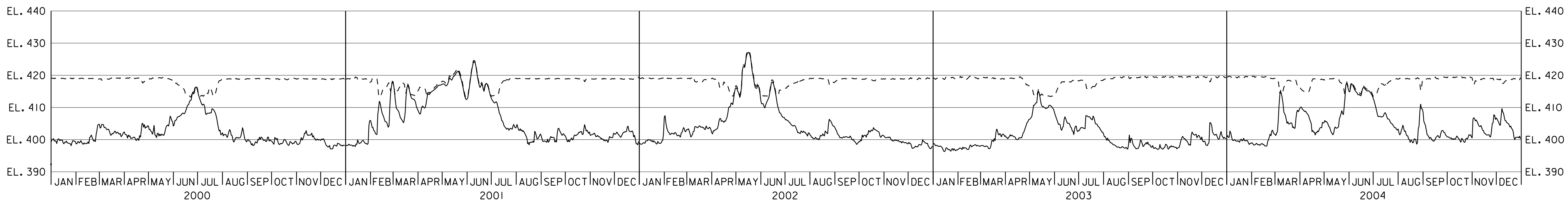
LOCK & DAM NO. 25 POOL
AND TAILWATER STAGE HYDROGRAPH
1999 TO PRESENT

M-EMP-6
H-2
DRAWING NUMBER

MEMP6-H02.DGN 11/29/2007 9:30:37 AM







LEGEND:
- - - - POOL STAGE
——— TAILWATER STAGE

US Army Corps of Engineers St. Louis District

Symbol	Description	Date	Appr.

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U.S. ARMY ENGINEER DIVISION
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ST. LOUIS, MISSOURI

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MISSISSIPPI RIVER
LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT

LOCK & DAM NO. 26 POOL
AND TAILWATER STAGE HYDROGRAPH
1990 TO 2004

M-EMP-6
H-3
DRAWING NUMBER

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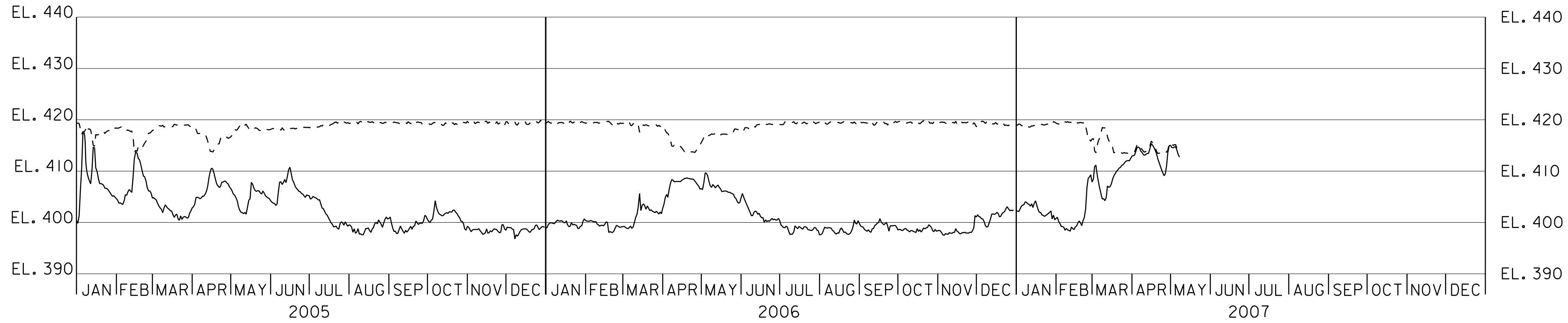

LEGEND:

---- POOL STAGE

—— TAILWATER STAGE

US Army Corps of Engineers
St. Louis District

Designed by: DARREN MULFORD, P.E.
Drawn by: Witt
Ckd by: Mulford
Reviewed by:
APPROVED: Thomas J. Quigley P.E. Chief, Design Branch
Date: JANUARY 2008
SUBMITTED:
File name: $$$DESIGN$FILE$SPECIFICATION$$$
Plot date: $$$$DATE-TIME$$$$
Plot scale:
SOL. NO. W912P9-04-B-0209

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN
MISSISSIPPI RIVER
LINCOLN AND ST. CHARLES COUNTIES, MISSOURI

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
POOLS 25 / 26
HABITAT REHABILITATION AND ENHANCEMENT

LOCK & DAM NO. 26 POOL
AND TAILWATER STAGE HYDROGRAPH
2005 TO PRESENT

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SPONSOR'S LETTER OF SUPPORT

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MISSOURI DEPARTMENT OF CONSERVATION

Headquarters

2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180

Telephone: (573) 751-4115 ▲ Missouri Relay Center: 1-800-735-2966 (TTY)

JOHN D. HOSKINS, Director

June 23, 2008

Mr. Joseph P. Kellett
Deputy District Engineer
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Dear Mr. Kellett:

The Missouri Department of Conservation (Department) supports the U.S. Army Corps of Engineers' (USACE) Pools 25 and 26 Islands Habitat Rehabilitation and Enhancement Project in St. Charles, Lincoln, and Pike counties, Missouri. Habitat restoration efforts are proposed for three islands within the Upper Mississippi Conservation Area. The project has the potential to help restore the structure and functions of the aquatic and terrestrial habitat complex that have been degraded by major flood events. Project outcomes include improvement of bottomland and slough habitats. The proposed restoration may involve mast tree plantings, placement of a water control structure, selective dredging of existing sloughs to enhance aquatic habitat and functions, and installation of a rock dike to maintain water depths for over-wintering and summer refuge habitats. This work would be accomplished under the authority of Water Resources Development Act of 1986 (Section 1103), as amended. The current total estimated first costs of the project are approximately $998,476 and the average annual operation and maintenance (O&M) costs are estimated to be $5,859.

It is the Department's understanding that under the provisions of the USACE's Environmental Management Program, this project would be constructed at 100% federal cost because the project area lies entirely on federal lands that the Department manages under a license agreement. As the project sponsor, the Department would be responsible for 100% of the O&M costs of the project. The Department's financial support would be dependent, of course, on total cost, appropriations authority, O&M responsibility, and benefits to the natural resources.

If additional information is needed, please contact Ms. Janet Sternburg of my staff at 573-522-4115, extension 3372.

Sincerely,

John Hoskins

JOHN D. HOSKINS
DIRECTOR

c: Janet Sternburg

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MEMORANDUM OF AGREEMENT BETWEEN DEPARTMENT OF THE ARMY AND U.S. FISH AND WILDLIFE SERVICE

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MEMORANDUM OF AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
THE UNITED STATES FISH AND WILDLIFE SERVICE
FOR
ENHANCING FISH AND WILDLIFE RESOURCES
OF THE
UPPER MISSISSIPPI RIVER RESTORATION SYSTEM
POOLS 25 & 26 ISLANDS
ST. CHARLES, LINCOLN, AND PIKE COUNTIES, MISSOURI
HABITAT REHABILITATION AND ENHANCEMENT PROJECT
MANAGED BY MISSOURI DEPARTMENT OF CONSERVATION

I. PURPOSE

The purpose of this Memorandum of Agreement (MOA) is to establish the relationships, arrangements, and general procedures under which the U.S. Fish and Wildlife Service (USFWS) and the Department of the Army (DA) will operate in constructing, operating, maintaining, repairing and rehabilitating the Pool 25 & 26 Islands, St. Charles, Lincoln, and Pike Counties, Missouri, Habitat Rehabilitation and Enhancement Project, separable element of the Upper Mississippi River Restoration System - Environmental Management Program (UMRRS-EMP).

II. BACKGROUND

a. The project lands of the Pool 25 & 26 Islands, St. Charles, Lincoln, and Pike Counties, Missouri, Habitat Rehabilitation and Enhancement Project are managed under a cooperative agreement between the Department of the Interior, USFWS, and the U.S. Army Corps of Engineers, dated 14 February 1963. Management of these project lands has been assumed by the Missouri Department of Conservation under a successive cooperative agreement.

b. Section 1103 of the Water Resources Development Act of 1986, Public Law 99-662, authorizes construction of measures for the purpose of enhancing fish and wildlife resources in the Upper Mississippi River System. Under conditions of Section 906(e) of the Water Resources Development Act of 1986, Public Law 99-662, all construction costs of those fish and wildlife features for the Pool 25 & 26 Islands, St. Charles, Lincoln, and Pike Counties, Missouri, Habitat Rehabilitation and Enhancement Project are 100 percent Federal, and pursuant to Section 107(b) of the Water Resources Development Act of 1992, Public Law 102-580, all costs of operation and maintenance for the Pool 25 & 26 Islands, St. Charles, Lincoln, and Pike Counties, Missouri, Habitat Rehabilitation and Enhancement Project are 100 percent non-Federal.

III. GENERAL SCOPE

The project to be accomplished pursuant to this MOA shall consist of the following:

a. Enhancing water level management capability at Westport Island (Pool 25) and removing sediments from an existing channel to improve the connection between the river and an interior slough complex.

b. Dredging approximately .5 acres of deep hole, construction of a rock dike structure adjacent to the deep hole for overwintering and summer refuge of fisheries, and removing sediments from an existing channel to improve the connection between the river and an interior slough at Bolters Island (Pool 26).

c. Mast tree plantings on approximately 59 acres at Westport Island (Pool 25) to restore forest diversity and provide food resources to wildlife.

d. Mast tree plantings on approximately 52 acres at Dardenne Island (Pool 26) to restore forest diversity and provide food resources to wildlife.

IV. RESPONSIBILITIES

A. The DA is responsible for:

1. **Construction**: Reforestation of 59 acres of abandoned cropland at sites with ground elevations exceeding 440 feet NGVD is proposed on Westport Island. Tree seedlings to be planted would consist of native hard mast species such as pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), bur oak (*Quercus macrocarpa*), pecan (*Carya illinoensis*), and Schuette oak (*Quercus x schuettii*, a hybrid between swamp white and bur oak). Native shrub species such as deciduous holly (*Ilex decidua*) and green hawthorne (*Crataegus viridis*) would be planted also. Plant materials would consist of seedlings produced using a root-pruned method, placed on a 30 by 30 foot spacing (49 per acre). Planting of tree and shrub seedlings at Dardenne Island would follow the same procedure to be used at Westport Island, except that planting sites in abandoned cropland would be in areas above 428 feet NGVD. Fifty-two acres of plantings are proposed on this 790-acre island.

a. Mechanical dredging of sediment is proposed in a portion of an existing 2,000-foot-long natural channel at the lower end of Westport Island. Sediments totaling 1,535 cubic yards would be removed from 1,000 feet of the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.7-acre disposal area (30 feet wide by 1,000 feet long) sited along the existing channel. Similar to Westport Island, mechanical dredging of sediment from an existing 1,250-foot-long natural channel at the lower end of Bolter Island (560 acres) is proposed. Sediments totaling 1,900 cubic yards would be removed from the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.85-acre disposal area (30 feet wide by 1,250 feet) sited along the existing channel.

b. A water control structure consisting of stop logs would be installed in the excavated channel of Westport Island. It is expected that this structure would be constructed off-site. A 1,265-foot long road would be constructed to provide access to the water control structure from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric.

c. A rock dike structure is proposed to be constructed in an interior slough at the lower end of Bolter Island, and a deep hole is proposed to be excavated immediately adjacent to the dike. The rock dike structure would be U-shaped and would consist of 165 tons of graded B stone. Sediments totaling 2,900 cubic yards would be mechanically excavated to a depth of eight feet in a 0.5 acre U-shaped area having a 13-foot wide bottom. Excavated sediments would be placed along either bank of the slough in two disposal areas measuring about 200 by 300 feet each. A 515-foot long road would be constructed to provide access to the natural channel and interior slough from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric.

2. **Major Rehabilitation**: The Federal share of any mutually agreed upon rehabilitation of the project that exceeds the annual operation and maintenance requirements identified in the Planning Design Analysis Report and that is needed as a result of specific storm or flood events.

3. **Construction Management**: Subject to and using funds appropriated by the Congress of the United States, and in accordance with Section 906(e) of the Water Resources Development Act of 1986, Public Law 99-662, the DA will construct the Pool 25 & 26 Islands, St. Charles, Lincoln, and Pike Counties, Missouri, Habitat Rehabilitation and Enhancement Project, as described in the Pool 25 & 26 Islands Planning and Design Analysis Report with Environmental Assessment, dated June 2008, applying those procedures usually followed or applied in Federal projects, pursuant to Federal laws, regulations, and policies. The USFWS will be afforded the opportunity to review and comment on all modifications and change orders prior to the issuance to the contractor of a Notice to Proceed. If DA encounters potential delays related to construction of the project, DA will promptly notify the USFWS of such delays.

4. **Maintenance of Records**: The DA will keep books, records, documents, and other evidence pertaining to costs and expenses incurred in connection with construction of the project to the extent and in such detail as will properly reflect total costs. The DA shall maintain such books, records, documents, and other evidence for a minimum of 3 years after completion of construction of the project and resolution of all relevant claims arising there from, and shall make available at its office, at reasonable times, such books, records, documents, and other evidence for inspection and audit by authorized representatives of the USFWS.

B. FWS Responsibilities: Upon completion of construction as determined by the District Engineer, St. Louis, the USFWS shall accept the project as part of the Mark Twain National Wildlife Refuge Complex.

C. **Non-Federal Responsibilities:** In accordance with Section 107(b) of the Water Resources Development Act of 1992, Public Law 102-580, 100 percent of all costs associated with the operation, maintenance, and repair of the Pool 25 & 26 Islands, St. Charles, Lincoln, and Pike Counties, Missouri, Habitat Rehabilitation and Enhancement Project will be borne by the Missouri Department of Conservation.

V. MODIFICATION AND TERMINATION

This MOA may be modified or terminated at any time by mutual agreement of the parties. Any such modification or termination must be in writing. Unless otherwise modified or

terminated, this MOA shall remain in effect for a period of no more than 50 years after initiation of construction of the project.

VI. REPRESENTATIVES

The following individuals or their designated representatives shall have authority to act under this MOA for their respective parties:

USFWS: Regional Director
U.S. Fish and Wildlife Service
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

DA: District Engineer
U.S. Army Engineer District, St. Louis
1222 Spruce Street
P.O. Box 2004
St. Louis, Missouri 63103-2833

EFFECTIVE DATE OF MOA

This MOA shall become effective when signed by the appropriate representatives of both parties.

THE DEPARTMENT OF ARMY **THE U.S. FISH AND WILDLIFE SERVICE**

BY: _____
THOMAS E. O'HARA
Colonel, U.S. Army
District Engineer

BY: _____
ROBYN THORSON
Regional Director
U.S. Fish and Wildlife Service

DATE: _____ DATE: _____

CERTIFICATION OF REVIEW

The Memorandum of Agreement (MOA) for the Habitat Rehabilitation and Enhancement Project of the Upper Mississippi River System at Pool 25 & 26 Islands, St. Charles, Lincoln, and Pike Counties, Missouri, is in compliance with the Model Agreement prescribed by CENCD-PE-PD-PL directive of 30 March 1993.

_____

Office of Counsel

_____

Date

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HABITAT EVALUATION AND INCREMENTAL COST ANALYSIS

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HABITAT EVALUATION AND INCREMENTAL COST ANALYSIS

Pools 25 & 26 Islands
Habitat Rehabilitation and Enhancement Project
Upper Mississippi River System – Environmental Management Program

This appendix describes two analyses that are fundamental to project formulation, evaluation, and selection of a recommended plan. A habitat evaluation was conducted to quantify the potential benefits of various habitat improvement features and plan alternatives at the Pools 25 & 26 Islands EMP-HREP project area. An incremental cost analysis was performed to compare the benefits and costs of each alternative, determine which alternatives are cost inefficient and ineffective, and identify the "best buy" or least cost alternatives.

1.0 HABITAT EVALUATION A team of biologists including representatives from the U.S. Fish and Wildlife Service (USFWS), Missouri Department of Conservation (MDC), and St. Louis District conducted the habitat evaluation.

1.1 HABITAT EVALUATION METHODS The methods used to assess habitat conditions within the project area include one for aquatic habitats and one for terrestrial habitats.

The habitat unit (HU) is the unit of measure used to express habitat outputs or improvements. A habitat unit is the product of habitat area and habitat quality. Area of habitat is expressed in acres. Habitat quality is expressed as a habitat suitability index (HSI), which varies from zero (no habitat quality) to one (maximum habitat quality). HSIs are obtained by assessing habitat characteristics at a particular sample site against what are considered to be ideal conditions. Habitat acres and HSIs are derived for each type of habitat, and for all project conditions - existing, future without a project, and future with a project. Habitat units can then be generated for all proposed alternatives. These habitat units are annualized so as to be consistent with the annualized costs used in the incremental cost analysis.

An aquatic habitat evaluation methodology that has gained acceptance by Federal and state natural resource agencies for use on the Upper Mississippi River at EMP-HREP project sites within the St. Louis District is the Aquatic Habitat Appraisal Guide (AHAG) (Mathias et al., 1996). This method was developed by the Corps' Engineer Research and Development Center (formerly Waterways Experiment Station) in coordination with the Corps' Rock Island District.

For the evaluation of terrestrial habitat, the Wildlife Habitat Appraisal Guide (WHAG) was used (MDC-SCS, 1990). WHAG was developed by the Missouri Department of Conservation and the former Soil Conservation Service based on the U.S. Fish and Wildlife Service's Habitat Evaluation Procedures methodology. WHAG is also accepted by Federal and state natural resources agencies, and it has become the primary

habitat-based method used in the St. Louis District for evaluation of terrestrial habitats at HREP project sites.

The AHAG or WHAG have not been field verified to determine how well they predict animal abundance. The indices they generate are considered to be estimates of habitat suitability. Assumptions made when using there models include: species abundance and distribution respond in a predictable and measurable fashion to changes in habitat quality; fish species within a guild have similar habitat requirements which can be described by the same set of habitat variables; at least one of the habitat variables used in the guide can potentially limit the distribution and abundance of the guild members.

1.2 Aquatic Habitat Appraisal Guide (AHAG) Mathias et al. (1996) prepared fish guilds for the AHAG method. They separated a list of fish species from the Upper Mississippi River into five guilds: swiftwater-large fishes (Group 1), swiftwater-small fishes (Group 2), slackwater-large fishes (Group 3), slackwater-small fishes (Group 4), and generalists (Group 5). Most species in Groups 1 and 2 are uncommon or occur only on a seasonal basis. These fishes prefer swiftwater habitats usually associated with coarse grain substrate. Their presence is indicative of good riverine habitat. Groups 3 and 4 are usually found in slackwater, although they occasionally enter swiftwater areas for feeding, dispersal, or spawning. Many of these species are economically important. Species in Group 5 are typically widespread and can tolerate a wide range of habitat conditions.

The AHAG uses habitat suitability index (HSI) scores to relate the value of selected habitat variables to a defined guild. Physical and water quality variables used in the guides have been identified as important in structuring fish communities in a variety of stream ecosystems. Furthermore, they characterize physical changes that have or could influence habitat quality. Each variable may limit the abundance and distribution of guild members.

For each guild, the range of habitat values is divided into classes and an HSI score was assigned to each class by life history stage (spawning, rearing, and adults). Each variable class is rated as excellent (1), good (.75), fair (.5), poor (.25), or unusable (0) habitat. The rating is based on information found in the HSI models published by the USFWS and other data sources. HUs can be determined by multiplying HSIs and acres. The AHAG data forms allow the user to enter all habitat measurements and calculate HSI values directly in the field.

TABLE 1 presents the AHAG habitat characteristics and evaluation species. The AHAG method includes eight evaluation species: white bass (guild 1); emerald shiner and river darter (guild 2); northern pike, smallmouth buffalo, walleye, and largemouth bass (guild 3); and bluegill (guild 4). The method also includes 16 habitat characteristics.

1.3 Wildlife Habitat Appraisal Guide (WHAG) The WHAG provides HSI values for terrestrial and wetland areas classified into broad land-use types. WHAG is based on the assumption that habitat can be numerically described by HSIs calculated from species-

TABLE 1. Habitat variables or characteristics for the Aquatic Habitat Appraisal Guide (Mathias et al., 1996).

1__ Average water temp oC (1)>30 (2)25-30 (3)20-25 (4)15-20 (5)10-15 (6)4-10 (7)0-4
2__ Average turbidity (NTU) (1)0-10 (2)10-50 (3)50-100 (4)100-150 (5)150-200 (6)>200
3__ Minimum daily dissolved O2 (mg/l) (1)0-1 (2)1-3 (3)3-5 (4)>5
4__ Percent of shoreline riprapped (1)0 (2)1-10 (3)10-25 (4)25-50 (5)>50
5__ Dominant substrate type (1)plants/detritus (2)clay/silt (<1.0mm) (3)sand (1-2 mm) (4) gravel (2-64mm) (5)rocks (>64mm)
6__ Percent surface area w/ visible logs, indundated timber, undercut banks, and/or brush (1)0-5 (2)5-10 (3)10-25 (4)25-30 (5)>50
7__ Percent of surface area with aquatic vegetation (lentic habitats only) (1)0-10 (2)10-25 (3)25-50 (4)50-75 (5)>75
8__ Water level fluctuation during spawning and egg incubation (1)stable (2)slow rise (0.5-1m) (3)rapid rise (1-2m) (4)rapid fall (0.5-1m)
9__ Variation in water depth, coefficient of variation, percent
Mean depth < 1m (1)0-25 (2)25-50 (3)50-100 (4) >100
Mean depth > 1m (1)0-20 (2)20-30 (3)30-50 (4)>50
10__ Percent of area with water depth greater than 1 m (lentic habitats only) (1)0-10 (2)10-25 (3) 25-50 (4)50-75 (5)>75
11__Percent of year/season backwaters are contiguous with the main stem river (lentic habitats only) (1)0 (2)1-25 (3)25-50 (4)50-75 (5)>75
12__ Average water velocity, cm/sec (1)0 (2)0.1-1 (3)1-4 (4)4-10 (5)10-25 (6)25-50 (7)50-75 (8)>75
13__ Average depth of thalweg, m (lotic habitats only) (1)<1 (2)1-2 (3)2-3 (4)>3
14__ Distance to nearest backwater with ave. depth >1m, miles (lotic habitats only) (1)<1 (2)1-2 (3)2-5 (4)>5
15__ Distance to nearest side channel with perm. water >2m and year round connectivity, miles (1)<0.5 (2)0.5-0.75 (3)0.75-1 (4)1-2 (5)2-5 (6)>5
16__ Percent of backwater/sidechannel area suitable as overwintering habitat from Nov-Feb (no current, H2O temp at least 1C warmer than main channel, DO>3.0 mg/l, water depth > 1.5m, periodically continuous with main river channel) (1)0 (2)1-25 (3)25-50 (4)50-75 (5)>75

habitat models. WHAG utilizes checklist-type appraisals for each habitat type. The guide breaks down habitat into the most important characteristics which are rated on a 1-to-5 or 1-to-10 scale, depending on their importance. Field data values are entered into a computer program which rates habitat types based on life requisite requirements for a variety of species. The resulting index ranges from a low HSI of 0.1 to a high of 1.0.

The HSIs and acres can be combined to assess the value of various proposed habitat improvements on the study area. Habitat units are annualized for a series of target years in order to evaluate changes in project features over time. Because the WHAG method rates habitat quality in terms of individual wildlife species, habitat units are also relative to individual species.

The terrestrial habitat characteristics and species used for evaluation are presented in TABLE 2. This information is referred to as the upland species characteristic matrix. The matrix includes 55 habitat characteristics and 14 wildlife species, including 11 birds and three mammals. In the matrix, habitat is categorized into five types – bottomland forest, upland forest, cropland, old field, and pasture. Of the 55 habitat characteristics, only portions are applicable to each habitat type. Likewise, no habitat characteristic is applicable to all 14 wildlife species.

1.4 Application of Methods The evaluation team conducted the AHAG and WHAG habitat evaluations by reviewing hydrographic and topographic maps, historic and current aerial photos, and hydrologic data for the project area, and visiting each of the sites.

1.4.1 Aquatic Habitats Sloughs located in the interior of Westport and Bolter Islands and a small side channel located at Dardenne Island represent the types of aquatic habitats that were evaluated. Following the aquatic habitat classification system of Wilcox (1993), these habitats correspond to “isolated floodplain lake – abandoned channel lake” and “tertiary channel”, respectively. Other kinds of aquatic habitats occur in the vicinity of the evaluated islands, such as “secondary channel” and “main channel – channel border”, but these were not evaluated.

1.4.2 Terrestrial Habitats Abandoned cropland and bottomland forest represent the types of terrestrial habitat that were evaluated. The evaluation team considered abandoned cropland on the islands to represent an early successional phase of bottomland forest. As the site manager of these islands, MDC carried on annual cropping activities up until the flood of 1993. Since then, woody encroachment into these abandoned fields has occurred. MDC has planted a grassy ground cover in these areas and periodically attempted to remove undesirable woody encroachment in anticipation of future tree planting.

1.4.3 Assessment Sites Interior slough habitat was assessed at Westport and Bolter Islands at one site, and side channel habitat was evaluated at Dardenne Island at one site. Abandoned cropland was assessed on Westport and Dardenne Islands at two sites each, and bottomland forest was evaluated at Howard Island and the adjacent unnamed island at one site each.

TABLE 2. Habitat variables or characteristics for bottomland hardwoods covertype, upland matrix, Wildlife Habitat Appraisal Guide (MDC-SCS, 1990).

1___Percent woodland (1)>75 (2)50-75 (3)25-50 (4)15-25 (5)5-15 (6)<5
2___Percent woodland fragmentation (% w/in 660 ft open) (1)50-75 (2)25-50 (3)10-25 (4)<10 (large block) (5)>75 (small tracts)
3___Percent woodland in regen and sapling size class (1)>25 (2)10-25 (3)<10 (4)zero
4___Percent woodland ungrazed (1)>75 (2)50-75 (3)25-50 (4)<25 (most grazed)
10___Woodland size class (1)regen (2)regen + 25-50% sawtimber (3)pole (4)pole + 25-50% sawtimber (5)sawtimber
11___Percent canopy old growth (>16 in dbh) (1)>25 (2)10-25 (3)5-10 (4)1-5 (5)zero
12___Woodland tree species (1)o,h,m,e,a,w (hard & soft mast) (2)o-h (3)both wo & bo (4) either (>75%) wo or bo or wal (5)e,w,c,s,m (soft mast only); or pine
13___Number of snags per acre (dead tree >6 in dbh & >10 ft tall) (1)>3 (2)2-3 (3)<2
14___Forest overstory canopy height (feet) (1)>80 (2)65-80 (3)40-65 (4)<40
15___Percent forest subcanopy closure (1)>90 (2)75-90 (3)50-75 (4)25-50 (5)<25
16___Stems per sq. yd. shrubs & tree reproduction >3 ft tall (1)>4 (2)3-4 (3)1-2 (4)<1
17___Woodland size (% w/in 660 ft open) (1)>90 (2)75-90 (3)50-75 (4)25-50 (5)<25
18___Percent woodland (stand) w/in 660 ft regen stand (1)>75 (2)50-75 (3)25-50 (4)<25
19___Forest openings (<2 ac) (1)5-10% scattered; regen; <40 ac tract;or >10% (2)5-10% (3)1-5% scattered (4)1-5% (5)<1%; or zero
20___Aspect (stand) tract (1)n,nw,ne, or bottomland (2) mixed n-s, e-w (3)neutral (4)s,se,sw
21___Number of cavity trees/ac (live tree w/ hole) (1)>7 (2)5-6 (3)3-4 (4)<2
24___Overstory tree canopy coverage (1)<5 (2)5-10 (3) 10-25 (4)25-50 (5)>50
25___Concealment cover (1)>10; or <10 ac & border >75% (2)5-10 (3)1-5 (4)<1 or zero
26___Vegetative cover (canopy cover 6-18 in tall) (1)>75 (very thick) (2)50-75 (3)25-50 (4)5-25 (sparse) (5)1-5 (6)zero or all veg <6 in tall
27___Herbaceous canopy cover (1)>90 (2)75-90 (3)50-75 (4)25-50 (5)<25
30___Flood frequency (1)none/infrequent (2)frequent dormant season (3) growing season
31___Edge extent (% perimeter with border) (1)>75 (2)50-75 (3)25-50 (4)<25; or >50% canopy coverage fescue
32___Border compostion (percent woody) (1)>75 (2)50-75 (3)25-50 (4)<25 or >50% canopy coverage of fescue
34___Plant diversity (1)>14 (2)7-14 (3)<7
40___Grazing pressure woodland (1)none (2)grazed
45___Dist to water (1)<250 ft (2)250 ft-1/8 mi (3)1/8 mi-1/4 mi (4)1/4-1/2 mi (5)1/2-1 mi (6)>1 mi
46___Dist to old field (1)<250 ft (2)250 ft-1/8 mi (3)1/8-1/4 mi (4)1/4-1/2 mi (5)1/2-1 mi (6)>1 mi or >50% canopy coverage fescue
51___Dist to cropland (1)<250 ft no fall till (2)250 ft-1/8 mi no fall till (3)<250 ft disc/chisel (4)250 ft-1/8 mi disc/chisel (5)1/8-1/4 mi no fall till (6)1/4-1/2 mi no fall till (7)1/8-1/4 mi disc/chisel (8)1/4-1/2 mi disc/chisel (9)1/2-1 mi no fall till (10)1/2-1 mi disc/chisel (11)>1 mi; or fall plowed
52___Dist grassland (1)<250 ft gpd (good plant diversity, l-mod use (2)250 ft-1/8 mi gpd, l-m use (3)<250 ft mpd, l-m use (4)250 ft-1/8 mi mpd, l-m use (5)1/8-1/4 mi gpd, l-m use (6)1/4-1/2 mi gpd, l-m use (7)1/8-1/4 mi mpd, l-m use (8)1/4-1/2 mi mpd, l-m use (9)1/2-1 mi gpd, l-m use (10)1/2-1 mi mpd, l-mod use (11)>1 mi; ppd; or heavy use
53___Dist cedar/pine (>2 ac & <6 in dbh) (1)<1/2 mi (2)1/2-1 mi (3)>1 mi
54___Dist to sapling or regeneration size class tract (stand) (1)<1/8 mi (2)1/8-1/4 mi (3)>1/4 mi

1.4.4 Target Evaluation Species/Groups All ten fish species in the AHAG are found in Pools 25 and 26 and were included in the evaluation. For each species, habitat conditions for three separate life stages were evaluated: spawning, rearing, and juvenile/adult. Because spawning is a spring-time activity for many fish species, the period April-May-June was evaluated for this life stage. As young fishes are reared soon after spawning, and the period June-July-August was evaluated for the rearing life stage. Because juveniles and adults must survive the following winter, the period November-December-January-February was assessed for the juvenile/adult life stage. AHAG's default matrix of scores for all species and life stages was used.

Ten evaluation species were assessed in WHAG for bottomland forest: white-tail deer, turkey, pileated woodpecker, fox squirrel, wood thrush, Kentucky warbler, bob white quail, rabbit, indigo bunting, ruffed grouse. They all occur in floodplain forests of Pools 25 and 26.

1.4.5 Target Years Habitat conditions were projected over a 50-year planning period. Existing conditions were represented by target year zero (2006), and future conditions by target year 50 (2056). Intermediate years were evaluated under AHAG (target year 1 and target year 10) and WHAG (target year 1 and target year 25). The team assessed aquatic and terrestrial habitats at each sample site under existing conditions, future-without conditions, and future-with conditions for each proposed feature or measure.

1.5 Proposed Measures The interagency team of biologists developed a total of eight features or measures to address the habitat objectives. These measures are displayed in TABLE 3.

1.6 Assumptions Assumptions concerning study conditions and habitat characteristics were made by the evaluation team for existing, future-without, and future-with conditions. For future conditions, it was assumed that there would be no significant changes to river regulating works or pool management in Pools 25 and 26 that would affect the project area.

1.6.1 Existing Conditions Corps hydrographic surveys available at the time of the field assessment were limited to the main channel and portions of the main channel border area. No survey covered the island slough habitats or the small side channel at Dardenne Island. Approximate depth soundings were taken for some of the unsurveyed areas using an electronic "fish-finder." Incomplete depth data led to the following assumptions about water depths at normal pool and other factors.

- The small side channel at Dardenne Island averages about 3-4 feet deep down its middle.

- The average depth of sloughs on Westport and Bolter Islands is 2-3 feet.

- The slough complex in the interior of Westport Island experiences partial loss of water

TABLE 3. Proposed measures to improve terrestrial and aquatic habitat conditions.

Measure Name	Location	Description of Measure
A	Westport Island	•plant oak-hickory tree seedlings in abandoned cropland at elevations where they naturally regenerate
B	Dardenne Island	•plant oak-hickory tree seedlings in abandoned cropland at elevations where they naturally regenerate
C	Bolter Island	•excavate/dredge an island channel to restore connection to river; •excavate/dredge a deep hole in slough; •build rock structure in slough that will use river's energy during floods to maintain deep hole
D	Dardenne Island	•excavate/dredge a deep hole in side channel; •build rock structure in side channel that will use the river's energy during floods to maintain deep hole
E	Westport Island	•excavate/dredge a deep hole in slough; •build rock structure in isolated slough that will use the river's energy during floods to maintain deep hole (structure #3)
F	Westport Island	•excavate a deep hole in abandoned cropland; •build rock structure in abandoned cropland that will use the river's energy during floods to maintain deep hole (structure #6)
G	Westport Island	•excavate/dredge an island channel to restore connection to river; •install water control structure in island channel to temporarily hold water in island's interior sloughs
H	Howard Island, unnamed	•place bank revetment on upstream ends of islands to minimize erosion

(surface area and depth) during periods of low river conditions and high air temperatures (i.e., summer).

- Appropriate tree planting elevations on Westport and Dardenne Islands, as determined by site visit, are above 440 and above 428 feet NGVD, respectively.

1.6.2 Future Without Project Conditions The following assumptions were made for the project area 50 years from now without any HREP project.

- Rates of sedimentation in backwater areas in Pools 25 and 26 are expected to be about 0.3 cm per year (WEST Consultants, Inc., 2000:164). Over a 50-year period, this rate would be equivalent to about 15 cm, or about 6 inches. This amount of additional sediment is assumed to accumulate in the project area's backwaters over the next 50 years.

- Sedimentation within island sloughs and the Dardenne Island side channel will not change the surface area (size) of these aquatic habitats.

- No flood event similar to that of 1993 will occur over the next 50 years, which would otherwise carry large amounts of river-borne sediment into backwater areas.

1.6.3 Future With Project Conditions These assumptions were made concerning the future with each of the alternative action plans.

- Survival of planted tree and shrub seedlings over time would be sufficient to establish a mature hard-mast forest community.

- Post-construction configuration of the natural channels on Westport and Bolter Islands would minimize future deposition of river-borne sediment, such that future blockages would not occur.

- Maintenance of water depth in the deep hole created at Bolter Island would be maintained by the constructed rock dike structure.

- During periodic closure of the water control structure on Westport Island, the surface area of the interior slough complex would increase slightly due to the temporary establishment of a perched water surface elevation.

1.7 Calculation Methods for Habitat Suitability Indices and Average Annual Habitat Units Fish habitat suitability indices (HSIs) were computed in Excel following the AHAG procedure. Aquatic HSIs were calculated for all fish species and all three life stages. Aquatic HSIs were averaged across these life stages for each fish species to compute average annual habitat units in Excel. Terrestrial HSIs were calculated using the WHAG software, and average annual habitat units were calculated for all species in Excel.

1.8 Results HSIs, habitat acres, and average annual habitat units are displayed for all project conditions and target evaluation species/groups.

1.8.1 Aquatic (AHAG) Habitat Quality AHAG field data are presented in TABLE 4. Habitat suitability indices for fish are presented in TABLE 7.

1.8.2 Terrestrial (WHAG) Habitat Quality WHAG field data are presented in TABLE 5 and TABLE 6. Habitat suitability indices generated from the WHAG software are given in TABLE 8 and TABLE 9.

1.8.3 Habitat Area Affected Changes in areas of aquatic and terrestrial habitats over time and due to project alternatives are presented in TABLE 10.

TABLE 4. AHAG field data for Measures C through G.

Habitat variable/project condition	Measure C (Bolter Island interior slough)			Measure D (Dardenne Island side channel)			Measure E (Westport Island interior slough)			Measure F (Westport Island cropland)			Measure G (Westport Island channel)		
	spawning	rearing	juv/adult	spawning	rearing	juv/adult	spawning	rearing	juv/adult	spawning	rearing	juv/adult	spawning	rearing	juv/adult
1. Average Water Temp °C															
present TY0	3	2	6	3	2	6	3	2	6	0	0	0	3	2	6
future w/o project TY1	3	2	6	3	2	6	3	2	6	0	0	0	3	2	6
future w/o project TY10	3	2	6	3	2	6	3	2	6	0	0	0	3	2	6
future w/o project TY50	3	2	6	3	2	6	3	2	6	0	0	0	3	2	6
future w/ project TY1	3	2	6	3	2	6	3	2	6	3	2	6	3	2	6
future w/ project TY10	3	2	6	3	2	6	3	2	6	3	2	6	3	2	6
future w/ project TY50	3	2	6	3	2	6	3	2	6	3	2	6	3	2	6
2. Average Turbidity (NTU)															
present TY0	3	3	2	3	3	2	3	3	2	0	0	0	3	3	2
future w/o project TY1	3	3	2	3	3	2	3	3	2	0	0	0	3	3	2
future w/o project TY10	3	3	2	3	3	2	3	3	2	0	0	0	3	3	2
future w/o project TY50	3	3	2	3	3	2	3	3	2	0	0	0	3	3	2
future w/ project TY1	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2
future w/ project TY10	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2
future w/ project TY50	3	3	2	3	3	2	3	3	2	3	3	2	3	3	2
3. Minimum Daily Dissolved O2 (mg/l)															
present TY0	4	2	3	4	3	4	4	2	4	0	0	0	4	2	4
future w/o project TY1	4	2	3	4	3	4	4	2	4	0	0	0	4	2	4
future w/o project TY10	4	2	3	4	3	4	4	2	4	0	0	0	4	2	4
future w/o project TY50	4	2	3	4	3	4	4	2	4	0	0	0	4	2	4
future w/ project TY1	4	3	3	4	3	4	4	2	4	5	2	4	4	2	4
future w/ project TY10	4	3	3	4	3	4	4	2	4	5	2	4	4	2	4
future w/ project TY50	4	3	3	4	3	4	4	2	4	5	2	4	4	2	4
4. Percent of Shoreline Riprapped															
present TY0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY10	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY50	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/ project TY1	2	2	2	2	2	2	2	2	2	4	4	4	1	1	1
future w/ project TY10	2	2	2	2	2	2	2	2	2	4	4	4	1	1	1
future w/ project TY50	2	2	2	2	2	2	2	2	2	4	4	4	1	1	1
5. Dominant substrate type															
present TY0	2	2	2	2	2	2	2	2	2	0	0	0	2	2	2
future w/o project TY1	2	2	2	2	2	2	2	2	2	0	0	0	2	2	2
future w/o project TY10	2	2	2	2	2	2	2	2	2	0	0	0	2	2	2
future w/o project TY50	2	2	2	2	2	2	2	2	2	0	0	0	2	2	2
future w/ project TY1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
future w/ project TY10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
future w/ project TY50	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6. Percent Surface Area w/ Visible logs, Indundated Timber and/or Brush															

present TY0	2	2	2	2	2	2	2	2	2	0	0	0	2	2	2
future w/o project TY1	2	2	2	2	2	2	2	2	2	0	0	0	2	2	2
future w/o project TY10	2	2	2	2	2	2	2	2	2	0	0	0	2	2	2
future w/o project TY50	2	2	2	3	3	3	2	2	3	0	0	0	2	2	2
future w/ project TY1	1	1	1	2	2	2	2	2	2	1	1	1	2	2	2
future w/ project TY10	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2
future w/ project TY50	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2
7. Percent of Surface Area with Aquatic Vegetation (lentic habitats only)															
present TY0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY10	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY50	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/ project TY1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
future w/ project TY10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
future w/ project TY50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8. Water Level Fluctuation															
present TY0	2	1	1	2	1	1	2	1	1	0	0	0	2	1	1
future w/o project TY1	2	1	1	2	1	1	2	1	1	0	0	0	2	1	1
future w/o project TY10	2	1	1	2	1	1	2	1	1	0	0	0	2	1	1
future w/o project TY50	2	1	1	2	1	1	2	1	1	0	0	0	2	1	1
future w/ project TY1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1
future w/ project TY10	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1
future w/ project TY50	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1
9. Variation in Water Depth, Coef of Variation, Percent															
(Mean Depth <1m)															
present TY0	1	1	1	1	1	1	1	1	1				1	1	1
future w/o project TY1	1	1	1	1	1	1	1	1	1				1	1	1
future w/o project TY10	1	1	1	1	1	1	1	1	1				1	1	1
future w/o project TY50	1	1	1	1	1	1	1	1	1				1	1	1
future w/ project TY1	1	1	1				1	1	1				1	1	1
future w/ project TY10	1	1	1				1	1	1				1	1	1
future w/ project TY50	1	1	1				1	1	1				1	1	1
(Mean Depth >1m)															
present TY0										0	0	0			
future w/o project TY1										0	0	0			
future w/o project TY10										0	0	0			
future w/o project TY50										0	0	0			
future w/ project TY1				2	2	2				3	3	3			
future w/ project TY10				2	2	2				3	3	3			
future w/ project TY50				1	1	1				3	3	3			
10. Percent of Area with Water Depth Greater than 1m (lentic habitats only)															
present TY0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY10	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY50	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/ project TY1	1	1	1	4	4	4	1	1	1	3	3	3	1	1	1
future w/ project TY10	1	1	1	3	3	3	1	1	1	3	3	3	1	1	1
future w/ project TY50	1	1	1	2	2	2	1	1	1	3	3	3	1	1	1
11. Percent of Year/Season Backwaters are contiguous with the Main Stem River															
present TY0	2	2	2	5	5	5	2	2	2	0	0	0	2	2	2
future w/o project TY1	2	2	2	5	5	5	2	2	2	0	0	0	2	2	2
future w/o project TY10	2	2	2	5	5	5	2	2	2	0	0	0	2	2	2
future w/o project TY50	2	2	2	5	5	5	2	2	2	0	0	0	2	2	2

future w/ project TY1	5	4	4	5	5	5	2	2	2	2	2	2	5	4	4
future w/ project TY10	5	4	4	5	5	5	2	2	2	2	2	2	5	4	4
future w/ project TY50	5	4	4	5	5	5	2	2	2	2	2	2	5	4	4
12. Average Water Velocity, cm/sec															
present TY0	2	2	2	2	2	2	2	1	1	0	0	0	2	2	2
future w/o project TY1	2	2	2	2	2	2	2	1	1	0	0	0	2	2	2
future w/o project TY10	2	2	2	2	2	2	2	1	1	0	0	0	2	2	2
future w/o project TY50	2	2	2	2	2	2	2	1	1	0	0	0	2	2	2
future w/ project TY1	3	2	2	2	2	2	2	1	1	2	1	1	3	2	2
future w/ project TY10	3	2	2	2	2	2	2	1	1	2	1	1	3	2	2
future w/ project TY50	3	2	2	2	2	2	2	1	1	2	1	1	3	2	2
15. Distance to nearest side channel w/ perm. water >2m & year round connectivity, miles															
present TY0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY10	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY50	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/ project TY1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
future w/ project TY10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
future w/ project TY50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16. Percent of backwater area suitable as overwintering habitat from Nov-Feb															
present TY0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY10	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/o project TY50	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
future w/ project TY1	2	2	2	3	3	3	2	2	2	2	2	2	1	1	1
future w/ project TY10	2	2	2	3	3	3	2	2	2	2	2	2	1	1	1
future w/ project TY50	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1

TABLE 5. WHAG field data for Measures A and B (tree planting on Westport and Dardenne Islands, bottomland hardwoods covertype).

