Appendix A

Authorization & Agreements

Authorization and Agreements

1. Upper Mississippi River Restoration Authorization
2. USFWS Corps General Plan Agreement, Cooperative Agreement with 2001 Amendment
3. USFWS & IDNR Cooperative Agreements with 4 Amendments (1957, 1985, 1988, 2012)

1. Upper Mississippi River Restoration Authorization

Upper Mississippi River Restoration Authorization

(Formerly referred to as Environmental Management Program)

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),
Section 2 of the Water Resources Development Technical Corrections of 1999 (P.L. 106-109), and Section 3177 of the Water Resources Development Act of 2007 (P.L. 110-114).

Additional Cost Sharing Provisions

Section 906(e) of the Water Resources Development Act of 1986 (P.L. 99-662) as amended by Section 221 of the Water Resources Development Act of 1999 (P.L. 106-53).

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, including research on water quality issues affecting the Mississippi River (including elevated nutrient levels) and the development of remediation strategies.

(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.

(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 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.

SEC. 906(e). COST SHARING.

(e) In those cases when the Secretary, as part of any report to Congress, recommends activities to enhance fish and wildlife resources, the first costs of such enhancement shall be a Federal cost when--

(1) such enhancement provides benefits that are determined to be national, including benefits to species that are identified by the National Marine Fisheries Service as of national economic importance, species that are subject to treaties or international convention to which the United States is a party, and anadromous fish;

(2) such enhancement is designed to benefit species that have been listed as threatened or endangered by the Secretary of the Interior under the terms of the Endangered Species Act, as amended (16 U.S.C. 1531, et seq.), or

(3) such activities are located on lands managed as a national wildlife refuge.

When benefits of enhancement do not qualify under the preceding sentence, 25 percent of such first costs of enhancement shall be provided by non-Federal interests under a schedule of reimbursement determined by the Secretary. Not more than 80 percent of the non-Federal share of such first costs may be satisfied through in-kind contributions, including facilities, supplies, and services that are necessary to carry out the enhancement project. The non-Federal share of operation, maintenance, and rehabilitation of activities to enhance fish and wildlife resources shall be 25 percent.

2. USFWS Corps General Plan Agreement, Cooperative Agreement with 2001 Amendment

GENERAL PLAN

For the

Use of Lands in the State of Illinois Acquired for the Project, Mississippi River Between the Missouri River and Minneapolis, Minnesota, For Wildlife Conservation and Management

WHEREAS the United States, through the Department of the Army, has acquired certain lands in the State of Illinois under authority of the Acts of 3 July 1930, as amended, and 30 August 1935, for the improvement of the Mississippi River by providing a 9-Foot Navigation Channel in the Mississippi River between the Missouri River and Minneapolis, Minnesota, hereinafter referred to as the Navigation Channel Project, said lands being in and adjacent to the pools formed by Mississippi River Locks and Dams Nos. 12, 13, 14, 16, 17, 18, 20, 21, 22, 24, 25 and 26; and

WHEREAS the Department of the Army is charged with the responsibility of operating and maintaining the said Navigation Channel Project, and with the further responsibility of administering the lands appurtenant thereto to obtain the maximum sustained public benefits; and

WHEREAS the Act of 14 August 1946 (60 Stat. 1080, 16 U.S.C. 661) (Public Law 732, 79th Congress, 2nd Session) provides in Section 3 thereof that "Whenever the waters of any stream or other body of water are impounded, diverted, or otherwise controlled for any purpose whatever, by any department or agency of the United States, adequate provision consistent with the primary purposes of such impoundment, diversion, or other control shall be made for the use thereof, together with any areas of land, or interests therein, acquired or administered in connection therewith, for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon. In accordance with general plans, covering the use of such waters and other interests for these purposes, approved jointly by the head of the department or agency exercising primary administration thereof, the Secretary of the Interior, and the head of the agency exercising administration over the wildlife resources of the State wherein the waters and areas lie, such waters and other interests shall be made available without cost for administration (a) by such State agency, if the management thereof for the conservation of wildlife relates to other

than migratory birds; (b) by the Secretary of the Interior, if the waters and other interests have particular value in carrying out the national migratory bird management program;" and

WHEREAS the Secretary of the Army finds that certain of said lands acquired for the Navigation Channel Project may be made available for wildlife conservation purposes; and

WHEREAS the Secretary of the Interior finds that all of the lands in the State of Illinois acquired for the Navigation Channel Project, which may be made available for wildlife conservation purposes, including lands inundated by the pools, have particular value in carrying out the national migratory bird management program;

NOW THEREFORE, the Secretary of the Army, the Secretary of the Interior, and the Director of the Department of Conservation of the State of Illinois DO HEREBY APPROVE the following as the general plan for the use and management of such of the aforesaid lands as are found available for wildlife conservation purposes, including those lands inundated by the pools:

(a) All of the Navigation Channel Project lands in the State of Illinois shown outlined by solid red lines on Exhibits A through Z and AA through TT, attached hereto and made a part hereof, shall be made available by the Secretary of the Army to the Secretary of the Interior for wildlife conservation and management by a cooperative agreement. The Secretary of the Interior may, upon request of the Director, make all or any part of such lands available to the State for administration under cooperative agreement.

(b) All of the lands covered by this General Plan which are suitable and adaptable for agricultural purposes shall be used for the production of crops, and any agricultural lands not so used shall revert to the Department of the Army without further action by the parties hereto.

(c) It is agreed that any application for an instrument granting rights-of-way for roads, telephone lines, power lines, and other similar uses over, across, in, and upon lands of either the Department of the Interior which are within and adjacent to the pools formed by said Mississippi River locks and dams or lands of the Department of the Army covered by this Plan will be submitted for processing to the agency having primary

jurisdiction over the lands involved but each agency will obtain concurrence of the other at field level.

(d) It may become desirable to modify this plan because some Navigation Channel Project lands, not herein made available for wildlife conservation purposes, may hereafter become available for those purposes; or a need and a demand may develop for facilities under the cognizance of the Department of the Army on certain lands herein made available for wildlife conservation purposes. In either event, modification of the areas covered by this plan will be made by mutual consent of all three parties hereto.

(e) Certain parcels of the lands which shall be made available to the Secretary of the Interior as provided in (a) above are covered by existing agricultural leases. Each such lease, which is in force and effect as of the last date of approval of this plan, will be terminated in accordance with the provisions of the lease within approximately one year from said last date of approval of this plan. In order to facilitate wildlife conservation and management, the said Division Engineer will furnish the Director, Fish and Wildlife Service, one conforming copy of each such lease as soon as practicable after the last date of approval of this plan, together with information as to when each lease will be terminated. The said Division Engineer will inform each lessee involved, at appropriate times, that his lease will be terminated as of a certain date; that the leased premises have been included with other lands made available to the Secretary of the Interior for management in the interest of wildlife conservation.