Variable	Existing	Future without			Future with		
	TY=0	TY=1	TY=25	TY=50	TY=1	TY=25	TY=50
1	3	3	3	3	3	3	3
2	2	2	4	4	2	4	4
3	2	2	3	3	2	3	3
4	1	1	1	1	1	1	1
10	1	1	4	5	1	4	5
11	5	5	5	1	5	5	1
12	5	5	5	5	1	1	1
13	4	4	3	1	4	3	1
14	4	4	3	2	4	3	2
15	5	5	4	4	5	4	3
16	1	1	2	3	3	2	3
17	5	5	5	5	5	5	5
18	4	4	4	4	4	4	4
19	1	1	1	1	1	1	1
20	3	3	3	3	3	3	3
21	4	4	4	3	4	4	3
24	1	1	4	5	1	4	5
25	4	4	3	2	4	3	2
26	5	5	4	3	5	4	3
27	1	1	3	4	1	3	4
30	3	1	1	1	1	1	1
31	4	4	4	4	4	4	4
32	1	1	1	1	1	1	1
34	3	3	3	3	3	2	2
40	1	1	1	1	1	1	1
45	3	3	3	3	3	3	3
46	1	1	6	6	1	6	6
51	11	11	11	11	11	11	11
52	11	11	11	11	11	11	11
53	3	3	3	3	3	3	3
54	1	1	3	3	1	3	3

TABLE 6. WHAG field data for Measure H (bank revetment at Howard Island and unnamed island, bottomland hardwoods covertype).

Variable	Existing	Future without			Future with		
	TY=0	TY=1	TY=25	TY=50	TY=1	TY=25	TY=50
1	3	3	3	3	3	3	3
2	2	2	2	2	2	2	2
3	2	2	2	2	2	2	2
4	1	1	1	1	1	1	1
10	5	5	5	5	5	5	5
11	1	1	1	1	1	1	1
12	5	5	5	5	5	5	5
13	1	1	1	1	1	1	1
14	2	2	2	2	2	2	2
15	4	4	4	4	4	4	4
16	3	3	3	3	3	3	3
17	5	5	5	5	5	5	5
18	4	4	4	4	4	4	4
19	1	1	1	1	1	1	1
20	3	3	3	3	3	3	3
21	3	3	3	3	3	3	3
24	5	5	5	5	5	5	5
25	2	2	2	2	2	2	2
26	3	3	3	3	3	3	3
27	4	4	4	4	4	4	4
30	1	1	1	1	1	1	1
31	4	4	4	4	4	4	4
32	1	1	1	1	1	1	1
34	3	3	3	3	3	3	3
40	1	1	1	1	1	1	1
45	2	2	2	2	2	2	2
46	4	4	4	4	4	4	4
51	11	11	11	11	11	11	11
52	11	11	11	11	11	11	11
53	3	3	3	3	3	3	3
54	3	3	3	3	3	3	3

TABLE 7. AHAG habitat suitability indices for Measures C through G.

Site/project condition	White bass	Emerald shiner	River darter	Northern pike	Smallmouth buffalo	Walleye	Largemouth bass	Bluegill
Measure C: Bolter Island interior slough								
present TY0	0.67	0.77	0.70	0.61	0.72	0.66	0.60	0.66
future w/o project TY1	0.67	0.77	0.70	0.61	0.72	0.66	0.60	0.66
future w/o project TY10	0.67	0.77	0.70	0.61	0.72	0.66	0.60	0.66
future w/o project TY50	0.67	0.77	0.70	0.61	0.72	0.66	0.60	0.66
future w/ project TY1	0.71	0.86	0.77	0.60	0.77	0.72	0.62	0.68
future w/ project TY10	0.71	0.83	0.76	0.62	0.79	0.72	0.63	0.69
future w/ project TY50	0.71	0.83	0.76	0.62	0.79	0.72	0.63	0.69
Measure D: Dardenne Island side channel								
present TY0	0.70	0.81	0.73	0.65	0.79	0.71	0.64	0.68
future w/o project TY1	0.70	0.81	0.73	0.65	0.79	0.71	0.64	0.68
future w/o project TY10	0.70	0.81	0.73	0.65	0.79	0.71	0.64	0.68
future w/o project TY50	0.67	0.79	0.70	0.67	0.79	0.69	0.66	0.70
future w/ project TY1	0.81	0.87	0.78	0.71	0.86	0.82	0.74	0.78
future w/ project TY10	0.79	0.87	0.78	0.70	0.86	0.80	0.73	0.78
future w/ project TY50	0.74	0.84	0.76	0.66	0.83	0.74	0.68	0.73
Measure E: Westport Island interior slough								
present TY0	0.68	0.77	0.70	0.62	0.73	0.66	0.61	0.66
future w/o project TY1	0.68	0.77	0.70	0.62	0.73	0.66	0.61	0.66
future w/o project TY10	0.68	0.77	0.70	0.62	0.73	0.66	0.61	0.66
future w/o project TY50	0.67	0.76	0.70	0.63	0.72	0.66	0.62	0.67
future w/ project TY1	0.69	0.79	0.73	0.61	0.74	0.68	0.63	0.69
future w/ project TY10	0.69	0.79	0.73	0.61	0.74	0.68	0.63	0.69
future w/ project TY50	0.69	0.79	0.73	0.61	0.74	0.68	0.63	0.69
Measure F: Westport Island cropland								
present TY0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
future w/o project TY1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
future w/o project TY10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
future w/o project TY50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
future w/ project TY1	0.79	0.84	0.77	0.60	0.76	0.76	0.68	0.76
future w/ project TY10	0.79	0.84	0.77	0.60	0.76	0.76	0.68	0.76
future w/ project TY50	0.79	0.84	0.77	0.60	0.76	0.76	0.68	0.76
Measure G: Westport Island channel								
present TY0	0.68	0.77	0.71	0.62	0.73	0.67	0.61	0.66
future w/o project TY1	0.68	0.77	0.71	0.62	0.73	0.67	0.61	0.66
future w/o project TY10	0.68	0.77	0.71	0.62	0.73	0.67	0.61	0.66
future w/o project TY50	0.68	0.77	0.71	0.62	0.73	0.67	0.61	0.66
future w/ project TY1	0.70	0.80	0.72	0.64	0.77	0.70	0.62	0.66
future w/ project TY10	0.70	0.80	0.72	0.64	0.77	0.70	0.62	0.66
future w/ project TY50	0.70	0.80	0.72	0.64	0.77	0.70	0.62	0.66

TABLE 8. WHAG habitat suitability indices for Measures A and B (abandoned cropland planted with tree and shrubs, Westport and Dardenne Islands).

Evaluation species	Existing	Future without			Future with		
	TY0	TY1	TY25	TY50	TY1	TY25	TY50
White-tailed deer	0.61	0.61	0.54	0.58	0.62	0.58	0.62
Turkey	0.53	0.53	0.51	0.58	0.55	0.56	0.63
Pileated woodpecker	0.10	0.10	0.46	0.73	0.10	0.57	0.84
Fox squirrel	0.10	0.10	0.50	0.68	0.10	0.62	0.80
Wood thrush	0.10	0.10	0.69	0.71	0.10	0.69	0.73
Kentucky warbler	0.10	0.10	0.66	0.70	0.10	0.66	0.72
Bobwhite quail	0.10	0.13	0.11	0.13	0.13	0.12	0.14
Rabbit	0.10	0.12	0.10	0.12	0.12	0.11	0.13
Indigo bunting	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Ruffed grouse	0.60	0.60	0.35	0.35	0.56	0.37	0.36

TABLE 9. WHAG habitat suitability indices for Measure H (bank revetment at Howard Island and unnamed island, bottomland hardwoods covertype).

Evaluation species	Existing	Future without			Future with		
	TY0	TY1	TY25	TY50	TY1	TY25	TY50
White-tailed deer	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Turkey	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Pileated woodpecker	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Fox squirrel	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Wood thrush	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Kentucky warbler	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Bobwhite quail	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Rabbit	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Indigo bunting	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Ruffed grouse	0.44	0.44	0.44	0.44	0.44	0.44	0.44

TABLE 10. Area of habitat (acres) affected by each Measure.

Measure	Existing	Future without			Future with		
	TY0	TY1	TY25	TY50	TY1	TY25	TY50
A	59.0	59.0	59.0	59.0	59.0	59.0	59.0
B	52.0	52.0	52.0	52.0	52.0	52.0	52.0
C	13.0	13.0	13.0	13.0	13.0	13.0	13.0
D	2.0	2.0	2.0	2.0	2.0	2.0	2.0
E	10.0	10.0	10.0	10.0	10.0	10.0	10.0
F	0.0	0.0	0.0	0.0	0.5	0.5	0.5
G	74.0	74.0	74.0	74.0	75.0	75.0	75.0
H	51.0	51.0	50.9	50.5	51.0	51.0	51.0

1.8.4 Fish Habitat Units Average annual habitat units for the eight fish species are provided in TABLE 11. The values reflecting the “net change” or difference between the future without and future with project condition for each alternative were summed across all species and carried over into the incremental cost analysis.

1.8.5 Terrestrial Animal Habitat Units Project benefits provided to the ten wildlife species are displayed in TABLE 12. The values reflecting the “net change” or difference between the future without and future with project condition for each alternative were summed across all species and carried over into the incremental cost analysis.

1.9 References Cited

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TABLE 11. AHAG average annual habitat units for Measures C through G.

Site/Project Condition	White bass	Emerald shiner	River darter	Northern pike	Smallmouth buffalo	Walleye	Largemouth bass	Bluegill	Total
Measure C (Bolter interior slough)									
Future without	8.68	9.99	9.16	7.96	9.42	8.61	7.07	8.54	69.44
Future with	9.18	10.76	9.86	8.01	10.21	9.41	7.51	8.93	73.87
Net change	0.50	0.77	0.70	0.05	0.79	0.81	0.44	0.39	4.44
Measure D (Dardenne Island side channel)									
Future without	1.37	1.60	1.43	1.32	1.58	1.41	1.30	1.38	11.39
Future with	1.54	1.72	1.54	1.36	1.69	1.56	1.42	1.51	12.33
Net change	0.16	0.11	0.11	0.05	0.11	0.15	0.12	0.13	0.94
Measure E (Westport north interior slough)									
Future without	6.75	6.75	7.02	6.27	7.28	6.62	6.16	6.65	53.50
Future with	6.92	6.92	7.35	6.12	7.43	6.80	6.32	6.87	54.72
Net change	0.17	0.17	0.33	-0.15	0.15	0.18	0.16	0.22	1.23
Measure F (Westport in cropland)									
Future without	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Future with	0.39	0.41	0.38	0.30	0.38	0.37	0.34	0.38	2.94
Net change	0.39	0.41	0.38	0.30	0.38	0.37	0.34	0.38	2.94
Measure G (Westport excavate channel)									
Future without	50.32	57.33	52.70	46.22	54.06	49.43	44.93	49.03	404.01
Future with	52.42	59.97	53.96	47.72	57.61	52.44	46.41	49.68	420.21
Net change	2.10	2.64	1.27	1.50	3.54	3.01	1.48	0.66	16.20

TABLE 12. WHAG average annual habitat units for Measures A, B, and H.

Evaluation species	Measure A (Westport Island)			Measure B (Dardenne Island)			Measure H (Howard & unnamed Islands)		
	Future without	Future with	Net change	Future without	Future with	Net change	Future without	Future with	Net change
Turkey	31.43	33.91	2.48	27.70	29.88	2.18	34.05	34.17	0.12
Fox squirrel	26.02	31.26	5.24	22.93	27.55	4.62	34.55	34.68	0.13
White-tailed deer	33.52	35.42	1.89	29.55	31.22	1.67	32.52	32.64	0.12
Pileated woodpecker	25.60	30.40	4.80	22.56	26.80	4.23	34.05	34.17	0.12
Wood thrush	31.95	32.25	0.29	28.16	28.42	0.26	35.06	35.19	0.13
Kentucky warbler	30.94	31.23	0.30	27.27	27.53	0.26	37.60	37.74	0.14
Bobwhite quail	7.07	7.51	0.44	6.23	6.62	0.38	7.11	7.14	0.03
Rabbit	6.49	6.93	0.44	5.72	6.10	0.38	6.61	6.63	0.02
Indigo bunting	5.90	5.90	0.00	5.20	5.20	0.00	5.08	5.10	0.02
Ruffed grouse	24.49	24.62	0.14	21.58	21.70	0.12	22.36	22.44	0.08
Total	223.42	239.43	16.01	196.91	211.02	14.11	248.99	249.90	0.91

2.0 Economics in Environmental Planning: Incremental Cost Analysis

For all projects, the Corps of Engineers' Principles and Guidelines (P&G) define four broad criteria for the evaluation of all plans: completeness; effectiveness; efficiency; and acceptability. Completeness is the extent to which an alternative plan provides and accounts for all necessary investments and other actions to ensure the realization of the planned effects. Effectiveness is the extent to which an alternative plan accomplishes its planning objectives. Efficiency is the extent to which an alternative plan is the most cost-effective means of accomplishing its planning objectives. Acceptability is the workability and viability of the alternative plan with respect to acceptance by state and local entities and the public and compatibility with existing laws, regulations and public policies (USWRC 1983).

For traditional projects (flood damage reduction, navigation), the NED objective (maximization of the net benefits) ensures that the efficiency criterion has been met. The alternative which maximizes the net benefits of the project (total benefits less total cost) is the alternative which meets this criterion. However, such a selection criterion falls short for environmental projects because of the difficulties in quantifying project benefits in traditional monetary terms. Without a reliable monetary estimate of project benefits with which to compare monetary costs, it is not possible to determine the alternative plan which maximizes net monetary benefits. However, this does not mean the economic efficiency of environmental plans cannot be properly evaluated in accordance with the decision criteria outlined in the Corps of Engineers' P&G.

The tool of cost effectiveness analysis enables planners to impose economic efficiency on the cost (production) side of the equation by assuring a range of cost effective plans are identified. This economic tool can ensure that either a set level of environmental output is produced for the least cost possible, or that for a set level of expenditures environmental output production is maximized. Although the cost analyses do not provide a discrete decision criterion, such as the maximization of net benefits in NED analysis, Incremental Cost Analysis (ICA) provides for the explicit comparison of the relevant changes in cost and output on which such decisions may be based.

Cost effectiveness analysis and ICA are rooted in economic production theory and utilize such economic principles as scarcity, choice and opportunity cost. The cost analysis examines changes in cost and output that result from decisions to implement alternative plans and plan components. Cost effectiveness analysis can be used to identify the least-cost plan for producing every attainable level of environmental output, as well as identifying those plans where more output could be produced for the same or less cost. Environmental scale selection choices based on average, instead of incremental cost information can lead to misinformed and improper decision making. The rationale behind incremental cost analysis is to *reveal* the variation in cost between one plan and another, whereas average cost tends to *obscure* the variation in cost between plans. ICA is an invaluable tool in determining the appropriate scale of mitigation or restoration by revealing variations in cost between alternatives (plans); explicitly asking for each attainable increment of output, "Is it worth it?"

2.1 Description of Measures and Alternatives

A brief description of all eight project Measures is presented in Table 1, in the form of the eight Alternatives that include only one of the eight different measures. Also presented is the Alternative that includes all eight measures (A through H). For the analysis, various combinations of one or more measures generate 256 separate Alternatives to be evaluated via ICA. Under the column heading Alternative, measures followed by a '1' within any Alternative name indicate that measure is *included* in that Alternative, whereas measures followed by a '0' within any Alternative name indicate that measure is *excluded* from that Alternative. For example, Alternative A1B0C0D0E0F0G1H1 *includes* measures A, G and H, while *excluding* measures B, C, D, E and F. Similarly, Alternative A1B1C1D1E1F1G1H1 includes all eight measures. More detailed descriptions of the eight measures are presented in the Environmental Section of the Report.

Table 1, Pools 25 and 26 Islands Project
Alternatives and Description of Measures

Measure Included	Alternative	Measure Description
(No Action)	A0B0C0D0E0F0G0H0	No Action
A	A1B0C0D0E0F0G0H0	Tree Planting : Westport
B	A0B1C0D0E0F0G0H0	Tree Planting : Dardenne
C	A0B0C1D0E0F0G0H0	Aquatic : Bolter
D	A0B0C0D1E0F0G0H0	Aquatic : Dardenne
E	A0B0C0D0E1F0G0H0	Aquatic : Westport (Structure #3)
F	A0B0C0D0E0F1G0H0	Aquatic : Westport (Structure #6 : Cropland)
G	A0B0C0D0E0F0G1H0	Aquatic : Westport (#5: Excavate Channel)
H	A0B0C0D0E0F0G0H1	Howard Island (Bank Revetment / Bank Stabilization)
All (A through H)	A1B1C1D1E1F1G1H1	All Eight Measures included in this Alternative

2.2 Cost and Total Output (Net AAHUs)

Construction first costs and all relevant OM&R costs are computed for all measures and subsequently for all project Alternatives. Average annual construction first costs and average annual OM&R costs are calculated via cost stream analysis for each measure, assuming a 50-year project period of evaluation and an FY 2007 project discount rate of 4.875 percent. Construction First Costs as well as all Average Annual Costs are presented in Table 2. Please note the average annual cost for each measure is additive when computing the average annual cost of an Alternative consisting of more than one measure. For example, Alternative A1B0C0D0E0F0G0H0 would have an average annual cost of $6,804, whereas Alternative A1B1C1D0E0F0G0H0 would have an

average annual cost of $19,256 (the sum of the average annual cost for measures A, B, and C at $6,804, $6,203 and $6,249, respectively). Alternative A1B1C1D1E1F1G1H1, consisting of all eight measures, has an average annual cost of $53,347 (the sum of the average annual cost for measures A through H).

Table 2, Pools 25 and 26 Islands Project
Construction First Costs and Average Annual Costs, By Measure

Measure	Construction First Costs	Average Annual Construction First Costs	Average Annual OM&R Costs	Average Annual Cost
(No Action)	$0	$0	$0	$0
A	$93,750	$5,036	$1,768	$6,804
B	$85,000	$4,566	$1,637	$6,203
C	$116,315	$6,249	$0	$6,249
D	$68,990	$3,706	$0	$3,706
E	$88,754	$4,768	$67	$4,836
F	$102,426	$5,503	$56	$5,559
G	$69,720	$3,746	*$2,163*	$5,909
H	$231,250	$12,423	*$1,657*	$14,081
All (A through H)	$856,205	$45,997	$7,348	$53,347

The ICA for the 256 Alternatives for Pools 25 and 26 Islands Project is performed in accordance with IWR-Plan, with reference to the Principles and Guidelines of Institute of Water Resources (IWR) Report #95-R-1, Evaluation of Environmental Investments Procedures Manual, Interim: Cost Effectiveness and Incremental Cost Analyses (May 1995). Through incremental cost analysis in IWR-Plan, several progressive steps in the multi-step process are taken to identify the most cost-effective Alternatives to be considered in environmental restoration planning. These steps are described and computed below. Regarding the computation of Total AAHUS used in the ICA, please refer to the Environmental Section above.

Total AAHUs and Average Annual Cost, by measure, are presented in Table 3.

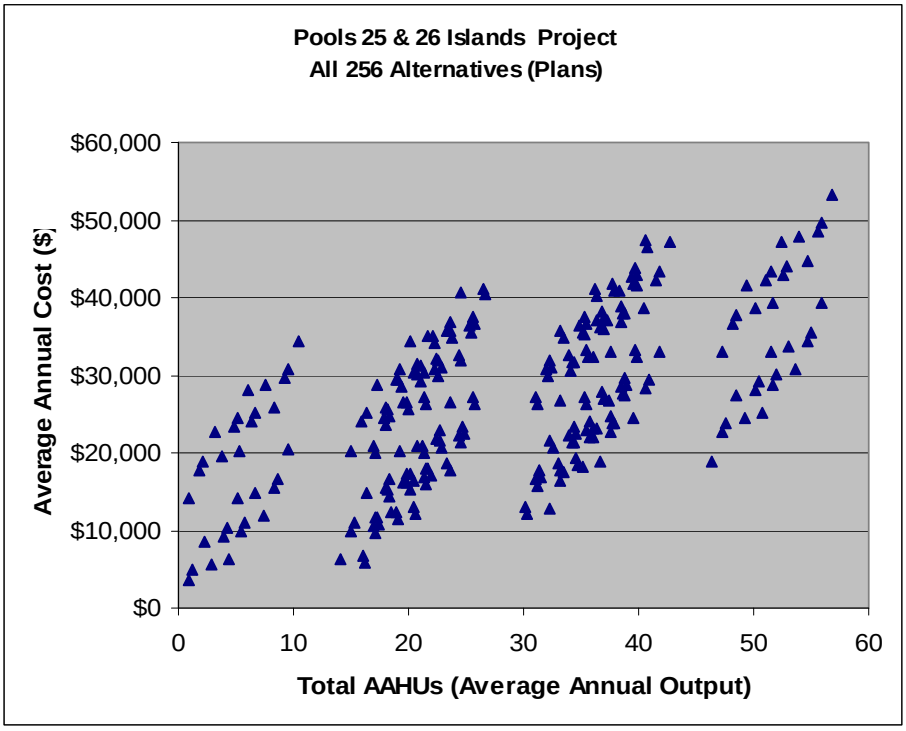
Table 3, Pools 25 and 26 Islands Project
Total AAHUs and Average Annual Cost, By Measure

Measures	Total AAHUs	Average Annual Cost
(No Action)	0.00	$0
A	16.01	$6,804
B	14.11	$6,203
C	4.45	$6,249
D	0.94	$3,706
E	1.26	$4,836
F	2.94	$5,559
G	16.20	$5,909
H	0.92	$14,081

2.3 Determining Cost Effective Alternatives

Prior to identifying cost effective Alternatives, all 256 Alternatives are sorted by Total AAHUs (average annual output level), from lowest to highest. Average Annual Cost and Total AAHUs for all 256 Alternatives are shown graphically in Figure 1.

Figure 1, Pools 25 and 26 Islands Project
Average Annual Cost and Total AAHUs (Average Annual Output)



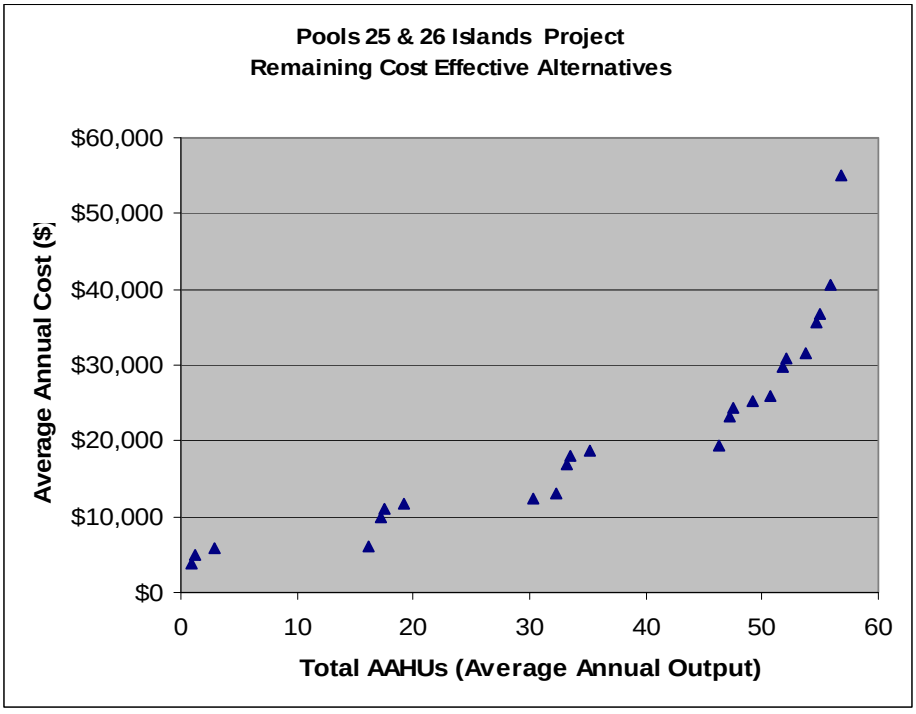
After sorting by Total AAHUs (output level), any non-cost effective Alternatives are identified as either *Inefficient in Production* or *Ineffective in Production*. *Inefficient in Production* is defined as any Alternative where the same output level can be generated at a lesser cost by another Alternative. The Alternatives are evaluated and wherever there are two or more Alternatives providing the same output level, aside from any other considerations (i.e., uncertainty about the reliability of cost or output estimates), the more costly Alternative(s) generating that same output level is eliminated. Next, any Alternatives that are *Ineffective in Production* are identified. *Ineffective in Production* is defined as any Alternative where a greater output level can be generated at a lesser or equal cost by another Alternative. With the Alternatives still sorted by output level (AAHUs), a pair-wise comparison of output level and average annual cost is made for all remaining Alternatives that 'passed' the *Inefficient in Production* screening in the previous step. The Alternatives are evaluated and any Alternative generating less output at an equal or greater cost is eliminated. These steps identify the least-cost Alternative for every level of output under consideration. All twenty-five (25) remaining

Alternatives comprising the set of cost effective Alternatives are presented in Table 4 and graphically in Figure 2.

Table 4, Pools 25 and 26 Islands Project
Remaining Cost Effective Alternatives, Total AAHUs and Average Annual Cost

Alternatives	Total AAHUs	Average Annual Cost	Alternatives	Total AAHUs	Average Annual Cost
A0B0C0D0E0F0G0H0 (No Action)	0.000	$0	A1B1C0D0E0F0G1H0	46.320	$18,916
A0B0C0D1E0F0G0H0	0.940	$3,706	A1B1C0D1E0F0G1H0	47.260	$22,622
A0B0C0D0E1F0G0H0	1.260	$4,836	A1B1C0D0E1F0G1H0	47.580	$23,752
A0B0C0D0E0F1G0H0	2.940	$5,559	A1B1C0D0E0F1G1H0	49.260	$24,475
A0B0C0D0E0F0G1H0	16.200	$5,909	A1B1C1D0E0F0G1H0	50.770	$25,165
A0B0C0D1E0F0G1H0	17.140	$9,615	A1B1C1D1E0F0G1H0	51.710	$28,871
A0B0C0D0E1F0G1H0	17.460	$10,745	A1B1C1D0E1F0G1H0	52.030	$30,001
A0B0C0D0E0F1G1H0	19.140	$11,468	A1B1C1D0E0F1G1H0	53.710	$30,724
A0B1C0D0E0F0G1H0	30.310	$12,112	A1B1C1D1E0F1G1H0	54.650	$34,430
A1B0C0D0E0F0G1H0	32.210	$12,713	A1B1C1D0E1F1G1H0	54.970	$35,560
A1B0C0D1E0F0G1H0	33.150	$16,419	A1B1C1D1E1F1G1H0	55.910	$39,266
A1B0C0D0E1F0G1H0	33.470	$17,549	A1B1C1D1E1F1G1H1	56.830	$53,347
A1B0C0D0E0F1G1H0	35.150	$18,272			

Figure 2, Pools 25 and 26 Islands Project
Average Annual Cost and Total AAHUs (Average Annual Output)



2.4 Incremental Cost Analysis

Incremental cost analysis (ICA) is conducted on the remaining Alternatives. This consists of several iterative steps where the incremental difference in both cost and output (total AAHUs) are computed. Incremental cost is the additional cost incurred by selecting one Alternative over another Alternative, and is computed by subtracting the cost of one Alternative under consideration from the cost of another Alternative under consideration. Similarly, incremental output is the additional output generated by selecting one Alternative over another Alternative, and is computed by subtracting the output of one Alternative under consideration from the output of another Alternative under consideration. The first step is compute the incremental change in cost and incremental change in output from implementing each Remaining Alternative over the No Action Alternative (Alternative A0B0C0D0E0F0G0H0), where the No Action Alternative is considered the baseline condition against which each remaining cost effective Alternative is compared. Next, the Alternative yielding the lowest incremental cost per unit over the No Action Alternative is identified. In other words, this identified Alternative is the most cost effective remaining Alternative for production of AAHUs over the No Action Alternative. After identifying this Alternative with the lowest incremental cost per unit (i.e., the most cost efficient from a production perspective, producing output at the lowest unit cost), any Alternatives generating a lower output level are removed from further consideration in the ICA process. The eliminated Alternatives are less efficient in production, producing a lower level of output at a higher incremental unit cost. The remaining Alternatives are further evaluated via repeated steps of this incremental ICA process, where the most cost effective remaining Alternative becomes the *new* baseline condition against which each remaining cost effective Alternative is compared. This iterative process continues until only the most cost effective, production efficient Alternatives remain. When the most cost effective remaining Alternative is the last Alternative evaluated, there is no need for further incremental cost analysis; the ICA process is complete.

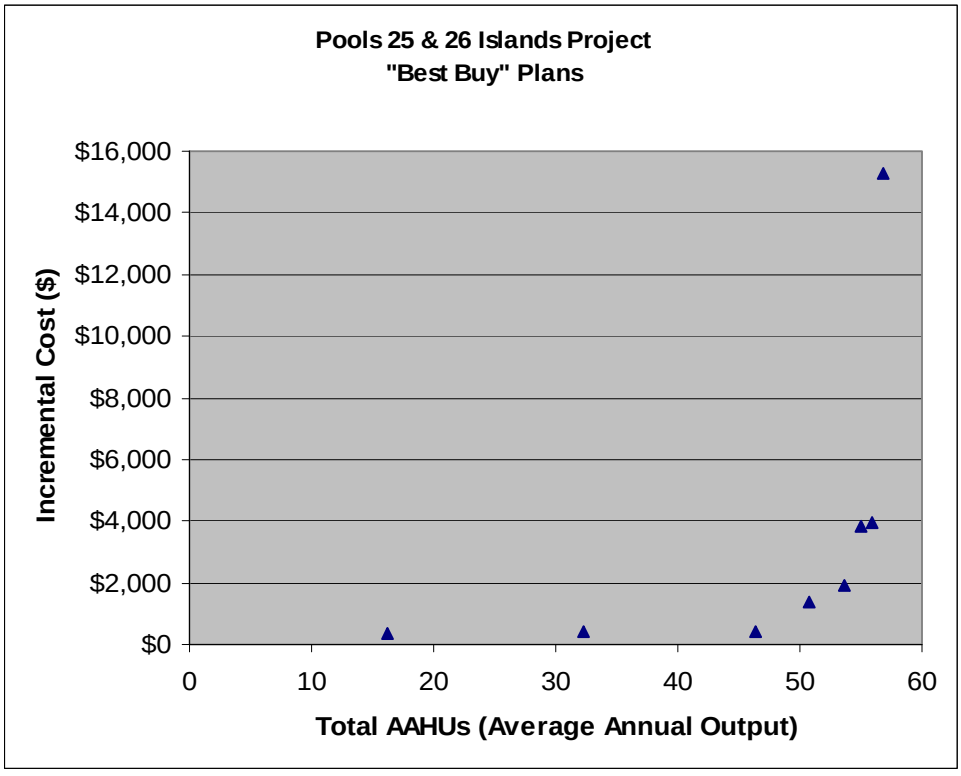
These final nine (9) remaining cost effective, production efficient Alternatives are presented in Table 5. Also known as “Best Buy” Plans, these Alternatives can be used to determine the desired project scale for environmental restoration planning. Characteristic of “Best Buy” Alternatives, the incremental average annual cost per unit increases for successive larger levels of incremental output (Total AAHUs).

Table 5, Pools 25 and 26 Islands Project,
Incremental Values of Remaining "Best Buy" Plans

Remaining Alternatives	Alternative No.	Construction Cost	Output (Total AAHUs)	Average Annual Cost	Incremental Output (Total AAHUs)	Average Annual Incremental Cost	Average Annual Incremental Cost per Unit
A0B0C0D0E0F0G0H0 (No Action)	(no action)	$0	0.00	$0	N / A	**N / A**	**N / A**
A0B0C0D0E0F0G1H0	1	$5,909	16.20	$5,909	16.20	$5,909	$364.8
A1B0C0D0E0F0G1H0	2	$12,713	32.21	$12,713	16.01	$6,804	$425.0
A1B1C0D0E0F0G1H0	3	$18,916	46.32	$18,916	14.11	$6,203	$439.6
A1B1C1D0E0F0G1H0	4	$25,165	50.77	$25,165	4.45	$6,249	$1,404.3
A1B1C1D0E0F1G1H0	**5**	**$30,724**	**53.71**	**$30,724**	**2.94**	**$5,559**	**$1,890.8**
A1B1C1D0E1F1G1H0	6	$35,560	54.97	$35,560	1.26	$4,836	$3,838.1
A1B1C1D1E1F1G1H0	7	$39,266	55.91	$39,266	0.94	$3,706	$3,942.6
A1B1C1D1E1F1G1H1	8	$53,347	56.83	$53,347	0.92	$14,081	$15,305.4

Average Annual Cost and Total AAHUs for all "Best Buy" Plans are shown graphically in Figure 3.

Figure 3, Pools 25 and 26 Islands Project
Average Annual Cost and Total AAHUs (Average Annual Output)



2.5 Conclusion: The "Best Buy" Alternatives presented in Table 5 provide the information necessary to make well-informed decisions regarding desired project scale. For example, progressing through the increasing levels of output for the Alternatives in Table 5 help determine whether the habitat value of the additional AAHUs in the next level of output is worth its additional cost. If it is determined Alternative A0B0C0D0E0F0G1H0, generating 16.20 habitat units at an incremental cost of $364.8 per unit, is "worth it"; i.e., preferred to the No Action Alternative, then one would proceed to the next level of output to determine if it is worth its additional cost. Proceeding to the next level of output reveals Alternative A1B0C0D0E0F0G1H0 generates an increase in habitat units of 16.01, an increase of almost 100 percent over Alternative A0B0C0D0E0F0G1H0, at a modestly higher incremental cost of $425.0 per unit. In other words, since Alternative A1B0C0D0E0F0G1H0 is essentially Alternative A1B0C0D0E0F0G0H0 plus the inclusion of the "G" measure, the statement can be made that for Alternative A1B0C0D0E0F0G1H0, the first 16.20 habitat units are generated at a cost of $364.8 per unit, and the next 16.01 habitat units are generated at a cost of $425.0 per unit. Proceeding to the next level of output reveals Alternative A1B1C0D0E0F0G1H0 generates an increase in habitat units of 1.411 over Alternative A1B0C0D0E0F0G1H0, at an incremental cost of $439.6 per unit.

Proceeding to the next level of output reveals Alternative A1B1C1D0E0F0G1H0 generates an increase in habitat units of 4.45 over Alternative A1B1C1D0E0F0G1H1, at an incremental cost of $1,404.3 per unit.

Proceeding to the next level of output reveals Alternative A1B1C1D0E0F1G1H0 generates an increase in habitat units of 2.94 over Alternative A1B1C1D0E0F0G1H0, at an incremental cost of $1,890.8 per unit.
Proceeding to the next level of output reveals Alternative A1B1C1D0E1F1G1H0 generates an increase in habitat units of 1.26 over Alternative A1B1C1D0E0F1G1H0, at an incremental cost of $3,838.1 per unit.

Proceeding to the next level of output reveals Alternative A1B1C1D1E1F1G1H0 generates an increase in habitat units of 0.94 over Alternative A1B1C1D0E1F1G1H0, at an incremental cost of $3,942.6 per unit.

Proceeding to the last level of output reveals Alternative A1B1C1D1E1F1G1H1, the Alternative including all eight measures, generates an increase in habitat units of 0.92 over Alternative A1B1C1D1E1F1G1H0, at an incremental cost of $15,305.4 per unit.

As long as decision makers consider a level of output to be "worth it", subsequent levels of output are considered. When a level of output is determined to be "not worth it", then subsequent levels of output will also likely be "not worth it", and the final decision regarding desired project scale for environmental restoration planning will have been reached.

As far as cost effectiveness, the first five Alternative choices generating habitat units are considered to be “worth it” based on their increase in habitat units over the preceding Alternative and the average annual incremental cost per habitat unit increase. The fifth Alternative, A1B1C1D0E0F1G1H0, generates a total of 53.71 Total AAHUs, at an incremental cost per unit of $1,890.8. Proceeding to the next level of output, Alternative A1B1C1D0E1F1G1H0, generates only an additional increase in habitat units of 1.26, from Total AAHUs of 53.71 to 54.97, whereas the incremental cost per unit of those additional 1.26 habitat units is $3,838.1. From a percentage standpoint, proceeding from Alternative A1B1C1D0E0F1G1H0 to Alternative A1B1C1D0E1F1G1H0 results in an increase in Total AAHUs of approximately 2.0 percent and an increase in the incremental cost per unit of approximately 102.0 percent. Therefore, Alternative A1B1C1D0E1F1G1H0 is not determined to be “worth it” based on the minimal additional output for the significant additional cost. Alternative A1B1C1D0E0F1G1H0 is identified as the most cost effective Alternative.

COORDINATION AND PUBLIC INVOLVEMENT

INDEPENDENT TECHNICAL REVIEW

FINAL FISH & WILDLIFE COORDINATION ACT REPORT

CULTURAL RESOURCES

SUMMARY OF PUBLIC INVOLVEMENT

COMMENTS

WRITTEN RESPONSES

BLANK

CEMVR-PM-F 6 June 2008

MEMORANDUM FOR RECORD

SUBJECT: Pools 26-26 Islands Habitat Rehabilitation and Enhancement Project, Upper Mississippi River Restoration, Certification of Independent Technical Review Completion

1. The Fact Sheet for the Pools 26-26 Islands Habitat Rehabilitation and Enhancement Project, Upper Mississippi River Restoration (Environmental Management Program) Certification of Independent Technical Review (ITR) has been completed. ITR issues have been resolved. The ITR Certification with signatures of ITR team members is attached.

2. The following table presents the ITR Team Members who completed the subject ITR.

Team Member Name	**ITR Role**	**US Army Corps of Engineers Office Symbol**	**Telephone Number**
Jodi Staebell	ITR Team Leader, Plan Formulation	CEMVR-PM-F	309.794.5448
Martha Cole	Real Estate	CEMVR-RE-P	
Natalie McKinley	Economist	CELRH-PD-F	304-399-5842
Elliott Stefanik	Environmental	CEMVP-PM-E	651-290-5260
Ron Deiss	Cultural Resources	CEMVR-PM-A	309-794-5185
Gary Swenson	Forestry	CEMVR-OD-MN	309-794-4489
Roger Perk	Engineering	CEMVR-EC-DN	309-794-5227
Jon Hendrickson	Hydrology & Hydraulics	CEMVP-EC-H	651-290-5634
Terri Kirkeeng	Cost Engineering	CEMVR-EC-DE	309-794-5425
Wen Tsau	Structural	CEMVR-EC-DS	309-794-5608

3. DrChecks document review and comment software was used to conduct the ITR. Attached to this Memorandum are the following reports, which were generated using DrChecks: All Comments, Snapshot by Discipline, and Snapshot by Submitter. All comments have been "Closed."

Attachments (4)

Jodi Staebell
ITR Team Leader
Regional Technical Specialist,
Ecosystem Restoration Plan Formulation
Planning and Policy Branch
Rock Island District

CF (electronically with attachments):
CEMVS-PM-N (Markert)
CEMVR-PM-M (Hubbell)
CEMVR-PM-F (Staebell, Perk)
CEMVR-RE-P (Cole)
CELRH-PD-F (McKinley)
CEMVP-PM-E (Stefanik)
CEMVR-PM-A (Deiss)
CEMVR-OD-MN (Swenson)
CEMVP-EC-H (Hendrickson)
CEMVR-EC-DE (Kirkeeng)
CEMVR-EC-DS (Joers)

CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW (ITR)

Notice is hereby given that an independent technical review (ITR) has been conducted, of the Pools 25-26 Islands Habitat Rehabilitation, Upper Mississippi River Environmental Fact Sheet dated 12 April 2007 and the Pools 25-25 Islands Environmental Assessment dated October 2006. Supporting documentation including the Habitat Evaluation and Incremental Cost Analysis and Clean Water Action 404(b)(1) Evaluation was also reviewed. The review was appropriate to the level of risk and complexity inherent in the project document. As part of the ITR process, compliance with established policy principles and procedures, using justified and valid assumptions was verified. This included review of assumptions, methods, procedures and material used in analyses; alternatives evaluated; the appropriateness of data used and the level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing USACE policy. The ITR was compiled by an independent team, external to the St. Louis District, consisting of the following personnel:

Jodi K. Staebell, Plan Formulation and ITR Lead
Regional Technical Specialist,
Date: 6/2/2008

Natalie McKinley, Economics
Plan Formulation Section, Huntington District
Date: 3 Jun 08

Elliott Stefanik, Environmental Analysis/NEPA compliance
Environmental Resources Section, St. Paul District
Date: 2 June 2008

Martha Cole, Real Estate
Partnership Programs Branch, Real Estate, Rock Island District
Date: May 13, 2008

Roger Perk, Civil Engineering
Environmental Engineering Section, Rock Island District
Date: 6/02/08

FOR Wen Tsau, Geotechnical Engineering
Structural Engineering Section, Rock Island District
Date: 3 June 08

Jon Hendrickson, Hydraulics and Hydrology
Hydraulics Section, St. Paul District
Date: 6/3/08

Terri Kirkeeng, Cost Estimating
Cost Engineering and Specifications Section, Rock Island District

5-12-08
Date

Gary Swenson, Forester
Natural Resources Branch, Mississippi River Project, Rock Island District

5-14-08
Date

Ron Deiss, Archaeologist
Economics and Environmental Analysis Branch, Rock Island District

12 MAY 2008
Date

Snapshot Report: Comment Category
Project: **EMP**
Review:**For the Pools 25 and 26 ITR**
(sorted by Category, Value)

Design Discipline									
Category Value	Comment		Evaluation					Backcheck	
	Total	Withdrawn	Pending	Concur	Check	Info	NonConcur	Closed	Open
Biology-Ecology (BIO)	3	0	0	3	0	0	0	3	0
Civil (CIV)	9	0	0	7	1	0	1	9	0
Cost Engineering (CEB)	22	0	0	19	0	0	3	22	0
Economics (ECO)	8	0	0	8	0	0	0	8	0
Engineering Support (ESB)	1	0	0	1	0	0	0	1	0
Environmental (ENV)	38	0	0	35	0	0	3	38	0
Geotechnical (GEO)	16	0	0	16	0	0	0	16	0
Hydraulics (HYD)	6	1	0	5	0	0	0	5	0
Natural Resources ()	2	0	0	2	0	0	0	2	0
Planning - Plan Formulation (PLN)	19	0	0	19	0	0	0	19	0
Real Estate (REA)	2	0	0	2	0	0	0	2	0
Structural (STR)	65 *	39	0	25	0	0	1	26	0
Total:	191								

Document Type									
Category Value	Comment		Evaluation					Backcheck	
	Total	Withdrawn	Pending	Concur	Check	Info	NonConcur	Closed	Open
Total:	0								

No designer problems have been identified to date.