(f) The Department of the Army permits issued to the Fish and Wildlife Service dated 10 October 1945, as extended, 27 August 1947, as extended, and 28 July 1948 covering lands in the State of Illinois; the right to police certain lands in Carroll County Drainage and Levee District No. 1 in said Pool No. 13 and in the Swan Lake Area in said Pool No. 26 granted in letters from the Secretary of War to the Secretary of the Interior dated 3 October 1940 and 3 October 1942, respectively; the right to manage for wildlife conservation certain lands in Calhoun County, Illinois, in said Pool No. 26 granted by letter from the Secretary of War to the Secretary of the Interior dated 28 October 1944; and that part of the agreement

between the Corps of Engineers and the Fish and Wildlife Service dated 15 May 1945 which pertains to lands in the State of Illinois shall be and are hereby terminated as of the last date of approval of this plan.

(g) The Secretary of the Interior shall take appropriate action at an early date to secure the revocation of Public Land Orders Nos. 379, 380 and 381.

(h) Pending the execution of said cooperative agreement between the Department of the Army and the Department of the Interior following revocation of Public Land Orders Nos. 379, 380, and 381 as provided in (g) above, temporary permission and authority are hereby given to the Secretary of the Interior, effective on the last date of approval of this plan, to manage for wildlife purposes in general accord with this plan the lands to be made available in accordance with paragraph (a) above. Said co-operative agreement shall be subject to the provisions and conditions of this plan and to any other conditions to be provided in said agreement.

IN WITNESS WHEREOF the parties hereto have affixed their signatures and dates thereof as follows:

DATE 2 November 1953 /s/ Robert T. Stevens
Secretary of the Army

DATE 27 October 1953 /s/ Orme Lewis
Asst Secretary of the Interior

DATE 11 February 1953 /s/ Glen D. Palmer
Director, Department of Conservation
State of Illinois

FWS

See Conds 7, 8, 9, & 13 -

COOPERATIVE AGREEMENT
Between the
DEPARTMENT OF THE ARMY
and the
DEPARTMENT OF THE INTERIOR, BUREAU OF SPORT FISHERIES AND WILDLIFE

THIS AGREEMENT made and entered into this 14th day of February, 1963 between the Department of the Army and the [redacted] through the Bureau of Sport Fisheries and Wildlife, hereinafter referred to as the Bureau, witnesseth that:

WHEREAS THE UNITED STATES, through the Department of the Army, has acquired certain lands in fee for the improvement of navigation in the upper Mississippi River to provide a 9-foot channel from the Missouri River to Minneapolis, hereinafter referred to as the Navigation Channel Project, and

WHEREAS, pursuant to Section 3 of the Fish and Wildlife Coordination Act (48 Stat. 401 as amended by 60 Stat. 1080 and 72 Stat. 563; 16 U.S.C. 661 et seq.), there have been formulated GENERAL PLANS FOR THE USE OF LANDS AND WATERS OF THE NAVIGATION CHANNEL PROJECT FOR WILDLIFE CONSERVATION AND MANAGEMENT and the same have been approved by the Secretary of the Army, the Secretary of the Interior, and the heads of the State agencies exercising administration over wildlife resources within the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin:

NOW THEREFORE, in accordance with the aforesaid Section 3 of the Fish and Wildlife Coordination Act and the aforesaid General Plans, the parties hereto hereby enter into this Cooperative Agreement.

THE DEPARTMENT OF THE ARMY hereby makes available to the Bureau the land and water areas of the Navigation Channel Project substantially as shown outlined in red on the exhibits attached to the General Plans referred to above, and by reference made a part hereof, for the conservation, maintenance, and management of wildlife resources thereof, and its habitat thereon, in connection with the national migratory bird management program in accordance with said General Plans. This Cooperative Agreement shall be subject to the provisions and conditions of the said General Plans and to the following additional conditions:

1. The Department of the Army reserves all rights, in and to the lands above described, which are not herein specifically granted, including, but not limited to, the development of facilities for public use in accordance with Condition 10 of this agreement, the harvesting and selling of merchantable timber, and the right to use existing roads as a means of ingress and egress to and from the Mississippi River and to any areas which the Department of the Army administers. In those cases where no roads exist, the Department of the Army reserves the right to designate, construct, maintain, and use roads or routes across said lands. No part of the foregoing shall be construed as a commitment by the Department of the Army to construct, improve, or maintain any road or route.

2. The use and occupation of the said premises shall be without cost or expense to the Department of the Army, under the general supervision of either the Division Engineer, U. S. Army Engineer Division, North Central, Chicago, Illinois, for Pools 4 through 22, or the Division Engineer, U. S. Army Engineer Division, Lower Mississippi Valley, Vicksburg, Mississippi, for Pools 24 through 26, both hereinafter referred to as the responsible Division Engineer, and subject also to such rules and regulations in the interest of navigation and flood control as they may from time to time prescribe.

3. Any damage to the property above described which results as an incident to the exercise of the privileges herein granted, shall be promptly corrected by the Bureau to the satisfaction of the responsible Division Engineer. The Bureau shall also take appropriate action to prevent and eliminate any trespass or unauthorized use of said property and shall report to the responsible Division Engineer each year on or before 1 April any such trespass or unauthorized use which may have occurred and the action taken to eliminate the same.

4. The exercise of the privileges herein granted shall in no way interfere with navigation and shall be subject at all times, without notice to or approval of the Bureau, to the occupation and use by the public for navigation and by the Department of the Army for navigation, flood control, and all other related purposes, including, but not limited

to, change in water-surface elevations, dredging and deposition of spoil therefrom and construction of training works, bank protection, and navigation aids.

5. The Department of the Army reserves the right to dispose of lands covered by this agreement for commercial and industrial sites; provided, that a condition of such disposal shall be the payment to the Bureau or the pertinent State of the current appraised value, approved by the responsible Division Engineer, of any improvements made by the Bureau or the pertinent State on the site.

6. It is agreed that any application for an instrument granting rights-of-way for roads, telephone lines, power lines, and other similar uses over, across, in, and upon lands of either the Department of the Interior which are within and adjacent to the pools formed by said Mississippi River locks and dams or lands of the Department of the Army covered by this agreement will be submitted for processing to the agency having primary jurisdiction over the lands involved bub each agency will obtain concurrence of the other at field level.

7. It is understood that the privileges hereby granted do not preclude the necessity of obtaining from the Department of the Army permits for work and structures in, under or over navigable waters as may be required under the provisions of Section 10 of the Act of March 3, 1899 (30 Stat. 1151; 33 U.S.C. 403).

8. No additions to or alterations of the premises shall be made without the prior written consent of the responsible Division Engineer.

9. In accordance with the aforesaid General Plans, authority to administer the lands and waters covered by this agreement may be delegated to the heads of the State agencies exercising administration over the wildlife resources of the aforesaid States by cooperative agreements entered into pursuant to the provisions of Sections 1 and 4 of the said Fish and Wildlife Coordination Act. Three copies of each such cooperative agreement shall be furnished to the responsible Division Engineer promptly upon execution.

10. In the development of the lands described herein for public use, the Department of the Army may, in its discretion, develop public use facilities or issue leases, licenses and easements for the same purpose, and special use licenses authorizing non-exclusive private uses which do not interfere with public use of the areas involved. However, every proposal for development of a public use area will first be coordinated with the Bureau for its recommendation and the Department of the Army will give full consideration to any adverse effect which any proposed development may have upon the wildlife management program. The instruments provided for in this condition shall be issued only by the Department of the Army and shall contain appropriate provisions prescribed by the Bureau regarding wildlife management, including the continuing rights of the Bureau to post and patrol to enforce hunting regulations; however, the Bureau shall not have the right to deny access to or use of public use areas as selected hereunder. Notification of selection by the Department of the Army of sites or areas for public use will be given to the Bureau at least thirty (30) days prior to effective date thereof and three copies of any instrument issued will be furnished to the Bureau.

11. Certain parcels of the lands covered by this agreement are covered by outgrants which may remain in force and effect indefinitely. The administration and use of such parcels shall be subject to all the rights and privileges reserved to the former owners at the time the lands were acquired by the United States for the Nine-Foot Channel project and the wildlife management activities of the Bureau on such parcels shall be limited to posting and patrolling to enforce hunting regulations. In order to facilitate wildlife conservation and management, the responsible Division Engineer will furnish the Bureau one conforming copy of each such outgrant as soon as practicable after the last date of approval of this agreement.

12. Agricultural leases on lands covered by this agreement which are in force and effect as of the last date of approval of this agreement, will be terminated in accordance with the provisions of the leases within approximately one year from said last date of approval of this agreement. In order to facilitate wildlife conservation and management, the responsible Division

Engineer will furnish the Bureau one conforming copy of each such lease as soon as practicable after the last date of approval of this agreement, together with information as to when each lease will be terminated. The responsible Division Engineer will inform each lessee involved, at appropriate times, that his lease will be terminated as of a certain date; that the leased premises have been included with other lands made available to the Secretary of the Interior for management in the interest of wildlife conservation.

13. All of the lands covered by this agreement which are suitable and adaptable for agricultural purposes shall be used for the production of crops and any agricultural lands not so used shall revert to the Department of the Army. The use of all agricultural lands covered hereunder shall be in compliance with laws, rules and regulations administered by the Department of Agriculture and applicable to this type of land; provided, that no part of the foregoing shall be construed as prohibiting the use of sharecrop agreements. All crops accruing to the Bureau or the pertinent States shall be used exclusively to provide food for wildlife and for no other purpose. However, in the event that all the yield thus made available for wildlife food is not used for that purpose, either by the States or the Bureau, the Bureau or the States shall, in order to avoid waste, sell for cash the remainder thereof in such manner as to protect the public interest. Pursuant to Section 4 of the Act of Congress approved 22 December 1944, as amended (76 Stat. 1195; 16 U.S.C. 460d), all proceeds from the disposal of any surplus production may be used by the Bureau or the States in the development, conservation, maintenance and utilization of such lands; provided, that any balance of proceeds not so utilized shall be paid to the responsible Division Engineer at five-year intervals. In connection therewith, the Bureau shall establish and maintain adequate accounts and render annual statements of receipts and expenditures to the responsible Division Engineer.

14. The Bureau shall administer and maintain the premises made available for wildlife conservation and management in accordance with an annual management program prepared and submitted to the responsible Division Engineer each year on or before 1 April. Such annual management program shall include information as to all areas designated for public

hunting, wildlife refuges, the production of food for wildlife, or other purposes; nature, site, and layout of proposed construction and improvements; estimated cost of construction of planned improvements; and plans for other such activities, on lands made available under this agreement. The annual management program may be amended from time to time as may be necessary, but the responsible Division Engineer shall be informed thereof prior to the effective date of any change.

15. This agreement may be revoked at the discretion of the Department of the Army in case of national emergency declared by the President, or in event of violation of any of the terms and conditions of this agreement, which violation is continued for a period of thirty (30) days after notice in writing by the responsible Division Engineer, or for nonuse for a period of two consecutive years.

16. This agreement may be relinquished by the Bureau at any time by giving to the responsible Division Engineer at least thirty (30) days' notice in writing.

17. If this agreement is relinquished or revoked as provided above, the Bureau shall vacate the said premises, remove all property of the Bureau therefrom, and subject to availability of funds therefor restore the premises to a condition satisfactory to the responsible Division Engineer, ordinary wear and tear and damage beyond the control of the Bureau excepted, within such time as the Secretary of the Army may designate.

18. The Cooperative Agreement dated 21 January 1954 between the Department of the Army and the Department of the Interior, as amended by Supplemental Agreement No. 1 dated 10 October 1958, is hereby terminated as of the last date of approval of this agreement.