(*) *Denotes that review contains critical comments.*

Report Complete

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Snapshot Report: Comment Submitters
Project: **EMP**
Review:**For the Pools 25 and 26 ITR**
(sorted by Office, Last Name)

Civil, Cost & Specifications Engineering Section									
Assigned Users (Last, First)	**Comments Authored**		**Evaluation**					**Backcheck**	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Bolton, Linda	0	0	0	0	0	0	0	0	0
OFFICE TOTALS	0	0	0	0	0	0	0	0	0
Cost Engineering Branch									
Assigned Users (Last, First)	**Comments Authored**		**Evaluation**					**Backcheck**	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Kirkeeng, Terri (view contributed)	22	0	0	19	0	0	3	22	0
OFFICE TOTALS	22	0	0	19	0	0	3	22	0
Economic and Environmental Branch									
Assigned Users (Last, First)	**Comments Authored**		**Evaluation**					**Backcheck**	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Deiss, Ronald (view contributed)	5	0	0	3	0	0	2	5	0
OFFICE TOTALS	5	0	0	3	0	0	2	5	0
Environmental & Economic Branch									
Assigned Users (Last, First)	**Comments Authored**		**Evaluation**					**Backcheck**	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Stefanik, Elliott (view contributed)	26	0	0	25	0	0	1	26	0
OFFICE TOTALS	26	0	0	25	0	0	1	26	0
Geotechnical Branch									
Assigned Users (Last, First)	**Comments Authored**		**Evaluation**					**Backcheck**	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Zaidi, Sibte (view contributed)	16	0	0	16	0	0	0	16	0
OFFICE TOTALS	16	0	0	16	0	0	0	16	0
Hydraulics & Hydrology Section									
Assigned Users (Last, First)	**Comments Authored**		**Evaluation**					**Backcheck**	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Hendrickson, Jon (view contributed)	5	0	0	5	0	0	0	5	0
OFFICE TOTALS	5	0	0	5	0	0	0	5	0
Natural Resource Management Section									
Assigned Users (Last, First)	**Comments Authored**		**Evaluation**					**Backcheck**	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Swenson, Gary (view contributed)	2	0	0	2	0	0	0	2	0
OFFICE TOTALS	2	0	0	2	0	0	0	2	0
Plan Formulation Branch									
Assigned Users (Last, First)	**Comments Authored**		**Evaluation**					**Backcheck**	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
McKinley, Natalie (view contributed)	7	0	0	7	0	0	0	7	0
OFFICE TOTALS	7	0	0	7	0	0	0	7	0
Programs Management Branch									
	Comments Authored		**Evaluation**					**Backcheck**	

Assigned Users (Last, First)	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Staebell, Jodi (view contributed)	32	1	0	31	0	0	0	31	0
OFFICE TOTALS	32	1	0	31	0	0	0	31	0

Project Management Branch

Assigned Users (Last, First)	Comments Authored		Evaluation					Backcheck	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Markert, Brian (view contributed)	0	0	0	0	0	0	0	0	0
OFFICE TOTALS	0	0	0	0	0	0	0	0	0

Real Estate Division

Assigned Users (Last, First)	Comments Authored		Evaluation					Backcheck	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Cole, Martha (view contributed)	2	0	0	2	0	0	0	2	0
OFFICE TOTALS	2	0	0	2	0	0	0	2	0

Resource Management Office

Assigned Users (Last, First)	Comments Authored		Evaluation					Backcheck	
	Total	Withdrawn	Pending	Concur	Check	Info	Non-Concur	Closed	Open
Perk, Roger (view contributed)	9	0	0	7	1	0	1	9	0
OFFICE TOTALS	9	0	0	7	1	0	1	9	0
Grand Total:	126								

LEGEND

- Total = Withdrawn + Pending + Concur + Check + Info + Non-Concur
- Pending Backcheck = Total - Withdrawn - Closed - Open

NOTES

- Withdrawn = Comments withdrawn prior to evaluation (by someone other than the submitter).
- Comments deleted by the submitter prior to evaluation are not tracked.

Snapshot Report: Customers
Project: **EMP**
Review:**For the Pools 25 and 26 ITR**
(sorted by Office, Last Name)

No customers have been assigned to this review.

Report Complete

Information in this report may be **SENSITIVE BUT UNCLASSIFIED**.
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Comment Report: All Comments
Project: EMP
Review: Pools 25 and 26 ITR
Displaying 151 comments for the criteria specified in this report.

Id	Discipline	Section/Figure	Page Number	Line Number
1223108	Structural	n/a	DRAWING G-1	n/a
(Document Reference: Title Block) Where're the "ABBREVIATION LIST" & "LEGEND", since only "DRAWING INDEX" is shown on this M-EMP-6 DRAWING NUMBER G-1. Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06				
1-0	Evaluation **Concurred** Abbreviations were added. Legends will be added to sheets that require a legend. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06			
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06			
	Current Comment Status: **Comment Closed**			
1223130	Structural	n/a	DRAWING G-1	n/a
(Document Reference: DRAWING INDEX) Should add "Cover Sheet" to the "DRAWING INDEX" List. Also, the "TITLE" for "SHEET G-3, 4, 5 & 6, C-1, 2 & 3" should match exactly as shown on the following sheets' Title Block respectively. Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06				
1-0	Evaluation **Concurred** Titles were changed on "G" sheets. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06			
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06			
	Current Comment Status: **Comment Closed**			
1223142	Structural	n/a	DRAWING G-2	n/a
(Document Reference: VICINITY MAP) Drawing Title "VICINITY MAP" is incorrect, should be "LOCAL/PROJECT MAP". Also, need to add a new Vicinity Map as shown on Report 1ST DRAFT JULY 2006 Page 24: Pools 25 & 26 Islands for PROJECT LOCATIONS. Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06				
1-0	Evaluation **Concurred** Will take into consideration. Submitted By: Darren Mulford (314-331-8248) Submitted On: 30-Aug-06			
1-1	Backcheck Recommendation **Close Comment**			

	Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223157	Structural	n/a	DRAWING G-5	n/a

(Document Reference: Westport Island - Pool 25)

Where's the Location for Legend Red Colored for "Rock Structure w/ Deep Hole"?

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** G-5 (Westport Island) does not have a rock structure. Submitted By: Darren Mulford (314-331-8248) Submitted On: 30-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223193	Structural	PLAN	DRAWING C-1	n/a

(Document Reference: BOLTERS ISLAND)

Need to indicate "8' Deep Hole" on drawing PLAN. Also, need to verify "12 FOOT WIDE ACCESS ROAD" & Construction Materials for the Standard Roadway Design.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Note on Plan view was changed to "Rock Structure and Deep Hole" to correspond with detail. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223293	Structural	(D) - SECTION	DRAWING C-1	n/a

(Document Reference: PLAN)

Need to indicate SECTION D - D on Drawing PLAN as required.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Drawing C-4 was edited to remove reference to section D. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06

	Current Comment Status: **Comment Closed**

1223320	Structural	(B) - SECTION	DRAWING C-1	n/a

(Document Reference: MECHANICAL DREDGE DETAIL)

Need to indicate that the TURF shall be established on new mechanically Dredged Spoil, and in all other disturbed areas that the Contractor has made during all construction activities.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** The specifications will discuss where to establish turf. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223330	Structural	(H) - SECTION	DRAWING C-2	n/a

(Document Reference: MECHANICAL DREDGE DETAIL)

Need to add Notes: New TURF shall be established on all new mechanically dredged Spoil, and in all other disturbed areas that the Contractor has made during all construction activities.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

Revised 25-Jul-06.

1-0	Evaluation **Concurred** The specifications will discuss where to establish turf. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223334	Structural	n/a	DRAWING C-2	n/a

(Document Reference: PLAN)

Need to verify the "10 FOOT WIDE ACCESS ROAD" & Construction Materials for the Standard Roadway Design.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Note was changed to reflect 20' wide road shown in detail. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06

	Current Comment Status: **Comment Closed**

1223342	Structural	n/a	DRAWING C-2	n/a

(Document Reference: PLAN)

"PREFAB BOX" is incorrect, should be "Precast Concrete Water Control Structure"

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Concur. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Open Comment** Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
1-2	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223376	Structural	n/a	DRAWING C-3	n/a

(Document Reference: HAUL ROAD)

Need to verify 20.00' Roadway Width, since M-EMP-6 DRAWING NUMBERS C-1 & 2 indicated 12' Wide for Bolters Island & 10' Wide for Westport Island's Access Roads. Also, need to show all vehicle loading criteria.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** All comments were changed to 20' wide haul road. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223386	Structural	n/a	DRAWING C-3	n/a

(Document Reference: STONE REVETMENT AT HEAD OF ISLAND)

Need to indicate that the "STONE REVETMENT AT NORTH HEADS OF HOWARD ISLAND & UN-NAMED ISLAND".

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** The stone revetment will be removed per the results of the revised incremental cost analysis. Submitted By: Darren Mulford (314-331-8248) Submitted On: 29-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment.

	Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223401	Structural	n/a	DRAWING C-4	n/a

(Document Reference: TYPICAL AGRICULTURAL FIELD AREA)

There's no any Cut Section (D / C1 / C4) shown on E-EMP-6 DRAWING NUMBER C-1.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Reference to section D was removed. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223409	Structural	n/a	DRAWING C-4	n/a

(Document Reference: NOTES: 3.)

"SEE SHEET C-4" is incorrect, should be "SEE DRAWING NUMBER C-5".

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Concur. Changed. Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223413	Structural	n/a	DRAWING C-4	n/a

(Document Reference: NOTES)

Need to add Abbreviation "AG" for the word "AGRICULTURAL".

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** "Ag" on C-5 was changed to "Agricultural". Submitted By: Darren Mulford (314-331-8248) Submitted On: 23-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223485	Structural	n/a	184	2

(Document Reference: Report 1ST DRAFT JULY 2006)

Should add a List of all M-EMP-6 DRAWING NUMBERS & TITLES for references.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** report will be updated Submitted By: Brian Markert (314-331-8455) Submitted On: 06-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223547	Real Estate	n/a	Drawing G3 Bolter's Island	n/a

(Document Reference: Real Estate Plan)

The drawing shows a cleared area across NE end of Island. Verbally this was identified as the area of a powerline easement or a fee ownership by a power company. The real estate plan needs to verify the correct situation (fee or easement), acknowledge this and discuss any impacts to the project.

Submitted By: Martha Cole (309-794-5277). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Real Estate plan will be revised accordingly. Submitted By: Brian Markert (314-331-8455) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Martha Cole (309-794-5277) Submitted On: 12-Sep-06
	Current Comment Status: **Comment Closed**

1223591	Real Estate	n/a	83	n/a

Clarification needed on the next to last sentence on page 83. What is being cost shared? Construction costs? O & M costs? Which federal agency is cost-sharing? USACE or USFWS?The MOA does not indicate this percentage. It says 100% of the O & M are borne by USFWS & MDC.

Submitted By: Martha Cole (309-794-5277). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** RE plan will be revised. Submitted By: Brian Markert (314-331-8455) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Submitted By: Martha Cole (309-794-5277) Submitted On: 12-Sep-06
1-2	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Martha Cole (309-794-5277) Submitted On: 12-Sep-06

	Current Comment Status: **Comment Closed**

1223739	Structural	TABLE OF CONTENTS	3	26

(Document Reference: Report 1ST DRAFT JULY 2006)

Need to add a List for all DESIGN PLATES for references.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** report will be updated Submitted By: Brian Markert (314-331-8455) Submitted On: 06-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223776	Structural	n/a	105	n/a

(Document Reference: Report 1ST DRAFT JULY 2006)

Need to add "Mozier Island Project Location" for un-named Island references.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Non-concurred** The map in this section of the report also identifies "Un-named Island" , "Mozier island" adds confussion. This is a non-issue though as this work is being dropped from recommended plan. Submitted By: Brian Markert (314-331-8455) Submitted On: 06-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223797	Structural	n/a	TITLE PAGE 2	23 & 24

(Document Reference: DESCRIPTION OF WORK)

"stoplog structure" should be "Precast Concrete Water Control Structure".

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Will make the change to estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223813	Structural	n/a	CONTENT PAGE 2	n/a

(Document Reference: 16.5.05. & 16.5.06.)

"STOPLOG STRUCTURE" should be "Precast Concrete Water Control Structure".

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Will make change to estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223840	Structural	n/a	SUMMARY PAGE 4	n/a

(Document Reference: 16.5.05. & 16.5.06.)

"STOPLOG STRUCTURE" should be "Precast Concrete Water Control Structure".

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Will make change to estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223849	Structural	n/a	DETAIL PAGE 11	n/a

(Document Reference: 16.5.05. STOPLOG STRUCTURE)

Need to verify why use "Concrete placed by pump" & "Reinforcing Steel in place" for "Precast Concrete Water Control Structure"?

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Will delete "concrete placed by pump" and "resteel in place" items and add "precast water control structure" to estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223865	Structural	CIV PM <03182 0700	DETAIL PAGE 11	n/a

(Document Reference: 16.5.05. STOPLOG STRUCTURE)

"Forms in place, walls, buttress forms, to 8' high" are incorrect cost estimates for the "Precast Concrete Water Control Structure" 4' High from Channel Floor, See M-EMP-6 DRAWING NUMBER S-1 for references.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Will delete "Forms in place" item and add a precast water control structure to MCACES estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223922	Structural	B MIL PM <05150 8270 > Stainless Steel Guide Channel	DETAIL PAGE 12	n/a

(Document Reference: 16.5.05. STOPLOG STRUCTURE)

The Type of "stainless steel guide channel to be embedded in the Precast Concrete" should be Type 304 and/or Type 316, and should be in accordance with the Contract Specifications.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** Will use Type 304. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1223948	Structural	MIL B-STRSTEEL	BACKUP PAGE 4	n/a

Need to verify where're the Locations for Structural Steel Workers to work?

Submitted By: Wen Tsau (309-794-5608). Submitted On: 24-Jul-06

1-0	Evaluation **Concurred** The steel workers associated with resteel placement will be eliminated. A precast water control structure will be added to MCACES estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1224258	Environmental	VI. Applicable Environ. Laws	Page 21 General Comment	n/a

(Document Reference: National Historic Preservation Act)

The EMP recommended action is not in compliance with the National Historic Preservation Act. The project, as proprosed, has not been coordinated with the Missouri State Historic Preservation Officer (SHPO). The project may require a Memorandum of Agreement, to be signed by the SHPO and/or other consulting and interested parties. This can be drafted and included in the EA report when it is distributed for public review, then signed prior to the signing of the EA Finding of No Significant Impact.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: 25-Jul-06

1-0	Evaluation **Concurred** 1.WE WILL INDICATE "PARTIAL COMPLIANCE" RATHER THAN "FULL COMPLIANCE". 2.WHILE A MEMORANDUM OF AGREEMENT MAY BE REQUIRED (IF POTENTIALLY SIGNIFICANT ARCHAEOLOGICAL REMAINS ARE IDENTIFIED DURING CONSTRUCTION-RELATED ACTIVITIES), IT WAS DETERMINED (BASED UOPN THE LOW PROBABILITY OF ENCOUNTERING POTENTIALLY SIGNIFICANT REMAINS) THAT IT WAS PREMATURE TO ENTER INTO AN MOA AT THIS TIME. GIVEN THE ANTICIPATED LOW PROBABILITY OF IMPACTS TO POTENTIALLY SIGNIFICANT ARCHAEOLOGICAL REMAINS, THE SHPO WILL BE PROVIDED A COPY OF THE EA CONCURRENT WITH TRANSMITTAL TO THE PUBLIC - CONSISTENT WITH REGULATIONS. Submitted by F. Terry Norris, District Archaeologist Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Ronald Deiss (309-794-5185) Submitted On: 11-Sep-06
	Current Comment Status: **Comment Closed**

1224260	Environmental	VII C.. finding number 6.	Page 22	n/a

(Document Reference: National Historic Preservation Act)

The statement on cultural resources as having no adverse impact forecloses on comments by consulting parties, as promulgated under the National Historic Preservation Act. This determination and compliance doucmentation must be provided prior to execution of the Finding of No Significant Impact.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: 25-Jul-06

Revised 25-Jul-06.

1-0	Evaluation **Concurred** Submitted by F. Terry Norris, District Archaeologist Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Ronald Deiss (309-794-5185) Submitted On: 11-Sep-06
	Current Comment Status: **Comment Closed**

1224263	Environmental	(i) Historic Properties	Page 19	n/a

(Document Reference: National Historic Preservation Act)

Any construction associated with the tree plantings has not been fully described relative to machinery used and ground disturbances occurring as the trees mature. Initially, the tree plantings may not have a direct impact, but as the trees mature (project goal) and the tap roots penetrate the plow zone and substrat, effects to significant historic properties may occur. Documents concerning any prehistoric occupation of the island has not been fully addressed. General Land Office Records do not typically included data on human occupations and additional land use records should be viewed.

Additionally, archeological properties has been discovered on similar landforms on the Upper Mississippi River, including scientific archeological data which is buried and/or are not entirely disturbed by past agricultural practices.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: 25-Jul-06

Revised 25-Jul-06.

1-0	Evaluation **Non-concurred** BASED UPON FIELD INSPECTION OF EXISTING CUTBANKS AND DETAILED LATE NINETEENTH CENTURY MISSISSIPPI RIVER COMMISSION MAPS, IT WAS DETERMINED THAT TWENTIETH CENTURY SEDIMENTATION WITHIN THE PROPOSED CONSTRCUTION ZONES AVERAGED IN EXCESS OF 2 METERS IN DEPTH. ROOT BALLS OF ANY FUTURE MATURE TREES WILL NOT EXTEND BENEATH THAT DEPTH. Submitted by F. Terry Norris, District Archaeologist Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** The reviewer was unaware of the documented 2-meter sedimentation, therefore the reviewer concurs with the author. Submitted By: Ronald Deiss (309-794-5185) Submitted On: 26-Jun-07
	Current Comment Status: **Comment Closed**

1224264	Environmental	Cultural Resource Plan	Page 69	n/a

(Document Reference: Memorandum for Record)

Archeological field monitoring to assess the pontential of the islands to contain historic properties during construction, should require comment from the Missouri State Historic Preservation Officer and any interested and/or consulting parties. This may require a Memorandum of Agreement or Programmtaic Memorandum of Agreement, prior to signing of the Finding of No Significant Impact.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: 25-Jul-06

1-0	Evaluation **Non-concurred** DISAGREE. WE HAVE ELECTED TO SELECTIVELY MONITOR CONSTRUCTION TO INSURE THAT OUR SEDIMENTATION DEPTH ESTIMATES ARE CORRECT. Submitted by F. Terry Norris, District Archaeologist Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Monitoring has the potential for adverse effects, and requries comment from the SHPO and/or consulting parties. Submitted By: Ronald Deiss (309-794-5185) Submitted On: 26-Jun-07
	Current Comment Status: **Comment Closed**

1224265	Environmental	Clean Water Act and Historic Properties Documentation	Page 61	n/a

Coordination with Native Americans and other consulting/interested parties is require by the National Historic Preservation Act. The Cultural Resources write-up in the EA report, should included whether any responces occurred as a result of the August 2, 2005 Corps correspondence.

Submitted By: Ronald Deiss (309-794-5185). Submitted On: 25-Jul-06

Revised 25-Jul-06.

1-0	Evaluation **Concurred** CONCUR. WE WILL INCLUDE THE RESULTS OF OUR SOLICITATION OF COMMENTS Submitted by F. Terry Norris, District Archaeologist Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Ronald Deiss (309-794-5185) Submitted On: 11-Sep-06
	Current Comment Status: **Comment Closed**

1224268	Structural	** EQUIPMENT BACKUP **	(TRACES) BACKUP PAGE 5	11

(Document Reference: SRC: GEN, ID.NO.: C55Z1960)

Need to verify "EQUIPMENT DESCRIPTION for CONC PUMP, 117CY/HR (89 M3/HR)", since Water Control Structure is a Precast Concrete Structure, not a Cast-In-Place Concrete Structure.

Submitted By: Wen Tsau (309-794-5608). Submitted On: 25-Jul-06

1-0	Evaluation **Concurred** Will delete "concrete placed by pump" item and add precast water control structure to estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Wen Tsau (309-794-5608) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226354	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Drawing C-3 and Cost Estimate. Any clearing and grubbing required prior to placement of revetment stone? Does not appear to be on drawing or in estimate.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Revetment is being removed from project. Submitted By: Darren Mulford (314-331-8248) Submitted On: 29-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226356	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Drawing C-1 and Cost Estimate for Bolter Island Channel Excavation. Should spreading of excavated material take into account swell factor for the 1900 CY and/or will material have to be worked several passes to accomplish placement in adjacent area? Section B shows water level and existing ground line to be at same elevation, will equipment be able to

work in the wet or is it certain that construction will occur in dray? (see Figure 3, pg 53). Concern is whether or not equipment will be able to manuever.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Work will be performed in the dry. The section will be adjusted to better reflect existing conditions. Submitted By: Darren Mulford (314-331-8248) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226358	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Drawing c-1 and Cost Estimate for Bolter Island Deep Hole Excavation. Similar concerns as was stated in the comment for Bolter Island, Channel Excavation

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Work will be performed in the dry. The cost estimate will be further updated during the plans and specs phase. Submitted By: Darren Mulford (314-331-8248) Submitted On: 29-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226359	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

General. Is/does sales tax need to be included?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Non-concurred** State Sales tax is not charged on materials for Federal contracts in Missouri. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 30-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226371	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Bolter Isaland, Access Road, detail pg 5. Looks like access road is conceptually about 600 Lf at 12 ft plus wide3 roadway. 2444 SY geotextile fabric seems like too large of a qty for access road even with consideration of lap for fabric. Also, line item for placement of crushed stone road looks like placement with excavator. How is material spread? Consider adjustment to qty for loose stone vs in place stone. What is SOW for disposal of stone, looks like excavator doing that work, is hauling needed to dispose of stone?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** ONE COMMENT PER ENTRY PLEASE! The haul road has recently been adjusted. The new geotex quantity for this Island is 1265 sy. It is assumed the rock will be placed and spread with either a track-hoe or bulldozer. The haul road on Bolter's Island will be removed, however, the haul road on Westport will remain. Submitted By: Darren Mulford (314-331-8248) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226385	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Mozier Island, Bank Revetment, detail pg 6; and Drawing C-3. Is there a need to key in revetment stone at the toe or ends? Looks like estimated qty is a direct result of 1625 lf x 10 tn/lf. Does the 10 tn/lf account for rock loss for underwater placement? Any need for bedding stone?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Revetment stone at head of islands is being removed from the project. Submitted By: Darren Mulford (314-331-8248) Submitted On: 29-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226393	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Mozier Isalnd, Mob/Demob, Detail pg 5. What equipment is the outside equip operator, heavy, for 50 hrs associated with? Floating crane shown for 4 hrs, but no oiler or operator for similar hrs shown, verify.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Will change equip. operator to truck driver which is associated with the TRK, HWY. Will add oiler and operator for 4 hours for floating crane. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment.

	Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226401	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Westport and Dardeene Island Tree Platinig. Is marine equipment needed to mob/demob the material/equipment/labor to job site?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Will add mob/demob marine equipment to tree planting work activity. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226407	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Wesport Island #5. Similar comments for channel excavation, access road as was stated for Bolter Island.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** The Westport Island haul road will be removed. Submitted By: Darren Mulford (314-331-8248) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226414	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Westport Island #5, Detail pg 11. Reinforcing steel show material cost @ $0.45/lb, is that adequate? Dewatering for stop log sturctur, detail pg 12, notes 10 hrs/da. Laborer's rate looks like wages are for straight time ($ 39.10/hr), should overtime have been included?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Will raise resteel material cost to $0.50/lb after talking to local supplier. Will reduce dewatering to 8 hrs/day. I'm assuming no overtime. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment.

	Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226437	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Construction work is listed under Feature 16, Bank Stablization. Would it be more appropriate for this work to have been categorized under any other feature(s)?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** I will change the Feature to 06. Fish and Wildlife Facilities. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 30-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226443	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Prime Contractor Mark-ups. Settings page does not list a percentage mark-up for insurance. Consider adding insurance as a mark-up.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** I will add Insurance mark-up. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 30-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226453	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Not certain whether or not there are sub contractors performing some of the work or not. The factor used in the profit weighted guidelines for the prime contractor would indicate that there is work being performed by a sub contractor. Did not see sub contractors listed in settings page, assumption is that sub contractor marking may be missing. Seems reasonable that if all this work is packaged together, that there would be multiple contractors involved.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Anticipate one subcontractor for the tree plantings. Will make adjustments to estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment.

	Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226496	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Profit weighted guidelines factor indicates construction period of 6 months. If so, is that reasonable?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** The team has agreed to increase the construction time to 10 months. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226504	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Feature 30. Listing shows plans/specs, EDC and program/project management. Where is the cost included for the preparation of this report?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** The cost estimate will be updated to include the cost of the report (planning) as requested. Submitted By: Brian Markert (314-331-8455) Submitted On: 25-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 06-Aug-07
	Current Comment Status: **Comment Closed**

1226507	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Should estimate be escalated to a project schedule in order to establish a Current Working Estimate, Total Project Cost?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Estimate will be updated to include estimated schedule for construction and priced accordingly (escalated) as suggested. Submitted By: Brian Markert (314-331-8455) Submitted On: 25-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment.

	Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 06-Aug-07
	Current Comment Status: **Comment Closed**

1226512	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Page 13 of the report, Para II.D.1.(a) mentions seeding for Bolter and Westport Islands. Has this been included in the estimate?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** I will add Establishment of Turf to the estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 30-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226519	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Footer for printout indicates NAT99 Equipment Database. Has there been any adjustment to factors, particularly for fuel?

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** A fuel adjustment factor will be add to the estimate. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226525	Cost Engineering	n/a	n/a	n/a

(Document Reference: MCACES Estimate)

Report pg 29. Para 3, Table 3 lists construction costs. These do not seem to match up with MCACES printout. It may be that relative to each other does not change analysis, but might be good idea to establish that those costs were preliminary (pre-final to latest MCACES) as it would seem appropriate to have the Project Cost Estimate, on page 25 of the report match the MCACES costs which may not match the costs used in the incremental analysis.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Incremental cost analysis section will be updated. Preliminary costs will be noted. Project Cost estimate was also preliminary to MCASES and was used in planning process. It will not match MCASES but will be noted for planning purposes. Submitted By: Brian Markert (314-331-8455) Submitted On: 06-Sep-06

1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226528	Cost Engineering	n/a	Report, pg 25	n/a

(Document Reference: Project Cost Estimate)

Suggest that it may be helpful to show contingency for either each line item or for each site location rather than rolled up at the bottom of the table. It may also be beneficial to break out Feature 30 and 31 for each project site, so that work sites are separable. Also consider incorporating code of accounts numbering into table. If goal is to show Total Project Cost, then seems that the Fully Funded Amounts should be shown on this Table also.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Non-concurred** This table represents preliminary costs for the work activities to be used in the Incremental Cost Analysis. The MCACES should be referenced for further details. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 30-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226531	Cost Engineering	n/a	Report, pg 25	n/a

(Document Reference: MCACES ESTIMATE)

Will it be necessary to shape the excavated channel or deep hole excavations? Does not seem like this is included in the estimate.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Shaping of the slopes will be done at the time of the mechanical excavation. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 30-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1226549	Cost Engineering	n/a	Report pg 140 plus	n/a

(Document Reference: Preliminary Specifcations)

Is the inclusion of this information consistent with the scope for this sort of report? Suggest that if included that these be cleaned up some. There is verbiage in these spec sections that may suggest that not all has been included in the cost estimate or that perhaps there is coverage of information in these sections that may not belong. For instance, pg 156, mentions removal of drift and debris. Not sure that this sort of effort is included in the cost estimate. Another possible example would be the with the tolerances mentioned on pg 157, is the qty in the estimate adequate?. Not sure what the 10 ton/lf was based on. Another possible example would be tmention of borrow areas, pg 151. Another example, pg 172, qtys shown for trees/shrubs para 2.1.

Submitted By: Terri Kirkeeng (309-794-5425). Submitted On: 27-Jul-06

1-0	Evaluation **Non-concurred** The specifications will be removed from the planning document. Submitted By: Dawayne Sanders (314/331-8321) Submitted On: 30-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Terri Kirkeeng (309-794-5425) Submitted On: 15-Sep-06
	Current Comment Status: **Comment Closed**

1227175	Civil	Preliminary Specifications	140 - 183	n/a

Recommend removal of all preliminary specifications from report. The specifications are not required for this document and are not at a sufficient level of detail to be used to construct the project. Removal of the specifications significantly reduces the volume of comments on the report. The specifications should be completed with the final Plans and Specifications when the design work is complete.

Submitted By: Roger Perk (309-794-5227). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** The specs will be removed and further refined for the Plans and Specs phase. Submitted By: Darren Mulford (314-331-8248) Submitted On: 29-Aug-06
1-1	Backcheck Recommendation **Close Comment** Back check concur. Submitted By: Roger Perk (309-794-5227) Submitted On: 07-Sep-06
	Current Comment Status: **Comment Closed**

1227207	Civil	Drawing C-1 & C-2	n/a	n/a

(Document Reference: Section B & Section H & Geotechnical Evaluation)

Show piled sidecast material placed to the side of and set back from the dredged section. The amount of setback shall be coordinated with geotech to not cause slope failure into the dredged section. 30 foot wide area distance of placement area should also be shown on section as noted on plan view.

Submitted By: Roger Perk (309-794-5227). Submitted On: 27-Jul-06

Revised 27-Jul-06.

1-0	Evaluation **Concurred** Geotech has looked at the situation and recommends a 15' buffer between the stockpile and the channel, along with a max 2' high stockpile. The section on C-1 has been revised. Submitted By: Darren Mulford (314-331-8248) Submitted On: 29-Aug-06
1-1	Backcheck Recommendation **Open Comment** The section on C-2 (Section H) should also be revised to show 15' buffer, 2' high stockpile and 30' wide stockpile width. Submitted By: Roger Perk (309-794-5227) Submitted On: 07-Sep-06
1-2	Backcheck Recommendation **Close Comment** Concur. This has been done. Submitted By: Darren Mulford (314-331-8248) Submitted On: 11-Sep-06
	Current Comment Status: **Comment Closed**

1227211	Civil	Drawing C-1 & C-2 & Hydraulics Consideratons	n/a	n/a

(Document Reference: Section B and Section H)

Verify that 3 feet of dredging depth is sufficient to potentially keep dredge channel free of sediment for life of the project. Consider dredging channel 6 to 8 feet deep to extend life of channel. Deeper channel will also provide overwintering habitat until depth reduced by sedimentation.

Submitted By: Roger Perk (309-794-5227). Submitted On: 27-Jul-06

Revised 27-Jul-06.

1-0	Evaluation **Non-concurred** The location of the dredging is the location of a remnant channel so there is already some depth. The dredging of three feet will give a total depth of 5-7 ft. The soil borings we collected did not exceed 5 feet so we did not want to exceed that depth. Submitted By: Michael Rodgers (314.263.8091) Submitted On: 11-Sep-06
1-1	Backcheck Recommendation **Open Comment** Sections B and H on Drawing C-1 and C-2 do not reflect the 5-7' of depth that the comment response references. The sections specifically show 3' of depth from the water surface. The drawn sections need to be changed to reflect the 5-7' of depth. Submitted By: Roger Perk (309-794-5227) Submitted On: 27-Sep-06
2-0	Evaluation **Check and Resolve** The drawings will be edited to show the total depth of the channel including the remnant channel depth. The current drawings only show the dredging depth. Submitted By: Michael Rodgers (314.263.8091) Submitted On: 18-Sep-06
2-1	Backcheck Recommendation **Close Comment** Concur with response. Submitted By: Roger Perk (309-794-5227) Submitted On: 15-Nov-06
	Current Comment Status: **Comment Closed**

1227226	Civil	Stone Revetment	Drawing C-3	n/a

Consider tying in stone at toe of slope and at island ground line to reduce chance of undercutting and erosion during flood events.

Submitted By: Roger Perk (309-794-5227). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** The island revetment will be removed per the results of the revised incremental cost analysis. Submitted By: Darren Mulford (314-331-8248) Submitted On: 29-Aug-06
1-1	Backcheck Recommendation **Close Comment** Backcheck concur. Comment not needed if revetment is being removed from project. Submitted By: Roger Perk (309-794-5227) Submitted On: 07-Sep-06
	Current Comment Status: **Comment Closed**

1227250	Civil	n/a	Drawing S-1	n/a

Consider eliminating entire drawing. The water control structure is listed as a prefabricated structure on the Plan view on Drawing C2. If the structure is in fact prefabricated then the structural drawings are not necessary. The structural details if even needed are better addressed in the subsequent Plans and Specifications. Removal of this drawing will eliminate a significant number of comments on the structural details on this drawing.

Submitted By: Roger Perk (309-794-5227). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** The drawings were provided for information and will be further refined in the Plans and Specs phase. Although Pre-cast, this box is specifically designed for this project. Submitted By: Darren Mulford (314-331-8248) Submitted On: 29-Aug-06
1-1	Backcheck Recommendation **Close Comment** Backcheck concur. Submitted By: Roger Perk (309-794-5227) Submitted On: 07-Sep-06
	Current Comment Status: **Comment Closed**

1227335	Economics	Views of Sponsor	6	n/a

The name of the sponsor is not identified. The "Expired MVD CAP Guidance" states that the fact sheet "include the name of the sponsor". Sponsor should be identified and named.

Submitted By: Natalie McKinley ((304)399-5842). Submitted On: 27-Jul-06

Revised 27-Jul-06.

1-0	Evaluation **Concurred** Fact sheet will be revised to include sponsor name. Submitted By: Brian Markert (314-331-8455) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Comment closed with no comment. Submitted By: Natalie McKinley ((304)399-5842) Submitted On: 13-Sep-06
	Current Comment Status: **Comment Closed**

1227353	Economics	Table EA-1.	12	n/a

Under the SOCIAL section Recreation line, it seems that there would be a beneficial effect to as a result of any of the three Alternatives. Improved environment quality usually translates into increased recreational opportunities.

Submitted By: Natalie McKinley ((304)399-5842). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Concur. The table will be modified to reflect the beneficial effect of each alternative upon recreation. Submitted By: Timothy George (314-331-8459) Submitted On: 05-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Natalie McKinley ((304)399-5842) Submitted On: 13-Sep-06
	Current Comment Status: **Comment Closed**

1227354	Civil	Hydrology Considerations	48	n/a

Two dredged channels are identified as project features as well as a deep hole and water control structure. None of these features or how they are expected to perform are addressed in the hydrology considerations. The ability of the deep hole and rock structure to keep the channel scoured out should be addressed.

Submitted By: Roger Perk (309-794-5227). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Performance will be addressed based on expected hydraulics. Submitted By: Michael Rodgers (314.263.8091) Submitted On: 11-Sep-06
1-1	Backcheck Recommendation **Close Comment** Response was not clear on when or how the performance would be addressed. Report should address performance or state that it will be addressed prior to plans and specifications. Submitted By: Roger Perk (309-794-5227) Submitted On: 27-Sep-06
2-0	Evaluation **Concurred** An appendix will be added describing how the performance of the dredging and hydraulic structure will perform based on the average annual hydrograph Submitted By: Michael Rodgers (314.263.8091) Submitted On: 18-Sep-06
	Backcheck not conducted
	Current Comment Status: **Comment Closed**

1227356	Civil	Hydrology Considerations Figures 4 thru 11	54-59	n/a

Consider creating these graphs for the island locations rather than at the gage locations. The graphs would seem to be more beneficial if they showed what water surface elevations that can be expected on the islands instead of at the gage locations.

Submitted By: Roger Perk (309-794-5227). Submitted On: 27-Jul-06

1-0	Evaluation **Non-concurred** The frequency data that are given in FIGURES 4 and 5 are based upon the report entitled "Water Surface Profiles, Upper Mississippi River Miles 0.0 to 847.5, Illinois River Miles 0.0 to 291.0" (U.S. Army Corps of Engineers; St. Paul, Rock Island and St. Louis Districts; January 2004). River elevation data for three frequency events (two-, five-, and 10-year floods) were plotted for various locations along Pools 25 and 26 in FIGURES 4 and 5, respectively. River elevations for each of the three frequency events at locations along the islands can be interpolated from FIGURES 4 and 5. Also included on these figures is a profile that occurred during maximum pool conditions (or, full pool conditions). Four river elevations were plotted, and straight lines were drawn between them. Estimates of river elevations for the instances of maximum pool conditions shown in these figures at locations along the islands can be interpolated. In FIGURES 4 and 5, gage locations and locations for islands' upstream and downstream ends were included to provide pertinent reference points. / The seasonal duration data that are given in FIGURES 6 through 11 are based upon time-series data collected over long periods at river gage locations. Long-term river gage data were essential in developing the seasonal duration curves. In developing FIGURES 6 through 11, the gage locations nearest to the islands were chosen for inclusion in the figures. Also, gages were chosen such that the islands fell between the most-upstream gage and the most-downstream gage. Estimates of seasonal duration data for river locations along the islands may be obtained with the data given in FIGURES 6 through 11 by linear interpolation. / St. Louis District environmental personnel assigned to this project requested both the frequency data and the seasonal duration data for use in their analyses, and they were able to successfully make use of the data in FIGURES 4 through 11. Submitted By: Ray Kopsky, Jr. (314-331-8375) Submitted On: 06-Sep-06
	Backcheck not conducted
2-0	Evaluation **Non-concurred** Ray Kopsky, Jr., of St. Louis District talked with Roger Perk of Rock Island District via telephone after Ray responded to Roger's comment (no. 1227356). Ray wanted to discuss his response to Roger's comment. Ray mentioned that part of the second sentence of Roger's comment, "water surface elevations that can be expected on the islands," could possibly refer to inundation mapping of the islands for various flood events. Ray told Roger that inundation

	mapping was not developed for the islands since it had not been requested by any members of the project team. Also during the conversation, Roger mentioned that his suggestion that the graphs be created for the island locations referred mainly to FIGURES 6-11 (i.e., the seasonal duration curves). Ray mentioned that these curves could be created for the island locations using linear interpolation between the data developed for the gage locations. Ray also said he would talk to St. Louis District environmental personnel, who requested the seasonal duration curves, to ask them if curves specifically for the island locations would be beneficial. The gentleman from the St. Louis District environmental group who requested the seasonal duration curves said that the form, shape and pattern of the curves was needed and not necessarily specific numbers at specific locations. He believes that the data that have already been developed are sufficient. Submitted By: Ray Kopsky, Jr. (314-331-8375) Submitted On: 12-Sep-06
2-1	Backcheck Recommendation **Close Comment** Concur with Evaluation 2 and have no further comment if St. Louis personel have the information that they need from the existing duration curves. Submitted By: Roger Perk (309-794-5227) Submitted On: 12-Sep-06
	Current Comment Status: **Comment Closed**

1227369	Civil	Line 24 (pg. 6) and line 28 (pg. 75)	6 and 75	n/a

Listed AAHUs do not seem to correspond between report and USFWS WHAG assessment. Page 6 lists a gain of 11.14 AAHUs and page 75 lists 36.80 AAHUs.

Submitted By: Roger Perk (309-794-5227). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Concur. The AAHUs currently shown on page 6 represent two target species, whereas those on page 75 reflect all evaluation species. We have redone the habitat evaluation to include all evaluation species. Submitted By: Timothy George (314-331-8459) Submitted On: 05-Sep-06
1-1	Backcheck Recommendation **Close Comment** Backcheck concur. Submitted By: Roger Perk (309-794-5227) Submitted On: 07-Sep-06
	Current Comment Status: **Comment Closed**

1227378	Economics	Table 2, Pools 25 & 26 Project Construction First Costs and Average Annual Cost By Measure	29	n/a

Reviewer was not able to duplicate the displayed Average Annual Costs (AAC) using the stated interest rate, 50 yr. period of analysis and the construction First Costs. This could be as a result of adding interest during contruction cost or annual O&M. Clarifying text and additional data could resolve this problem. In theory a miscalculation of AAC could impact project formulation and selection. Should not be an issue for this project. PDT Economist can resolve this by providing some additional information and adding narrative to more clearly illustrate how the AAC were derived.

Submitted By: Natalie McKinley ((304)399-5842). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** OM&R costs were included in the calculation of AAC, but were not listed in the report. Believe this is the reason for reviewer being unable to duplicate AAC. Table column of OM&R costs will be included in Final Report in appropriate location, enabling duplication of AAC by any future reviewer. Submitted By: David Kelly (314-331-8474) Submitted On: 12-Sep-06

1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Natalie McKinley ((304)399-5842) Submitted On: 13-Sep-06
	Current Comment Status: **Comment Closed**

1227383	Civil	D. 2. (a)	15	n/a

Report states that the recommended plan is not expected to result in the loss of any wetlands. However, the areas for sidecasting of dredge material are shown on Drawing C-1 Section B at the water surface elevation. It is expected that this area may be a wetland. Review of elevation of existing ground may be needed.

Submitted By: Roger Perk (309-794-5227). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Concur. The areas for sidecasting of dredge material are wetlands, and the report will be modified to reflect this. Submitted By: Timothy George (314-331-8459) Submitted On: 05-Sep-06
1-1	Backcheck Recommendation **Close Comment** Backcheck concur. Submitted By: Roger Perk (309-794-5227) Submitted On: 07-Sep-06
	Current Comment Status: **Comment Closed**

1227396	Economics	Table 2, Pools 25 & 26 Project Construction First Costs and Average Annual Cost By Measure	29	n/a

Average Annual Costs (AAC) should include an annual O&M amount. The text and table do not indicate that annual O&M costs are included. In theory the omission of annual O&M costs could significantly change formulation and the recommended alternative. However, this omission in this case probably would not change the end recommendations of this report. Annual O&M should be estimated for each measure/alternative and the calculations updated accordingly.

Submitted By: Natalie McKinley ((304)399-5842). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Please see David Kelly reply to #1227378 regarding OM&R costs, which were included in the calculations and will be clearly shown in the Final Report. Submitted By: David Kelly (314-331-8474) Submitted On: 12-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Natalie McKinley ((304)399-5842) Submitted On: 13-Sep-06
	Current Comment Status: **Comment Closed**

1227409	Economics	Incremental Cost Analysis	27	n/a

It appears that the software package IWR Plan was used to complete the Incremental Cost Analysis for this report but is not documented as such. If IWR Plan was used, it should be stated since the software is generally accepted by the Corps as an analysis tool. However, this comment/resolution is not significant to formulation of this project.

Submitted By: Natalie McKinley ((304)399-5842). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** IWR Plan was used to generate the full spectrum of 256 Alternatives, and the subsequent ICA

	process used in IWR Plan matched exactly with applying basic Excel computations which were used to 'double check' the results of IWR. Also Excel was used to compute all Average Annual Costs. IWR Plan in its entirety will be used for the ICA process in the Final Draft. Submitted By: David Kelly (314-331-8474) Submitted On: 12-Sep-06
1-1	Backcheck Recommendation **Close Comment** Concur. Would suggest that it be stated in the report that IWR Plan was used for the analysis. Submitted By: Natalie McKinley ((304)399-5842) Submitted On: 13-Sep-06
	Current Comment Status: **Comment Closed**

1227414	Economics	n/a	n/a	n/a

The report does not address Cost Sharing as required by guidance. Cost Share infomation is very important to implement the project. Based upon the ITR overview conference call, the project costs will be 100% Federal and the O&M is the responsibilty of the Sponsor. This should be stated clearly in the report.

Submitted By: Natalie McKinley ((304)399-5842). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** Cost sharing and O & M information will be more clearly stated Submitted By: Brian Markert (314-331-8455) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Natalie McKinley ((304)399-5842) Submitted On: 13-Sep-06
	Current Comment Status: **Comment Closed**

1227416	Economics	n/a	n/a	n/a

No Letter of Intent (LOI) is included in the report package. A LOI is required as stated in the "Outdated MVD Cap Guidance". A LOI should be obtained from the Sponsor to include their commitment to O&M and included with the report package.

Submitted By: Natalie McKinley ((304)399-5842). Submitted On: 27-Jul-06

1-0	Evaluation **Concurred** A letter from sponsor will be included in final report Submitted By: Brian Markert (314-331-8455) Submitted On: 31-Aug-06
1-1	Backcheck Recommendation **Close Comment** Closed without comment. Submitted By: Natalie McKinley ((304)399-5842) Submitted On: 13-Sep-06
	Current Comment Status: **Comment Closed**

1227738	Environmental	n/a	n/a	n/a

For a PDA, the EA needs to be a stand-alone document. Currently this is not the case. Recommend creating a separate document for the EA.

Submitted By: Elliott Stefanik (651-290-5260). Submitted On: 28-Jul-06

1-0	Evaluation **Concurred** Concur. The EA will be set apart as a distinct document in the report. Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment**

	Closed without comment. Submitted By: Elliott Stefanik (651-290-5260) Submitted On: 13-Sep-06
	Current Comment Status: **Comment Closed**

1227739	Environmental	n/a	9	n/a

Your introduction is adequate. However, I suggest breaking out Authority; Purpose; and Project Location. This adds clarity.

Submitted By: Elliott Stefanik (651-290-5260). Submitted On: 28-Jul-06

1-0	Evaluation **Concurred** Concur. This suggestion will be implemented. Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Submitted By: Elliott Stefanik (651-290-5260) Submitted On: 13-Sep-06
	Current Comment Status: **Comment Closed**

1227742	Environmental	n/a	n/a	n/a

For the EA, add a section describing existing conditions and the need for action.

Submitted By: Elliott Stefanik (651-290-5260). Submitted On: 28-Jul-06

1-0	Evaluation **Concurred** Concur. A description of existing conditions and problems and opportunities will be added to the EA. Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Closed, assuming remaining edits are completed for historic properties (yellow highlighted text). Submitted By: Elliott Stefanik (651-290-5260) Submitted On: 03-Jan-07
	Current Comment Status: **Comment Closed**

1227747	Environmental	n/a	n/a	n/a

Table on bottom of page 11 isn't necessary for an EA. Much of the discussion on pgs. 11 and top of 12 also are beyond what is typically included in a stand-alone EA (suggest moving to another report section). Table EA-1 is fine.

Submitted By: Elliott Stefanik (651-290-5260). Submitted On: 28-Jul-06

1-0	Evaluation **Concurred** Concur. This information will be moved into the Alternative Plans Considered portion of the fact sheet. Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Edit appears acceptable. Submitted By: Elliott Stefanik (651-290-5260) Submitted On: 03-Jan-07
	Current Comment Status: **Comment Closed**

1227749	Environmental	n/a	13	n/a

EA - Before discussion of the effects of the recommended plan, you need to describe the effected environment. This should included biological, social and cultural resources. These sections can be streamlined by using references to appropriate documents.

Submitted By: Elliott Stefanik (651-290-5260). Submitted On: 28-Jul-06

1-0	Evaluation **Concurred** Concur. The EA will be revised to include a discussion of affected environment. Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Edit appears to be incorporated. Submitted By: Elliott Stefanik (651-290-5260) Submitted On: 03-Jan-07
	Current Comment Status: **Comment Closed**

1227750	Environmental	n/a	70	n/a

EA - Does this EA included a 404(b)(1) report? Page 70 has text at the bottom (all caps) that would suggest that a 404 (b)(1) should follow, but I don't see it.

Submitted By: Elliott Stefanik (651-290-5260). Submitted On: 28-Jul-06

1-0	Evaluation **Concurred** There is no 404(b)(1) document contained in the current report, but one will be added. Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** A 404(b)(1) document has been created. PLEASE NOTE that a detailed review of the 404(b)(1) hasn't been performed, but after brief review it appears adequate. Submitted By: Elliott Stefanik (651-290-5260) Submitted On: 03-Jan-07
	Current Comment Status: **Comment Closed**

1227751	Environmental	n/a	n/a	n/a

EA - It appears the EA was structured after a 404(b)(1). However, they fulfill different requirements and probably should be separated. Suggest adding an appendix for 404(b)(1). Cross referencing is fine to reduce length. The discussion included on pgs. 13 and 14 often is in greater detail than typically found in an EA for these categories (but this info would be found in the 404(b)(1)).

Submitted By: Elliott Stefanik (651-290-5260). Submitted On: 28-Jul-06

1-0	Evaluation **Concurred** Concur. As mentioned in the response to the previous comment, the EA and 404(b)(1) documents will be separated. Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Edit has been incorporated. Submitted By: Elliott Stefanik (651-290-5260) Submitted On: 03-Jan-07
	Current Comment Status: **Comment Closed**

1227752	Environmental	n/a	n/a	n/a

The EA discusses few short-term impacts. These may not be substantial, but you should at least acknowledge the short-term disturbance to wildlife, changes in water quality, etc.

Submitted By: Elliott Stefanik (651-290-5260). Submitted On: 28-Jul-06	
1-0	Evaluation **Concurred** Concur. A discussion of short term impacts will be included in the EA. Submitted By: Timothy George (314-331-8459) Submitted On: 01-Sep-06
1-1	Backcheck Recommendation **Close Comment** Edit appears to be incorporated. Submitted By: Elliott Stefanik (651-290-5260) Submitted On: 03-Jan-07
	Current Comment Status: **Comment Closed**

COORDINATION AND PUBLIC INVOLVEMENT

INDEPENDENT TECHNICAL REVIEW

FINAL FISH & WILDLIFE COORDINATION ACT REPORT

CULTURAL RESOURCES

SUMMARY OF PUBLIC INVOLVEMENT

COMMENTS

WRITTEN RESPONSES

BLANK

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Marion Illinois Suboffice (ES)
8588 Route 148
Marion, IL 62959
(618) 997-3344

June 5, 2008

Colonel Lewis F. Setliff III
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attn: Mr. Timothy George, CEMVS-PM-E

Dear Colonel Setliff:

This letter constitutes our Final Fish and Wildlife Coordination Act Report (Report) for the Pools 25 and 26 Islands Habitat Rehabilitation and Enhancement Project (HREP). The project is located in Lincoln, Pike, and St. Charles Counties, Missouri, between river miles 224 and 261. This report is intended to provide compliance with Subsection 2(b) of the Fish and Wildlife Coordination Act, (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); Section 7 of the Endangered Species Act of 1973, as amended; and, the National Environmental Policy Act. This Report has been reviewed by the Missouri Department of Conservation and their concurrence is noted.

The Pools 25 and 26 Islands HREP is a component of the Upper Mississippi River System Environmental Management Program (EMP) authorized by Section 1103 of the Water Resources Development Act (WRDA) of 1986. The goal of EMP is to implement "numerous enhancement efforts...to preserve, protect, and restore habitat that is deteriorating due to natural and man-induced activities." The Pools 25 and 26 Islands project initially addressed habitat rehabilitation and enhancement opportunities at five major islands and their surrounding aquatic habitats in Mississippi River Pools 25 and 26. These include Mozier, Westport, and Kickapoo in Pool 25 (between river miles 261 and 253) and Dardenne and Bolter in Pool 26 (between river miles 228 and 224). These properties are owned by the Army Corps of Engineers (Corps) and managed by the Missouri Department of Conservation (MDC) through a cooperative agreement.

The proposed project consists of: planting tree and shrub seedlings to reforest 111 acres of abandoned agricultural fields on Westport (59 acres) and Dardenne (52 acres) Islands; improving the connection between the river and island interior sloughs on Westport and Bolter Islands by removing accumulated sediments from existing small natural channels; improving water depth in

interior sloughs of Westport Island by installing a water control structure; and, creating a deep hole in a slough on Bolter Island.

THREATENED AND ENDANGERED SPECIES

We have reviewed the Biological Assessment provided in the Draft Environmental Assessment (EA) for this project. In responding to the EA, we concurred that with implementation of the conservation measures discussed in the report, the project is not likely to adversely affect any known federally listed threatened or endangered species.

RESOURCE PROBLEMS AND OPPORTUNITIES

Prior to the Great Flood of 1993, approximately 400 acres on Westport and Dardenne Islands were in row crop agriculture. After the flood these areas were abandoned as cropland and planted with mast producing trees (oak-hickory) by MDC in 1994, 1995, and 1996. However, based on site visits conducted in the spring of 2005, the majority of these tree plantings did not survive and have been replaced by more rapidly growing soft mast species such as cottonwood.

Interior sloughs occur on Dardenne, Bolters, and Westport Islands, but are isolated from the main channel at low river stages. Additionally many of the sloughs are shallow due to the accumulation of large amounts of silt. The shallow depths of these sloughs make them unlikely to support diverse fish communities. They provide little over wintering habitat for fish due to their uniformly shallow depths and isolation from the main stem river.

Bank erosion is a problem at a number of islands in the impounded portion of the Mississippi River, especially at the upstream tips of islands. Howard Island and the unnamed island between Howard and Mozier Islands are experiencing degradation of shoreline habitat due to wind-wave and navigation induced erosion.

GOALS AND OBJECTIVES

The goal of this project is to rehabilitate and enhance the fish and wildlife habitats located on the Pools 25 and 26 Islands to benefit a variety of fish and wildlife resources, including migratory birds and game fish species. To achieve this goal a planning team of biologists from the Corps (St. Louis District), MDC, and the U.S. Fish and Wildlife Service (Service) developed four major planning objectives for the project. These include the following:

Objective 1: Increase the spatial extent of the oak-hickory community in floodplain forests of the Upper Mississippi River System Pools 25 and 26 over the next 50 years by planting oak-hickory seedlings in abandoned cropland at elevations where they will naturally regenerate.

Objective 2: Restore and maintain connections between the river and adjacent backwater habitats in Pools 25 and 26 over the next 50 years by excavating/dredging existing island channels to restore connections to the river.

Objective 3: Create and maintain deepwater habitat in backwater areas in Pools 25 and 26 over the next 50 years by excavating/dredging deep holes in island sloughs, and by building rock structures that will use the river's energy during floods to maintain these deep holes.

Objective 4: Maintain islands in Pools 25 and 26 over the next 50 years by placing bank revetment on upstream ends of islands to minimize erosion.

Although the Pools 25 and 26 Islands HREP is a component of the Upper Mississippi River System Environmental Management Program (EMP), the project also fits well into the higher order goals established for the Upper Mississippi River System Navigation and Ecosystem Sustainability Program (NESP). These goals, provided to the Corps by the Environmental Science Panel, are as follows (Lubinski and Barko 2003).

First Tier Goal (Sustainability Goal):

"The balance of economic, environmental, and social conditions so as to meet the current and future needs of the Upper Mississippi River System without compromising the ability of future generations to meet their needs."

Second Tier Goals:

1. Maintain viable populations of native species in situ.
2. Represent all native ecosystems types across their natural range of variation.
3. Restore and maintain evolutionary and ecological processes (e.g., disturbance regimes, hydrologic regime, nutrient cycles, etc.).
4. Integrate human uses and occupancy within these constraints.

In addition to the development of higher order goals for the Upper Mississippi River System, the Science Panel worked initially to condense over 2,600 ecosystem objectives into 81 objectives (Lubinski and Barko 2003). These 81 objectives have been further refined, deleted, and combined into more practical and quantifiable objectives by the Science Panel Goals and Objectives Team (Barko et al. 2006).

Since 2006, the Science Panel has further worked to develop system-wide Goals and Objectives for the UMRS. In Galat et al. (2007), the Science Panel proposed the following ecosystem-wide goal:

> "to conserve, restore, and maintain the ecological structure and function of the Upper Mississippi River System to achieve the vision of the Navigation and Ecosystem Sustainability Program."

Further, the science panel proposed the five system wide objectives framed within essential ecosystem characteristics discussed in Galat et al. (2007). They include management for:

1. a more natural hydrologic regime (hydrology and hydraulics)
2. processes that shape a diverse and dynamic river channel (geomorphology)
3. processes that input, transport, assimilate, and output materials within UMR basin river-floodplains: water quality, sediments, and nutrients (biogeochemistry)
4. a diverse and dynamic pattern of habitats to support native biota (habitat)
5. viable populations of native species and diverse plant and animal communities (biota)

The Pools 25 and 26 HREP Project fits well into the higher order ecosystem-wide goals and objectives developed by the Science Panel and further the project will meet the following specific objectives identified in Barko et al. (2006):

- Objective 1.8: Maintain adequate DO concentrations for fishes.
- Objective 2.1: Enhance channel geomorphic diversity.
- Objective 4.2: Provide pathways for animal movement
- Objective 4.8: Modify channels to provide suitable habitat for fishes
- Objective 4.9: Increase habitat corridor sizes and connectivity.
- Objective 5.1: Maintain viable populations of native species throughout their range in the UMRS at levels of abundance in keeping with their biotic potential.
- Objective 5.2: Maintain the diversity and extent of native communities throughout their range in the UMRS.

PROPOSED PROJECT FEATURES

To achieve the project objectives, eight project alternatives were evaluated. The recommended plan (alternative 4) consists of the following:

1. Expand floodplain forest: Plant a total of 111 acres of oak-hickory tree seedlings in abandoned cropland on Westport Island (59 acres) and Dardenne Island (52 acres).

2. Restore river-backwater connections: Mechanically dredge a total length of approximately 2,250 feet of existing channels at Bolter Island (1,250 feet) and Westport Island (1,000 feet) to improve the natural connection between these islands' interior sloughs and the river, and construct a water control structure in the channel on Westport Island.

3. Create and maintain deepwater habitat in backwater areas: Mechanically dredge an 8-foot deep hole (about 0.5 acre in area) in the interior slough on Bolter Island, and build a 300-foot long U-shaped rock structure around the upstream side of this hole that will use the river's energy during floods to maintain the hole's depth.

METHODOLOGY TO EVALUATE ALTERNATIVES

The Pools 25 and 26 Islands HREP was analyzed using the Wildlife Habitat Appraisal Guide (WHAG) and the Aquatic Habitat Appraisal Guide (AHAG). The target species for the WHAG included fox squirrel and pileated woodpecker. The target species for the AHAG included largemouth bass and smallmouth buffalo. Existing conditions, future without project conditions and future with project conditions were examined. This analysis was conducted with team members representing the Corps, MDC, and Service.

The evaluation models utilized produce a rating of habitat quality for each respective habitat type. This rating is referred to as a Habitat Suitability Index (HSI). The HSI, a value ranging from 0.1 to 1.0, measures the existing and future habitat conditions compared to optimum habitat which is 1.0. This value, when multiplied by the available habitat within the project area, will provide a measure of available habitat quality and quantity known as habitat units (HUs). Average annual habitat units (AAHUs) for each species are typically calculated to reflect expected habitat conditions over a 50-year project life.

The WHAG model includes limiting factors in each matrix. Absence of critical life requisites for a particular species makes the habitat unsuitable and results in an HSI value of 0.1 regardless of other habitat characteristic scores. The AHAG model did not include limiting factors.

EXISTING, FUTURE WITHOUT, AND FUTURE WITH CONDITIONS

A number of assumptions were made about what the project area and vicinity would be like 50 years in the future without any project. One assumption was that as cottonwood trees continued to colonize the abandoned crop fields, they would outcompete more desirable species such as oaks and hickories. The end result would be an area increasingly dominated by a monoculture of cottonwood providing fewer benefits to wildlife, including migratory birds. A second assumption was that the interior sloughs are not deep enough to provide adequate over wintering habitat for fish and do not provide high quality spawning or rearing habitat for fish.

The overall habitat quantity for the two target terrestrial species remains the same with or without the project because cropland is being converted to forested habitat in both cases. However, habitat quality is improved with the project over the existing condition due to the establishment of hard mast producing trees such as oak and hickory as opposed to a monoculture of cottonwood. For example, HSI scores (Table 1) for pileated woodpecker increase from 0.1 in the existing condition to 0.73 at 50 years without the project. However, the HSI increases to

0.84 at 50 years with the project. Similarly the HSI scores for fox squirrel increase from 0.68 to 0.80 for future without project and future with project, respectively.

Generally, most of the terrestrial species show increases in HSI scores both with and without the project, although the indigo bunting HSI's show no change. The ruffed grouse is the only terrestrial species that shows a decrease in HSI's from 0.60 in the existing condition to 0.35 with the project and 0.36 without the project. The decreases in habitat suitability and habitat units for ruffed grouse is primarily the result of this species utilizing open habitats such as old fields and forests in early regenerative stages. At 50 years with and without project the old cropland habitat is expected to become late regenerative forest thereby showing a marked decrease in HSI's for the ruffed grouse. Existing habitat suitability is generally poor for quail, rabbits and indigo buntings. This is not expected to change with or without the project.

The incorporation of mast producing tree species into the forest restoration will generally improve habitat quality for the majority of forest species. From a biological point of view, the HSI's do not truly reflect the value of adding a mast component to the restoration of forested habitat on these islands. Acorns are a valuable food source for many wildlife species, particularly during the winter when other food resources are limited. This value is not very well reflected in the WHAG model as only two questions (out of 31) address plant species composition and diversity.

Habitat quantity for aquatic species is not expected to change with or without the project over existing conditions. As the AHAG model did not incorporate limiting factors, the overall HSI's (Table 3) and AAHU's (Table 4) do not adequately represent the actual conditions for each of the aquatic species during certain parts of the year, nor do they present a good picture of the value of the proposed project to aquatic species. For example, the overall HSI for smallmouth buffalo is 0.72 in the existing condition. The juvenile/adult HSI for the existing condition is 0.75. These HSI's would seem to indicate fairly good habitat quality throughout the year. However, none of the backwater habitats are currently suitable for overwintering habitat during the period from November to February. The HSI score for this variable is 0.25 for the smallmouth buffalo and is not expected to change with or without the project. Therefore, although the overall HSI represents good quality habitat, much of this habitat is not very suitable for overwintering habitat. Similarly, the overall HSI for largemouth bass is 0.60, representing moderate value habitat. However, the HSI value for suitability of overwintering habitat is 0. This value increases to 0.25 with the project.

The major change (benefit) associated with the project is the percentage of the year these backwaters are contiguous with the main stem of the river. Under existing conditions, the backwaters are contiguous with the main stem of the river a maximum of 25% of the year and this is not expected to change without the project. However, with the project, this will increase from 50% to 75% depending upon the season of the year. For smallmouth buffalo, this will result in an increase in the HSI score for this variable from 0.25 to 1.0 for the spawning and

rearing seasons. For the largemouth bass, the HSI score for this variable increases from 0.5 to 1.0 during the spawning season and from 0.75 to 1.0 for the rearing season.

CONCLUSIONS AND RECOMMENDATIONS

According to the WHAG and AHAG analysis, the preferred project will yield a net increase of 36.80 AAHUs for all terrestrial species (Table 2) and 16.31 AAHUs for all aquatic species (Table 4). While these do not appear to be large gains, the Service recognizes the general benefits associated with contiguous forest habitat, especially those comprised of hard mast producing species and providing connectivity between isolated sloughs and the main stem river.

The proposed project will be beneficial to the Mississippi River and biota dependent upon the river by improving habitat quality in this portion of river. The project will enhance forest quality, depth diversity in backwater habitats, and flow and connectivity to the main channel. Aquatic organisms will gain improved access to important habitat for several life stages, such as spawning, rearing and over wintering. This area will also provide an important feeding area for many species and serve as a production area for small fish and invertebrates that other species feed upon. Increased depth diversity and improved flow should elongate the life of the interior sloughs and improve water quality. For these reasons, the project will improve habitat for a number of species including a variety of mammals, migratory song birds, and many large river fish species. The proposed Pools 25 and 26 Islands HREP will be beneficial to fish and wildlife, including migratory birds. Therefore, the Service supports this project.

Thank you for the opportunity to provide this Final Fish and Wildlife Coordination Act Report. If you have questions, please contact Matt Mangan of my staff at (618) 997-3344, ext. 345.

Sincerely,

Joyce A. Collins
Assistant Field Supervisor

cc: MoDOC (Sternburg, Lodges, Moore, Brown,)
FWS (Westphall, Ellis, Mabery, Scott, Simmonds)
IDNR (Schanzle, Atwood)

Table 1: Habitat Suitability Index (HIS) scores for Existing, Future Without (Year 50) and Future With (Year 50) for terrestrial species (upland and bottomland forests), Pools 25 and 26 Islands HREP.

Habitat Type – Upland: Bottomland Hardwood	Existing	Future Without (Year 50)	Future With (Year 50)	Net (FW – FWO)
Westport				
Turkey	0.53	0.58	0.63	0.05
Fox squirrel	0.10	0.68	0.80	0.12
Deer	0.61	0.58	0.62	0.04
Pileated woodpecker	0.10	0.73	0.84	0.09
Wood thrush	0.10	0.71	0.73	0.02
Kentucky warbler	0.10	0.70	0.72	0.02
Quail	0.10	0.13	0.14	0.01
Rabbit	0.10	0.12	0.13	0.02
Indigo bunting	0.10	0.10	0.10	0.00
Ruffed grouse	0.60	0.35	0.36	0.00
Dardenne				
Turkey	0.53	0.58	0.63	0.05
Fox squirrel	0.10	0.68	0.80	0.12
Deer	0.61	0.58	0.62	0.04
Pileated woodpecker	0.10	0.73	0.84	0.09
Wood thrush	0.10	0.71	0.73	0.02
Kentucky warbler	0.10	0.70	0.72	0.02
Quail	0.10	0.13	0.14	0.01
Rabbit	0.10	0.12	0.13	0.01
Indigo bunting	0.10	0.10	0.10	0.00
Ruffed grouse	0.60	0.35	0.36	0.01

Table 2: Average Annual Habitat Units for Future With Project (Year 50) and Future Without Project (Year 50) for terrestrial species (upland and bottomland forests), Pools 25 and 26 Islands HREP.

Habitat Type – Upland: Bottomland Hardwood	Future With (Year 50)	Future Without (Year 50)	Net (FW- FWO)
Westport			
Turkey	34.62	31.87	2.75
Fox squirrel	37.45	31.15	6.30
Deer	35.42	33.26	2.16
Pileated woodpecker	36.95	31.18	5.77
Wood thrush	37.82	37.35	0.47
Kentucky warbler	36.72	36.25	0.47
Quail	7.60	7.07	0.53
Rabbit	7.02	6.49	0.53
Indigo bunting	5.90	5.90	0.00
Ruffed grouse	22.85	22.27	0.58
Subtotal	262.35	242.79	19.56
Dardenne			
Turkey	30.51	28.09	2.42
Fox squirrel	33.01	27.46	5.55
Deer	31.22	29.31	1.91
Pileated woodpecker	32.57	27.48	5.09
Wood thrush	33.34	32.92	0.42
Kentucky warbler	32.36	31.95	0.41
Quail	6.70	6.23	0.47
Rabbit	6.18	5.72	0.46
Indigo bunting	5.20	5.20	0.00
Ruffed grouse	20.14	19.63	0.51
Subtotal	231.23	213.99	17.24
Grand total	493.58	456.78	36.80

Table 3: Habitat Suitability Index (HSI) scores for Existing, Future Without Project (Year 50) and Future With Project (Year 50) for aquatic species, Pools 25 and 26 Islands HREP.

Habitat Type - Aquatic	Existing	Future Without (Year 50)	Future With (Year 50)	Net (FW - FWO)
Bolters				
Largemouth bass	0.60	0.60	0.63	0.03
Smallmouth buffalo	0.72	0.72	0.79	0.07
White bass	.67	.67	.71	0.04
Emerald shiner	.77	.77	.83	0.06
River darter	.70	.70	.76	0.06
Northern pike	.61	.61	.62	0.01
Walleye	.66	.66	.72	0.06
Bluegill	.66	.66	.69	0.03
Westport				
Largemouth bass	.61	.61	.62	0.01
Smallmouth buffalo	.73	.73	.77	0.04
White bass	.68	.68	.70	0.02
Emerald shiner	.77	.77	.80	0.03
River darter	.71	.71	.72	0.01
Northern pike	.62	.62	.64	0.02
Walleye	.67	.67	.70	0.03
Bluegill	.66	.66	.66	0.00

Table 4: Average Annual Habitat Units for Existing, Future Without Project (Year 50) and Future With Project (Year 50) for aquatic species, Pools 25 and 26 Islands HREP.

Habitat Type - Aquatic	Future With (Year 50)	**Future Without (Year 50)**	**Net (FW- FWO)**
Bolters			
Largemouth bass	8.19	7.74	0.45
Smallmouth buffalo	10.21	9.42	0.79
White bass	9.18	8.68	0.50
Emerald shiner	10.82	10.01	0.81
River darter	9.89	9.10	0.79
Northern pike	8.03	7.93	0.10
Walleye	9.35	8.58	0.77
Bluegill	8.95	8.58	0.37
Subtotal	74.62	70.04	4.58
Westport			
Largemouth bass	45.80	44.93	0.87
Smallmouth buffalo	56.85	54.06	2.79
White bass	51.79	50.32	1.47
Emerald shiner	59.18	56.98	2.20
River darter	53.27	52.54	0.73
Northern pike	47.35	45.88	1.47
Walleye	51.78	49.58	2.20
Bluegill	48.84	48.84	0.00
Subtotal	414.86	403.13	11.73
Grand total	489.48	473.17	16.31

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Barko, J.W., B.L. Johnson, and C.H. Theiling. 2006. Environmental Science Panel Report: Implementing Adaptive Management. Upper Mississippi River System, Navigation and Environmental Sustainability Program, ENV Report 2, August 2006, prepared for the U.S. Army Corps of Engineers.

Galat, D.L., J.W. Barko, S.M. Bartell, M. Davis, B.L. Johnson, K.S. Lubinski, J.M. Nestler, D.B. Wilcox. 2007. Environmental Science Panel Report: Establishing System-wide Goals and Objectives for the Upper Mississippi River System. Upper Mississippi River System Navigation and Ecosystem Sustainability Program, ENV Report 6, November 2007, prepared for the U.S. Army Corps of Engineers.

Lubinski, K.S., and J.W. Barko. 2003. Upper Mississippi River – Illinois Waterway System Navigation Feasibility Study: Environmental Science Panel Report. ENV Report 52, December 2003, prepared for the U.S. Army Corps of Engineers.

COORDINATION AND PUBLIC INVOLVEMENT

INDEPENDENT TECHNICAL REVIEW
FINAL FISH & WILDLIFE COORDINATION ACT REPORT
CULTURAL RESOURCES
SUMMARY OF PUBLIC INVOLVEMENT
COMMENTS
WRITTEN RESPONSES

BLANK

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

August 2, 2005

Engineering Division
Curation and Archives
Analysis Branch

Mr. John Barrett, Chairman
Citizen Potawatomi Nation
1601 South Gordon Cooper Drive
Shawnee, Oklahoma 74801

Dear Chairman Barrett:

This letter addresses the habitat rehabilitation and enhancement project at specific islands in Pools 25 and 26 of the Upper Mississippi River. The five islands that comprise the project area are Mosier, Westport, and Kickapoo Islands in Pool 25, and Dardenne and Bolters Islands in Pool 26 (see attached Map 1). The habitat rehabilitation and enhancement project is located approximately forty miles north of St. Louis, Missouri (see attached Map 2). The islands are located along the right descending bank of the Mississippi River between Upper Mississippi River mile markers 254 to 261 and 224 to 229.

This project focuses on improving habitat that has been degraded over time, mainly by sediment. The lands are owned by the U.S. Army Corps of Engineers and operated by the Missouri Department of Conservation (MDC) under a general plan agreement. This project is taking place on U.S. Army Corps of Engineers fee-title land and property.

The impact of sedimentation and human activities over time has resulted in degraded habitats. The declining quantity and diversity of floodplain forest in the pooled portion of the river are due to past agricultural conversions and the effects of the 1993 flood. The project will seek to increase the spatial extent of the Oak-hickory community in floodplain forest by planting trees in abandoned croplands at elevations where they naturally regenerate. The degraded diversity of aquatic habitats is a result of sedimentation. This project proposes dredging to deepen backwater areas and selective excavation in remnant channels to restore connection to the river. Stone structures are proposed for the backwater areas, which would use the river's energy at flood stage to maintain the deep-water areas providing overwintering habitat. The loss of islands in the pooled portion of the river is due principally to wind-wave erosion. Minimizing wind-wave erosion by armoring the upstream islands' tips will help protect this habitat.

This habitat rehabilitation and enhancement project may include the following impacts.

Pool 25 includes Mosier, Westport, and Kickapoo Islands.

Mosier Island

- Protect the head of Howard Island and the smaller island between Howard and Mozier by reinforcing them with rock to provide habitat diversity and island protections.

Westport Island

- Plant hard mast trees in old agricultural fields at the elevation of 440 feet and above and adjust to 439 feet according to river slope at lower end of agricultural fields.

- In the upper slough construct a rounded small-scale rock structure with v-shape that provides permanent water conveyance at normal pool across the slough to maintain deepwater habitat. Below the v-shaped structure, excavate one hole approximately 8 to 10 feet deep and 50 feet long.

- In the middle slough (island interior and fish habitat) construct a rounded small-scale rock structure with v-shape that provides permanent water conveyance at normal pool across the slough to maintain deepwater habitat. Below the v-shaped structure, excavate one hole approximately 8 to 10 feet deep and 50 feet long.

- In the lower slough and interior water level management area construct a rounded small-scale rock structure with v-shape that provides permanent water conveyance at normal pool across the slough to maintain deepwater habitat. Below the v-shaped structure, excavate one hole approximately 8 to 10 feet deep and 50 feet long. Excavate existing channel to a depth of 3 feet below normal pool elevation and place a pre-cast concrete stop log for water control (open top for fish passage).

Kickapoo Island

- Plant hard mast trees in the old agricultural fields at the elevation of 439 feet and above.

Pool 26 includes Dardenne and Bolters Islands.

Dardenne Island

- Plant hard mast trees in old agricultural fields at the elevation of 428 feet and above. Allow natural regeneration at lower elevations for herbaceous habitat.

- In Old Chute at upper end of island notch existing dike and reconnect lower end of chute to main channel. Dredge lower portion of slough providing holes 8 to 10 feet deep for fish overwintering. The dredge disposal will be paced in adjacent old agricultural fields.

- Construct a rounded small-scale rock structure with v-shape that provides permanent water conveyance at normal pool across the south end to maintain deepwater habitat.

Bolters Island

- Connect the large slough at lower end of the island with the river by excavating the existing channel through a log jam at lower end of slough up to rock structure to provide conveyance for water and fish.

- In the interior of the island (fish habitat) construct a rounded small-scale rock structure with v-shape that provides permanent water conveyance at normal pool across the slough to maintain deepwater habitat. Below the v-shaped structure, excavate one hole approximately 8 to 10 feet deep and 50 feet long.

Impacts to potentially significant historic properties are not anticipated during this activity. If sites will be impacted the tribes who have indicated an interest in this area will be contacted and consultation will take place. Should an inadvertent discovery of Native American human remains occur, then Section 3 of the Native American Graves Protection and Repatriation Act will be followed.

The project lands are encompassed within the area judicially established by a finding of the Indian Claims Commission as being the aboriginal territory of the Kaskaskia Indians. The Peoria Tribe is believed to be descended from the Kaskaskia. All of the following tribes are being notified regarding this project as potential interested parties.

Sac & Fox Nation of Oklahoma
Sac & Fox Tribe of Iowa
Sac & Fox Nation of Kansas
Ho-Chunk Nation
Winnebago Tribe
Iowa Tribe of Kansas
Iowa Tribe of Oklahoma
Kickapoo Tribe of Oklahoma
Kickapoo Traditional Tribe of Texas
Kickapoo Tribe of Kansas
Miami Tribe
Osage Nation
Citizen Potawatomi Nation
Forest County Potawatomi
Pokagon Band of Potawatomi
Huron Potawatomi Nation
Prairie Band of Potawatomi
Gun Lake Potawatomi
Hannahville Indian Community
Peoria Tribe

A draft Environmental Assessment report is being completed, and if your tribe would like to review this report, please contact Ms. Roberta L. Hayworth at (314) 331-8833 by September 2, 2005, and your tribe will be added to the distribution list. Please send all comments and concerns, by August 19, 2005, to Ms. Hayworth, the St. Louis District Native American coordinator, at the following address.

U.S. Army Engineer District, St. Louis
ATTN: CEMVS-ED-Z (Hayworth)
1222 Spruce Street
St. Louis, Missouri 63103-2833
E-Mail: roberta.hayworth@mvs02.usace.army.mil

If you have further questions or need additional information, please contact Ms. Hayworth.

Sincerely,

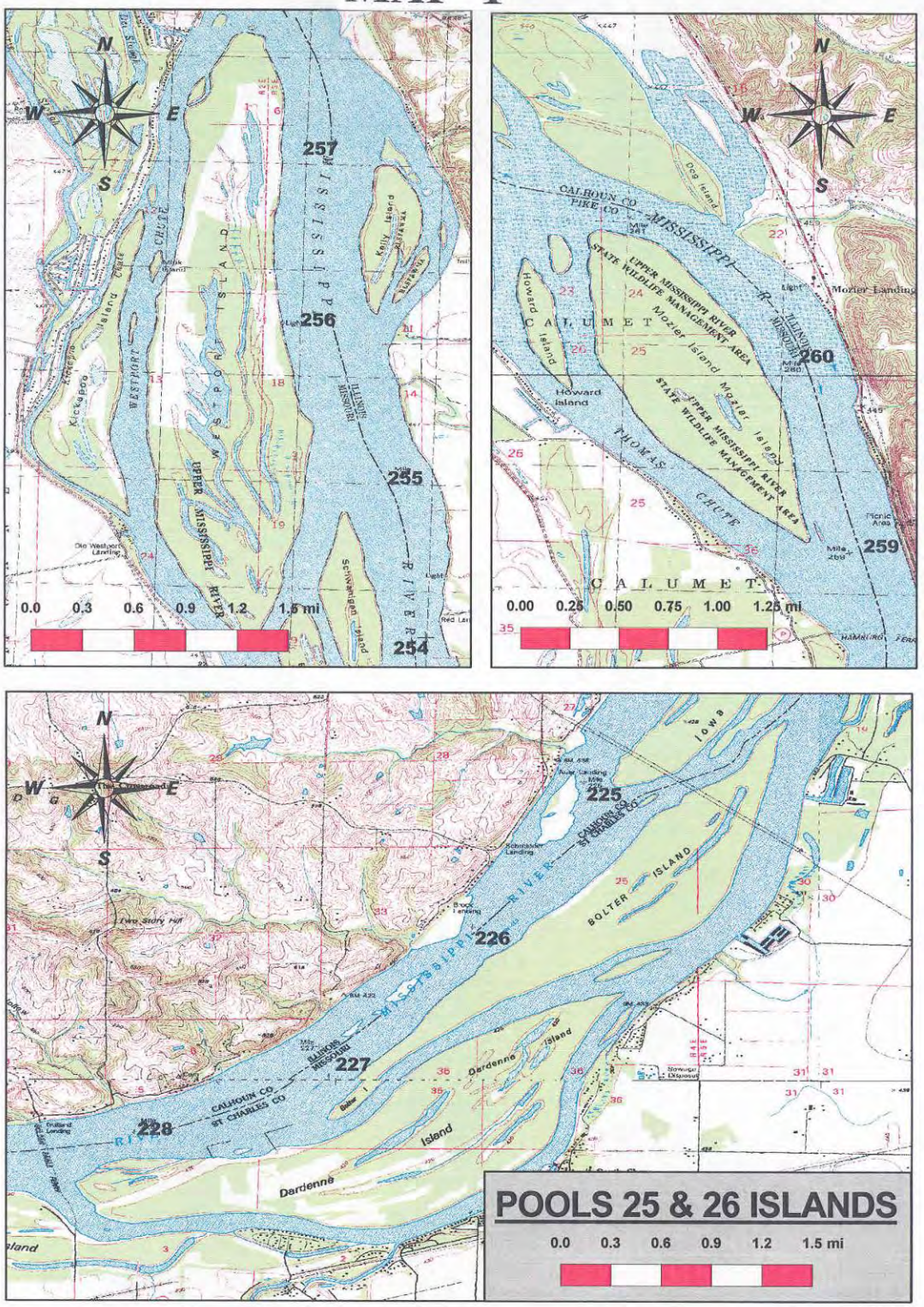
Michael K. Trimble, Ph.D.
Chief, curation and Archives
Analysis Branch

Attachments

Copy Furnished:

Mr. Jeremy Finch
Tribal Representative

MAP 1


N
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257
256
255
254
MISSISSIPPI RIVER
WESTPORT ISLAND
CHUTE
UPPER MISSISSIPPI RIVER
0.0 0.3 0.6 0.9 1.2 1.5 mi
CALHOUN CO
PIKE CO
MISSISSIPPI R
ILLINOIS
MISSOURI
260
259
Howard Island
CALUMET
Mozier Island
Mozier Landing
STATE WILDLIFE MANAGEMENT AREA
THOMAS CHUTE
0.00 0.25 0.50 0.75 1.00 1.25 mi
IOWA
225
226
227
228
ST CHARLES CO
BOLTER ISLAND
Dardenne Island
POOLS 25 & 26 ISLANDS
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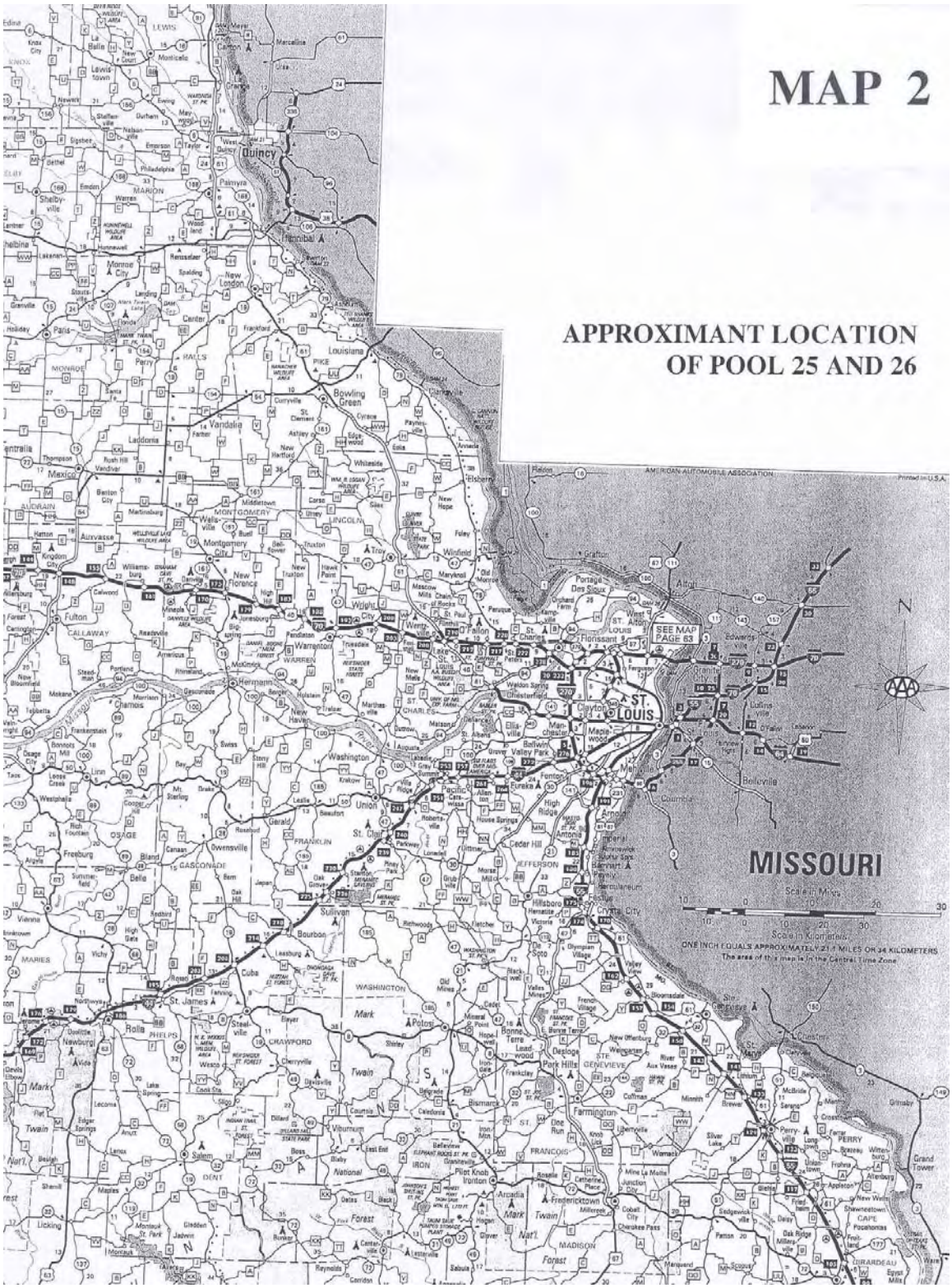
MAP 2
APPROXIMANT LOCATION
OF POOL 25 AND 26
MISSOURI
ST. LOUIS
SEE MAP PAGE 63
Scale in Miles
Scale in Kilometers
ONE INCH EQUALS APPROXIMATELY 21.1 MILES OR 34 KILOMETERS
The area of this map is in the Central Time Zone

SAME LETTER SENT:

TRIBAL CHAIRPERSONS

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Mr. Leon Campbell, Chairman
Iowa Tribe of Kansas
Route 1, Box 58A
White Cloud, Kansas 66094

Ms. Phoebe O'Dell, Chairwoman
Iowa Tribe of Oklahoma
Route 1, Box 721
Perkins, Oklahoma 74059

Mr. Juan Garza, Chairman
Kickapoo Traditional Tribe of Texas
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Eagle Pass, Texas 78853

Mr. Tony Salazar, Chairman
Kickapoo Tribe of Oklahoma
P.O. Box 70
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Mr. Steve Cadue, Chairman
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P.O. Box 271
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Ms. Kay Rhoads, Principal Chief
Sac & Fox Nation of Oklahoma
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Stroud, Oklahoma 74079

Ms. Sandra Keo, Chairman
Sac & Fox Nation of Missouri in Kansas and Nebraska
Rt. 1, Box 60
Reserve, Kansas 66434

Mr. Homer Bear, Jr., Chairman
Sac & Fox Tribe of Mississippi In Iowa
3137 F. Avenue
Tama, Iowa 52339

Mr. Floyd E. Leonard, Chief
Miami Tribe of Oklahoma
P.O. Box 1326
Miami, Oklahoma 74355

Mr. Jim Gray, Principal Chief
Osage Nation of Oklahoma
P.O. Box 779
Pawhuska, Oklahoma 74056

SAME LETTER SENT:

TRIBAL REPRESENTATIVE:

Mr. Jeremy Finch
Citizen Potawatomi Nation
1601 S. Gordon Cooper Dr.
Shawnee, Oklahoma 74801

Mr. Vince Leppart
Forest County Potawatomi
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P.O. Box 340
Crandon, Wisconsin 54520

Mr. Floyd Rhode
Hannahville Indian Community
P.O. Box 351, W 399
Highway 2 & 42
Harris, Michigan 49845

Mr. Dale Andersen
Huron Potawatomi Nation
2221—1 ½ Mile Road
Fulton, Michigan 49052

Mr. Rey Kitchkumme
Prairie Band of Potawatomi
Government Center
16281 Q Road
Mayetta, Kansas 66509

Mr. Larry Garvin
Cultural Resources Division
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Black River Falls, Wisconsin 54615

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Mr. Anthony Whitehorn
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Pawhuska, Oklahoma 74056

Mr. Emmett E. Ellis
The Peoria Tribe of Oklahoma
6435S. Quebec Avenue
Tulsa, Oklahoma 74136

COORDINATION AND PUBLIC INVOLVEMENT

BLANK

Summary of Public Involvement

Pools 25 and 26 Islands Project
Mississippi River Navigation Pools 25 and 26
St. Charles, Lincoln, and Pike Counties, Missouri

The St. Louis District solicited public comment on the proposed plan through various programs.