3 Oct 1961
(Date)

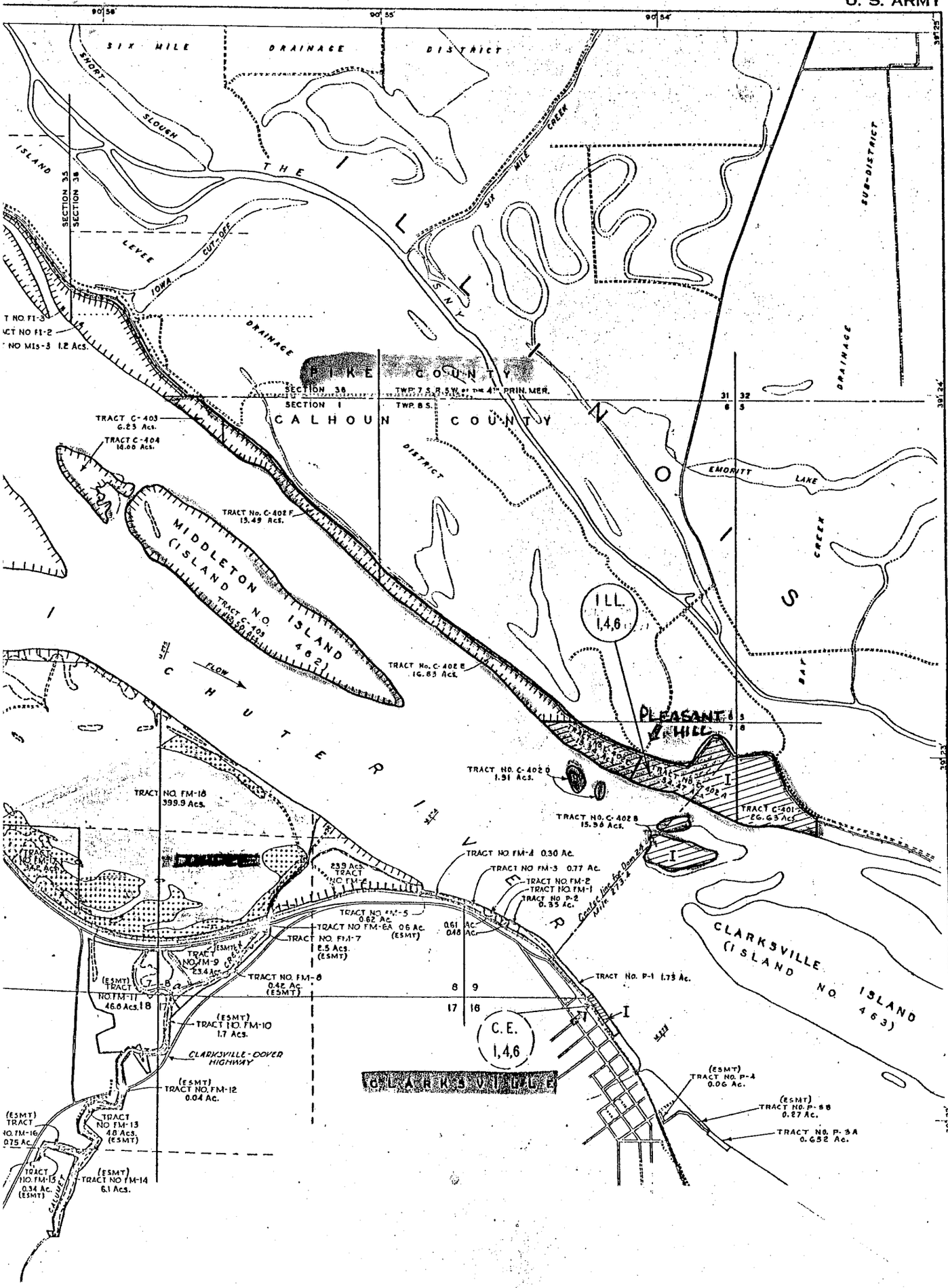
DEPARTMENT OF THE ARMY

By Virginia H. Hilsdell

DEPARTMENT OF THE INTERIOR,
BUREAU OF SPORT FISHERIES
AND WILDLIFE

FEB 14 1962
(Date)

By R. V. Jamieson



UPPER MISSISSIPPI RIVER
MASTER PLAN
NAVIGATION POOL 24

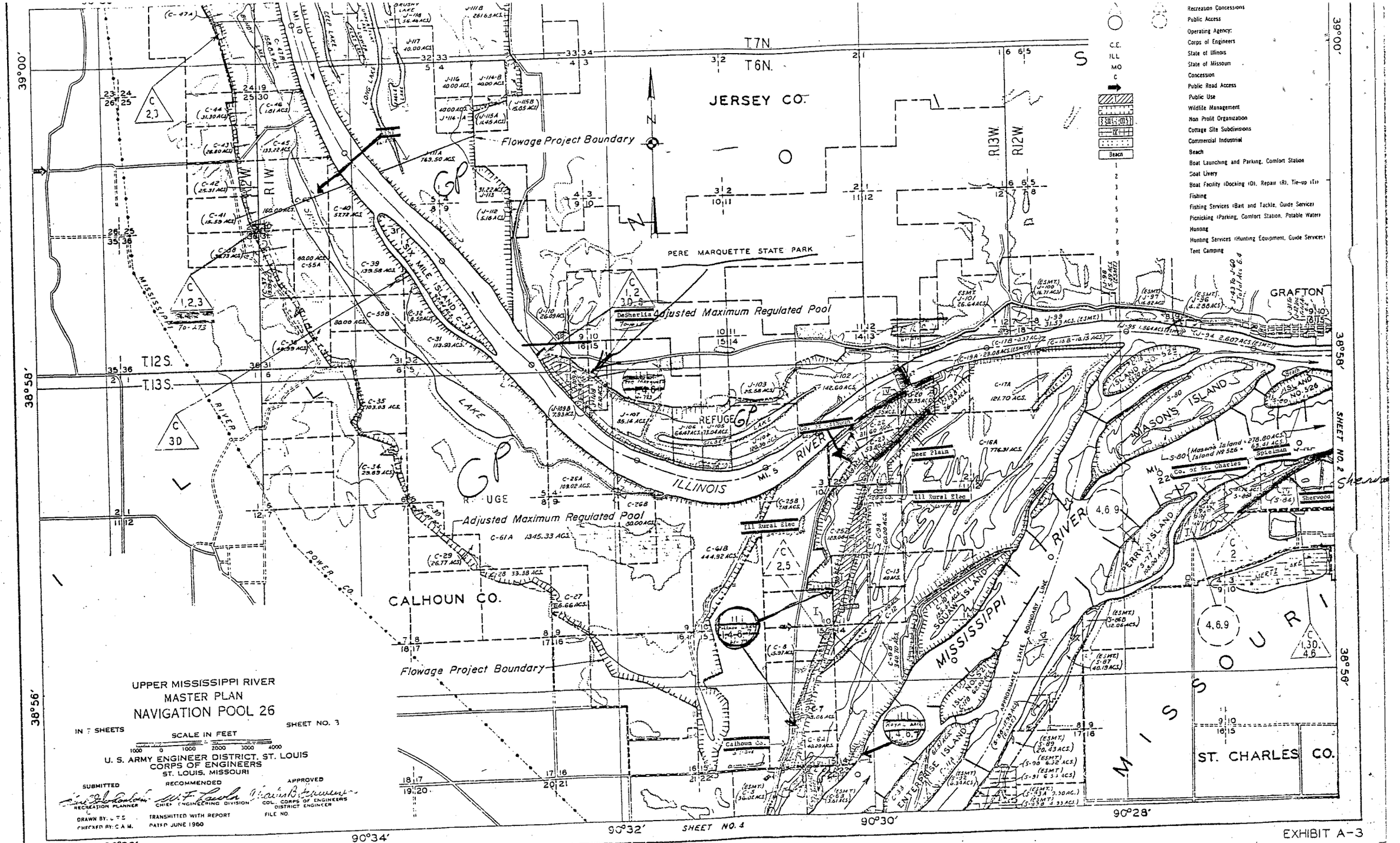
IN 7 SHEETS SHEET NO. 1

SCALE IN FEET
1000 0 1000 2000 3000

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

SUBMITTED	RECOMMENDED	APPROVED
RECREATION PLANNER	CHIEF, ENGINEERING DIVISION	COL, CORPS OF ENGINEERS DISTRICT ENGINEER

DRAWN BY: D T S
CHECKED BY: C. A. M.
TRANSMITTED WITH REPORT DATED MARCH 1961
FILE NO.



UPPER MISSISSIPPI RIVER
MASTER PLAN
NAVIGATION POOL 26

IN 7 SHEETS

SHEET NO. 3

SCALE IN FEET
1000 0 1000 2000 3000 4000

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

SUBMITTED	RECOMMENDED	APPROVED
RECREATION PLANNER	CHIEF, ENGINEERING DIVISION	COL., CORPS OF ENGINEERS, DISTRICT ENGINEER

DRAWN BY: C T S
CHECKED BY: C A M
TRANSMITTED WITH REPORT
DATED JUNE 1960
FILE NO.

EXHIBIT A-3

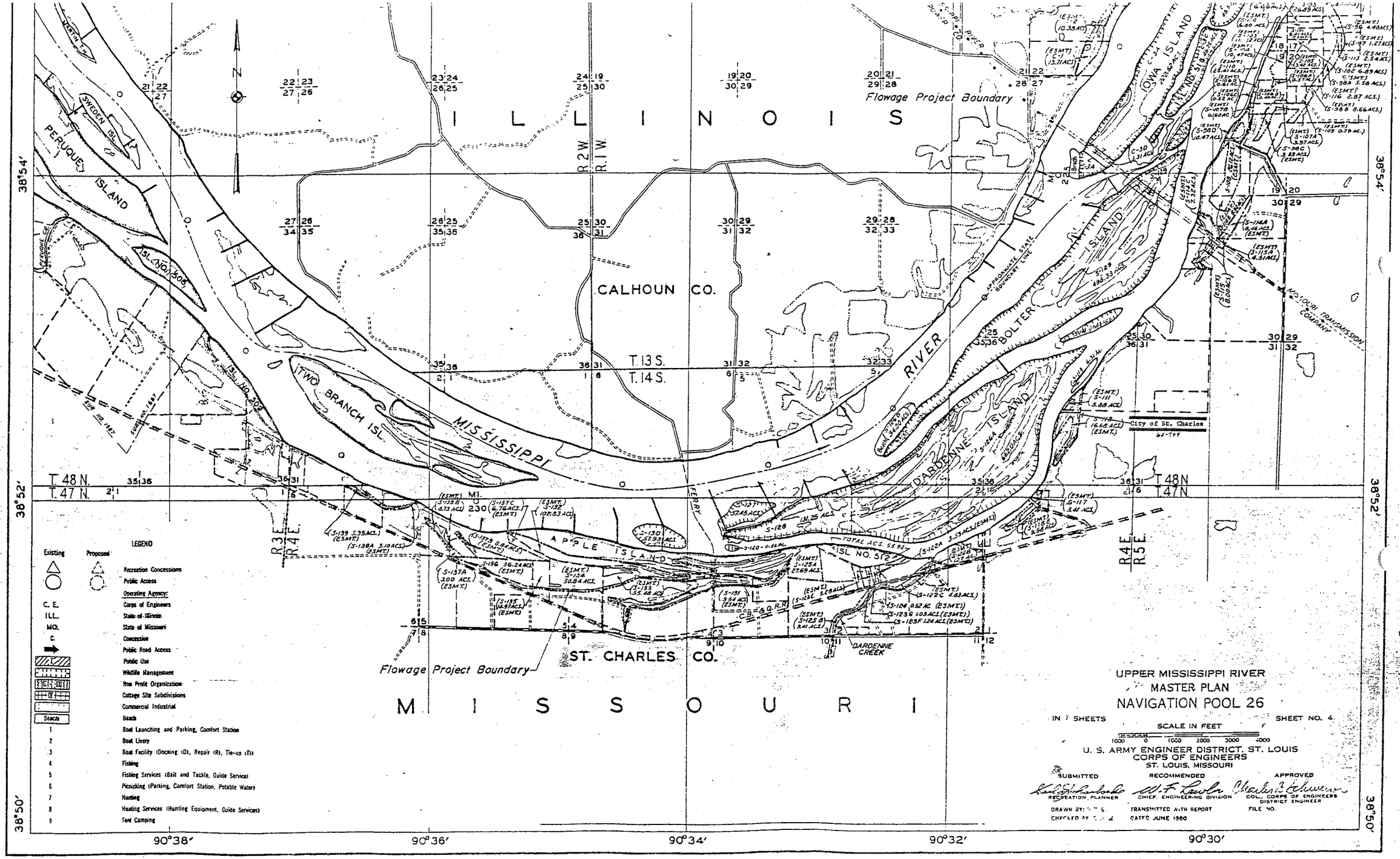
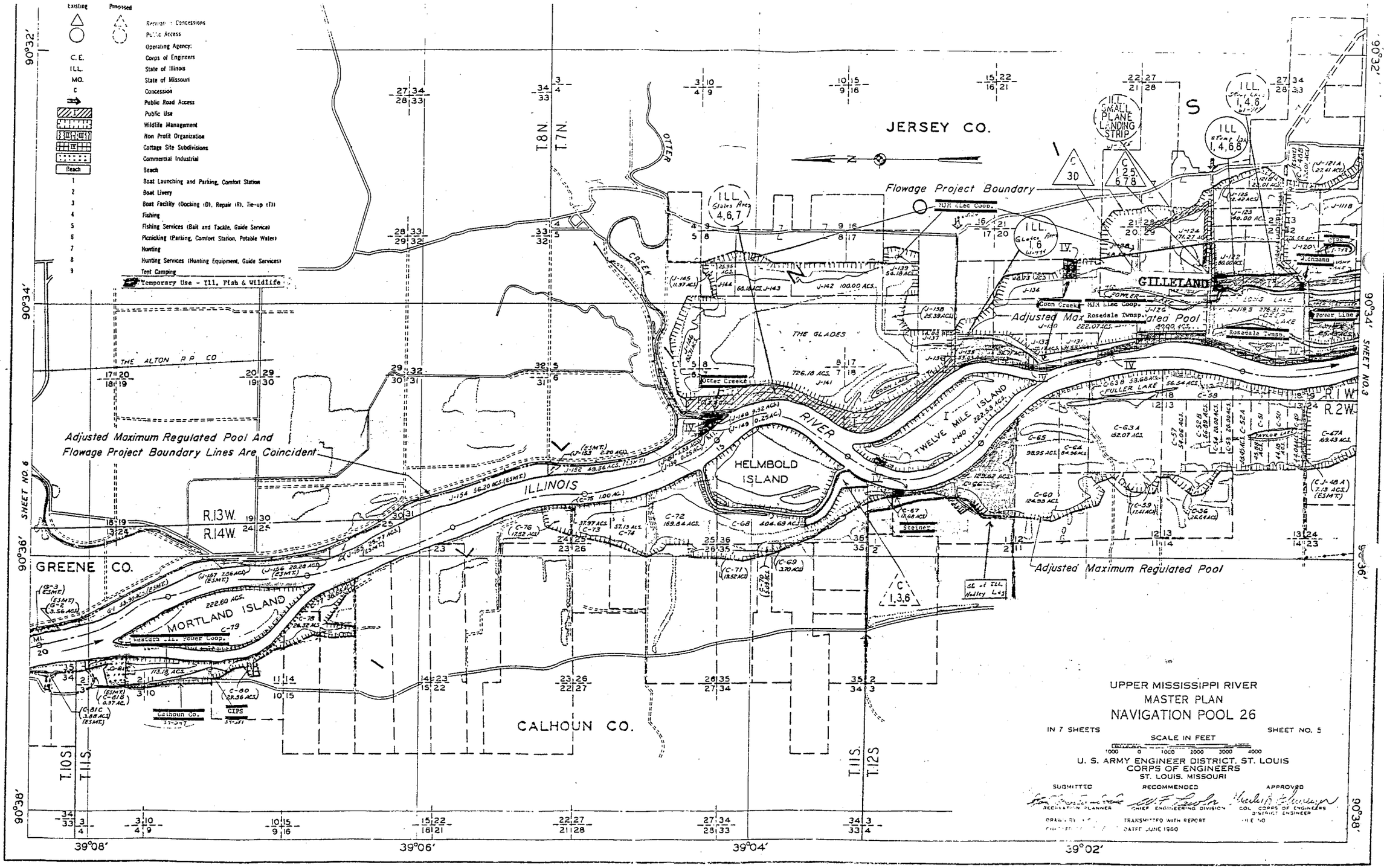
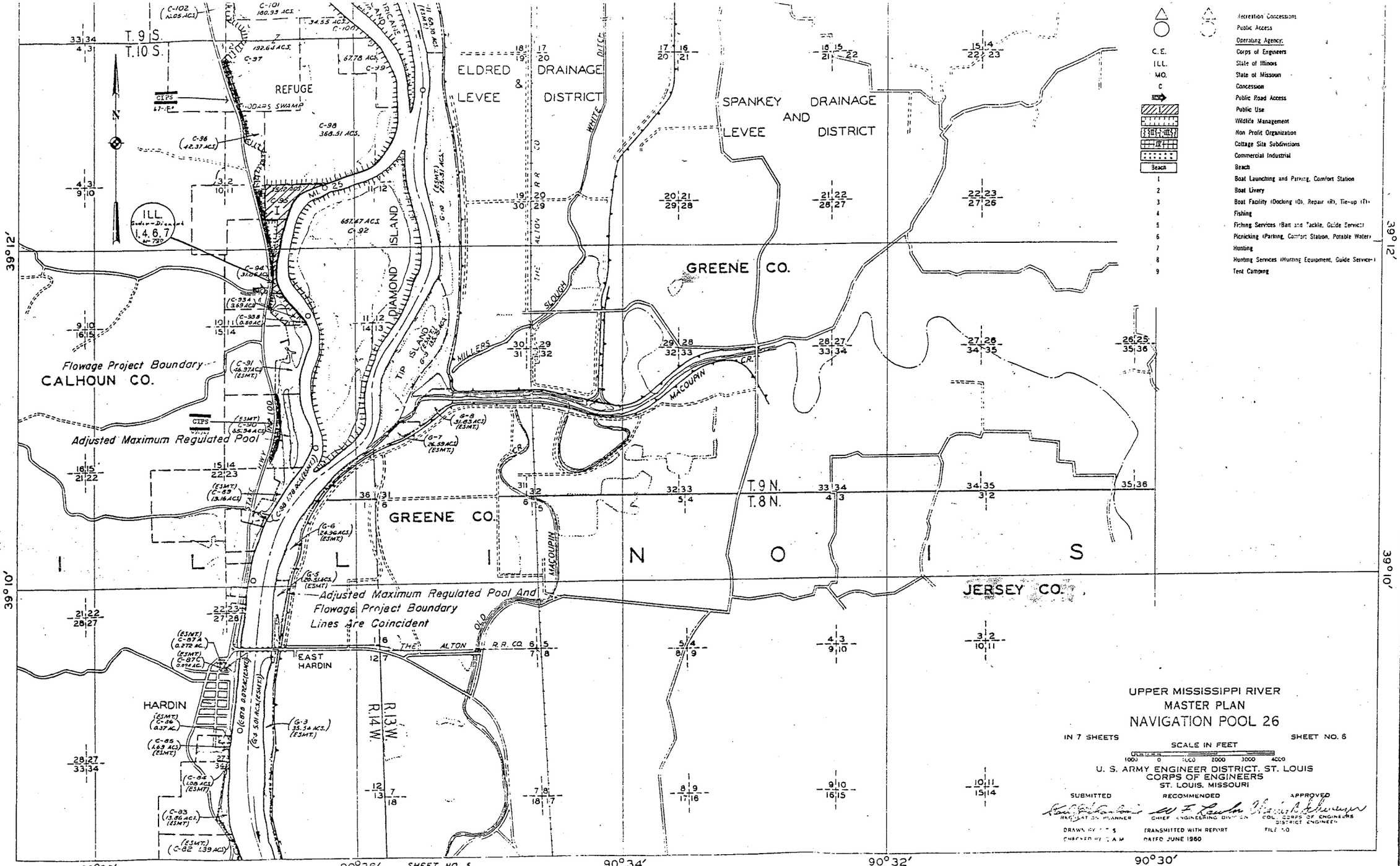