Solicitation for Public Comment on Recommended Plan

Regulatory Public Notice. Under the authority of its permit program, the Regulatory Branch issued a public notice dated December 19, 2007, which solicited comment for a 5-week period. The proposal requires authorization under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Copies of the public notice were mailed to several hundred entities included in the office's standard mailing list, consisting of public officials, government agencies, private organizations, and interested groups and individuals.

NEPA Review. The Environmental Branch circulated for public review an Environmental Assessment, Draft Finding of No Significant Impact, project maps, and a Section 404(b)(1) Evaluation Report for the proposed project as part of its process to attain compliance with a variety of environmental laws and regulations, including the National Environmental Policy Act NEPA). These documents were mailed on December 18, 2007 for a 5-week review period to over 30 entities, including various public officials, government agencies, private organizations, and interested groups and individuals.

Informal Public Meeting. The Public Affairs Office issued a press release on January 31, 2008, announcing an informal public meeting scheduled for February 11, 2008, in Elsberry, Missouri, located near the proposed project area. The public was invited to discuss and comment on the proposal informally with representatives from the District, U.S. Fish and Wildlife Service, and Missouri Department of Conservation. The public comment period was extended to February 29.

Respondents

In response to Regulatory's public notice, written comments were submitted by four respondents:

•Matt Mangan – Fish and Wildlife Biologist, Marion Illinois Suboffice, U.S. Fish and Wildlife Service, Marion, IL
•Dr. Andrea A. Hunter – Tribal Historic Preservation Officer, Osage Nation Tribal Historic Preservation Office, Pawhuska, OK

•Carrie M. Schulte – NPDES Permits and Engineering Section, Missouri Department of Natural Resources, Jefferson City, MO
•Robert K. Morrison, P.E. – Chief, Water Pollution Control Branch, Missouri Department of Natural Resources, Jefferson City, MO

In response to the NEPA review, written comments were submitted to the District from four respondents:

•Congressman Todd Akin – 2nd District, Missouri
•Joyce Collins – Assistant Field Supervisor, Marion Illinois Suboffice, U.S. Fish and Wildlife Service, Marion, IL
•Karen Westphall – Wildlife Biologist, Mark Twain Refuge Complex, U.S. Fish and Wildlife Service, Quincy, IL
•Ken Dalrymple – Wildlife Biologist, Two Rivers National Wildlife Refuge, U.S. Fish and Wildlife Service, Brussels, IL

At the public meeting, about 10 people attended, and they were either local residents or fishing and hunting enthusiasts. Although the opportunity was provided to submit written comments, no comments were received as a result of the public meeting.

Submitted Comments and Corps Responses

Public Officials

Congressman Todd Akin In his letter dated January 23, 2008 to Colonel Lewis F. Setliff III, District Engineer, Congressman Akin raised concerns that the proposed tree planting activity might cause impairment of water quality of the Mississippi River if displaced soil at the proposed tree planting sites contained residual elevated levels of agricultural nutrients.

Response: In a letter dated April 7, 2008, Colonel Setliff stated that there was little to no potential for the proposed tree planting activity in abandoned cropland to harm water quality for several reasons: a relatively small amount (about 200 cubic yards) of dirt would be displaced, the displaced dirt would be replaced and erosion control measures (seeding) would be implemented to stabilize disturbed ground at each planting site, and there is no reason to believe that the last application of agricultural fertilizers on the islands over ten years was done improperly.

Federal Agencies

Matt Mangan (USFWS) In an email message dated January 9, 2008, Mr. Mangan stated that he would not be providing comments in response to the public notice, but rather to the environmental assessment.

Response: Comment noted.

Joyce Collins (USFWS) In her letter dated February 25, 2008 to Colonel Lewis F. Setliff III, District Engineer, Ms. Collins expressed the Service's support for the project by stating "it appears that proposed project activities will be conducted in a manner to minimize and avoid impacts to threatened and endangered species and will be beneficial to a variety of fish and wildlife resources. Therefore, we have no objection to a Finding of No Significant Impact for this activity." The letter also raised a variety of points or issues, including whether the proposed improvements to the interior slough on Bolter Island might cause a permanent lowering of that waterbody's surface elevation.

Response: In a letter dated June 5, 2008, Thomas M. Keevin, Ph.D., chief, Environmental Branch, provided responses to each item, and furnished hydrological information supporting the belief that the proposed improvements to the interior slough would not alter its water surface elevation because the slough is not perched relative to the river, rather the slough is periodically connected to the river, and their water surface elevations are often similar.

Karen Westphall (USFWS) In her email message dated March 14, 2008 to Timothy George, Ecologist, Environmental Branch, Ms. Westphall raised two major issues – that tree species other than the proposed hard mast species may need to be used for reforestation activities on Westport and Dardenne Islands, and that the proposed improvements to the interior sloughs on Westport and Bolter Islands may act to drain them and thereby lower water surface elevations.

Response: In a letter dated June 5, 2008, Thomas M. Keevin, Ph.D., chief, Environmental Branch, provided hydrological and ecological information supporting the proposed use of hard mast species for reforestation, and hydrological information like that in the response to Collins to support the opinion that the proposed improvements to the sloughs would not adversely alter their surface water elevations.

Ken Dalrymple (USFWS) In his email message dated January 3, 2008 to Timothy George, Ecologist, Environmental Branch, Mr. Dalrymple requested that prior to the proposed reforestation activities on Westport and Dardenne Islands, the planting sites should be surveyed to locate any surviving oaks, pecans, and sycamores that were planted as seedlings during the 1990s, in order to protect them from any damage inflicted during the proposed clearing of undesirable vegetation from these planting sites prior to planting.

Response: In an email message dated January 10, 2008, Mr. George stated that the District would ensure that the requested survey to locate previously planted tree seedlings would be conducted prior to planting.

State Agencies

Carrie Schulte (MDNR) In an email message dated February 6, 2008 to Charles Frerker of the Regulatory Branch, Ms. Schulte stated that the proposal would require an individual Section 401 water quality certification from her agency. She also stated that

wetland impacts should be avoided or minimized, designated beneficial uses of the river should not be adversely affected, tree clearing and vegetation removal should be minimized, active public outreach and full public participation should be attained, and measures should be taken to minimize the potential for pollution of the river during construction. She also stated that the proposal must comply with a Missouri Clean Water Commission order dated September 12, 2007, which prohibits the discharge of sediment into the waters of Missouri by all Corps habitat restoration projects.

Response: Comments noted. In an email message dated March 5, 2008 to Ms. Schulte, Charles Frerker requested that MDNR commence its final water quality certification review. He also stated that he believed coordination between the District and MDNR had satisfactorily resolved concerns based on the Commission's order that the project might cause sediment to be placed into Missouri's portion of the Mississippi River.

Robert Morrison (MDNR) In letter dated June 2, 2008 to Charles Frerker of the Regulatory Branch, Mr. Morrison stated that Section 401 water quality certification was issued for the proposed project. The certification is subject to compliance with seven conditions, five of which were expressed in Ms. Schulte's email message. The two new conditions are that bank stabilization work shall employ suitable materials (the recommended plan does not include any bank stabilization activities), and that MDNR's certification does not replace or supersede the requirements of any other permits the District may need or have.

Response: Comments noted. The project has been designed to minimize impacts to wetlands as well as vegetation and tree clearing activities. Because the proposal does not include any activity involving placement of sediment into waters of Missouri, it will comply with the Clean Water Commission's order. Other designated beneficial uses of the river will not be adversely impacted, including navigation and recreational activities. As described in this document, the District has pursued public outreach commensurate with the nature of this project. The District will include each of the certification's conditions in the specifications prepared for all of this project's construction contracts

Tribes

Dr. Andrea Hunter (Osage Nation) In letter dated January 2, 2008 to Charles Frerker of the Regulatory Branch, Dr. Hunter stated that the proposal "will not adversely affect properties of cultural or sacred significance to the Osage Nation." She also expressed the opinion that the District fulfilled compliance with the National Historic Preservation Act by consulting with her office. She also requested that if during project construction any artifacts or human remains are discovered, work would immediately cease and the Osage Nation Tribal Historic Preservation Office be contacted.

Response: Comments noted. The District will place language in the specifications for the construction contract that work shall cease immediately if artifacts or human remains are discovered, and that her office shall be notified.

COORDINATION AND PUBLIC INVOLVEMENT

INDEPENDENT TECHNICAL REVIEW
FINAL FISH & WILDLIFE COORDINATION ACT REPORT
CULTURAL RESOURCES
SUMMARY OF PUBLIC INVOLVEMENT
COMMENTS

•Matt Mangan – Fish and Wildlife Biologist, Marion Illinois Suboffice, U.S. Fish and Wildlife Service, Marion, IL
•Dr. Andrea A. Hunter – Tribal Historic Preservation Officer, Osage Nation Tribal Historic Preservation Office, Pawhuska, OK
•Carrie M. Schulte – NPDES Permits and Engineering Section, Missouri Department of Natural Resources, Jefferson City, MO; written response given before comment
•Robert K. Morrison, P.E. – Chief, Water Pollution Control Branch, Missouri Department of Natural Resources, Jefferson City, MO

•Congressman Todd Akin – 2nd District, Missouri
•Joyce Collins – Assistant Field Supervisor, Marion Illinois Suboffice, U.S. Fish and Wildlife Service, Marion, IL
•Karen Westphall – Wildlife Biologist, Mark Twain Refuge Complex, U.S. Fish and Wildlife Service, Quincy, IL
•Ken Dalrymple – Wildlife Biologist, Two Rivers National Wildlife Refuge, U.S. Fish and Wildlife Service, Brussels, IL

WRITTEN RESPONSES

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W. TODD AKIN
2D DISTRICT, MISSOURI

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(202) 225-2561

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P.O. BOX 519
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Congress of the United States
House of Representatives
Washington, DC 20515

COMMITTEES
ARMED SERVICES
SCIENCE
SMALL BUSINESS
CHAIRMAN, SUBCOMMITTEE ON WORKFORCE, EMPOWERMENT, AND GOVERNMENT PROGRAMS

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rep.akin@mail.house.gov
Website:
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January 23, 2008

Commander
St. Louis District
U.S. Army Corps of Engineers
ATTN: CEMVS-PM-E (Tim George)
1222 Spruce Street
St. Louis, MO 63103-2833

Dear Mr. George:

This memo pertains to the Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for Pools 25 & 26 Islands Habitat Rehabilitation and Enhancement Project of the Mississippi River, Lincoln and St. Charles Counties, Missouri. My concern with this document is that it does not adequately address the potential of releasing agricultural fertilizer residues into the Mississippi River.

Soil analysis of farmland that was recently being disturbed in another Corps environmental restoration project on the Missouri River revealed that the soil contained high levels of agricultural nutrients, including phosphorous (P). When released into bodies of water, this soil amendment, whether in elemental form or as a component of chemical compounds, has been implicated in contributing to oxygen depletion in those waters. However, no evidence was offered in the Draft EA and FONSI for Pools 25 & 26 that the abandoned farmland on Westport and Dardenne Islands has been tested to determine the quantities of agricultural chemicals which still may be present.

The following references in the EA, when taken together, lead to my concerns:

1. (page 6): "Prior to 1993, some lands on Westport and Dardenne islands (189 and 118 acres, respectively) were cropped by the Missouri Department of Conservation for wildlife purposes, but this activity was terminated after the flood of that year."
    - **Comment:** Were soil amendments or fertilizers ever used at these locations?
2. (page 8): "An environmental baseline study of the project area's islands was conducted by the St. Louis District in April 2006 to determine if any hazardous, toxic, or radioactive waste was ever stored, released or disposed of on these properties. A site visit, interviews, and record review did not reveal any evidence of such wastes."

- **Comment:** Was a soil analysis conducted to determine the presence of agricultural chemicals in the abandoned cropland areas?

3. (page 30): (Westport Island)(Pool 25) "Reforestation of 59 acres of abandoned cropland … is proposed…."
4. (page 31): (Dardenne Island)(Pool 26) "Fifty-two acres of plantings are proposed on this 790-acre island."
5. (page 32): "Quantity of Material.
   - "Westport Island: earthen material (excavated to make planting holes) - 105 - cubic yard"
   - "Dardenne Island: earthen material (excavated to make planting holes) - 95 - cubic yard"
6. (page 32): "Description of Proposed Discharge Sites"
   - Westport Island: tree planting over 59 acres – abandoned cropland
   - Dardenne Island: tree planting over 52 acres – abandoned cropland
   - **Comment:** It appears that the excavated material will be left in the vicinity of each planted tree.
7. (page 32): "… disposal sites will be unconfined."
8. (page 33): "Dredged and fill materials will be subject to the forces of flood flows. As none of the disposal sites will be confined, all materials will have the potential to migrate downhill."
   - **Comment:** This statement means that excavated materials may migrate into the river.
9. (page 38): "No practicable alternatives exist which meet the study objectives and do not involve discharge of fill into waters of the United States….Hauling mechanically dredged sediments to disposal sites off these islands was not considered."
   - **Comment:** Sediments deposited over decades should not contain excessive levels of agricultural chemicals. However, no mention is made here of excavated soil from abandoned cropland, which may contain significant levels of residual agricultural chemicals.
10. (page 39): "The proposed project will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Life stages of aquatic organisms and other wildlife would not be adversely affected in a significant manner."
    - **Comment:** If no soil analysis has been conducted on the abandoned cropland from which 200 cubic yards of soil will be disturbed and from which residues of agricultural chemicals may leach into the Mississippi

River and then flow to the Gulf of Mexico, then this statement is not necessarily true.

Recommendations: Accomplish the following actions:

1. Determine if the Missouri Department of Conservation ever used fertilizers or soil amendments on the farmland on Westport and Dardenne Islands. If yes:
2. Conduct soil analysis at multiple sites on the abandoned cropland on Westport and Dardenne Islands. Determine if quantities of phosphorous (P) or other agricultural residues are present that may harm aquatic life locally or downstream. If yes:
3. Amend the project plan to include one of the following options:
    a. Assemble excavated cropland (105 and 95 cubic yards of soil, respectively) at one disposal site on each island, tamp, and plant fast-growing grasses to reduce the likelihood of migration. (**Comment:** If chemical residues remain in cropland that was repeatedly flooded over many decades, it is unlikely to leach out at significant rates if excavated soil once again is properly tamped and stabilized). Or:
    b. Haul the 200 cubic yards of soils from the islands to upland deposit sites.

Thank you for giving due consideration to these comments. Should you have questions or need further information, please feel free to contact my Projects Coordinator, Jim Mitas, at (314) 590-0029, by fax at (314) 590-0037, or via email at Jim.Mitas@mail.house.gov.

Sincerely,

W. Todd Akin
Member of Congress

WTA:jm

CF:
John D. Hoskins, Director, Missouri Department of Conservation, 2901 W. Truman Blvd, Jefferson City, MO 65109
Doyle Childers, Director, Missouri Department of Natural Resources, 1101 Riverside Dr., PO Box 176, Jefferson City, MO 65102-0176

Comments

Congress of the United States
House of Representatives
Washington, DC 20515–2502

OFFICIAL BUSINESS

PRINTED ON RECYCLED PAPER

M.C.

Commander
St. Louis District
U.S. Army Corps of Engineers
ATTN: CEMVS-PM-E (Tim George)
1222 Spruce Street
St. Louis, MO 63103-2833

Frerker, Charles F MVS

From: Matthew_Mangan@fws.gov
Sent: Wednesday, January 09, 2008 11:12 AM
To: Frerker, Charles F MVS
Cc: Joyce_Collins@fws.gov
Subject: Army Corps Public Notic P-2571 to P-2573

Chuck,

We will not be providing comments for Public Notices P-2571 to P-2753 as we will be providing our comments on the EA for those projects.

Matt Mangan
Fish and Wildlife Biologist
Ecological Services
Marion Illinois Sub-Office
8588 Route 148
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618-997-3344 ex 345
618-997-8961 Fax
matthew_mangan@fws.gov

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Comments

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Marion Illinois Suboffice (ES)
8588 Route 148
Marion, IL 62959
(618) 997-3344
February 25, 2008

Colonel Lewis F. Setliff, III
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attn: Mr. Timothy George, CEMVS-PM-E

Dear Colonel Setliff:

We have received and reviewed the Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) addressing the proposed Pools 25 & 26 Islands Habitat Rehabilitation and Enhancement Project (HREP). The project area is comprised of five islands located in Pools 25 & 26 of the Mississippi River between river miles 224 and 261, Lincoln, Pike, and St. Charles Counties, Missouri. The islands are owned by the U.S. Army Corps of Engineers and managed for fish and wildlife purposes by the Missouri Department of Conservation. These comments are provided under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); and the Endangered Species Act of 1973, as amended; and the National Environmental Policy Act.

The proposed project consists of planting tree and shrub seedlings to reforest 111 acres of abandoned agricultural fields on Westport (59 acres) and Dardenne (52 acres) Islands, improving the connection between the river and island interior sloughs on Westport and Bolter Islands by removing sediments from small natural channels, and improving water depth in interior sloughs of Westport Island by installing a water control structure, and creating a deep hole in a slough on Bolter Island.

In the draft EA on page 18, Howard Island and some unnamed Islands are listed under Lincoln County in the Federally threatened and endangered species list. However, Howard Island and the unnamed Islands should be listed as occurring in Pike County, Missouri. We have included the federally listed species for Pike County, Missouri below and included background information for the two species not currently described in the EA.

Pike County, Missouri (Pool 25, Howard and unnamed Islands):

Gray bat (*Myotis grisescens*) – endangered

Indiana bat (*Myotis sodalis*) – endangered

Decurrent false aster (*Boltonia decurrens*) - threatened

Fat pocketbook pearlymussel (*Potamilus capax*) – endangered

Spectaclecase mussel (*Cumberlandia monodonta*) – candidate

Gray bat: During the summer and winter, gray bats inhabit caves. This species forages over rivers and reservoirs adjacent to forests. Project activities that impact cave and forest resources have the potential to adversely affect this species.

Fat pocketbook pearlymussel: This mussel species utilizes sand substrates and may be found individually or in beds with other species. This species occurs in the Ohio River; a tributary of the Mississippi River and in the Lower Mississippi River. This species is considered extirpated from Pike County.

Indiana bat: Information in the EA on pages 19, 20, and 37 describing the time period for tree felling (September 1 through March 31) should be changed to October 1 through March 31.

Information in the draft EA indicates that tree removal will occur during the winter months when Indiana bats maternity roosting is not known to occur. Spectaclecase is considered extirpated or "non-viable or unknown" according to information in the draft EA and fat pocketbook pearlymussel is also considered extirpated as described previously. In addition, according to information in the draft EA, eastern massasauga rattlesnakes, pallid sturgeon, and decurrent false aster are not known to occur within the project areas and running buffalo clover is a terrestrial species and is not likely to be adversely affected by project activities. As cave habitats will not be impacted by the proposed project, gray bats are not likely to be affected. Based upon this information, we concur that the proposed project is not likely to adversely affect any known federally listed threatened or endangered species. This precludes the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. Should the project be modified or new information indicate endangered species may be affected, consultation should be initiated.

The bald eagle (*Haliaeetus leucocephalus*) has officially been removed from the List of Endangered and Threatened Species as of August 8, 2007. Although the bald eagle has been removed from the threatened and endangered species list, it continues to be protected under the MBTA and the BGEPA. The USFWS developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. A copy of the NBEM Guidelines is available at:

http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf. According to the information in the draft EA, no bald eagle nesting areas are known to occur in the vicinity of the islands on which work is proposed and tree removal will not affect any perching, feeding, or roosting habitat. In the event that bald eagle use changes in the project area, the NBEM guidelines should be applied as appropriate.

The Draft Fish and Wildlife Coordination Act Report for the Pools 25 and 26 Islands HREP project should have been included in the Draft EA. We will be finalizing this Fish and Wildlife Coordination Act Report in the near future and recommend that it be included in the Final EA and Finding of No Significant Impact.

We would like to see more detailed information included in the EA regarding the timeline for dredging and excavation activities on Westport and Bolter Islands. We recommend that dredging and excavation activities should not occur from mid-March to early June in order to avoid impacts during the primary timeframe for fish spawning. Additionally, we would like to see more detailed information on erosion control measures included in the detailed description of recommended plan (Alternative 4) section.

Information in the draft EA suggests no ground water resources will be affected by any of the considered action alternatives and that mechanical dredging and excavation is not expected to lead to a lowering of the water surface elevation of the sloughs on Westport and Bolter Islands. We would like to see more information provided in the draft EA supporting the determination that no impact will occur. Otherwise, we recommend that a soil composition study be conducted in the proposed dredging areas to determine appropriate depths for dredging in relation to the risk of impacting perched ground water tables and water permanency within interior sloughs.

Based on information in the draft EA, it appears that proposed project activities will be conducted in a manner to minimize and avoid impacts to threatened and endangered species and will be beneficial to a variety of fish and wildlife resources. Therefore, we have no objection to a Finding of No Significant Impact for this activity. Thank you for the opportunity to provide comment on the Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI). If you have any questions, please contact Matt Mangan of my staff at (618) 997-3344, ext. 345.

Sincerely,

Joyce A. Collins
Assistant Field Supervisor

cc: MoDOC (Sternburg, Moore, Brown)
FWS (Westphall, Simmonds)
IDNR (Schanzle, Atwood)

Comments

U.S. DEPARTMENT O[illegible]
FISH & WILDLIFE SERVICE

8588 RT. 148
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OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

Mr. Timothy George
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, MO 63103

63103$2833 C003

George, Timothy K MVS

From: Karen_Westphall@fws.gov
Sent: Friday, March 14, 2008 2:31 PM
To: George, Timothy K MVS
Cc: Dick_Steinbach@fws.gov; Joyce_Collins@fws.gov; Brian.Loges@mdc.mo.gov>; MatthewMangan/R3/FWS/DOI
Subject: Pool 25/26 Islands - EA comments

Attachments: Pool 25_26 EA comments.doc

Pool 25_26 EA comments.doc (41...

Tim,
Attached are a few comments on the Pool 25/25 Islands HREP (finally!). The main points are that 1) we should more carefully evaluate tree planting species and locations and 2) we need to be sure that dredging won't negatively impact the water holding capacity of the sloughs.

I know Brian Markert is struggling with a very tight EMP budget this year. Will planning continue on this project, or is it pretty much on hold now until FY09?

Karen

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Comments

Pool 25 and 26 Islands HREP
Draft Environmental Assessment comments
Karen Westphall
March 2008

Page 1 Objectives
Objective 1) Increase the spatial extent of the oak-hickory community.
Rather than specifying oak-hickory, I suggest re-wording to something along the lines of "Restore the diversity, distribution and regeneration of bottomland forest communities in appropriate relationship to landscape position and current Mississippi River hydrology." "Oak-hickory" probably is not the best description of the forest community type we want to restore on these islands, plus I don't want us to limit ourselves unnecessarily if we find later that other types are more appropriate in these locations.

Objective 4) Maintain islands.
I think this refers specifically to erosion control? If so, suggest changing the wording to state that outright, e.g., "Reduce island erosion."

Page 4. Measures A&B.
"Plant oak-hickory seedlings in abandoned cropland at elevations where they naturally regenerate…"
My understanding is that hickory is not present on Westport (or Dardenne?) and isn't recommended for planting as part of this project. I also thought that the few remaining oaks aren't regenerating at all?

Page 5. Planting of native tree and shrub seedlings.
I strongly support the idea of diversifying the planting beyond oaks and pecans. Holly and hawthorn are specifically mentioned, but maybe we could include even more variety of non-oak native species with appropriate flood tolerance. Based on Figures EA-3 and EA-4, it looks like planned elevations for tree planting (above 440' on Westport and 428' on Dardenne) fall somewhere near the 2 to 5 year flood frequency zone.

Pages 6 through 8 Hydrologic condition
This section should include discussion of historic hydrology of these islands and how it compares with the current condition. For example, are "normal" water levels higher on the islands now than they were pre-lock-&-dam? Have the 2-, 5-, and 10-year flood elevations increased? Are water level changes more frequent and flashy? This information could influence which plant species are most likely to survive and reproduce under current conditions.

Figs EA-3 and EA-4.
What do the solid green lines indicate? They're labeled "10-Feb-98" for Pool 25 and "30-Oct-2002" for Pool 26. Why are these dates significant?

Page 8. G. Ground Water Resources
"Perched ground water tables are likely to occur in the vicinity of the islands' sloughs."

What's the evidence for this and what's the potential significance for the project? My understanding of ground water is almost zero, but this statement caught my eye because I'm aware that ground water conditions can affect natural distribution and sustainability of vegetation communities in some locations. Does this statement mean that ground water might be perched higher than river level on some parts of the islands?

Page 9. Terrestrial and Aquatic Habitats

While reading this section, I wanted to see more detailed information on the historic and current condition of the forest. The narrative states, for example, that "oaks and hickories…once were typical of higher elevations" on these islands. How do we know that – is historic forest survey data available? Did forest composition begin to change following construction of the lock and dam system, or were the oak-hickory stands healthy and reproducing up until the flood of 1993?

What's the estimated age distribution of the "scattered pecans and pin oaks" that remain today, i.e. when did the last successful natural regeneration occur? Are any young trees present? Evidence of natural regeneration would increase the likelihood that plantings of these species would be successful in the long term. If younger trees aren't present, it's possible that those elevations won't sustain those species anymore due to altered hydrology. This section mentions several potential reasons for low hard mast regeneration, but doesn't discuss hydrologic changes in the pools.

"Water surface elevation in some sloughs appears to be dependent on river stage."
We need to know for sure whether or not the slough bottoms are connected hydrologically to the river. If they're not connected, dredging could break through the impermeable layer and reduce their water-holding capacity. The site managers think it probably won't be a problem based on their observations, but definitive data from borings or other methods also should be obtained for confirmation.

George, Timothy K MVS

From: Kenneth_Dalrymple@fws.gov
Sent: Thursday, January 03, 2008 12:45 PM
To: George, Timothy K MVS
Cc: John_Mabery@fws.gov
Subject: Pools 25&26 EA and FONSI

Tim,

It was interesting reading about the proposed projects in pools 25 and 26.
Sure would have been nice if alternative 8 could have been the recommended plan. The EA and FONSI seemed to be sufficient for the project however I would like to make a suggestion.
Both of the areas that have been designated as tree restoration sites (on Dardeene and Westport) have been planted to hard mast trees, in many of the locations, in the 1990s by my staff when I worked for MDC. Before you clear these areas completely of soft mast trees an inventory should be conducted and all existing hard mast trees (oak and pecan) as well as Sycamore marked is such a fashion that damage does not occur (I have observed some tree survival on these areas) during the clearing process.
The Sycamore (planted for future wood duck nesting habitat) could be 20 to 40 feet tall in some locations (about the same height as the cottonwood).
If any of the oak are still surviving the competition will have caused them to become extremely tall compared with the diameter at dbh and they will have very few limbs (difficult to identify by most laymen).

Thanks,

Ken

Ken Dalrymple
Wildlife Biologist
Two Rivers NWR
(618) 883-2524
Fax (618) 883-2201
E-Mail Kenneth_Dalrymple@fws.gov

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Comments

Frerker, Charles F MVS

From: Frerker, Charles F MVS
Sent: Wednesday, March 05, 2008 11:13 AM
To: MDNR MVS External Stakeholder
Cc: Carrie Schulte; Shannon Slater
Subject: RE: Revised - Army Corps of Engineers, Saint Louis District, P-2571 to P-2573/CES002012

Carrie,

Please initiate your final Section 401 Water Quality Certification review for P-2571 to P-2573 (Bolters, Dardenne and Westport Islands). I was on a conference call with Rob and Drew this past Monday. I believe the issues related to these project and your referenced MO Clean Water Commission Order have been resolved.

Thanks
Chuck

-----Original Message-----
From: WPSC.Water Quality Certification [mailto:wpsc401cert@dnr.mo.gov]
Sent: Wednesday, February 06, 2008 4:19 PM
To: Frerker, Charles F MVS
Cc: Hansen, Rick MVS External Stakeholder; Brown, Doyle MVS External Stakeholder; Goodwin, Bill MVS External Stakeholder; Stevens.Carl@epamail.epa.gov; Carrie Schulte; Shannon Slater
Subject: Revised - Army Corps of Engineers, Saint Louis District, P-2571 to P-2573/CES002012

Revised comments - please replace the earlier comments. Thanks.

The Missouri Department of Natural Resources' Water Protection Program has reviewed Public Notice No. P-2571 to P-2573/CES002012 in which the Army Corps of Engineers (Corps) has proposed to rehabilitate and enhance aquatic and wetland habitats on Bolters, Dardenne and Westport Islands within the Mississippi River Pools 25 and 26. The proposed activities comprise of the Corps' Pools 25 & 26 Island Habitat Rehabilitation and Enhancement Project, which has been developed under the Environmental Management Program (EMP-HREP), pursuant to Section 1103, Water Resources Development Act of 1986 (PL 99-662).

The Corps proposes to conduct filling and dredging/excavating activities in waters of the United States in conjunction with implementing the proposed Pools 25 & 26 Island EMP-HREP project, which consists of features at Westport, Dardenne and Bolters Islands. Planned features address the following objectives: expansion of flood plain forest, restoration of river-backwater connections, and creation and maintenance of deepwater habitat in backwater areas. Total impacts associated with filling activities in jurisdictional waters are approximately 5.0 acres of wetlands.

Westport Island is located in Pool 25 of the Mississippi River, lies in Lincoln County, Missouri, between river miles 257.5 and 254.0. This island is about five miles east of Elsberry. Dardenne and Bolters Islands are located about 20 miles to the south in Pool 26 of the Mississippi River in St. Charles County, Missouri, between river miles 228.0 and 224.5. These two islands are about five miles north of St. Peters, Missouri.

We offer the following comments:

1. The Corps should obtain an individual Water Quality Certification from the Department of Natural Resources prior to proceeding with construction of these projects.

2. Wetlands were once a significant component of Missouri's natural heritage, accounting for almost 11 percent of its surface area. Historical wetland losses in Missouri have been significant. This department and other federal and state agencies are directed to implement a policy of no net loss of wetlands in permitting and certification work and, therefore, the wetlands impact should be avoided or minimized if possible. It is the national and state policy that there be no net loss of our remaining wetlands. Mitigation for loss of wetlands should be in conformance with the State of Missouri

Aquatic Resources Mitigation Guidelines.

3. Regarding disposal of excavated or dredged material from the construction of these projects including any designed velocity related erosion, the Corps should refer to and comply with the Missouri Clean Water Commission order (attached) dated September 12, 2007.

4. The projects should not adversely impact other designated beneficial uses of the Mississippi River.

5. The Corps should minimize the amount of vegetation and tree clearing, unless it is necessary to the project.

6. The Corps should pursue active public outreach and ensure full public participation to include but not limited to publication in a local newspaper, public meeting and response to local comments. In addition, separate notices should be sent to surrounding landowners within a one-mile radius of the site.

7. Care should be taken to keep machinery out of the waterway as much as possible. Fuel, oil and other petroleum products, equipment and any solid waste shall not be stored below the ordinary high water mark at any time or in the adjacent floodway beyond normal working hours. All precautions shall be taken to avoid the release of wastes or fuel to streams and other adjacent water bodies as a result of this operation.

Thank you for the opportunity to comment on this proposed project. If you have any questions, please contact Carrie M. Schulte of the NPDES Permits and Engineering Section at (573) 751-7023.

CS:pc

Attachment

STATE OF MISSOURI

Matt Blunt, Governor • Doyle Childers, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

JUN 2 2008

Mr. Charles Frerker
Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, MO 63103-2833

Lincoln & St. Charles Counties
P-2571 to P-2573/CES002012
Mississippi River Projects

RE: Army Corps of Engineers' St. Louis District's Mississippi River Projects - Bolters, Dardenne and Westport Islands

The Missouri Department of Natural Resources' Water Protection Program has reviewed Public Notice No. P-2571 to P-2573/CES002012 in which the Army Corps of Engineers (Corps) has proposed to rehabilitate and enhance aquatic and wetland habitats on Bolters, Dardenne and Westport Islands within the Mississippi River Pools 25 and 26. The proposed activities comprise of the Corps' Pools 25 & 26 Island Habitat Rehabilitation and Enhancement Project, which has been developed under the Environmental Management Program (EMP-HREP), pursuant to Section 1103, Water Resources Development Act of 1986 (PL 99-662).

The Corps proposes to conduct filling and dredging/excavating activities in waters of the United States in conjunction with implementing the proposed Pools 25 & 26 Island EMP-HREP project, which consists of features at Bolters, Dardenne and Westport Islands. Planned features address the following objectives: expansion of floodplain forest, restoration of river-backwater connections and creation and maintenance of deepwater habitat in backwater areas. Total impacts associated with filling activities in jurisdictional waters are approximately 5.0 acres of wetlands.

Westport Island is located in Pool 25 of the Mississippi River in Lincoln County, Missouri, between river miles 257.5 and 254.0. This island is about five miles east of Elsberry. Dardenne and Bolters Islands are located about 20 miles to the south in Pool 26 of the Mississippi River in St. Charles County, Missouri, between river miles 228.0 and 224.5. These two islands are about five miles north of St. Peters, Missouri.

This office certifies that the ongoing activities apparently will not cause the general or numeric criteria to be exceeded nor impair beneficial uses established in the Water Quality Standards, 10 CSR 20-7.031, provided the following conditions are met:

1. The projects shall not adversely impact other designated beneficial uses of the Mississippi River.

2. The Corps shall minimize the amount of vegetation and tree clearing, unless it is necessary to the project.

3. Care shall be taken to keep machinery out of the waterway as much as possible. Fuel, oil and other petroleum products, equipment and any solid waste shall not be stored below the ordinary high water mark at any time or in the adjacent floodway beyond normal working hours. All precautions shall be taken to avoid the release of wastes or fuel to streams and other adjacent water bodies as a result of this operation.

4. Regarding disposal of excavated or dredged material from the construction of these projects, the Corps shall refer to the enclosed Missouri Clean Water Commission Order dated September 12, 2007, as amended March 12, 2008.

5. The permittee shall employ suitable materials for bank stabilization where needed, and will avoid any practices other than those identified in this certification that have potential to cause violations of the general criteria of the Water Quality Standards, 10 CSR 20-7.031 (3) (A) - (H).

6. The certification shall not be construed or interpreted to imply the requirements for other permits are replaced or superseded.

7. The permittee shall pursue active public outreach and ensure full public participation.

Pursuant to Chapter 644.052.9, RSMo, commonly referred to as the Missouri Clean Water Law, this certification shall be valid only upon payment of a fee of seventy-five dollars ($75.00). The enclosed invoice contains the necessary information on how to submit your fee. Payment must be received within fifteen (15) days of receipt of this certification. Upon receipt of the fee, a copy of the certification will be mailed to the applicable office of the Corps to inform them the certification is now in effect and final.

You may appeal to have the matter heard by the administrative hearing commission. To appeal, you must file a petition with the administrative hearing commission within thirty (30) days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission.

Water Quality Standards must be met during any operations authorized by these permits. If you have any questions, please contact Ms. Carrie Schulte of the NPDES Permits and Engineering Section by phone at (573) 751-7023, by e-mail at carrie.schulte@dnr.mo.gov, or by mail at Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102-0176.

Sincerely,

WATER PROTECTION PROGRAM

Robert K. Morrison, P.E., Chief
Water Pollution Control Branch

RKM:csp

Enclosures

c: Clean Water Commission
DNR - SLRO

ORDER
OF THE MISSOURI CLEAN WATER COMMISSION

In light of recent letters from Governor Blunt affirming the powers of the Missouri Clean Water Commission, the letter from Colonel Roger Wilson of the U.S. Army Corps of Engineers requesting that the Missouri Clean Water Commission (the "Commission") clarify its position, and the permit application for the Barney Bend project, it is appropriate that the Commission state its current policy regarding the discharge of millions of tons of sediment into the Missouri River by the U.S. Army Corps of Engineers in cooperation with the U.S. Fish and Wildlife Service:

1. Under 644.029(9),RSMo, the Commission may issue orders prohibiting or abating discharges of water contaminants into the waters of the state or adopt other remedial measures to prevent, control or abate pollution.

2. Under both federal and Missouri Clean Water Law, sediment is a pollutant and its discharge into a waterbody is pollution.

3. The permits issued to the U.S. Army Corps of Engineers for habitat restoration projects under general permit MO-G69900 are for return water and stormwater runoff and do not specifically grant the discharge of soils into the waters of Missouri.

4. Therefore, the Commission hereby prohibits and orders the immediate abatement of the discharge of sediment into the waters of Missouri by all habitat restoration projects.

It is hereby **ORDERED** that all sediment of all habitat restoration projects excavated or designed to erode shall be placed on land with such a design that it will not enter the waters of Missouri now or in the future. Section 644.071, RSMo, provides that this Order may be subject to judicial review.

Issued: September 12, 2007

BEFORE THE MISSOURI CLEAN WATER COMMISSION

In re: USACE Shallow Water Habitat Construction Projects	)	**No. 07-001**
	)	

AMENDED ORDER

Under 644.026.1(9), RSMo, the Commission may issue orders prohibiting or abating discharges of water contaminants into the waters of the state or adopt other remedial measures to prevent, control or abate pollution.

1. Sediment is a pollutant under the Federal Clean Water Act and a water contaminant under the Missouri Clean Water Law.

2. General Permit MO-G69900 as issued to the U.S. Army Corps of Engineers' for certain habitat construction projects on the Missouri River authorizes the Corps to discharge return water and storm water runoff and does not authorize the discharge of sediment or soil into the waters of Missouri.

3. The Corps' activities in connection with the aforementioned shallow water habitat construction projects, as approved by the U.S. Fish & Wildlife Service, have resulted in the unauthorized discharge of excessive sediment into the waters of Missouri, in violation of § 644.051.1(3), RSMo.

4. The Commission, the Missouri Department of Natural Resources and the U.S. Environmental Protection Agency have imposed significant fines and penalties against various entities related to the discharge of sediment into the waters of Missouri, and required those persons to stop discharging.

Therefore, the Commission hereby prohibits and orders the immediate cessation of the discharge of sediment and topsoil into the waters of Missouri by the Corps in connection with the construction of all Missouri River shallow water habitat construction projects.

It is hereby **ORDERED** that the Corps' shall, for all Missouri River shallow water habitat construction projects, put to beneficial reuse consistent with this Amended Order or place on land in accordance with an individual permit or certification for each specific site, all topsoil and excavated sediments. No sediment or topsoil disturbed by construction activities at said projects shall enter the waters of Missouri now or in the future, except in *de minimis* amounts related to normal construction and operation as provided in the applicable approvals by the Missouri Department of Natural Resources.

This Order supersedes the Commission's Order dated September 12, 2007. Section 644.071, RSMo, provides that this Order may be subject to judicial review.

Issued: March 12, 2008

Kristin M. Perry
Chair

Ron Hardecke
Vice-Chair

Samuel M. Hunter
Commissioner

Frank L. Shorney
Commissioner

Ben A. "Todd" Parnell, III
Commissioner

Kristin M. Perry
Chair

Ron Hardecke
Vice-Chair

Samuel M. Hunter
Commissioner

Frank L. Shorney
Commissioner

Ben A. "Todd" Parnell, III
Commissioner

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Comments

TRIBAL HISTORIC PRESERVATION OFFICE

Date: **January 2, 2008** **File: 0708-149MO-1**

RE: **Public Notice P-2571-2573, Wetland Restoration in Pool 25- Westport Island, Lincoln Co., Missouri and Pool 26- Dardenne and Bolters Islands, St. Charles Co., Mississippi River**

U.S. Army Corps of Engineers, St. Louis District
ATTN: CEMVS-OD-F (Frerker)
1222 Spruce Street
St. Louis, Missouri 63103-2833

Dear Mr. Frerker,

The Osage Nation Tribal Historic Preservation Office has received Public Notice P-2271-2573 regarding the proposed wetland restoration project in Pool 25 on Westport Island, Lincoln Co., Missouri and in Pool 26 on Dardenne and Bolters Islands, St. Charles Co., in the Mississippi River. Most likely, this project **will not adversely affect properties of cultural or sacred significance to the Osage Nation.**

In accordance with the National Historic Preservation Act, (NHPA) [16 U.S.C. 470 §§ 470-470w-6] 1966, undertakings subject to the review process are referred to in S101(d)(6)(A), which clarifies that historic properties may have religious and cultural significance to Indian tribes. Additionally, Section 106 of NHPA requires Federal agencies to consider the effects of their actions on historic properties (36 CFR Part 800) as does the National Environmental Policy Act (43 U.S.C. 4321 and 4331-35 and 40 CFR 1501.7(a) of 1969). **The Osage Nation concurs that as a part of the scoping process USACE, St. Louis District fulfilled NHPA and NEPA compliance by consulting with the Osage Nation Tribal Historic Preservation Office in regard to the proposed project referenced in Public Notice P-2571-2573, Wetland Restoration in Pool 25- Westport Island, Lincoln Co., Missouri and Pool 26- Dardenne and Bolters Islands, St. Charles Co., Mississippi River.**

The Osage Nation has vital interests in protecting its historic and ancestral cultural resources. With a plan of site avoidance in the plan of operations, we do not anticipate that this project will adversely impact any cultural resources or human remains protected under the NHPA, NEPA, the Native American Graves Protection and Repatriation Act, or Osage law. **If, however, artifacts or human remains are discovered during project construction, we ask that work cease immediately and the Osage Nation Tribal Historic Preservation Office be contacted.**

Should you have any questions or need any additional information please feel free to contact me at the number and/or email address listed below. Thank you for consulting with the Osage Nation on this matter.