ILLINOIS
MISSOURI
CALHOUN CO.
ST. CHARLES CO.
Flowage Project Boundary
Flowage Project Boundary
PERUQUE ISLAND
SWEDEN ISL.
ISLAND 508
TWO BRANCH ISL.
MISSISSIPPI RIVER
APPLE ISLAND
DARDENNE ISLAND
BOLTER ISLAND
IOWA ISLAND
ISL. NO. 512
ISL. NO. 509
ISL. NO. 507
ISL. NO. 506
ISL. NO. 505
ISL. NO. 504
ISL. NO. 503
ISL. NO. 502
ISL. NO. 501
DARDENNE CREEK
FERRY
City of St. Charles
MISSOURI TRANSMISSION COMPANY
APPROXIMATE STATE BOUNDARY LINE
T.13S.
T.14S.
T. 48 N.
T. 47 N.
R2W
R1W
R3E
R4E
R5E
38°54'
38°52'
38°50'
90°38'
90°36'
90°34'
90°32'
90°30'
LEGEND
Existing
Proposed
Recreation Concessions
Public Access
Operating Agency:
Corps of Engineers
State-of-Illinois
State of Missouri
Concession
Public Road Access
Public Use
Wildlife Management
Non Profit Organization
Cottage Site Subdivisions
Commercial Industrial
Beach
1 Boat Launching and Parking, Comfort Station
2 Boat Livery
3 Boat Facility (Docking (D), Repair (R), Tie-up (T))
4 Fishing
5 Fishing Services (Bait and Tackle, Guide Service)
6 Picnicking (Parking, Comfort Station, Potable Water)
7 Hunting
8 Hunting Services (Hunting Equipment, Guide Services)
9 Tent Camping
UPPER MISSISSIPPI RIVER
MASTER PLAN
NAVIGATION POOL 26
IN 7 SHEETS
SHEET NO. 4.
SCALE IN FEET
1000 0 1000 2000 3000 4000
U. S. ARMY ENGINEER DISTRICT, ST. LOUIS
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI
SUBMITTED
RECREATION PLANNER
RECOMMENDED
CHIEF, ENGINEERING DIVISION
APPROVED
COL., CORPS OF ENGINEERS
DISTRICT ENGINEER
DRAWN BY:
CHECKED BY
TRANSMITTED WITH REPORT
DATED JUNE 1960
FILE NO.

EXHIBIT A-4


Existing
Proposed
C.E.
ILL.
MO.
C
Reach
1
2
3
4
5
6
7
8
9
Recreation Concessions
Public Access
Operating Agency:
Corps of Engineers
State of Illinois
State of Missouri
Concession
Public Road Access
Public Use
Wildlife Management
Non Profit Organization
Cottage Site Subdivisions
Commercial Industrial
Beach
Boat Launching and Parking, Comfort Station
Boat Livery
Boat Facility (Docking (D), Repair (R), Tie-up (T))
Fishing
Fishing Services (Bait and Tackle, Guide Service)
Picnicking (Parking, Comfort Station, Potable Water)
Hunting
Hunting Services (Hunting Equipment, Guide Services)
Tent Camping
Temporary Use - Ill. Fish & Wildlife
JERSEY CO.
GREENE CO.
CALHOUN CO.
Flowage Project Boundary
Adjusted Maximum Regulated Pool And
Flowage Project Boundary Lines Are Coincident
Adjusted Maximum Regulated Pool
ILLINOIS RIVER
HELMBOLD ISLAND
TWELVE MILE ISLAND
MORTLAND ISLAND
THE GLADES
GILLELAND
THE ALTON R P CO
Otter Creek
Coon Creek
Fuller Lake
Long Lake
Steiner
Rosedale Twnsp.
Western Ill. Power Coop.
NUA Elec Coop.
Calhoun Co.
CIPS
ILL. Glades Area 4,6,7
ILL. Glades Area 1,6
ILL. Small Plane Landing Strip
ILL. State Lds. 1,4,6
ILL. State Lds. 1,4,6,8
C 30
C 125 678
C 1,3,6
St. of ILL. Valley Lds.
SHEET NO. 6
SHEET NO. 3
T.8N.
T.7N.
T.10S.
T.11S.
T.12S.
R.13W.
R.14W.
R.1W.
R.2W.
90°32'
90°34'
90°36'
90°38'
39°08'
39°06'
39°04'
39°02'
UPPER MISSISSIPPI RIVER
MASTER PLAN
NAVIGATION POOL 26
IN 7 SHEETS
SHEET NO. 5
SCALE IN FEET
1000 0 1000 2000 3000 4000
U. S. ARMY ENGINEER DISTRICT, ST. LOUIS
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI
SUBMITTED
RECOMMENDED
APPROVED
RECREATION PLANNER
CHIEF ENGINEERING DIVISION
COL. CORPS OF ENGINEERS
DISTRICT ENGINEER
TRANSMITTED WITH REPORT
DATED JUNE 1960