Andrea A. Hunter

Dr. Andrea A. Hunter
Tribal Historic Preservation Officer

Phone: (918) 287-5671 * Email: ahunter@osagetribe.org

627 Grandview, Pawhuska, OK 74056, (918) 287-5446, Fax (918) 287-5562

Comments

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COORDINATION AND PUBLIC INVOLVEMENT

INDEPENDENT TECHNICAL REVIEW
FINAL FISH & WILDLIFE COORDINATION ACT REPORT
CULTURAL RESOURCES
SUMMARY OF PUBLIC INVOLVEMENT
COMMENTS
WRITTEN RESPONSES

•Carrie M. Schulte – NPDES Permits and Engineering Section, Missouri Department of Natural Resources, Jefferson City, MO; written response shown with comment

•Congressman Todd Akin – 2nd District, Missouri
•Joyce Collins – Assistant Field Supervisor, Marion Illinois Suboffice, U.S. Fish and Wildlife Service, Marion, IL
•Karen Westphall – Wildlife Biologist, Mark Twain Refuge Complex, U.S. Fish and Wildlife Service, Quincy, IL
•Ken Dalrymple – Wildlife Biologist, Two Rivers National Wildlife Refuge, U.S. Fish and Wildlife Service, Brussels, IL

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DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

APR 07 2008

Planning, Programs and Project Management Division
Environmental Branch

Honorable W. Todd Akin
Representative in Congress
301 Sovereign Court, Suite 201
St. Louis, Missouri 63011

Dear Mr. Akin:

I am writing in response to your request dated January 23, 2008, expressing water quality concerns regarding the St. Louis District's proposed Pools 25 and 26 Islands Habitat Rehabilitation and Enhancement Project on the Mississippi River, in Lincoln and St. Charles counties, Missouri. Your letter was submitted in response to our request for public review and comment on the Environmental Assessment and ancillary documents circulated for this project.

Your letter states that "My concern with this document is that it does not adequately address the potential of releasing agricultural fertilizer residues into the Mississippi River." Your concern focuses on the proposed tree planting activities in abandoned agricultural fields on two islands. You raise the possibility that soil excavated during tree planting activities (about 200 cubic yards) might contain excessive levels of agricultural fertilizers, which could be carried into the Mississippi River during a flood and impair water quality.

We have considered your comments, and do not believe that our proposal would result in the release of fertilizer residues into the river. First, unlike the Missouri River restoration project you mention in your letter, we do not propose to dispose of any sediments into the river. Second, soil disturbance from our proposed tree planting would be minimal. Third, no cropping or application of fertilizers has taken place at our proposed tree planting sites for at least 10 years. Lastly, strong erosion control measures would be implemented at all construction sites for this project, including tree planting areas.

In your letter, you provided six specific comments in response to our report. The following text responds to these comments.

a. *Comment: "Were soil amendments or fertilizers ever used at these locations?"*
Response: In the early 1990s, the Missouri Department of Conservation (MDC) used permittee farmers to crop the fields on these islands, and these farmers applied fertilizers during the planting of small grain crops. MDC specified as a contract condition that these farmers apply fertilizer, herbicide, and plant seed in a controlled manner and consistent with all applicable federal and state statutes. The years 1993 and 1996 experienced failed crops, and 1997 was the last year that small grain crops were planted. Thereafter, the multiyear contract was never renewed.

District Reading File

b. *Comment: "Was a soil analysis conducted to determine the presence of agricultural chemicals in the abandoned cropland areas?"*
Response: No soil analysis was conducted. An Environmental Baseline Study was performed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§ 9601 – 9675. The purpose of this study was to determine if hazardous substances were stored, released into the environment or structures, or disposed of on the project area's islands while the property has been owned by the federal government. In performing the assessment, sufficient information was developed to adequately assess the health and safety risks, define the nature, magnitude, and extent of any environmental contamination, and potential liabilities associated with the proposed action. The property assessment included a review of past government property uses, area maps, interviews, and a site visit. As part of this study, we considered past agricultural activities, including applications of fertilizers. Once we completed our assessment, we did not identify any reason to believe that excessive levels of agricultural chemicals might be present in these fields. Therefore, we concluded that no additional investigation such as soil testing was merited.

c. *Comment: It appears that the excavated material will be left in the vicinity of each planted tree."*
Response: Yes, the excavated material will be left in the vicinity of each planted tree. Tree planting activities would consist of digging small holes in the abandoned agricultural fields, backfilling each seedling with excavated dirt, and tamping the excavated area to secure the seedling in the ground.

d. *Comment: "This statement means that excavated materials may migrate into the river."*
Response: We concur, but note that further down on the same page in Section III.A.6. of our report, we list a variety of actions, including revegetation measures that would minimize the potential for soil migration at our construction sites. At each planting hole, we propose to revegetate disturbed soil by using existing sod displaced at the time of planting, tamp everything after the sod is put back into place, and reseed any remaining barren areas with wild rye. This revegetation measure is expected to minimize the potential for future floodwaters to erode soil disturbed during the planting process and carry it into the Mississippi River.

e. *Comment: "Sediments deposited over decades should not contain excessive levels of agricultural chemicals. However, no mention is made here of excavated soil from abandoned cropland, which may contain significant levels of residual agricultural chemicals."*
Response: As mentioned above, we conducted an assessment to identify the potential presence of any Hazardous, Toxic, and Radioactive Waste (HTRW) materials, and concluded that none are likely to be present on the islands. If HTRW materials were identified, we would remove them from the island and dispose of them at a suitable facility. We have not identified any reason to believe that this will be necessary for soil excavated during tree planting.

f. *Comment: "If no soil analysis has been conducted on the abandoned cropland from which 200 cubic yards of soil will be disturbed and from which residues of agricultural chemicals may leach into the Mississippi River and then flow to the Gulf of Mexico, then this statement is not necessarily true."*
Response: We believe the statement is true for our proposal for several reasons. First, soil disturbance associated with tree planting would be minimal. We estimate that a total of about two hundred cubic yards of soil would be displaced to plant about 5,500 tree seedlings, which is equivalent to about one cubic foot of soil per seedling. At each tree planting hole, all excavated soil would be replaced in and around the hole. Second, revegetation measures would be implemented at each planting hole to minimize the potential for erosion by rainfall and flooding. Third, at least ten years have passed since agricultural fertilizers were last applied on these islands. Fertilizer concentrations would have dissipated with the passage of this amount of time. Lastly, as a result of our HTRW assessment, we did not identify any reason to believe that excessive levels of fertilizer residues were present in the abandoned agricultural fields.

In your letter, you also recommended that certain measures be implemented to prevent the migration of any excess nutrients contained in soil displaced by tree planting into the river. We believe that your recommendation of revegetating a single site consisting of excess soil obtained from all planting holes is fundamentally no different than our tree planting proposal.

Copies of this letter are being furnished to Mr. John D. Hoskins, Director, Missouri Department of Conservation, and Mr. Doyle Childers, Director, Missouri Department of Natural Resources.

We thank you for your comments concerning this proposed project. Should you have any additional questions or comments, please feel free to contact my Executive Assistant, Ms. Julie Ziino at 314-331-8016, or my biologist, Mr. Tim George, at 314-331-8459, by fax at 314-331-8806, or by email at Timothy.K.George@usace.army.mil.

Sincerely,

Signed
Lewis F. Setliff III
Colonel, U.S. Army
District Engineer

Lewis F. Setliff III
Colonel, U.S. Army
District Engineer

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DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

June 5, 2008

REPLY TO
ATTENTION OF:

Planning, Programs and Project Management Division
Environmental Branch

Ms. Joyce A. Collins
Assistant Field Supervisor
U.S. Fish and Wildlife Service
Marion Illinois Suboffice (ES)
8588 Route 148
Marion, Illinois 62959

Dear Ms. Collins:

I am writing in response to your letter dated February 25, 2008, providing comments regarding the St. Louis District's Pools 25 and 26 Islands Habitat Rehabilitation and Enhancement Project on the Mississippi River, in Pike, Lincoln, and St. Charles counties, Missouri. Your letter was submitted in response to our request for public review and comment on the Environmental Assessment (EA) and ancillary documents circulated for this project.

Because our EA did not address Federally threatened and endangered species listed for Pike County, Missouri, we would like to amend our EA to reflect the five species you included in your letter, three of which we already treated for Lincoln and St. Clair counties, and two of which were not discussed at all. These two species are the gray bat (*Myotis grisescens*, endangered) and the fat pocketbook pearlymussel (*Potamilus capax*, endangered). Although your letter stated that our recommended plan is not likely to harm either of these two species, we would like to offer the following additional information in support of that conclusion.

Whereas gray bat colonies inhabit caves, the recommended plan would not affect any caves. The closest known maternity roost cave used by this species is located in Pike County near Frankford, about 40 miles northwest of the northern limit of our project area. Gray bats used the cave historically, but population census efforts conducted in the 1970s and 1990s did not find any maternal colonies. Deforestation is considered to be one of the primary threats to this species, especially the loss of trees in the vicinity of roosting caves and in areas between roosts and adjacent water bodies, such as rivers and reservoirs, over which these bats forage for flying insects. The effect on this species of removing a few scattered large trees associated with channel excavation on Westport and Bolter Islands, and the clearing of small trees for tree planting in old crop fields on Westport and Dardenne Islands, would be insignificant. Therefore, the proposed action is unlikely to adversely affect the gray bat.

The fat pocketbook pearlymussel was distributed historically in the Upper Mississippi River north of St. Louis, but is now considered to be extirpated from this area. An effort to recolonize this species in the Mississippi River at a site in Pike County, Missouri proved unsuccessful.

Therefore, because the fat pocketbook pearlymussel is considered to be absent from the project area, the recommended plan would not affect this species.

With regard to the endangered Indiana bat, we note the accepted time period for tree felling has been changed to October 1 through March 31. We would like to know if your agency has made any recent announcement of this change.

With regard to the bald eagle, we will ensure that the National Bald Eagle Management Guidelines are applied if bald eagle use should change in the project area, to minimize potential project impacts that may constitute "disturbance" to this species.

Per your recommendation, we will incorporate the Final Fish and Wildlife Coordination Act Report in the EA and Finding of No Significant Impact for this project.

Regarding specific timelines for dredging and excavation activities on the islands, per your recommendation we will restrict these activities from occurring during the period from mid-March to early June to avoid impacts during the main fish spawning season.

You also asked that more detailed information on erosion control measures be included in the description of the recommended plan. Such details were presented in sections III.A.6 and III.C.4 of the Section 404(b)(1) Evaluation Report, and they will be included in the detailed plan description.

Your letter asks for substantiation of statements in the EA that the proposed mechanical dredging and excavation on Westport and Bolter Islands would not lead to a lowering of water surface elevations of interior sloughs hydraulically connected to the river. Our conclusion of no change is based on our assessment that "the normal surface elevation of these waterbodies is about equal to the normal pool (river) elevation" (p. 14 of EA, section "F. Surface Water Resources"). If water levels in these interior sloughs were normally perched above the river's typical pool elevation, then the potential for lowering slough water surface elevations would exist. However, we do not believe this is the case. To arrive at our assessment, we have relied on various observations including site visits, as well as comparisons of mean pool elevations with prevailing slough water surface elevations and with proposed excavation and dredging depths.

Westport Island

To estimate the prevailing water surface elevation of the interior slough complex on Westport Island, we used the same topographic data that allowed us to locate areas of abandoned cropland suitable for mast tree planting (above elevation 440). This topographic information is displayed for the south end of the island on the enclosed map. Note that the interior slough complex that drains to the Mississippi River via the natural channel is surrounded by a green contour line denoting elevation 436. In addition, below this 436 contour, most ground surface spot elevations surrounding the slough complex range from 435 to 436, and at least one is below 435. From these topographic data we can conclude that the prevailing water surface elevation of this slough complex apparently lies between 434 and 435.

Regarding mean elevation of the pooled river, the water level management plan for Pool 25 calls for maintenance of a target elevation of 434.0 feet NGVD at mid-pool. To estimate the mean elevation of the pool at the south end of Westport Island (river mile 254), we have interpolated data obtained from stage gages located upriver and downriver from the island. At Mosier Landing, about six miles upriver (river mile 260.3), the mean pool elevation is about 436. About 13 miles downriver from the island at Lock and Dam 25 (river mile 241.5), the mean pool elevation is about 433 feet NGVD. By interpolation, the mean pool elevation at the south end of Westport Island is estimated to be about 435. Note that this value is very similar to the estimate of the prevailing slough water surface elevation obtained from the topographic data. This close similarity is the basis for our assessment that the interior slough complex is not normally perched above the mean pool elevation. For your information, these stage data, based on a period of record starting in 1940, are available from the St. Louis District's website (http://mvs-wc.mvs.usace.army.mil/trans/gages.html).

With regard to observations, aerial photos of Westport Island show that normal pool extends up the natural channel that is hydraulically connected to the interior slough complex for a considerable distance. The sediment plug that is proposed to be removed by mechanical dredging is "upstream" of this permanently inundated natural channel, as shown on the map with topographic data. During a visit to the island by the interagency team on April 13, 2005, Pool 25 was experiencing a minor flood. On that date gage readings at Mosier Landing and Lock and Dam 25 (upper) were 439.83 and 430.16, respectively (the pool was on tilt), and the river's rise continued slowly for the next several days. During our site visit we observed river water flowing forcefully up the natural channel and into the lowest slough in the complex. We were able to boat up the natural channel almost half way to this lowest slough. Based on that day's gage readings, the pool elevation at the south end of the island is estimated to have been about 436.5, or about 1.5 feet above the mean elevation.

The set of plates we prepared displaying this project's engineering drawings that accompanied the EA did not include a typical cross section of the existing natural channel and proposed sediment removal. Nevertheless, by comparing the prevailing slough water surface elevation and mean pool elevation with the nature of the proposed mechanical dredging, we believe it is clear that this action should not cause any lowering of the water surface elevation of the interior slough complex. Rather, removal of the sediment plug would establish a more reliable connection between the river and slough, and would allow riverine fish greater access to this backwater habitat. Similarly, the water control structure proposed to be built in this channel has been designed to allow for fish passage.

Bolter Island

To estimate the prevailing water surface elevation of the interior slough at the lower end of Bolter Island, we examined the same kind of topographic data that we used at Westport Island. However, because tree planting was not a measure at Bolter Island, spot elevations had not been developed for the island and therefore are unavailable. The interior slough and surrounding topographic contour lines on two foot intervals are displayed for the lower end of the island on a separate map (enclosed). Note that the island and interior slough are bounded by the 420 contour

line. From these topographic data we can conclude that the prevailing water surface elevation of this slough apparently lies a little below elevation 420.

Regarding mean pool elevations, Pool 26 is maintained at its midpoint at a target elevation of 419.0 feet NGVD. To estimate the mean elevation of the pool at the lower end of Bolter Island (river mile 224.5), again we have interpolated stage gage data from sites located upriver and downriver from the island. At Dixon Landing, about four miles upriver (river mile 228.3), the mean pool elevation is about 421. About six miles downriver from the island at Grafton (river mile 218.6), the mean pool elevation is a little under 418. By interpolation, the mean pool elevation at the south end of Westport Island is estimated to be about 419.5. Like Westport Island, this value is also very similar to the estimate of the prevailing slough water surface elevation obtained from the topographic data. These stage data, based on a period of record beginning prior to 1940, are also available from the District's website mentioned above.

With regard to observations, unlike Westport Island, the natural channel at the lower end of Bolter Island does not normally hold permanent water. Sediment would be removed from the channel's entire length. During a visit to the island by the interagency team on April 12, 2005, Pool 26 was also experiencing a minor flood. On that date gage readings at Dixon Landing and Grafton were 424.32 and 419.61, respectively, and the river continued rising slowly for the next several days. During this site visit, river water was backed up into the natural channel for a distance considerably less than half way to the interior slough. Based on these gage readings, the pool elevation at the south end of the island on this day is estimated to have been about 422.5, or about 2.0 feet above the mean elevation. During a second site visit to Bolter Island about two months later (June 8, 2005) to survey the profile of the natural channel, the elevation of the pool at the lower end of the island is estimated to have been at elevation 421.5, and the interior slough was determined to be about one inch higher than the river. (This survey information is enclosed on two separate pages. Similar information for Westport Island was not collected.) To further characterize flooding observed on April 12-13, the magnitude of this rise is less than a 2-year event, based on the Corps' 2004 Upper Mississippi River System Flow Frequency Study (http://www2.mvr.usace.army.mil/flow_freq/flow_freq.cfm, http://www2.mvr.usace.army.mil/flow_freq/flow_freq.cfm).

Regarding the potential for the proposed deep hole to drain the interior slough via a direct connection established with the groundwater table, we believe this would be a concern only if the slough were perched considerably higher than the river's mean pool elevation. Assuming the slough is about two feet deep, the proposed hydraulic dredging to a depth of eight feet below the slough's bottom would extend down to about ten feet below the pool's mean elevation. Given this condition, there is no potential for the slough to be lowered by creation of a hole. We expect that a deep hole such as this would be continually recharged by groundwater.

Copies of this letter are being furnished to Janet Sternburg, Travis Moore, and Danny Brown of the Missouri Department of Conservation, Karen Westphall and Rob Simmonds of the U.S. Fish and Wildlife Service, and Bob Schanzle and Butch Atwood of the Illinois Department of Natural Resources.

We thank you for your comments concerning this proposed project. Should you have any additional questions or comments, please feel free to contact Tim George, at 314-331-8459, by fax at 314-331-8806, or by email at Timothy.K.George@usace.army.mil.

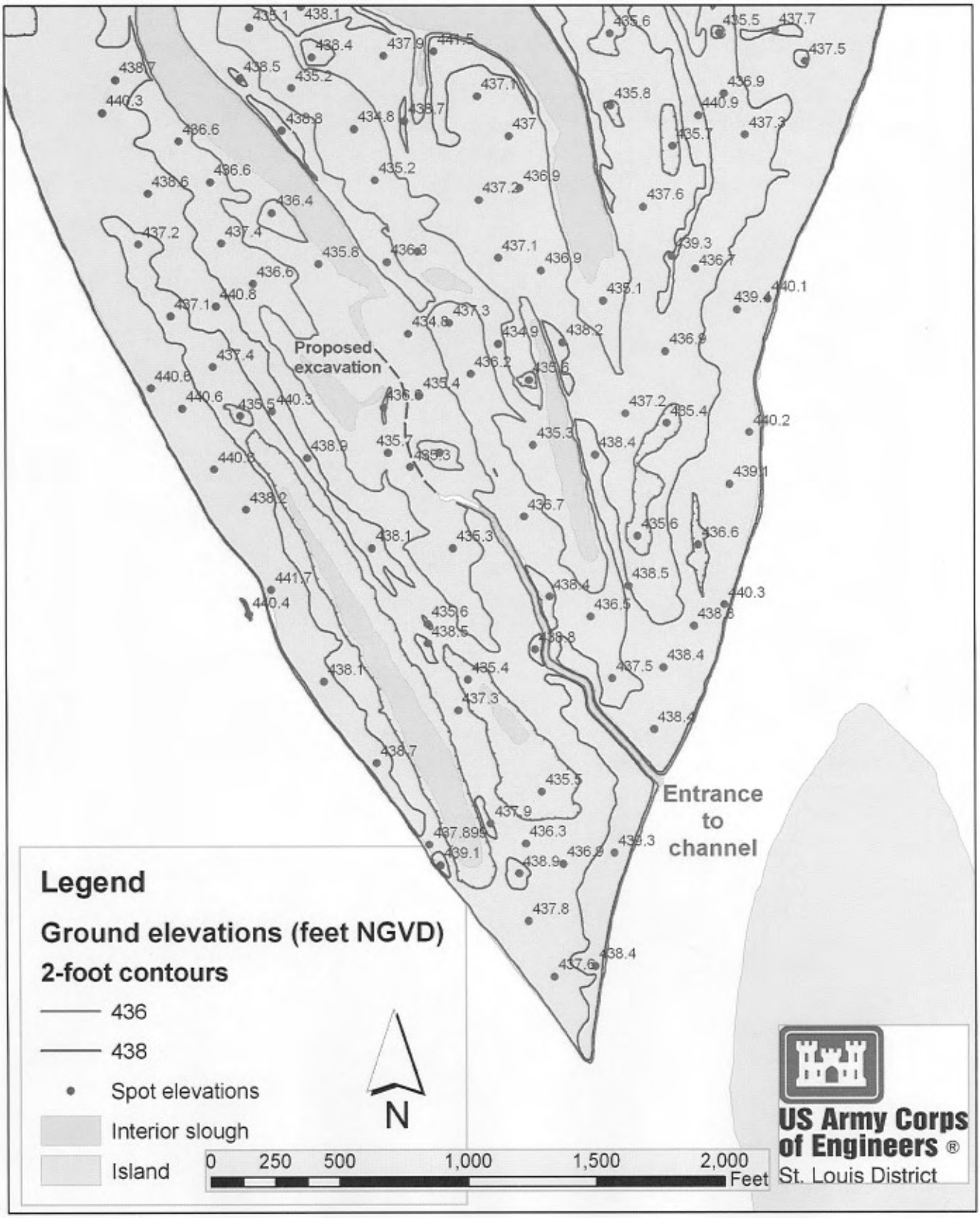
Sincerely,

Thomas Keevin

Thomas M. Keevin, Ph.D.
Chief, Environmental Branch

South End of Westport Island

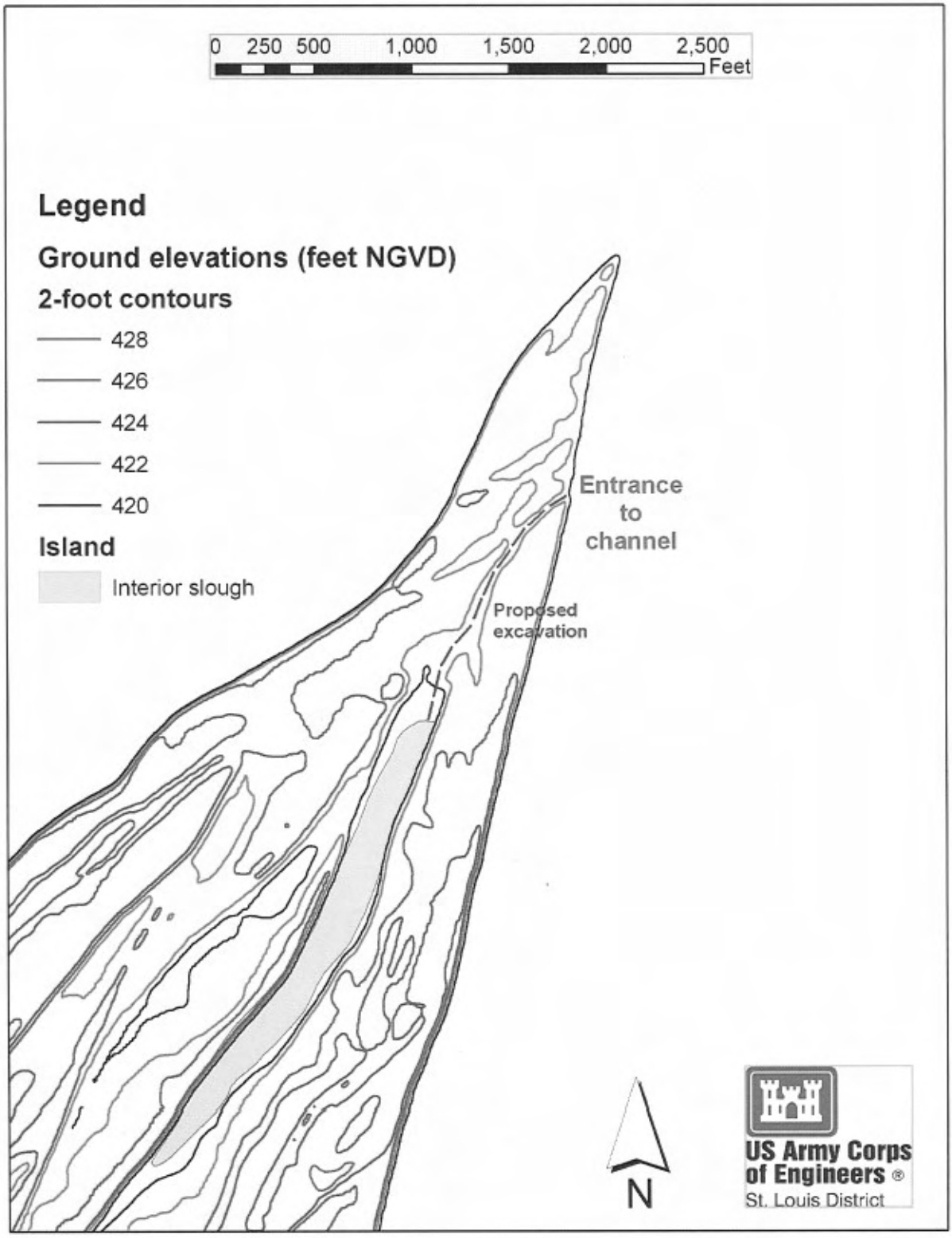
Mississippi River (mile 254), Lincoln Co., MO
Pools 25 & 26 Islands HREP Project



Downstream End of Bolter Island

Mississippi River (mile 225), St. Charles Co., MO

Pools 25 & 26 Islands HREP Project



George, Timothy K MVS

From: Markert, Brian J MVS
Sent: Tuesday, June 28, 2005 12:03 PM
To: George, Timothy K MVS; Lee, Gary J MVS; Mulford, Darren K MVS; Runyon, Kip R MVS
Subject: FW: BOULTER SLOUGH GAGE

Attachments: BOLTER ISLAND SURVEY COMPS.xls; DARDENE BOLTER AERL.doc


BOLTER ISLAND SURVEY COMPS.xls.. DARDENE BOLTER AERL.doc (2 MB)...

Riverlands surveyed the cut at bolters and is placing gages for both bolters and westport. They will also be surveying the connection at westport.

>_____
>From: Cannon, John MVS
>Sent: Wednesday, June 08, 2005 5:42 PM
>To: Kopsky, Raymond J JR MVS
>Cc: Markert, Brian J MVS; Deutsch, Charlie MVS; Manar, Katy MVS
>Subject: BOULTER SLOUGH GAGE
>
>
>Ray, Find attached xcel spreadsheet showing spot elevations taken today along the drainage from Bolters Slough to the River. River was benchmarked at 0.00 ft and the slough was found to be 0.08 ft. above the river (see info on spread) today (not much). We set a 12 foot gage post in Bolters Slough with approx 3 ft post below water level, and a little over 5 ft post above water level. I need to order a gage to place on the post, but want to know where you might want to call "0.0" on the gage, or whatever numbers you want, limiting them to 8 numbers, seven feet of gage. The easiest way to do this is with an attached blank plate gage marked in black and white / graduated in tenths of feet, and attach numbers along side, i.e. from 0.0 gage up and / or down. Just let me know where you want to put the 0.0. Plan on ordering one two foot gage and one five foot gage for a total of 7 feet of available gage, placed then on a probably a treated 1x6 x 8 foot, and attach this to the post. The exit channel where I measured the river elevation is depicted on the attached picture in the word document, if you can correlate that spot to any river elevation today at 1200 noon. Anything other info, let me know. I would like to order the gage tomorrow if possible to install next Tuesday. Thanks.
>
>John Cannon
>Team Leader, Environmental Stewardship
>Riverlands Section, Rivers Project Office U.S. Army Engineer District,
>St. Louis
>301 Riverlands Way, West Alton, MO 63386
>636.899.2600.239 Office
>636-899.2655 Fax
>314.581.9054 Mobile
>
>

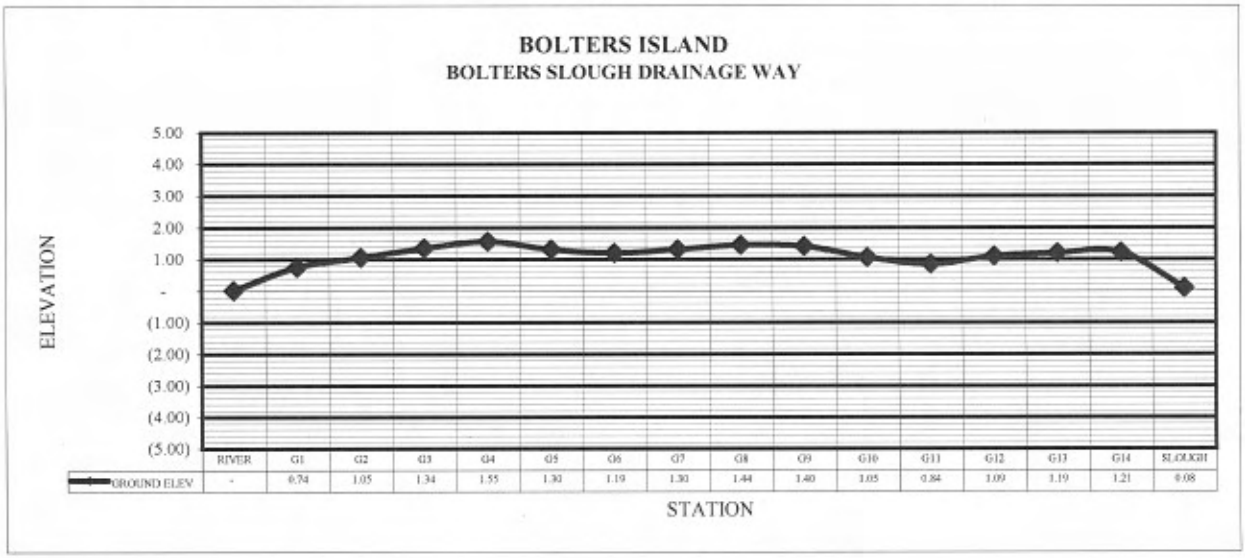
BOLTERS ISLAND - BOLTERS SLOUGH DRAINAGE WAY

STATION	BM	BM ELEV	HI	READ	ELEV	FR
RIVER	RIVER	0.00	8.92	8.92	-	
G1	RIVER	0.00	8.92	8.18	0.74	
G2	RIVER	0.00	8.92	7.87	1.05	
G3	RIVER	0.00	8.92	7.58	1.34	
G4	RIVER	0.00	8.92	7.37	1.55	
G5	RIVER	0.00	8.92	7.62	1.30	
G6	RIVER	0.00	8.92	7.73	1.19	
G7	G6	1.19	6.84	5.54	1.30	
G8	G6	1.19	6.84	5.40	1.44	
G9	G6	1.19	6.84	5.44	1.40	
G10	G6	1.19	6.84	5.79	1.05	
G11	G6	1.19	6.84	6.00	0.84	
G12	G11	0.84	6.14	5.05	1.09	
G13	G11	0.84	6.14	4.95	1.19	
G14	G11	0.84	6.14	4.93	1.21	
SLOUGH	G14	0.08	6.78	6.70	0.08	

	BM ELEV	READ	HI	HI
RIVER	-	8.92	8.92	17.84
POST	4.67	4.25	8.92	13.17
G6	1.19	7.73	8.92	17.84
G6	1.19	5.65	6.84	12.49
G11	0.84	6.00	6.84	12.49
G11	0.84	5.30	6.14	11.44
G14	1.21	4.93	6.14	11.44
G14	1.21	5.57	6.78	12.35
SLOUGH	0.08	6.70	6.78	12.35

12 FT U SIGN POST GAGE SET AT BOLTERS SLOUGH IN APPROX 3 FT WATER AT 1300 HRS - TOP OF GAGE AT 5.40 ABOVE SLOUGH = 5.40 + .08

RIVER BM TAKEN AT 1200 HRS WED 8 JUN 2005, GRAFTON GAGE AT 419.46
MELPRICE POOL AT ALTON AND GRAFTON FLUCTUATIONS LESS THAN 0.2 AT ALTON OVER 4 DAYS
MELPRICE POOL AT DAM HOLDING BETWEEN 418.3 TO 418.5 OVER LAST 4 DAYS
TAILWATERS CRESTED AT 24 AND 25 8 JUN 2005 AM'S, MEL PRICE AT OR NEAR CRESTING AFTERNOON



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DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

June 5, 2008

REPLY TO
ATTENTION OF:

Planning, Programs and Project Management Division
Environmental Branch

Ms. Karen Westphall
Wildlife Biologist
U.S. Fish and Wildlife Service
1704 North 24th Street
Quincy, Illinois 62301

Dear Ms. Westphall:

I am writing in response to your email message of March 14, 2008, providing comments regarding the St. Louis District's Pools 25 and 26 Islands Habitat Rehabilitation and Enhancement Project on the Mississippi River, in Pike, Lincoln, and St. Charles counties, Missouri. Your comments were submitted in response to our request for public review and comment on the Environmental Assessment (EA) and ancillary documents circulated for this project. Your comments are addressed in the order that you provided them to us, and we refer to each using the specific header you used.

Page 1, Objectives. In your comment you suggest rewording the first objective because you think that "oak-hickory" tree species may not be the most appropriate kinds to plant at the specified sites on Westport and Dardenne Islands. From your comment it is not clear why you are suggesting this change, whether it is because you suspect current hydrological conditions are too wet to support hard mast species, or that you think such species are not appropriate for planting because they are not a natural forest component. Regarding the later notion, these hard mast species (pin oak, swamp white oak, bur oak, pecan, Schuette oak) are a natural component of the local floodplain forests. Pecan currently occurs on these islands, and it represents the "hickory" part of the hard mast species assemblage, since it is a member of the hickory family.

We do not believe that the proposed planting sites are too wet with regard to prevailing groundwater. A recommended strategy for restoration of bottomland hardwoods in the pooled portion of the Mississippi River includes choosing sites far enough upstream of the influence of navigation dams that the typical depth to saturated soil conditions is great enough to support tree growth (Sparks, R.E., J.C. Nelson, and Y. Yin. 1998. Naturalization of the flood regime in regulated rivers, the case of the upper Mississippi River. BioScience 48(9): 706-721). Westport Island is just below the midpoint of Pool 25, and Dardenne Island is just above the midpoint of Pool 26. At Westport Island, the minimum ground elevation for planting (440 feet NGVD) is about 4-5 feet above the mean pool elevation at these sites, which is about 435.5 feet NGVD as interpolated between the Mosier Landing and Lock and Dam 25 (upper) gages. At Dardenne Island, the minimum ground elevation for planting (428 feet NGVD) is about 7-8 feet above the mean pool elevation at these sites, which is about 420.5 feet NGVD as interpolated between the

Dixon Landing and Grafton gages. We think it is reasonable to assume that the mean pool elevation corresponds closely with the prevailing groundwater surface on these islands. Given this assumption, we conclude that at the proposed planting sites, the prevailing groundwater elevation is far enough below the ground surface that a sufficient depth of intermittently saturated soil exists for successful establishment of root systems. After all, many trees of diverse species already grow on these two islands.

With regard to tolerance of hard mast species to frequency of overbank flooding, hard mast restoration along the Middle Mississippi River is recommended at sites with ground elevations between the 2- and 5-year events (Heitmeyer, M.E. 2008. An evaluation of ecosystem restoration options for the middle Mississippi River regional corridor. Prepared for U.S. Army Corps of Engineers, St. Louis District, and The Middle Mississippi River Partnership). Although this project is in the pooled river, we provide the following table displaying the relationship of the minimum planting elevations on the islands with interpolated elevations for the 2- and 5-year frequency events. These flood elevations (in feet NGVD) are available from http://www2.mvr.usace.army.mil/flow_freq/flow_freq.cfm.

Location/River Mile	2-yr event	5-yr event
Westport Island (Pool 25) – 440 minimum		
River mile 257	440.2	443.4
River mile 255	439.4	442.6
Dardenne Island (Pool 26) – 428 minimum		
River mile 228	429.3	433.4
River mile 227	428.9	433.0

From this table it is apparent that the minimum planting elevation at Westport Island is equivalent to a 2-year frequency flood. Sites attaining elevation 442 would be closer to a 5-year event. At Dardenne Island, the minimum elevation of 428 is about one foot below the 2-year event, whereas sites attaining elevation 430 would be above it.

There is the notion that maybe these islands experience too frequent flooding, or flooding of prolonged duration, that inhibits natural regeneration of hard mast species. To further characterize the hydrology at the proposed planting sites, we can examine flood duration data developed by the Upper Mississippi Environmental Sciences Center to assist reforestation efforts along the Upper Mississippi and lower Illinois Rivers (http://www.umesc.usgs.gov/data_library/water_elevation/flood_potential.html). These flood potential models provide the percentage chance of flooding per annual growing season for a range of durations and elevations. For example, the table below displays estimated elevations (feet NGVD) at Westport and Dardenne Islands for a 50% chance of flooding during the growing season for six specific durations.

	Elevation of Water Surface - 50% chance of flooding	
Duration	**Westport Island (river mile 256), 440 min. planting elevation**	**Dardenne Island (river mile 228), 428 min. planting elevation**
3-day	441.0	428.8
1 week	440.5	428.0
2 weeks	439.3	426.5
4 weeks	438.0	425.0
6 weeks	436.5	424.3
8 weeks	436.0	423.3

In this table, we see that the maximum duration of inundation during the growing season at the proposed planting sites is about one week. (The UMESC report states that these durations may represent multiple events during a single growing season). The flood potential models also show that if the probability of flooding were reduced to 25%, for example, then these elevations would be about 3-4 feet higher.

The wetland indicator status of the species proposed for planting, as provided by the Plants Database for Region 3 (in which Missouri lies, http://plants.usda.gov/wetland.html), provides a description of their likelihood to occur naturally in wetlands. As shown in the table below, all species except for bur oak are considered to be facultative wetland species, meaning they usually occur in wetlands. Swamp white oak is considered to be more tolerant of wetness than the other FACW species. Bur oak, as a FAC minus species, is regarded to occur slightly more often in non-wetlands than wetlands.

Tree/shrub species	Wetland indicator status (Region 3 – MO)
Swamp white oak (*Quercus bicolor*)	FACW+
Bur oak (*Quercus macrocarpa*)	FAC-
Pin oak (*Quercus palustris*)	FACW
Pecan (*Carya illinoinensis*)	FACW
Deciduous holly (*Ilex decidua*)	FACW
Green hawthorn (*Crataegus viridis*)	FACW

We believe the above hydrological and ecological information supports the planting of hard mast species at the specified sites on these islands. It is likely that Ken Dalrymple, former site manager with the Missouri Department of Conservation, considered these kinds of information over ten years ago before he promoted the idea of doing hard mast plantings. To our knowledge the only piece of information that potentially calls this objective into question is that oak and pecan regeneration has not been observed during casual site visits to these islands. The reason for such an apparent lack of regeneration is not known. Based on the above information, and given that we have no new information from the public review process that indicates that hard mast species are unsuitable for planting (including what you provided in your comments), we believe it is appropriate to keep this objective as it is worded.

Objective 4) Maintain islands. This objective does indeed refer to erosion or bankline control at islands, and your suggested change is understandable. However, the planning team

approved the project's objectives as worded several years ago, and we typically do not change project objectives this late in the planning process.

Page 4. Measures A&B. Pecan rather than hickory is present on Westport and Dardenne Islands, and hickory is not recommended for planting as part of this project. We have addressed the issue of natural regeneration in our response to your first comment.

Page 5. Planting of native tree and shrub seedlings. We do not regard the proposed list of species to be planted to be inflexible. As you suggest, we ought to identify several additional species other than oaks and pecan, if only to be flexible should any of the currently listed species not be available from suppliers. We have already commented on the relationship of planting elevations with the incidence of frequent flooding on the islands in our response to your first comment.

Pages 6 through 8 Hydrologic condition. Contrary to what your comment suggests, characterization of the historic hydrology of the Mississippi River as it relates to these islands is possible only in broad terms. Although recent flow-frequency analysis of the (upper) Mississippi, Missouri, and Illinois Rivers has led to detailed estimates of stage-frequency relationships for current conditions along these rivers, no such analysis for historic conditions has been done. Major impediments include the small number of river gages with substantial periods of historic records, and problems associated with developing a rating curve representative of historic conditions at each of these gages that would then be used for calculating historic stage-frequency relationships. Consequently, we are limited to stage data from those gages with substantial historic records, and then extrapolating or inferring hydrological patterns or relationships from these points to other locations on the river. Gages with substantial historic data that are closest to Pools 25 and 26 include Grafton (river mile 218.6, 1879-present) near the lower end of Pool 26, and Louisiana (river mile 282.9, 1873-present) in Pool 24.

To address your specific questions, we have performed a few simple analyses of Grafton data. The mean stage (in feet NGVD) for the historic (pre-dam, 1879-1940) and recent (post-dam, 1941-2007) conditions is 413.73 and 419.85, respectively. This difference of about six feet would represent the effect of creating Pool 26 and implementing subsequent water level management. Similarly, the lowest recorded stage at Grafton for these two conditions is 402.79 and 416.39, respectively. This change illustrates how the current system has prevented the river from attaining historic lows in order to maintain sufficient depth for navigation.

With regard to the first of your specific questions - are "normal" water levels of the river higher at these islands today? In general the answer is yes, in that under today's water regime we have eliminated the historic low stages that otherwise would not provide adequate depth for navigation. To mitigate this effect to some degree, we have implemented environmental pool management on an annual basis in the pools for over 10 years to simulate the historic summer low-flow period. How much higher current water levels are above the historic norm is inversely proportional to the distance of the islands from the closest dam downriver. If creation of Pool 26 raised the mean stage elevation at Grafton by about 6 feet and Grafton is located a little more than a third of the pool upriver from the lock and dam, then the effect at Dardenne Island, which

is above the pool's midpoint, would be less than six feet. To help visualize this effect, we think examining Figure 10 of the following publication is helpful (Sparks, R.E. 1995. Need for ecosystem management of large rivers and their floodplains. BioScience 45(3): 168-182). With regard to providing elevations of historic 2-, 5-, and 10-year frequency floods, we noted above that this kind of historic information has not been developed. "Are water level changes more frequent and flashy?" Yes, they are on an annual basis, according to some authors (Sparks, R.E., J.C. Nelson, and Y. Yin. 1998. Naturalization of the flood regime in regulated rivers, the case of the upper Mississippi River. BioScience 48(9): 706-721). We do not think that this information causes us to deviate from the plan to plant hard mast tree species.

Figs EA-3 and EA-4. According to our hydrologist Ray Kopsky, these solid green lines represent a particular point in time when the river acted as if the locks and dams were not present. The dates that are given are when this occurred.

Page 8. G. Ground Water Resources. As noted above, we believe that the prevailing ground water elevation on the islands correlates closely with pool elevation. Over the long term, the average elevation for the two should be very similar, whereas on a day to day basis the ground water elevation would lag behind changes in pool elevation. Because much of the surface of these islands is covered by impermeable soils, there is likely to be a seasonal perched water table above the prevailing groundwater elevation. The main source of this perched water table would be direct rainfall and local runoff. In terrestrial areas such as forest it would often occur in the plant root zone. In aquatic areas like interior sloughs it would correspond with the zone just below the water body. Since we prepared the EA, we now think that a perched ground water condition is unlikely to exist for most of the islands' sloughs, as most are intermittently connected to the river through a natural channel, and the prevailing groundwater elevation likely coincides with slough surface water elevations. Perched water tables might be associated with those sloughs that are normally isolated from the river, and a few of these exist on Westport Island, for example. The significance of a perched water table in terrestrial areas is that wet soils in the root zone during the growing season have a major influence on the kinds of plant species than can thrive in these conditions, whereas the effect of the prevailing ground water elevation, which is often below the root zone, is not as strong. Therefore, tree and shrub species to be planted should be able to tolerate "wet feet".

Page 9. Terrestrial and Aquatic Habitats. We do not have any pre-dam forest survey data for these project islands, nor do we have any detailed data concerning the condition or age distribution of the current forest. The presence of "oaks and hickories" on Westport Island was noted in 1985-1986 during the natural features inventory for Lincoln County. The occurrence of hard mast species on the islands' higher elevations is based on observations by Missouri Department of Conservation land managers (the statement pertains to current forest conditions rather than historic ones). We do not have information which describes any forest changes on these islands associated with construction of the navigation system or with the flood of 1993. As noted above, there are a few mature oaks and pecans on the islands today, but why there is an apparent lack of natural regeneration is unknown.

"Water surface elevation in some sloughs appears to be dependent on river stage." We addressed this comment separately in our response to the letter from Joyce Collins of your

agency. Briefly, in that response we expressed the opinion that we do no think that creation of a deep hole in the slough on Bolter Island has the potential to drain that waterbody by establishing a connection to groundwater. Our reasoning is that interior sloughs that are periodically connected to the river by a natural channel have a surface elevation that is very similar to that of the river. Consequently, the prevailing ground water elevation would usually coincide with the slough's water surface elevation. Therefore, we do no think that gathering further data such as soil borings is needed to confirm this.

A copy of this letter is being furnished to Dick Steinbach, Joyce Collins, and Matthew Mangan of your agency, and Brian Loges of the Missouri Department of Conservation.

We thank you for your comments concerning this proposed project. Should you have any additional questions or comments, please feel free to contact Tim George, at 314-331-8459, by fax at 314-331-8806, or by email at Timothy.K.George@usace.army.mil.

Sincerely,

Thomas Keevin

Thomas M. Keevin, Ph.D.
Chief, Environmental Branch

George, Timothy K MVS

From: George, Timothy K MVS
Sent: Thursday, January 10, 2008 4:14 PM
To: 'Kenneth_Dalrymple@fws.gov'
Cc: John_Mabery@fws.gov
Subject: RE: Pools 25&26 EA and FONSI

Thanks, Ken. I appreciate you taking the time to give us this info.
I'll make sure Brian Loges and Tom Leifeld get it, and that we plan accordingly.

Hope all goes well with you guys.

Tim

Timothy K. George
Ecologist
Environmental Analysis Branch (CEMVS-PM-E) St. Louis District, U.S. Army Corps of Engineers
1222 Spruce Street
St. Louis, Missouri 63103-2833
314-331-8459
Timothy.K.George@mvs02.usace.army.mil

-----Original Message-----
From: Kenneth_Dalrymple@fws.gov [mailto:Kenneth_Dalrymple@fws.gov]
Sent: Thursday, January 03, 2008 12:45 PM
To: George, Timothy K MVS
Cc: John_Mabery@fws.gov
Subject: Pools 25&26 EA and FONSI

Tim,

It was interesting reading about the proposed projects in pools 25 and 26. Sure would have been nice if alternative 8 could have been the recommended plan. The EA and FONSI seemed to be sufficient for the project however I would like to make a suggestion.
Both of the areas that have been designated as tree restoration sites (on Dardeene and Westport) have been planted to hard mast trees, in many of the locations, in the 1990s by my staff when I worked for MDC. Before you clear these areas completely of soft mast trees an inventory should be conducted and all existing hard mast trees (oak and pecan) as well as Sycamore marked is such a fashion that damage does not occur (I have observed some tree survival on these areas) during the clearing process. The Sycamore (planted for future wood duck nesting habitat) could be 20 to 40 feet tall in some locations (about the same height as the cottonwood). If any of the oak are still surviving the competition will have caused them to become extremely tall compared with the diameter at dbh and they will have very few limbs (difficult to identify by most laymen).

Thanks,

Ken

Ken Dalrymple
Wildlife Biologist
Two Rivers NWR
(618) 883-2524
Fax (618) 883-2201
E-Mail Kenneth_Dalrymple@fws.gov

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PERMIT AUTHORIZATION

The authorization issued by the Regulatory Branch under Section 404 of the Clean Water Act and Section 10 of the Rives and Harbors Act consists of a package of documents, including 1) a memorandum dated 25 June 2008, 2) the public notice dated December 19, 2007, 3) the Missouri Department of Natural Resource's letter dated 2 June 2008, and 4) the District's Environmental Assessment with Draft Finding of No Significant Impact and Section 404(b)(1) Evaluation Report dated December 2007.

Only the memorandum and public notice are provided here in this appendix. The MDNR letter is included in the Coordination and Public Involvement Appendix under Comments, and the EA is found after the Fact Sheet.

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CEMVS-OD-F (1145b) 25 June 2008

FOR CEMVS-PM (Markert)

SUBJECT: Rehabilitate and enhance aquatic and wetland habitats on Bolters, Dardenne and Westport Islands within Mississippi River Pools 25 and 26, Lincoln and St. Charles County, Missouri.

1. This office has reviewed your request for Department of the Army authorization pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The authorization is associated with your request to rehabilitate and enhance aquatic and wetland habitats on Bolters, Dardenne and Westport Islands within Mississippi River Pools 25 and 26, as detailed in the attached public notice and environmental assessment. The public notice (P-2571, P-2572 and P-2573) was circulated by CEMVS-OD-F on 19 December 2007, to approximately 150 parties, including federal and state agencies (Attachment 1).

2. The Missouri Department of Natural Resources issued Section 401 Water Quality Certification on 2 June 2008, with seven (7) associated conditions (Attachment 2). These conditions must be abided to remain in compliance with the Regulatory Branch Section 10 and Section 404 authorization.

3. This office has determined that the proposed project is authorized under Section 10 of the Rivers and Harbor Act and Section 404 of the Clean Water Act. The St. Louis District, Project Management Environmental Analysis Branch, prepared an Environmental Assessment, 404(b)(1) evaluation and Finding of No Significant Impact, which have been evaluated and determined to meet compliance with the Section 404(b)(1) guidelines for the proposed work. A copy of our Statement of Findings will be retained in our files for recordation and available viewing.

The following seven (7) special conditions are hereby required to maintain compliance with this Department of the Army Section 10 and Section 404 authorization:

a. The authorization will be revoked or a stop work order be issued if the State of Missouri notifies us that the proposed activities are not being performed in conformance with the their Section 401 water quality certification conditions.

b. Any contractor hired to complete work associated with this authorization shall ensure all activities remain in the designated construction limits as delineated on the associated design plans. This would include, but not be limited to the stone placement area, storage areas and equipment staging site(s).

c. The contractor shall have a contingency plan for the prevention and control of spills of fuels, oils or other hazardous materials. This shall be for land-based operations. This plan shall be maintained on-site at all times and all personnel shall be familiar with the plan.

d. In the event any items are encountered for any portion of this project that could be historically significant, the contractor shall cease operation at that location and contact the Corps of Engineers Regulatory Branch and the State Historic Preservation Office.

e. The proposed activities will not require mitigation, as the project purpose itself is a fish and wildlife rehabilitation and enhancement project with an associated component of planting trees to restore approximately 110 acres of wooded wetlands and bottomland forest.

f. Any adjacent land disturbance activities shall be conducted in a manner that best minimizes runoff and erosion impacts.

g. Adequate planning and supervision during the project construction period shall be provided for implementing construction methods, processes, and cleanup procedures necessary to prevent water pollution and control erosion.

4. You are reminded that this authorization is based on submitted plans. Variations from these plans shall constitute a violation of Federal law and may result in the revocation of this authorization. This authorization is valid until **23 June 2018**.

5. This authorization is applicable only to the permit program administered by the U.S. Army Corps of Engineers Regulatory Branch. It does not eliminate the need to obtain other Federal, state, or local approvals before beginning work.

SUBJECT: Rehabilitate and enhance aquatic and wetland habitats on Bolters, Dardenne and Westport Islands within Mississippi River Pools 25 and 26, Lincoln and St. Charles County, Missouri.

6. The point of contact is Charles Frerker, 314-331-8583. Reference P-2571 to P-2573 when requesting additional information.

(✓) **APPROVED** ( ) **DISAPPROVED**

Approved for the Commander by:

DATE: June 25, 2008

FOR DANNY D. MCCLENDON
Chief, Regulatory Branch

3 Enclosures

1. Public Notice, 19 December 2007
2. MDNR 401 Certification, 2 June 2008
3. PDA Report with EA and Finding of No Significant Impact, December 2007

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Public Notice

US ARMY CORPS
OF ENGINEERS
St. Louis District
Gateway to Excellence

Reply To:
U.S. Army Corps of Engineers
Attn: CEMVS-OD-F
1222 Spruce Street
St. Louis, MO 63103-2833

Public Notice No.
P-2571 to P-2573
Public Notice Date
December 19, 2007
Expiration Date
January 23, 2008

Postmaster Please Post Conspicuously Until:

Interested parties are hereby notified that an application has been received for Department of the Army authorization for certain work in waters of the United States, as described below.

COMMENTS AND ADDITIONAL INFORMATION: Comments on the described work should reference the U.S. Army Corps of Engineers File Number shown above and must reach this office no later than the above expiration date of the Public Notice to become part of the record and be considered in the decision. Comments should be mailed to the following address:

U.S. Army Corps of Engineers
ATTN: CEMVS-OD-F (Charles Frerker)
1222 Spruce Street
St. Louis, Missouri 63103-2833

APPLICANT: The Planning, Programs, and Project Management Division of the St. Louis District, U.S. Army Corps of Engineers, 1222 Spruce Street, St. Louis, Missouri 63103-2833 has applied:

a. To the St. Louis District, Corps of Engineers, Regulatory Branch for Department of the Army authorization under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act to rehabilitate and enhance aquatic and wetland habitats on Bolters, Dardenne and Westport Islands within Mississippi River Pools 25 and 26. The proposed activities comprise the Corps' Pools 25 & 26 Islands Habitat Rehabilitation and Enhancement Project, which has been developed under the Environmental Management Program (EMP-HREP), pursuant to Section 1103, Water Resources Development Act of 1986 (PL 99-662).

b. By issuance of this public notice, the project plans have been submitted to the Missouri Department of Natural Resources, Water Pollution Control Program for state certification, in accordance with Section 401 of the Clean Water Act. The certification, if issued, will express the Agency's opinion that the proposed activities will not violate applicable water quality standards. Written comments concerning possible impacts to waters of Missouri should be addressed to: Water Pollution Control Program, P.O. Box 176, Jefferson City, Missouri 65102-0176, with copy provided to the Corps of Engineers.

LOCATION: Westport Island, located in Pool 25 of the Mississippi River, lies in Lincoln County, Missouri, between river miles 257.5 and 254.0. This island is about five miles east of Elsberry. Dardenne and Bolters Islands are located about 20 miles to the south in Pool 26 of the Mississippi River in St. Charles

County, Missouri, between river miles 228.0 and 224.5. These two islands are about five miles north of St. Peters, Missouri. These islands are depicted on the attached location map.

PROJECT DESCRIPTION: The applicant seeks authorization to conduct filling and dredging/excavation activities in waters of the United States in conjunction with implementing the proposed Pools 25 & 26 Islands EMP-HREP project, which consists of features at Westport, Dardenne and Bolters Islands. Planned features address the following objectives: expansion of floodplain forest, restoration of river-backwater connections, and creation and maintenance of deepwater habitat in backwater areas. Total impacts associated with filling activities in jurisdictional waters are approximately 5.0 acres of wetlands.

Bolters Island (P-2571, Pool 26)

1. Removal of sediment from island channel. Mechanical dredging of sediment from an existing 1,250-foot-long natural channel at the lower end of Bolters Island (560 acres) is proposed. Sediments totaling 1,900 cubic yards would be removed from the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.85-acre disposal area (30 feet wide by 1,250 feet) sited along the existing channel. Dredging would enhance the existing connection between the main river and a single slough in the interior of the island, thus providing ingress and egress for fish species over a wider range of river stages. Fish would better utilize the interior slough habitat for spawning, rearing, and over-wintering. Placement of fill materials associated with dredging would occur in 0.85 acre of forested wetlands subject to Section 404 jurisdiction. An average depth of 1.5 feet of sediments would be placed around existing larger trees. Tree clearing to allow for excavation and disposal would be limited to a handful of trees.

2. Construction of rock dike structure and excavation of deep hole in island slough. A rock dike structure is proposed to be constructed in an interior slough at the lower end of the island, and a deep hole is proposed to be excavated immediately adjacent to the dike. The rock dike structure would be U-shaped and would consist of 165 tons of graded B stone. Sediments totaling 2,900 cubic yards would be mechanically excavated to a depth of eight feet in a 0.5 acre U-shaped area having a 13-foot wide bottom. Excavated sediments would be placed along either bank of the slough in two disposal areas measuring about 200 by 300 feet each.

The island's interior slough is connected to the river by the channel to be mechanically dredged. Average water depth in the slough (about two to three feet) is not optimal for over wintering fish. The 8-foot deep hole would provide optimal over wintering habitat, and would also provide refuge for riverine fish from summer extremes. The rock structure is designed to create a scour in the slough on its downstream side when high flow events on the river overtop it, and thus maintain water depth in the excavated hole in the future. Placement of fill materials associated with dredging would occur in 0.85 acre of forested wetlands subject to Section 404 jurisdiction. An average depth of 1.5 feet of sediments would be placed in these areas. Tree clearing to allow for disposal would be necessary; a few desirable trees would be maintained.

3. Temporary access road. A 515-foot long road would be constructed to provide access to the natural channel and interior slough from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric. Placement of fill materials associated with this road would occur in wetlands subject to Section 404 jurisdiction. The crushed stone would be

placed in 0.25-acre of herbaceous and forested wetland. The road would be sited to minimize the clearing of desirable trees, and would be removed upon completion of the project.

Dardenne Island (P-2572, Pool 26)

1. Planting of native tree and shrub seedlings. Planting of tree and shrub seedlings at Dardenne Island would follow the same procedure to be used at Westport Island, except that planting sites in abandoned cropland would be in areas above 428 feet NGVD. Fifty-two acres of plantings are proposed on this 790-acre island. This is the only proposed activity on the island. Placement of fill materials associated with seedling planting would occur in wetlands subject to Section 404 jurisdiction, and would be limited to the side casting of small amounts of earthen material obtained from digging holes for planting.

Westport Island (P-2573, Pool 25)

1. Planting of native tree and shrub seedlings. Reforestation of 59 acres of abandoned cropland at sites with ground elevations exceeding 440 feet NGVD is proposed on this 625-acre island. Tree seedlings to be planted would consist of hard mast species such as pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), bur oak (*Quercus macrocarpa*), pecan (*Carya illinoensis*), and Schuette oak (*Quercus x schuettii*, a hybrid between swamp white and bur oak). Native shrub species such as deciduous holly (*Ilex decidua*) and green hawthorne (*Crataegus viridis*) would be planted also. Plant materials would consist of seedlings produced using a root-pruned method, placed on a 30 by 30 foot spacing (49 per acre).

Existing hard mast tree species such as oaks and pecans currently occur on the island at higher elevations but are scarce. Converting old agricultural fields to hard mast tree species at the appropriate elevation would provide habitat for many species of wildlife including deer, squirrel, turkey, and neo-tropical migrant birds. Placement of fill materials associated with seedling planting would occur in wetlands subject to Section 404 jurisdiction, and would be limited to the side casting of small amounts of earthen material obtained from digging holes for planting.

2. Removal of sediment from island channel. Mechanical dredging of sediment is proposed in a portion of an existing 2,000-foot-long natural channel at the lower end of Westport Island. Sediments totaling 1,535 cubic yards would be removed from 1,000 feet of the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.7-acre disposal area (30 feet wide by 1,000 feet long) sited along the existing channel. Dredging would enhance the existing connection between the main river and a complex of sloughs in the interior of the island, thus providing ingress and egress for fish species over a wider range of river stages. Fish would better utilize the interior slough habitat for spawning, rearing, and over-wintering. Placement of fill materials associated with dredging would occur in 0.7 acre of forested wetlands subject to Section 404 jurisdiction. An average depth of 1.5 feet of sediments would be placed around existing larger trees. Tree clearing to create the disposal area would be limited to smaller trees.

3. Placement of water control structure in island channel. A water control structure consisting of stop logs would be installed in the excavated channel. It is expected that this structure would be constructed off-site. The structure would be operated once every two to three years, and would be closed to temporarily hold water in the interior sloughs when the river is falling to

benefit fish species and wetland wildlife. Placement of fill materials associated with this structure would occur in the excavated channel, which is subject to Section 404 jurisdiction, and would be limited to a small amount of earthen material used as backfill around the structure.

4. Permanent access road. A 1,265-foot long road would be constructed to provide access to the water control structure from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric. Placement of fill materials associated with this road would occur in wetlands subject to Section 404 jurisdiction. The crushed stone would be placed in 0.6 acre of forested wetland. The road would be permanent and would be sited to minimize the clearing of desirable trees.

ENVIRONMENTAL ASSESSMENT: The St. Louis District's Environmental Branch announces the availability of the "Pools 25 & 26 Islands, Lincoln and St. Charles Counties, Missouri, Habitat Rehabilitation and Enhancement Project, Upper Mississippi River Environmental Management Program, Environmental Assessment with Draft Finding of No Significant Impact (FONSI)". The purpose of this document, prepared in compliance of the National Environmental Policy Act, is to present a detailed description of potential environmental, economic, and social impacts associated with this proposed project. This document is available for electronic viewing on the St. Louis District's web page at http://www.mvs.usace.army.mil/pm/pm-reports.html. A hard copy of the document is available for viewing in the Environmental Branch, St. Louis District Office, Robert A. Young Federal Building, 1222 Spruce Street, St. Louis, Missouri, by contacting Tim George at 314-331-8459.

LOCATION MAPS AND DRAWINGS: This information is available for viewing in the above mentioned environmental assessment, which is located at: http://www.mvs.usace.army.mil/pm/pm-reports.html

SECTION 404 (b)(1) EVALUATION: The impact of the activity on the public interest has been evaluated in accordance with the Environmental Protection Agency's guidelines pursuant to Section 404 (b)(1) of the Clean Water Act. The evaluation has been conducted by the St. Louis District's Environmental Branch, and is appended to the project's Environmental Assessment (availability described above).

PUBLIC HEARING: Any person may request that a public hearing be held to consider the applicant's proposal, provided such request identifies significant issues that would warrant additional public review and comment.

ENDANGERED SPECIES: In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the St. Louis District's Environmental Branch requested the U. S. Fish and Wildlife Service (USFWS) provide a listing of Federally threatened or endangered species, currently classified or proposed for classification, that may occur in the vicinity of the Pools 25 and 26 Islands project. The USFWS provided the following list of species, and added that there is no designated critical habitat in the project areas at this time.

Lincoln County: Bald eagle (*Haliaeetus leucocephalus*) - threatened, Indiana bat (*Myotis sodalis*) - endangered, Spectaclecase mussel (*Cumberlandia monodonta*) - candidate.

St. Charles County: Bald eagle (*Haliaeetus leucocephalus)* - threatened, Indiana bat (*Myotis sodalis)* -endangered, Eastern massasaugua (*Sistrurus catenatus catenatus*) - candidate, Pallid sturgeon (*Scaphirhynchus albus)* - endangered, Decurrent false aster (*Boltonia decurrens)* - threatened
Running buffalo clover (*Trifolium stoloniferum)* - endangered.

The St. Louis District's Environmental Branch has evaluated potential impacts of this project on these species, and has determined that none of these species are likely to be adversely affected. This determination is provided in the Environmental Assessment, referenced in Number 2, above.

CULTURAL RESOURCES: The St. Louis District will evaluate information provided by the State Historic Preservation Officer and the public in response to this public notice and to the District's Environmental Assessment, and we may conduct or require a reconnaissance survey of the project area.

EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impact, including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits that reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership, and, in general, the needs and welfare of the people. A permit will be issued only if it is found not contrary to the public interest. Based on our initial processing of the applicant's proposal, the action is not expected to result in any significant adverse effects on the quality of the human environment. However, a final determination of the need for an environmental impact statement will not be made until the St. Louis District has completed its full review of this application. The review will include our evaluation of any written responses received as a result of this public notice.

SOLICITATION OF COMMENTS: Any interested parties, particularly navigation interests, Federal and state agencies for the protection of environmental and cultural resources, and the officials of any state, town, or local associations whose interest may be affected by this work, are invited to submit to this office written facts, arguments, or objections on or before the closing date of this public notice. The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are also used to determine the overall public interest of the proposed activity.

All replies to this public notice must be submitted in writing and sent to the U.S. Army Corps of Engineers, St. Louis District, 1222 Spruce Street, Attn: OD-F (Frerker), St. Louis, Missouri 63103-2833, or by electronic mail to *charles.f.frerker@mvs02.usace.army.mil*, on or before the close of the public notice comment period.

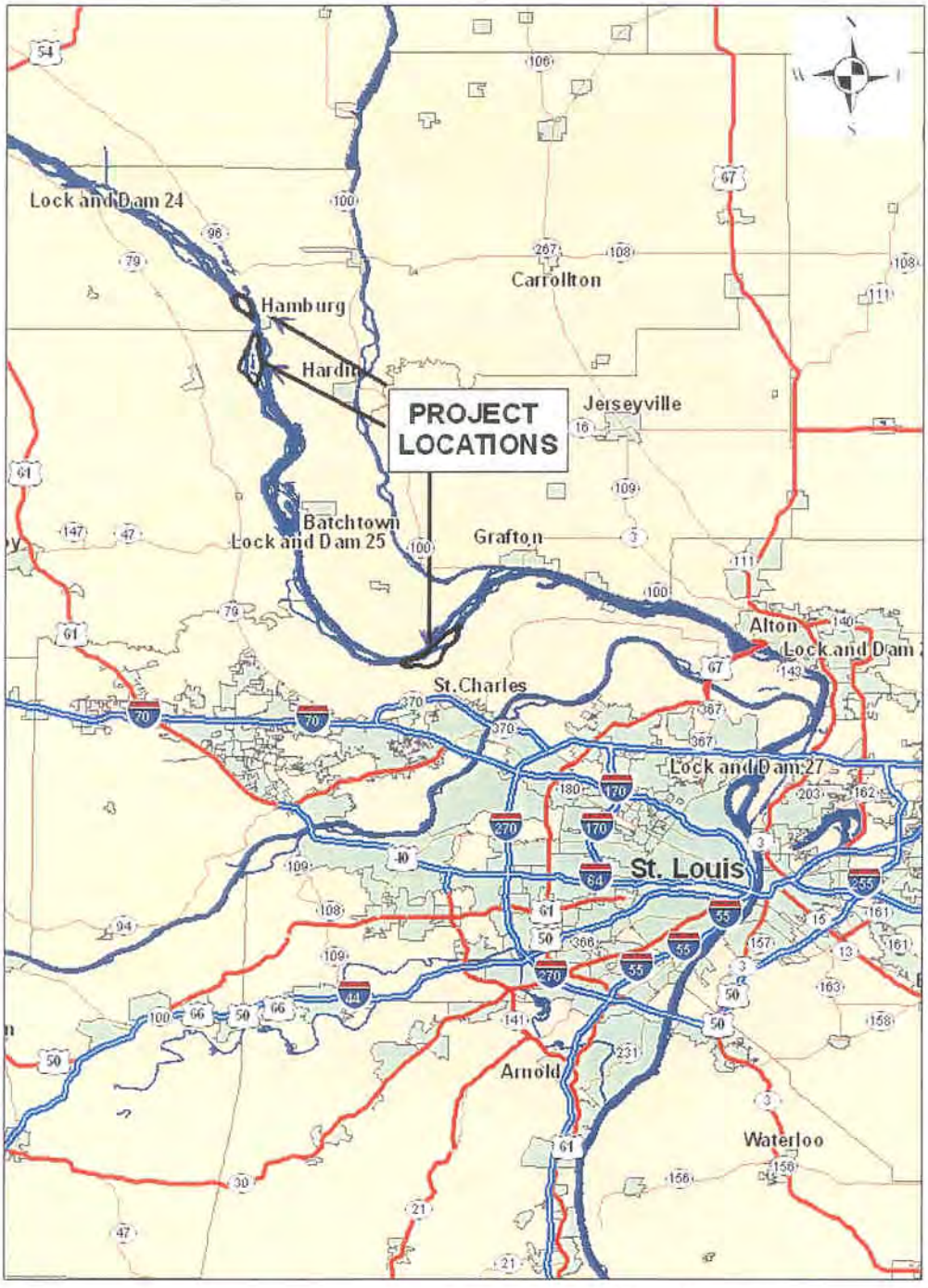
Danny D. McClendon
Chief, Regulatory Branch

Attachments

NOTICE TO POSTMASTERS:

It is requested that this notice be conspicuously and continually placed for 21 days from the date of the issuance of this public notice.

VICINITY MAP



Pools 25 & 26 Islands

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SIGNED FINDING OF NO SIGNIFICANT IMPACT

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Finding of No Significant Impact

Pools 25 and 26 Islands Project
Mississippi River Navigation Pools 25 and 26
St. Charles, Lincoln, and Pike Counties, Missouri

A. I have reviewed and evaluated the District's Environmental Assessment, Section 404(b)(1) Evaluation Report, and U.S. Fish and Wildlife Service's Final Fish and Wildlife Coordination Act Report for the proposed Pools 25 and 26 Islands Habitat Rehabilitation and Enhancement Project, conducted under the Upper Mississippi River System (UMRS)-Environmental Management Program. These documents are herein incorporated by reference. I have also reviewed and evaluated the summary of public involvement for this project.

The recommended plan will improve terrestrial and aquatic habitats on Westport Island in Pool 25 and Dardenne and Bolter Islands in Pool 26. Reforesting about 110 acres of abandoned cropland with various oak-hickory tree species on Westport and Dardenne Islands will help restore the diminished hard-mast component of UMRS floodplain forests. Removing accumulated sediments from natural connections between the Mississippi River and interior sloughs on Westport and Bolter Islands will improve access to these backwater habitats by aquatic species, especially riverine fishes. Creating and maintaining a 0.5-acre area of deepwater habitat in the interior slough on Bolter Island will provide needed overwintering fish habitat. Implementation of these habitat improvements is likely to occur in 2010-2011.

B As part of this evaluation, I have considered existing resources and the no-action alternative, as well as impacts to existing resources with all formulated plans, including the recommended plan.

C. The possible consequences of these alternatives have been studied for physical, environmental, cultural, social and economic effects, and engineering feasibility. My evaluation of significant factors has contributed to my finding:

1. The recommended plan will not affect the geology, groundwater, or topography of the project area. Proposed dredging activities will remove only river-deposited sediments, and disposal areas created from side -casted material will be less than two feet high.

2. Inducement of development in the flood plain will not result from this recommended action. Management of these islands by the Missouri Department of Conservation for fish and wildlife purposes will not change.

3. No substantial impacts are expected to the floodway of the Mississippi River. The proposed construction will have a negligible effect on flooding.

4. Federally listed endangered, threatened, and candidate species, including the decurrent false aster, Indiana bat, gray bat, pallid sturgeon, running buffalo clover, fat pocketbook pearlymussel, spectaclecase mussel, and eastern massasauga, are unlikely to be adversely impacted. With regard to the endangered Indiana bat, removal of a few scattered large trees

associated with channel excavation on Westport and Bolter Islands will be restricted to the colder months (October 1 through March 31) when maternity roosting is not known to occur. With this restriction, the proposed project is unlikely to affect this bat. With regard to the delisted bald eagle, the National Bald Eagle Management Guidelines will be applied if bald eagle use should change in the project area, to minimize potential project impacts that may constitute "disturbance" to this species.

5. Dredging activities on Westport and Bolter Islands will be restricted from occurring during the period from mid-March to early June to avoid adverse impacts during the main fish spawning season.

6. There will be no adverse impacts to cultural resources. Previous investigations suggest that any presently unknown, potentially significant archaeological remains are buried at least 1 meter below the present ground surface. If any artifacts or human remains are discovered during project construction, work will immediately cease and the Missouri State Historic Preservation Office and the Osage Nation Tribal Historic Preservation Office will be contacted.

7. There will be no effect to farmland, and no conversion of land to nonagricultural use. Farmland is not found on these islands, and the designated land use is nonagricultural.

8. There will be no appreciable degradation to the physical environment (e.g., noise, air quality, and water quality) due to the recommended action. Creation of the deep hole on Bolter Island and removal of sediments from the natural channels on Westport and Bolter Islands will not lower water levels in the interior sloughs on these islands, because water levels of these water bodies are closely tied to river elevation.

9. No significant adverse impacts to the aesthetic value, social, or recreational resources will result.

10. The proposed project will not result in the net loss of any wetlands. The planting of 52 acres of tree and shrub seedlings in wetlands (abandoned cropland) on Dardenne Island is expected to offset the temporary and permanent impacts associated with construction activities adversely affecting about 5.25 acres of forested wetlands on Westport and Bolter Islands.

D. Based on the disclosure of impacts contained within this Environmental Assessment, I find no significant impacts to the human environment are likely to occur as a result of the proposed action. The proposed action has been coordinated with the appropriate resource agencies and the public, and there are no significant unresolved issues. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with the recommended plan for the Pools 25 and 26 Islands project.

25 June 2008
Date

For Lewis F. Setliff III
Colonel, Corps of Engineers
District Engineer

Signed FONSI

SIGNED SECTION 404(B)(1) EVALUATION REPORT

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Section 404(b)(1) Evaluation Report on the Effects of the Discharge of Dredged or Fill Material Into Waters of the United States

Pools 25 & 26 Islands
Habitat Rehabilitation And Enhancement Project
Pools 25 And 26, Mississippi River,
Pike, Lincoln And St. Charles Counties, Missouri

Upper Mississippi River System
Environmental Management Program

I. Purpose of this Evaluation

This document presents a Section 404(b)(1) Guideline evaluation for the Pools 25 & 26 Islands project. This evaluation is based on the regulations found at 40 CFR 230, Section 404(b)(1): Guidelines for Specification of Disposal Sites for Dredged or Fill Material.

The purpose of these Guidelines is to restore and maintain the chemical, physical, and biological integrity of waters of the United States through the control of discharges of dredged or fill material. Fundamental to these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern. From a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines. The guiding principle should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources.

These Guidelines have been developed by the Administrator of the Environmental Protection Agency in conjunction with the Secretary of the Army acting through the Chief of Engineers under section 404(b)(1) of the Clean Water Act (33 U.S.C. 1344). The Guidelines are applicable to the specification of disposal sites for discharges of dredged or fill material into waters of the United States.

II. Project Description

A. Location. The proposed project involves three islands. Westport Island, located in Pool 25 of the Mississippi River, lies in Lincoln County, Missouri, between river miles 257.5 and 254.0. This island is about five miles east of Elsberry. Dardenne and Bolters Islands are located about 20 miles to the south in Pool 26 of the Mississippi River in St. Charles County, Missouri, between river miles 228.0 and 224.5. These two islands are about five miles north of St. Peters.

B. General Description

1. Area Subject to Section 404 Jurisdiction. Essentially all of the project area is considered to be a water of the United States, and therefore subject to Section 404 review requirements. This is because these three islands are either below the plane of ordinary high water of the Mississippi River, or portions of these islands are considered to meet the definition of wetlands according to the Corps' wetlands delineation manual [U.S. Army Corps of Engineers-Environmental Laboratory (USACE-EL). (1987). "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1 (on-line manual), U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.]

At Westport Island, the plane of ordinary high water (OHW) at river mile 255.5 is 443.5 feet NGVD. At Dardenne Island, OHW at river mile 226.5 is at 428.5 feet NGVD. According to two-foot contour mapping obtained by the St. Louis District for these two islands, each of these islands is essentially below their respective OHW elevations.

According to USACE (1987), wetlands subject to Section 404 must exhibit positive indicators for hydric soils, wetland vegetation, and wetland hydrology. In summary, a small portion of Westport Island is considered wetlands, and nearly all of Dardenne and Bolters Islands are considered wetlands. Although wetland vegetation is present on all three islands, the soils of Dardenne and Bolters Islands are hydric because they exhibit a water table at a depth of one foot or less during the growing season, whereas the soils at Westport Island are not hydric because they are more permeable and consequently the water table is lower in the ground.

With regard to soils, Westport Island in Lincoln County is mapped as "Dockery silty clay loam, frequently flooded" (1,022 acres) and "water" (74 acres, http://ims.missouri.edu/moims/step1.AOI/countylist.asp?STATUS=new). The Dockery soil series is not classified by the Natural Resources Conservation Service as hydric, but inclusions of Carlow silty clay loam can occur within the Dockery series and they are classified as hydric or wetland soils (http://efotg.nrcs.usda.gov/). Carlow inclusions make up about 5 percent of the Dockery mapping unit, and they meet the hydric criterion because of the presence of a water table at a depth of one foot or less during the growing season (criterion 2B3). In St. Charles County, Dardenne Island is mapped as "Carlow silty clay loam, occasionally flooded" (762 acres) and "water" (9 acres). Bolters Island is also mapped as "Carlow silty clay loam, occasionally flooded" (527 acres) and "water" (14 acres). As mentioned above, the Carlow series is classified as hydric, and about 90 percent of the Carlow mapping unit is considered hydric.

Except for some abandoned cropland, the islands consist of predominantly forest. Bottomland forest is comprised of mostly facultative wetland plants (usually occur in wetlands, but also occur in nonwetlands), but also includes some obligate wetland species as well as facultative wet species (occur often in both wetlands and nonwetlands). Abandoned cropland consists of a variety of mainly herbaceous species but some small woody species.

Each of the islands is subject to flooding from the Mississippi River. The plane of ordinary high water is equivalent to a flood event having a return interval of about once in every two years.

2. Proposed Project Features for Recommended Plan. Proposed features at the three islands address the following objectives: expansion of floodplain forest, restoration of river-backwater connections, and creation and maintenance of deepwater habitat in backwater areas.

Westport Island (Pool 25)

a. Planting of native tree and shrub seedlings. Reforestation of 59 acres of abandoned cropland at sites with ground elevations exceeding 440 feet NGVD is proposed on this 625-acre island. Tree seedlings to be planted would consist of hard mast species such as pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), bur oak (*Quercus macrocarpa*), pecan (*Carya illinoensis*), and Schuette oak (*Quercus x schuettii*, a hybrid between swamp white and bur oak). Native shrub species such as deciduous holly (*Ilex decidua*) and green hawthorne (*Crataegus viridis*) would be planted also. Plant materials would consist of seedlings produced using a root-pruned method, placed on a 30 by 30 foot spacing (49 per acre).

b. Removal of sediment from island channel. Mechanical dredging of sediment is proposed in a portion of an existing 2,000-foot-long natural channel at the lower end of Westport Island. Sediments totaling 1,535 cubic yards would be removed from 1,000 feet of the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.7-acre disposal area (30 feet wide by 1,000 feet long) sited along the existing channel.

c. Placement of water control structure in island channel. A water control structure consisting of stop logs would be installed in the excavated channel. It is expected that this structure would be constructed off-site.

d. Permanent access road. A 1,265-foot long road would be constructed to provide access to the water control structure from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric.

Dardenne Island (Pool 26)

a. Planting of native tree and shrub seedlings. Planting of tree and shrub seedlings at Dardenne Island would follow the same procedure to be used at Westport Island, except that planting sites in abandoned cropland would be in areas above 428 feet NGVD. Fifty-two acres of plantings are proposed on this 790-acre island.

Bolters Island (Pool 26)

a. Removal of sediment from island channel. Similar to Westport Island, mechanical dredging of sediment from an existing 1,250-foot-long natural channel at the lower end of Bolters Island (560 acres) is proposed. Sediments totaling 1,900 cubic yards would be removed from the channel to provide an additional three feet of channel depth across a channel bottom width of five feet. Dredge material would be side cast within a 0.85-acre disposal area (30 feet wide by 1,250 feet) sited along the existing channel.

b. Construction of rock dike structure and excavation of deep hole in island slough. A rock dike structure is proposed to be constructed in an interior slough at the lower end of the island, and a deep hole is proposed to be excavated immediately adjacent to the dike. The rock dike structure would be U-shaped and would consist of 165 tons of graded B stone. Sediments totaling 2,900 cubic yards would be mechanically excavated to a depth of eight feet in a 0.5 acre U-shaped area having a 13-foot wide bottom. Excavated sediments would be placed along either bank of the slough in two disposal areas measuring about 200 by 300 feet each.

c. Temporary access road. A 515-foot long road would be constructed to provide access to the natural channel and interior slough from the island's edge. The road would be 20 feet wide, and consist of 12-inch thick crushed stone on geotextile fabric.

C. Authority and Purpose. This project has been conducted under the authority of the Habitat Rehabilitation and Enhancement Project (HREP) component of the Upper Mississippi River System-Environmental Management Program. Initial authorization and appropriations for the Environmental Management Program were provided on August 15, 1985, by the Supplemental Appropriations Bill (PL 99-88). A more comprehensive authorization was provided by Section 1103 of the Water Resources Development Act (WRDA) of 1986 (PL 99-662). Subsequent WRDA language of 1992, 1996, and 1999 further modified the authorization.

D. General Description of Dredged or Fill Material

1. General Characteristics of Material (grain size, soil type)

a. Fill Material. Fill materials include rock (quarry run limestone consisting of graded B stone, 12" crushed stone) and earthen material (on-site sediments consisting of silts and clays).

b. Dredged Material. Dredged material, defined as material that is either dredged or excavated from waters of the United States, will consist of sediments (alluvial silts and clays) to be mechanically dredged or excavated from natural channels and sloughs.

2. Quantity of Material. The following quantities of materials will be handled:

Westport Island

Sediments (mechanical dredging, natural channel)	1,535	cubic yard
Backfill (earthen material, water control structure)	<1	cubic yard
12" crushed stone (permanent access road)	2,163	ton
Earthen material (excavated to make planting holes)	105	cubic yard

Dardenne Island

Earthen material (excavated to make planting holes)	95	cubic yard

Bolters Island

Sediments (mechanical dredging, natural channel)	1,900	cubic yard
Graded B stone (rock dike structure in slough)	165	ton
Sediments (mechanical dredging, slough)	2,900	cubic yard
12" crushed stone (temporary access road)	1,482	ton

3. Source of Material. Stone used for the project will be obtained from commercial stone quarries in the vicinity of the project area. Earthen material will be obtained from onsite.

E. Description of the Proposed Discharge Sites

1. Location. The location of the proposed features and work is displayed in the project's Environmental Assessment and associated drawings. These discharge sites are located on islands of the Mississippi River.

2. Size (acres) and Types of Habitat. The proposed discharge sites at all three islands total about 5.25 acres.

Westport Island

<0.1 acre	Tree planting over 59 acres	Abandoned cropland
0.7 acre	Disposal area, sediment from natural channel	Forested wetland
<0.1 acre	Water control structure, backfil	Natural channel
0.6 acre	Permanent access road	Forested wetland

Dardenne Island

<0.1 acre	Tree planting over 52 acres	Abandoned cropland

Bolters Island

0.85 acre	Disposal area, sediment from natural channel	Forested wetland
2.75 acre	Disposal area, sediment from slough	Forested wetland
0.1 acre	Disposal area, rock dike structure	Slough
0.25 acre	Temporary access road	Herb. & forested wetland

Excavation to remove sediments will affect about 0.4 acres of natural channel habitat on Westport Island, and on Bolters Island about 0.5 acres of natural channel habitat and about 0.5 acres of slough habitat.

3. Type of Site (confined, unconfined, open water)

a. Permanent Deposits of Dredged and Fill Material. All disposal sites are for permanent deposits of dredged and fill materials, except for the temporary access road on Bolters Island. These disposal sites will be unconfined.

b. Temporary Deposits of Fill Materials. The access road on Bolters Island is the only temporary disposal site. It will be unconfined.

4. Timing and Duration of Discharge. Work to be performed will need to be accomplished during normal (nonflood) pool conditions. Depending on local weather and flooding conditions, the estimated duration of the construction period is about nine months. Actual duration of discharges will only be a fraction of that time.

F. Description of Disposal Method (hydraulic, drag line, etc.). Sediment removed from the natural channels on Westport and Bolters Islands will be dredged mechanically, as will the sediment from the slough on Bolters Island to create the deep hole. Heavy equipment such as a backhoe is expected to be used to excavate these sites. This piece of equipment is expected to be capable of placing excavated sediments into the proposed disposal sites. Trucks will haul graded B stone to the site of the rock dike structure on Bolters Island, and 12" crushed stone to the sites of the access roads on Westport and Bolters Islands.

III. Factual Determinations

A. Physical Substrate Determinations

1. Substrate Elevation and Slope. On Westport Island, ground elevations range from about 435 to 445 feet NGVD. On Dardenne and Bolters Islands, ground elevations range from about 420 to 430 feet NGVD. Most of the natural slopes within the project area are less than two percent.

2. Sediment Type (grain size). The digital soil survey for Lincoln and St. Charles Counties describes the soils within the project area as alluvial materials consisting of silty clay loams. Material on the bottom of the slough on Bolters Island and in the natural channels on Westport and Bolters Islands probably consists of finer grained materials.

3. Dredged/Fill Material Movement. Dredged and fill materials will be subject to the forces of flood flows. As none of the disposal sites will be confined, all materials will have the potential to migrate downhill.

4. Physical Effects on Benthos (burial, changes in sediment type, etc.). Benthos (organisms that live on the bottom of water bodies) are found in the aquatic portions of the project area, which include the natural channels on Westport and Bolters Islands, and the interior slough on Bolters Island. Benthos present in these areas, which total about 1.5 acres, will be destroyed by either excavation or burial.

5. Other Effects. No other effects are expected.

6. Actions Taken to Minimize Impacts. The primary actions taken to avoid adverse effects on the substrate are designing stable slopes on structures, use of stone large enough to resist erosive forces, placement of silt fences or hay bales to arrest the migration of material, and revegetation measures to minimize erosion (lateral movement) of fill or dredged materials.

B. Water Circulation, Fluctuation and Salinity Determinations

1. Water

a. Salinity. Not applicable.

b. Water Chemistry. No changes in water chemistry are anticipated.

c. Clarity. Water clarity within the interior slough on Bolters Island is expected to experience temporarily elevated turbidity levels during placement of the rock dike structure and excavation of the deep hole.

d. Color. No change is expected.

e. Odor. The recommended plan is not expected to have an impact on water odors.

f. Taste. The project is not expected to impact water taste; no surface waters within the project area serve as public water supplies.

g. Dissolved Gas Levels. Construction activities associated with the project will have no significant adverse impact on dissolved gas levels.

h. Nutrients. Nutrients are not expected to be released to wetland or aquatic areas during the construction process.

i. Eutrophication. The project is not expected to contribute toward eutrophication of the water column in aquatic areas.

j. Water Temperature. Temperatures are not expected to change, except for those in the deep hole to be excavated in the interior slough on Bolters Island, where greater water depth is expected to attenuate extremes in winter and summer to some degree.

2. Current Patterns and Circulation

a. Current Patterns and Flow. The hydraulic connection between the Mississippi River and interior sloughs on Westport and Bolters Islands is expected to become more frequent with the removal of accumulated sediments from these channels. The rock dike structure to be placed in the interior slough on Bolters Island is designed to concentrate erosive forces of overtopping river flows into the area of the deep hole. At low river levels, this structure is expected to act as a barrier within the slough, and may retard the circulation of the upper water column due to wind action. The water control structure to be placed in the natural channel at Westport Island is designed to stop or retard the exchange of water between the island's interior slough complex and the river. Other than these anticipated changes, no other changes to patterns or circulation are expected.

b. Velocity. Increases in velocity are expected in the interior slough on Bolters Island at the rock dike structure when the river is high and overtops the island, and in the natural channel on Westport Island at the location of the water control structure, when velocity will decrease when the structure is closed. Reductions in velocity are expected in the areas of tree planting when the river overtops the island, due to the roughness presented by the vegetation as it grows.

c. Stratification. Stratification is expected to occur only in the deep hole to be created in the interior slough on Bolters Island.

d. Hydrologic Regime. The project will not alter the seasonal or annual hydrologic regime of Pools 25 or 26. The hydrologic regime of the interior sloughs on Westport and Bolters Islands will become more dynamic due to the removal of sediments within the natural channels that connect these sloughs with the Mississippi River. The water control structure on Westport Island will be left open most of the time, but once every two to three years, it is expected to be closed temporarily by the Missouri Department of Conservation to hold water in the interior slough complex while the river is falling.

3. Normal Water Level Fluctuations (tides, river stage, etc.). The project will not affect normal fluctuations in the elevation of Pools 25 and 26.

4. Salinity Gradients . Not applicable.

5. Actions Taken to Minimize Impacts. The water control structure to be placed in the natural channel on Westport Island will be designed in such a manner that when in the open position, it will not impede movement of water to and from the river.

C. Suspended Particulate/Turbidity Determinations

1. Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. Increases in suspended particulates and turbidity due to construction activities are expected to be the greatest in the vicinity of the rock dike structure and adjacent deep hole in the interior slough on Bolters Island. These increases are expected to be of relatively short duration after construction is completed. Minor temporary increases in levels of particulates and turbidity levels may occur on

Bolters Island at the junction of the Mississippi River and the natural channel to be cleaned out of sediment. Elsewhere construction activities are to be conducted "in the dry" when river levels are low, and such changes are not expected.

2. Effects (degree and duration) on Chemical and Physical Properties of the Water Column. The natural channels on Westport and Bolters Islands are shallow and at low river levels have little water in them. The interior sloughs on these islands are permanent and deeper (average depth 2 to 3 feet).

a. Light Penetration. Because of the shallow depth of Bolters Island's slough, a decrease in light penetration is unlikely.

b. Dissolved Oxygen. The only expected change in dissolved oxygen levels is in the deep hole to be excavated in the slough on Bolters Island; levels in summer are expected to be somewhat higher after the project is completed than in the rest of the slough.

c. Toxic Metals and Organics. No toxic metals or organics are known to occur at any proposed disposal site of fill or dredged material.

d. Pathogens. There is no reason to believe any pathogens exist in any of the proposed areas of construction.

e. Aesthetics. Aesthetics of work sites are likely to be temporarily adversely affected during construction, but are expected to improve with the establishment of vegetation after construction.

f. Water Temperature. No changes in water temperatures are expected to occur, except at the deep hole, where temperature extremes during winter and summer occurring in the rest of the slough are expected to be attenuated by the greater water depth.

3. Effects on Biota

a. Primary Production, Photosynthesis. No impacts to primary production and photosynthetic processes are expected to occur.

b. Suspension/Filter Feeders. A temporary reduction in benthos production is expected only in the slough on Bolters Island in the vicinity of the rock dike structure and deep hole.

c. Sight Feeders. Temporary impacts to sight-feeders are expected in the Bolters Island slough in the vicinity of the rock dike structure and deep hole.

4. Actions taken to Minimize Impacts. Actions to minimize impacts associated with suspended particulates and turbidity include placement of silt curtains in the Bolters Island slough upstream and downstream of the work site, seeding of disposal sites to minimize erosion, and design of adequate sideslopes in channel cleanout areas to prevent erosion.

D. Contaminant Determinations. No toxic metals or organics are known to occur at any proposed disposal site of fill or dredged material.

E. Aquatic Ecosystem and Organism Determinations

1. Effects on Plankton. No impacts on phytoplankton production are expected.

2. Effects on Benthos. Benthic organisms in Bolters Island slough in the vicinity of the rock dike structure and deep hole are expected to be lost due to burial or excavation, as well as in the natural channels to be cleaned of sediments on Westport and Bolters Islands. These sites are expected to become recolonized after construction is completed.

3. Effects on Nekton. The term "nekton" refers basically to larger, free swimming aquatic organisms, such as fishes. Adverse impacts on sight-feeding fish are expected to be limited to Bolters Island slough, and would be temporary.

4. Effects on Aquatic Food Web. Construction activities are not expected to disrupt the aquatic food chain.

5. Effects on Special Aquatic Sites

a. Sanctuaries and Refuges. Westport Island Natural Area envelops about 480 acres of the lower half of Westport Island, and was established in 1984 to protect a large undisturbed area of old-growth bottomland forest along with sloughs and shrub swamps. Only minimal man-made alterations are allowed in the natural area. The proposed mechanical excavation of sediments from the natural channel, placement of the water control structure, and construction of the permanent access road are located in this natural area.

b. Wetlands. Construction activities are expected to impact about 5.25 acres of wetlands. (In addition to these wetland impacts, about 0.9 acres of natural channels will be affected by mechanical dredging.) Of the wetland impacts, disposal sites for mechanically dredged sediments will affect about 4.3 acres, and access roads will affect about 0.85 acres. Sediments taken from the natural channels will be placed in 1.55 acres of forested wetland disposal sites at an average depth of about 1.5 feet. Tree clearing at these disposal sites will be minimal. Sediments obtained from the Bolters Island slough will be placed in 2.55 acres of forested wetland disposal sites at an average depth of 0.65 feet (about 8 inches). At these disposal sites, tree clearing is expected to be more extensive. Crushed rock for access roads will be placed in 0.85 acres of forested and herbaceous wetlands at an average depth of 12 inches. Tree clearing for access roads will also be minimal. Tree planting sites in abandoned cropland on Westport Island are not considered wetlands (because of the absence of hydric soils), whereas on Dardenne Island, tree planting sites in abandoned cropland are considered wetlands (because of the presence of wetland soils).

The planting of 52 acres of tree and shrub seedlings in wetlands (abandoned cropland) on Dardenne Island is expected to offset the temporary and permanent impacts associated with construction activities affecting about 5.25 of forested (and a little herbaceous) wetlands.

c. Mud Flats. No mud flat-like conditions exist within any proposed discharge site.

d. Vegetated Shallows. No vegetated shallows occur at any proposed disposal sites.

e. Coral Reefs. Not applicable.

f. Riffle and Pool Complexes. There are no riffle and pool complexes in the project area.

6. Threatened and Endangered Species. In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the St. Louis District received from the U. S. Fish and Wildlife Service the following list of federally threatened or endangered species, currently classified or proposed for classification that may occur in the vicinity of the Pools 25 and 26 Islands project.

Lincoln County (pool 25, Westport Island):

Bald eagle (*Haliaeetus leucocephalus)* - threatened

Indiana bat (*Myotis sodalis)* - endangered

Spectaclecase mussel (*Cumberlandia monodonta)* - candidate

St. Charles (pool 26, Dardenne and Bolter Islands):

Bald eagle (*Haliaeetus leucocephalus)* - threatened

Indiana bat (*Myotis sodalis)* -endangered

Eastern massasaugua (*Sistrurus catenatus catenatus*) - candidate

Pallid sturgeon (*Scaphirhynchus albus)* - endangered

Decurrent false aster (*Boltonia decurrens)* - threatened

Running buffalo clover (*Trifolium stoloniferum)* – endangered

Based on our evaluation, it is the St. Louis District's opinion that the proposed project will not adversely impact any of the five threatened or endangered species or two candidate species, provided that tree felling is restricted to the time of the year (September 1 through March 31) when Indiana bat maternity colonies are not present. Likewise, the action will not affect any critical habitat of these species.

7. Other Fish and Wildlife. Sloughs on islands that are connected periodically to the Mississippi River through natural connections serve as spawning, rearing, and overwintering habitat for riverine fishes. Shallow water depths in these sloughs have limited the value of these areas as overwintering habitat. Creation of the deep hole in the interior slough on Bolters Island and construction of the rock structure to maintain its depth are expected to provide about 0.3 acres of overwintering habitat. Sedimentation in the natural channels that form temporary connections with the river reduces the amount of time these connections occur. Excavation of the channels on Bolters and Westport Islands will increase the amount of time they can perform this function. Since the combination of deep hole excavation with a scouring rock structure on Bolters Island is novel, this portion of the project is considered experimental.

Reforestation of abandoned cropland using various species of oak-hickory tree seedlings on Westport and Dardenne Islands is expected to benefit wildlife species that forage for mast. Such tree species are underrepresented on the Mississippi River floodplain following land clearing for agriculture and the flood of 1993. The Missouri Department of Conservation manages these islands for river-associated wildlife species including mammals, waterfowl and other birds, reptiles, and amphibians.

Waterfowl would benefit once the trees begin producing a mast food source and from the thermoregulatory benefits the trees would provide by acting as a windbreak. A mast crop can be expected from some species in three to five years. The planted area is expected to be used for food and shelter by such species as bobwhite quail, turkey, deer, squirrels, various species of waterfowl, and other migratory birds that feed on insects found in oaks. These benefits would increase progressively as the stand matures. The establishment of larger blocks of continuous forest by planting abandoned cropland would also benefit area sensitive species such as the pileated woodpecker. Without the tree planting proposed by this project, the forest habitat component on these islands would continue to degrade. The improvement in connections between the river and interior sloughs on Bolters and Westport Islands is also expected to benefit a variety of mammals, birds, amphibians, and reptiles that use these open-water wetlands as either feeding areas or for reproduction.

8. Actions to Minimize Impacts. More intrusive habitat improvements on Westport Island that would be located within the natural area have been eliminated from further consideration. Adverse impacts to 5.25 acres of wetlands on Westport and Bolters Islands are not expected to be significant, given the proposed tree planting in 52 acres of wetlands (abandoned cropland) on Dardenne Island.

F. Proposed Disposal Site Determinations

1. Mixing Zone Determination. The discharges of fill and dredged material will largely occur in areas without permanent water (such as forested and herbaceous wetland). Discharges in areas of permanent water are limited to less than one acre of the 13-acre slough on Bolters Island. The concentration of resuspended material in this slough is not expected to be high enough to require a mixing zone.

2. Determination of Compliance with Applicable Water Quality Standards. Section 401 water quality certification will be required from the Missouri Department of Natural Resources.

3. Potential Effects on Human Use Characteristics.

a. Municipal and Private Water Supply. No municipal water supply will be adversely impacted by project construction.

b. Recreational and Commercial Fisheries. Commercial fisheries are present in Pools 25 and 26. Recreational fishing is also present, and the recommended plan is expected to benefit fishing opportunities.

c. Water Related Recreation. Water-related recreation is an important activity in Pools 25 and 26 of the Mississippi River. The recommended plan is not expected to impact this kind of recreation.

d. Aesthetics. Construction activities will have minor impacts on the aesthetic quality of the project area during the duration of the work. Noise and exhaust will be generated by heavy equipment during the construction process.

e. Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The project will not impact any of these resources.

f. Determination of Cumulative Effects on the Aquatic Ecosystem. Past, present, and reasonably foreseeable future Corps activities in Pools 25 and 26 of the Mississippi River include 1) the navigation project, 2) channel maintenance work including maintenance dredging and dikes and revetments, 3) other existing EMP-HREP projects (Batchtown, Stag Island, Cuivre Island, Calhoun Point, Dresser Island), 4) existing bullnose dikes at Slim, Peruque, and Portage Islands (constructed under the Avoid and Minimize Program), 5) and activities under the Navigation and Environmental Sustainability Program, including a dam point control study for Pool 25, design of lock expansion at Lock and Dam 25, and a fish passage study at Lock and Dam 26. Between these projects, there are no significant cumulative impacts on the aquatic ecosystem.

g. Determination of Secondary Effects on the Aquatic Ecosystem. No significant secondary impacts to the aquatic ecosystem have been identified.

IV. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

A. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation.

In this evaluation of discharges proposed as part of the Pools 25 & 26 Islands EMP-HREP project, the Environmental Protection Agency's Section 404(b)(1) Guidelines of 24 December 1980 were applied without significant adaptation.

B. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem.

No practicable alternatives exist which meet the study objectives and do not involve discharge of fill into waters of the United States. As ground elevations on all islands are below the plane of ordinary high, there are no sites considered to be upland and not subject to the Clean Water Act. Hauling mechanically dredged sediments to disposal sites off these islands was not considered.

C. Compliance with Applicable State Water Quality Standards.

Water quality certification under Section 401 of the Clean Water Act will be required from the Missouri Department of Natural Resources. The certification's conditions will be incorporated into the project's plans and specifications. Coordination of the proposed plan with this agency will be accomplished.

D. Compliance with Applicable Toxic Effluent Standard or Prohibition under Section 307 of the Clean Water Act.

The proposed activities are not expected to violate the toxic effluent standards of Section 307 of the Clean Water Act.

E. Compliance with Endangered Species Act of 1973.

The recommended plan is not expected to adversely affect any of the seven federally listed endangered, threatened, or candidate species or their critical habitat, provided that a restriction on tree felling is imposed during the warm months when Indiana bats are assumed to be present.

F. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972.

Not applicable.

G. Findings of Significant Degradation of the Waters of the United States.

The proposed project will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Life stages of aquatic organisms and other wildlife would not be adversely affected in a significant manner. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values would not occur.

H. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem.

All appropriate and practicable measures have been taken through application of procedures contained in Subpart H of the Guidelines to insure minimal adverse effects of the proposed discharges. Actions to minimize impacts associated with suspended particulates and turbidity include placement of silt curtains in the Bolters Island slough upstream and downstream of the work site, seeding of disposal sites to minimize erosion, and design of adequate side slopes in channel cleanout areas to prevent erosion.

I. On the Basis of the Guidelines the Proposed Disposal Sites for the Discharge of Dredged and Fill Material.

Based on this evaluation, the proposed Pools 25 & 26 Island EMP-HREP project is specified as complying with the requirements of these guidelines with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

Prepared by:

Timothy K. George

Mr. Timothy K. George, Ecologist Environmental Branch; Planning, Programs, and Project Management Division

Approved by:

Thomas M. Keevin

Dr. Thomas M. Keevin, Chief Environmental Branch; Planning, Programs, and Project Management Division

25 JUN 2000

Date

Robert J. Bayer for

Lewis F. Setliff III
Colonel, Corps of Engineers
District Engineer

To be signed following the review of comments received during the public comment period.

Signed 404(b)(1)

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REAL ESTATE PLAN

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Real Estate Plan
Pools 25 & 26 Islands
Habitat Rehabilitation and
Enhancement Project (HREP)
Pike, Lincoln & St. Charles Counties, Missouri

Project Description

The Habitat Rehabilitation and Enhancement Project at specific islands in Pools 25 and 26 of the Upper Mississippi River. The five islands that comprise the project are Mosier, Westport, and Kickapoo in Pool 25, and Dardenne and Bolters Islands in Pool 26. The restoration sites begin approximately forty miles north of St. Louis, Missouri. The islands are located along the right bank of the Mississippi River between Upper Mississippi River mile markers 254 to 261 and 224 to 229.

This project focuses on improving habitat that has been degraded over time, mainly by sediment. The lands are owned by the Government and operated by Missouri Department of Conservation (MDC) under a general plan agreement.

The impacts of sedimentation and human activity overtime have resulted in degraded habitats. The declining quantity and diversity of floodplain forest in the pooled portion of the river is due to past agricultural conversions and the effects of the 1993 flood. This project will seek to increase the spatial extent of the Oak-hickory community in floodplain forest by planting trees in abandoned croplands at elevations where they naturally regenerate. The degraded diversity of aquatic habitats is a result of sedimentation. This project proposes dredging to deepen backwater areas and selective excavation in remnant channels to restore connection to the river. Stone structures are proposed for the backwater areas which would use the rivers energy at flood stage to maintain the deep water areas providing over wintering habitat. The loss of islands in the pooled portion of the river is due principally to wind-wave erosion. Minimizing wind-wave erosion by armoring the upstream islands tips will help protect this habitat.

Project Authorization

This project will be constructed and operated under the provisions of the United States Army Corps of Engineers' Environmental Management Program (EMP) as authorized by WRDA 1986 (Section 1103) as amended. The islands are included in certain lands acquired for the navigation project that were identified in a General Plan and made available to the States, through Cooperative Agreements between the Corps of Engineers and the Department of Interior (DOI), and between the DOI and each State. These lands were made available for use in the conservation and management of wildlife resources thereof, and its habitat thereon, in connection with the national migratory bird program. This project will be managed under the Habitat Rehabilitation and Enhancement Project at specific islands in Pools 25 and 26 of the Upper Mississippi River.

1. Purpose

This Real Estate Plan was prepared in support of Habitat Rehabilitation and Enhancement Project in Pools 25 and 26 of the Upper Mississippi River.

2. Lands, Easements and Right of Way (LER) Required for the Construction

The construction and operation of this project will not require any additional real estate interests. The real estate required for this project is owned by the Government and managed by MDC under a general plan agreement. Four islands comprise the project. They are Mozier Island at 425 acres, Westport Island at 625 acres, Dardenne Island at 790 acres, and Bolter's Island at 562 acres. Kickapoo Island was evaluated during the planning process but no features are planned for this Island.

Fee

a. No additional land required, the Government owns all of the Islands.

Permanent Easement

b. None is required.

Temporary Construction Easement

c. None is required.

3. LER Required that is Owned by the Sponsor

No LER required that is owned by MDC.

4. Proposed Non-standard Estates

No non-standard estates are required for this project. All property is owned in fee.

5. Existing Federal Projects within the LER Required for the Project

The federal government owns the property in fee in Pools 25 and 26 of the Upper Mississippi River. The five islands that comprise the project are Mosier, Westport, and Kickapoo in Pool 25, and Dardenne and Bolters Islands in Pool 26. Four of the five islands are required for the ecosystem restoration and they are Mozier Island at 425 acres, Westport Island at 625 acres, Dardenne Island at 790 acres, and Bolter's Island at 562 acres. Kickapoo Island was evaluated during the planning process but no features are planned for this Island. The islands are operated and maintained by MDC. The cost would be shared 75 percent federal/25 percent non-Federal. No additional estates are necessary, the lands are owned by the Government in fee.

6. Federally Owned Land Required for the Project

All lands required for the project are already owned by the Government. The Habitat Rehabilitation and Enhancement Project improves diversity of the floodplain forest in the pooled portion of the river. The four islands contain 2402 total acres.

MDC has been managing these lands for many years and is considered to be an excellent partner for this ecosystem restoration.

The Government owns these properties in fee therefore no additional estates are required.

7. Navigation Servitude

Navigation servitude is not applicable to this project.

8. Map Depicting the Area

A project map of the area is included as Exhibit A.

9. Possibility of Induced Flooding Due to Project

There will be no induced flooding as a result of the construction, operation and maintenance of this project.

10. Baseline Cost Estimate

Since there are no additional real estate requirements for this project, a baseline cost estimate is not required for this Real Estate Plan.

11. Relocation Assistance Benefits Under PL 91-646

No homes, businesses or farms will be impacted because of the proposed project; therefore, no relocation assistance benefits will be required.

12. Mineral Activity in Project Area

There are no known mineral activities that will be impacted because of this project.

13. Sponsor's Legal and Professional Capability to Acquire LER

MDC has the authority and capability to acquire LER, but as previously stated all required LER is owned by the Government.

14. Zoning Ordinances Proposed

Zoning is not applicable.

15. Schedule of Land Acquisition Milestones

Not applicable.

16. Facility of Utility Relocations

There are no utility relocations anticipated for this project.

17. Impacts on Suspected or Known Contaminants

Prior to construction of this project an Environmental Checklist will be completed and EC-HQ will make a determination as to whether an Environmental Baseline Study is necessary.

18. Landowner Support or Opposition to the Project

The immediate landowners consist of MDC, USFWS and the Corps of Engineers, who are all in favor of this project. There is no known opposition to the project by landowners in the project area.

19. Notification to the Non-Federal Sponsor Regarding Risks Associated with Acquiring Land Before Execution of the PCA

Not applicable.

20. Other Real Estate Issues Relevant to the Project

None.

Anne L. Kosel
Chief, Real Estate Division

Date 9/27/2005

Real Estate Plan – Mary Winston 8/8/05

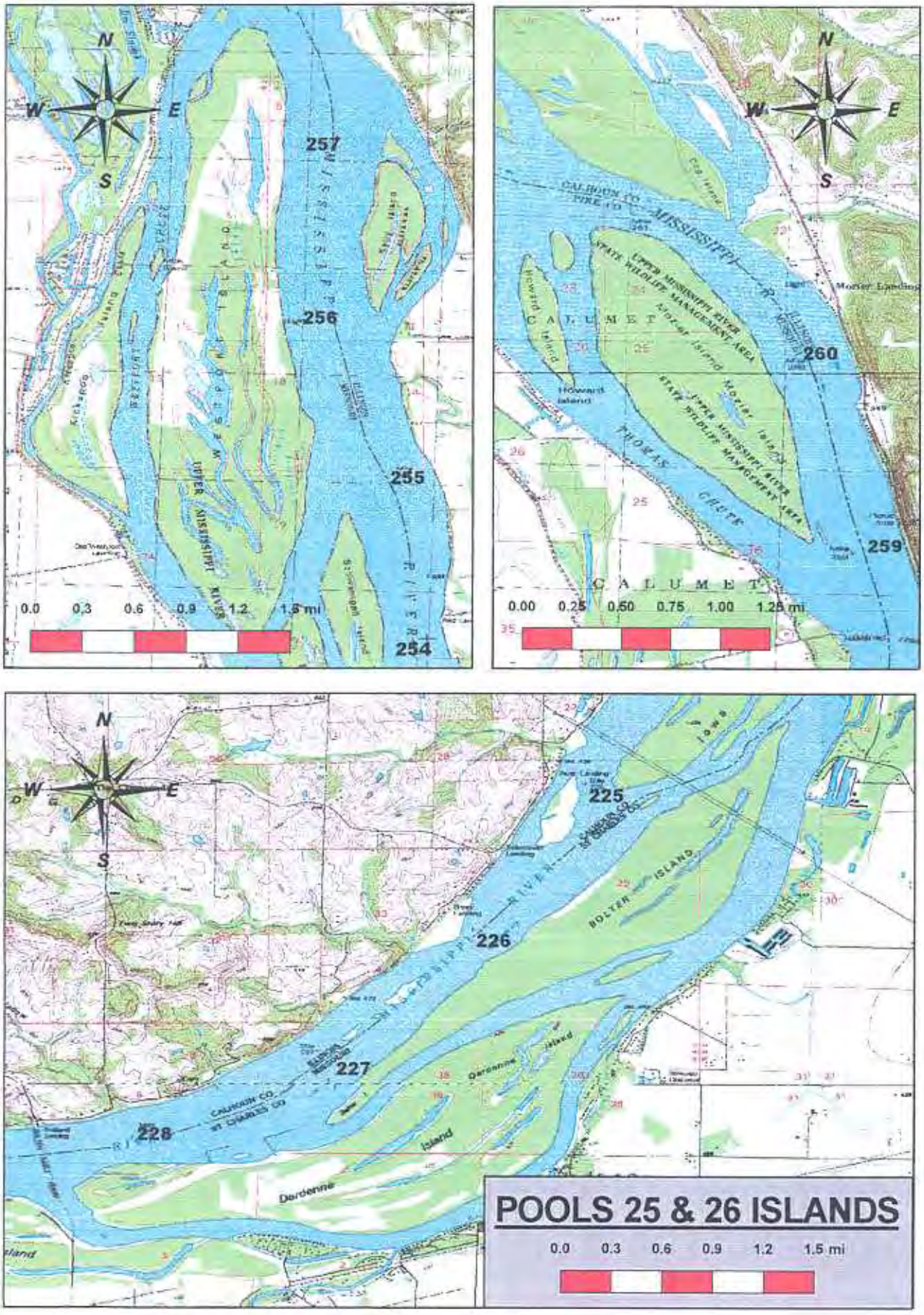

EXHIBIT A
RE Plan

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LEGAL REVIEW

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CERTIFICATION OF LEGAL REVIEW

The Planning, Design, and Analysis Report and Environmental Assessment for Pools 25 & 26 Islands, MO, between the Department of Army and the Missouri Department of Conservation, has been fully reviewed by the Office of Council, USACE, St. Louis and found to be legally sufficient.

William P. Levins
Chief Counsel

Date 6/26/08

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Appendix C

POST-AUTHORIZATION DECISION DOCUMENT CHECKLIST
PROJECT SPECIFIC

I. BASIC INFORMATION:

a. Name of Authorized Program: **Upper Mississippi River Restoration (formerly Upper Mississippi River System - Environmental Management Program)** Project Name: **Pools 25 & 26 Islands Habitat Rehabilitation and Enhancement Project (HREP), Missouri, St. Charlies, Lincoln, and Pike Counties, Upper Mississippi River System, River Miles 224 - 261.**

b. Name of Separable Element: **N/A**

c. PWI Number: **076150**

d. Authorizing Document: **Comprehensive Master Plan for the Management of the Upper Mississippi River System dated January 1, 1982, prepared by the Upper Mississippi River Basin Commission and submitted to Congress pursuant to Public Law 95-502.**

e. Law/Section/Date of Project Authorization: **Section 1103 of the Water Resources Development Act of 1986, Public Law 99-662), as amended (see attachment 1).**

f. Laws/Sections/Dates of Any Post-Authorization Modification:
WRDA 1990 (P.L. 101-640), Section 405, 1990
WRDA 1992 (P.L. 102-580), Section 107, 1992
WRDA 1999 (P.L. 106-53), Section 509, 1999
WRDA Technical Corrections 1999 (P.L. 106-109), Section 2, 1999

g. Non-Federal Sponsor(s): **N/A, project is a 100% federal effort**.

h. Project/Separable Element Purpose(s): **Ecosystem Restoration (Habitat Rehabilitation and Enhancement)**

i. Congressional Interests (Senator(s), Representative(s) and District(s)): **Sen. Christopher Bond, Sen. Claire McCaskill, Kenny Hulshof Rep. District #9 and W.Todd Akin Rep. District # 2.**

II. PROJECT DOCUMENTS:

a. Type of Decision Document: **Planning Design Analysis Report/Environmental Assessment**

b. Approval Authority of Decision Document: **Approval was delegated to the MSC by EC 1165-2-205.**

c. Project Management Plan Approval Date: **April 2003**

d. Independent Technical Review (ITR) Approval Date: **June 2008**

e. Mitigation Authorized: ___ Yes _X_ No Cost of Mitigation _____
Describe Type of Mitigation and Whether Included in Project Report:_____
(Note: Project report is the one that supports the authorization for the mitigation. Need to make sure that mitigation is authorized as part of the project cost)

f. Current M-CACES Estimate: **$999,000 (Fully Funded Estimate)** Date Prepared and Price Level: **Prepared May 2008, Price Level of May 2008**

g. Section 902 Cost Limit: $ **N/A (Continuing Authorization in WRDA '99)** Fully Funded as of 1 Oct FY 2008

h. Date of Latest Economic Analysis: **2006 (Incremental cost analysis and IWR Plan were used to quantify habitat enhancement features and identify the NER plan.)**

i. Current Economics: BCR **N/A** @ ____ % FY ___ (Note: list period of analysis)
RBRCR **N/A** @ ____ % FY ___

III. COST SHARING SUMMARY:

(Note: This project is 100 percent Federal. Section 906(e) of WRDA 1986 states that first cost funding will be 100 percent Federal cost because the project features will be located on federally owned land that is managed by the U.S. Fish and Wildlife Service as a national wildlife refuge.)

Purpose (s)	Non- Fed Cash	Non-Fed LERRD	Non-Fed Const. Credit	Total Non-Fed Share	Federal Share (%)	Total Project Cost
Ecosystem Restoration					**100%**	**$999,000**
Total					**100%**	**$999,000**

a. Projected Credit for Section 215 Work and Date 215 Agreement Signed: **$0**

b. Projected Credit for Section 104 or Other Authorized Creditable Work and Date Work Approved by ASA(CW) or Agreement Addressing Work Signed: **$0**

c. Annual Non-Fed OMRR&R Costs (1 Oct FY 2008_ Price Levels): **$5,859, May 2008 price level**

IV. FUNDING HISTORY

a. Appropriations History for Project/Separable Element:

Fiscal Year	Budget Amount 1/	Appropriated Amount 1/
1990-1996	**$143,800,000 2/**	**$127,688,000**
1997	**$ 16,694,000 2/**	**$ 17,892,000**
1998	**$ 16,000,000 2/**	**$ 18,729,000**
1999	**$ 18,900,000 2/**	**$ 17,320,000**
2000	**$ 18,955,000 2/**	**$ 17,711,000**
2001	**$ 21,000,000 2/**	**$ 21,207,000**
2002	**$ 20,000,000 2/**	**$ 16,235,000**
2003	**$ 12,200,000 2/**	**$ 10,266,000**
2004	**$ 19,000,000 2/**	**$ 14,683,000**
2005	**$ 17,500,000 2/**	**$ 15,548,000**
2006	**$ 33,500,000 2/**	**$ 19,800,000**
2007	**$ 26,800,000 2/**	**$ 21,894,000**
2008	**$ 23,464,000 2/**	**$ 16,851,000**

1/ Figures include budgeted and appropriated amounts for the Upper Mississippi River Restoration, which the Pools 25 & 26 Islands HREP is implemented under. Appropriated amounts reflect conference amount less rescission.

2/ Of the amounts budgeted between 1990 and 2008, the Pools 25 &26 Islands HREP expended $126,000 (2000), $21,000 (2001), $42,000 (2002), $121,000 (2003), $2,000 (2004), $218,000 (2005), $119,000 (2006), $69,000 (2007), and $36,000 (as of May 08).

V. CERTIFICATION FOR DELEGATED DECISION DOCUMENTS: YOU MUST ANSWER "YES" TO ALL OF THE FOLLOWING QUESTIONS TO APPROVE THE DECISION DOCUMENT UNDER DELEGATED AUTHORITY.

a. **PROJECT PLAN**

Has the project study issue checklist been completed and all issues resolved? **X** Yes ___No (Note: Is the project the same as contained in the project report supporting authorization; if not, is it within the 902 limit, who has the authority to allow the change by regulation...district, division, Chief, Congress) **A programmatic Project Study Issue Checklist for the Upper Mississippi River Restoration was approved by HQUSACE on 5 June 2006(see attachment 2).**

Does the non-Federal sponsor concur in the project plan as submitted? ___Yes ___No
N/A, project is 100% Federal.

Has project plan as submitted been reviewed and concurred in by the non-Federal sponsor's counsel?

___ Yes ___ No **N/A, project is 100% Federal.**

b. **AUTHORITY**

Has authority been delegated to the MSC for approval of the project report?
_X_ Yes ___ No **Approval was delegated to the MSC by EC 1165-2-205.**

Is authority adequate to complete the project as proposed? _X_ Yes ___ No

c. **POLICY/LEGAL/TECHNICAL COMPLIANCE**

Has the District Counsel reviewed and approved the decision document for legal sufficiency? _X_ Yes (Certification included in decision document package submittal) ___ No

Have all aspects of ITR been completed with no unresolved issues remaining?
_X_ Yes ___ No

Has the District Commander documented policy/legal/technical compliance of the decision document? _X_ Yes ___ No

Has the MSC certified the policy/legal/technical compliance of the decision document?
_X_ Yes ___ No

VI. AUTHENTICATION:

Brian Markert
Project Manager
Date: 6-25-08

Bruce Munholand
Chief, Project Management Branch
Date: 6-26-08

Bill Levins
District Counsel
Date: 6/26/08

for Joe Kellett
Deputy District Engineer (PPPM)
Date: 6/26/08

For Col. Lewis F. Setliff, III
District Engineer
Date: 6/26/08

Rayford Wilbanks
Planning and Policy CoP (MVD)
Date: 9/12/08

Larry Barnett
MVD Counsel
Date: 9/19/08

BG Michael J. Walsh
MVD Commander
Date: 24 Sep 2008

UMRBA
2/5/00

Environmental Management Program Authorization*

[*Section 1103 of the Water Resources Development Act of 1986 (P.L. 99-662) as amended by Section 405 of the Water Resources Development Act of 1990 (P.L. 101-640), Section 107 of the Water Resources Development Act of 1992 (P.L. 102-580), Section 509 of the Water Resources Development Act of 1999 (P.L. 106-53), and Section 2 of the Water Resources Development Technical Corrections of 1999 (P.L. 106-109).]

SEC. 1103. UPPER MISSISSIPPI RIVER PLAN.

(a)(1) This section may be cited as the "Upper Mississippi River Management Act of 1986".

(2) To ensure the coordinated development and enhancement of the Upper Mississippi River system, it is hereby declared to be the intent of Congress to recognize that system as a nationally significant ecosystem and a nationally significant commercial navigation system. Congress further recognizes that the system provides a diversity of opportunities and experiences. The system shall be administered and regulated in recognition of its several purposes.

(b) For purposes of this section --

(1) the terms "Upper Mississippi River system" and "system" mean those river reaches having commercial navigation channels on the Mississippi River main stem north of Cairo, Illinois; the Minnesota River, Minnesota; Black River, Wisconsin; Saint Croix River, Minnesota and Wisconsin; Illinois River and Waterway, Illinois; and Kaskaskia River, Illinois;

(2) the term "Master Plan" means the comprehensive master plan for the management of the Upper Mississippi River system, dated January 1, 1982, prepared by the Upper Mississippi River Basin Commission and submitted to Congress pursuant to Public Law 95-502;

(3) the term "GREAT I, GREAT II, and GRRM studies" means the studies entitled "GREAT Environmental Action Team--GREAT I--A Study of the Upper Mississippi River", dated September 1980, "GREAT River Environmental Action Team--GREAT II--A Study of the Upper Mississippi River", dated December 1980, and "GREAT River Resource Management Study", dated September 1982; and

(4) the term "Upper Mississippi River Basin Association" means an association of the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, formed for the purposes of cooperative effort and united assistance in the comprehensive planning for the use, protection, growth, and development of the Upper Mississippi River System.

(c)(1) Congress hereby approves the Master Plan as a guide for future water policy on the Upper Mississippi River system. Such approval shall not constitute authorization of any recommendation contained in the Master Plan.

(2) Section 101 of Public Law 95-502 is amended by striking out the last two sentences of subsection (b), striking out subsection (i), striking out the final sentence of subsection (j), and redesignating subsection "(j)" as subsection "(i)".

(d)(1) The consent of the Congress is hereby given to the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, or any two or more of such States, to enter into negotiations for agreements, not in conflict with any law of the United States, for cooperative effort and mutual assistance in the comprehensive planning for the use, protection, growth, and development of the Upper Mississippi River system, and to establish such agencies, joint or otherwise, or designate an existing multi-State entity, as they may deem desirable for making effective such agreements. To the extent required by Article I, section 10 of the Constitution, such agreements shall become final only after ratification by an Act of Congress.

(2) The Secretary is authorized to enter into cooperative agreements with the Upper Mississippi River Basin Association or any other agency established under paragraph (1) of this subsection to promote and facilitate active State government participation in the river system management, development, and protection.

(3) For the purpose of ensuring the coordinated planning and implementation of programs authorized in subsections (e) and (h)(2) of this section, the Secretary shall enter into an interagency agreement with the Secretary of the Interior to provide for the direct participation of, and transfer of funds to, the Fish and Wildlife Service and any other agency or bureau of the Department of the Interior for the planning, design, implementation, and evaluation of such programs.

(4) The Upper Mississippi River Basin Association or any other agency established under paragraph (1) of this subsection is hereby designated by Congress as the caretaker of the master plan. Any changes to the master plan recommended by the Secretary shall be submitted to such association or agency for review. Such association or agency may make such comments with respect to such recommendations and offer other recommended changes to the master plan as such association or agency deems appropriate and shall transmit such comments and other recommended changes to the Secretary. The Secretary shall transmit such recommendations along with the comments and other recommended changes of such association or agency to the Congress for approval within 90 days of the receipt of such comments or recommended changes.

(e) Program Authority

(1) Authority

(A) In general. The Secretary, in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, may undertake, as identified in the master plan

(i) a program for the planning, construction, and evaluation of measures for fish and wildlife habitat rehabilitation and enhancement; and

(ii) implementation of a long-term resource monitoring, computerized data inventory and analysis, and applied research program.

(B) Advisory committee. In carrying out subparagraph (A)(i), the Secretary shall establish an independent technical advisory committee to review projects, monitoring plans, and habitat and natural resource needs assessments.

(2) REPORTS. — Not later than December 31, 2004, and not later than December 31 of every sixth year thereafter, the Secretary, in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, shall submit to Congress a report that —

(A) contains an evaluation of the programs described in paragraph (1);

(B) describes the accomplishments of each of the programs;

(C) provides updates of a systemic habitat needs assessment; and

(D) identifies any needed adjustments in the authorization of the programs.

(3) For purposes of carrying out paragraph (1)(A)(i) of this subsection, there is authorized to be appropriated to the Secretary $22,750,000 for fiscal year 1999 and each fiscal year thereafter.

(4) For purposes of carrying out paragraph (1)(A)(ii) of this subsection, there is authorized to be appropriated to the Secretary $10,420,000 for fiscal year 1999 and each fiscal year thereafter.

(5) Authorization of appropriations.—There is authorized to be appropriated to carry out paragraph (1)(B) $350,000 for each of fiscal years 1999 through 2009.

(6) Transfer of amounts.—For fiscal year 1999 and each fiscal year thereafter, the Secretary, in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, may transfer not to exceed 20 percent of the amounts appropriated to carry out clause (i) or (ii) of paragraph (1)(A) to the amounts appropriated to carry out the other of those clauses.

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(7)(A) Notwithstanding the provisions of subsection (a)(2) of this section, the costs of each project carried out pursuant to paragraph (1)(A)(i) of this subsection shall be allocated between the Secretary and the appropriate non-Federal sponsor in accordance with the provisions of section 906(e) of this Act; except that the costs of operation and maintenance of projects located on Federal lands or lands owned or operated by a State or local government shall be borne by the Federal, State, or local agency that is responsible for management activities for fish and wildlife on such lands and, in the case of any project requiring non-Federal cost sharing, the non-Federal share of the cost of the project shall be 35 percent.

(B) Notwithstanding the provisions of subsection (a)(2) of this section, the cost of implementing the activities authorized by paragraph (1)(A)(ii) of this subsection shall be allocated in accordance with the provisions of section 906 of this Act, as if such activity was required to mitigate losses to fish and wildlife.

(8) None of the funds appropriated pursuant to any authorization contained in this subsection shall be considered to be chargeable to navigation.

(f) (1) The Secretary, in consultation with any agency established under subsection (d)(1) of this section, is authorized to implement a program of recreational projects for the system substantially in accordance with the recommendations of the GREAT I, GREAT II, and GRRM studies and the master plan reports. In addition, the Secretary, in consultation with any such agency, shall, at Federal expense, conduct an assessment of the economic benefits generated by recreational activities in the system. The cost of each such project shall be allocated between the Secretary and the appropriate non-Federal sponsor in accordance with title I of this Act.

(2) For purposes of carrying out the program of recreational projects authorized in paragraph (1) of this subsection, there is authorized to be appropriated to the Secretary not to exceed $500,000 per fiscal year for each of the first 15 fiscal years beginning after the effective date of this section.

(g) The Secretary shall, in his budget request, identify those measures developed by the Secretary, in consultation with the Secretary of Transportation and any agency established under subsection (d)(1) of this section, to be undertaken to increase the capacity of specific locks throughout the system by employing nonstructural measures and making minor structural improvements.

(h)(1) The Secretary, in consultation with any agency established under subsection (d)(1) of this section, shall monitor traffic movements on the system for the purpose of verifying lock capacity, updating traffic projections, and refining the economic evaluation so as to verify the need for future capacity expansion of the system.

(2) Determination.

(A) In general. The Secretary in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, shall determine the need for river rehabilitation and environmental enhancement and protection based on the condition of the environment, project developments, and projected environmental impacts from implementing any proposals resulting from recommendations made under subsection (g) and paragraph (1) of this subsection.

(B) Requirements. The Secretary shall

(i) complete the ongoing habitat needs assessment conducted under this paragraph not later than September 30, 2000; and

(ii) include in each report under subsection (e)(2) the most recent habitat needs assessment conducted under this paragraph.

(3) There is authorized to be appropriated to the Secretary such sums as may be necessary to carry out this subsection.

(i) (1) The Secretary shall, as he determines feasible, dispose of dredged material from the system pursuant to the recommendations of the GREAT I, GREAT II, and GRRM studies.

(2) The Secretary shall establish and request appropriate Federal funding for a program to facilitate productive uses of dredged material. The Secretary shall work with the States

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which have, within their boundaries, any part of the system to identify potential users of dredged material.

(j) The Secretary is authorized to provide for the engineering, design, and construction of a second lock at locks and dam 26, Mississippi River, Alton, Illinois and Missouri, at a total cost of $220,000,000, with a first Federal cost of $220,000,000. Such second lock shall be constructed at or in the vicinity of the location of the replacement lock authorized by section 102 of Public Law 95-502. Section 102 of this Act shall apply to the project authorized by this subsection.

4

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

05 JUN 2006

CECW-MVD

MEMORANDUM FOR COMMANDER, MISSISSIPPI VALLEY DIVISION (CEMVD-PD)

SUBJECT: Appendix A – Project Study Checklist for the Upper Mississippi River Restoration (UMRR) Program

1. Reference CEMVD-PD-SP memorandum dated 30 April 2006, subject: as above.

2. We have reviewed the enclosed project study checklist and concur that the checklist appropriately addresses programmatic issues associated with the UMRR program. As each individual project is formulated, please ensure that the district prepares the appropriate National Environmental Policy Act documentation and fully coordinates with the vertical team regarding any proposed land acquisition other than fee title to confirm that the appropriate estate is acquired. In the event a policy sensitive issue arises for an individual project, the district will coordinate a specific project study checklist with the MSC and HQUSACE for resolution through the vertical team.

FOR THE COMMANDER:

Encl

THOMAS W. WATERS. P.E.
Chief, MVD Regional Integration Team
Directorate of Civil Works

Attachment 2