UPPER MISSISSIPPI RIVER
MASTER PLAN
NAVIGATION POOL 26

IN 7 SHEETS — SHEET NO. 6

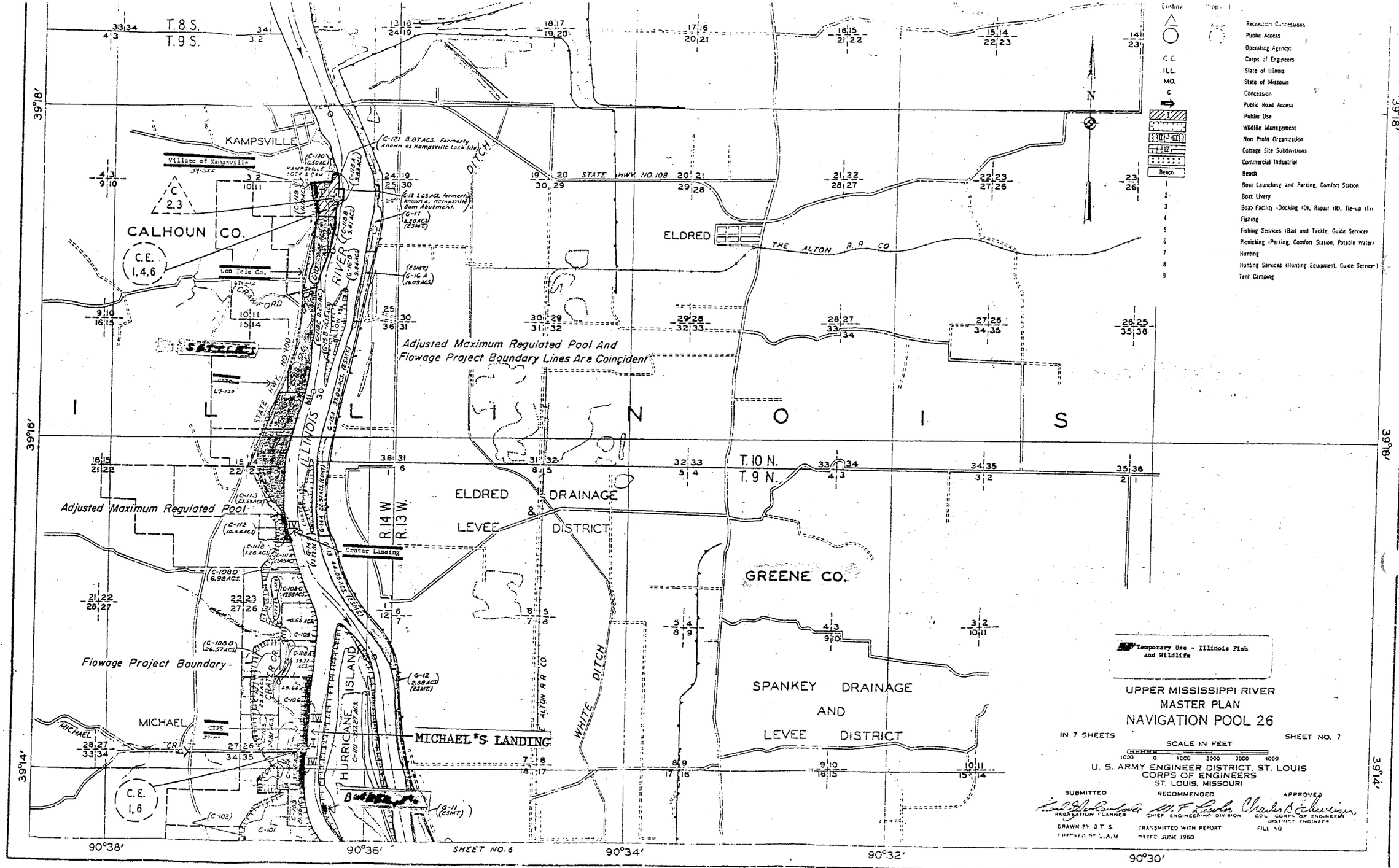
SCALE IN FEET
1000 0 1000 2000 3000 4000

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

SUBMITTED — RECOMMENDED — APPROVED

DRAWN BY [illegible]
CHECKED BY [illegible]
TRANSMITTED WITH REPORT DATED JUNE 1960
FILE NO.

EXHIBIT A-6



UPPER MISSISSIPPI RIVER
MASTER PLAN
NAVIGATION POOL 26

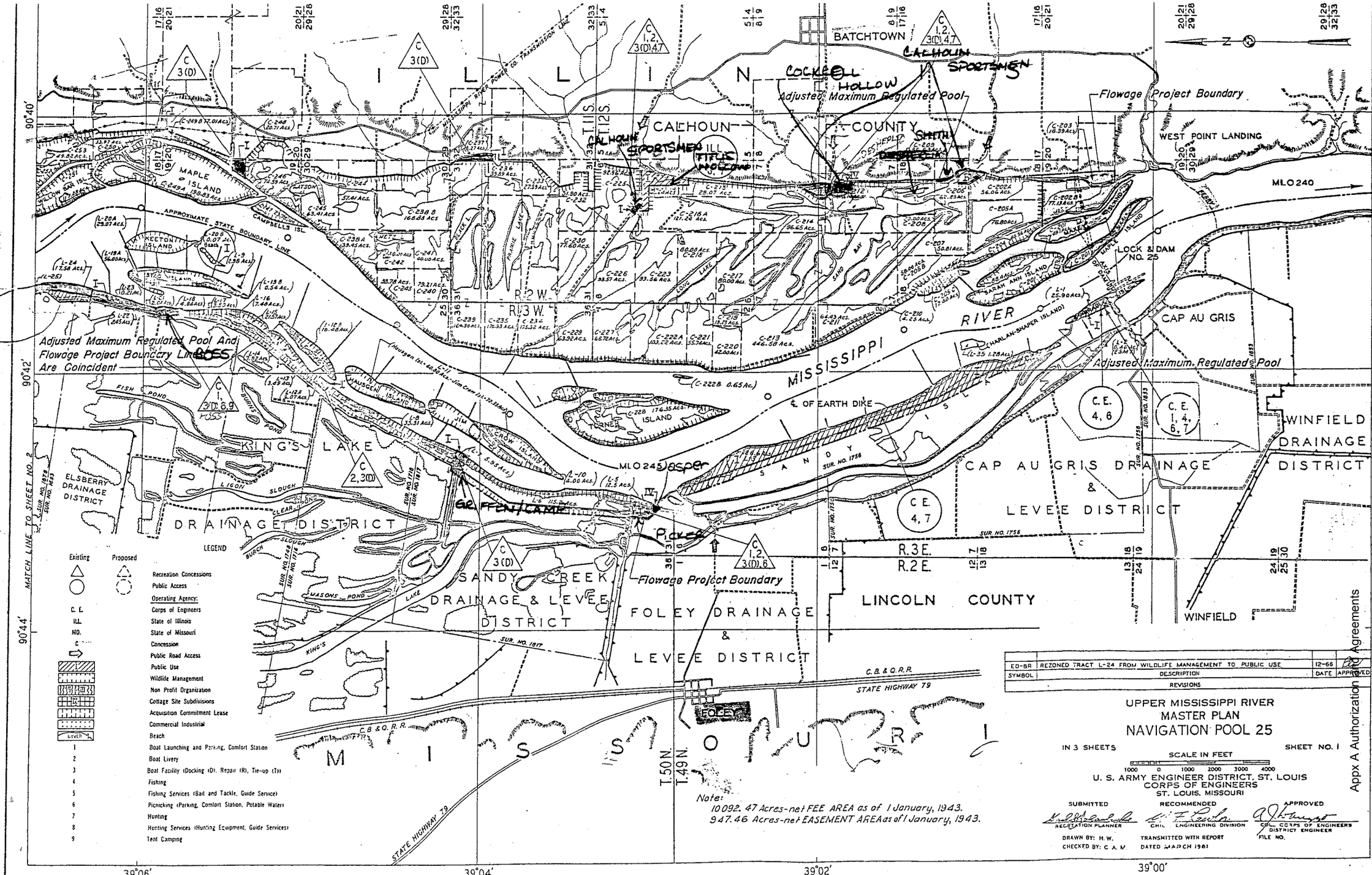
IN 7 SHEETS — SHEET NO. 7

SCALE IN FEET
1000 0 1000 2000 3000 4000

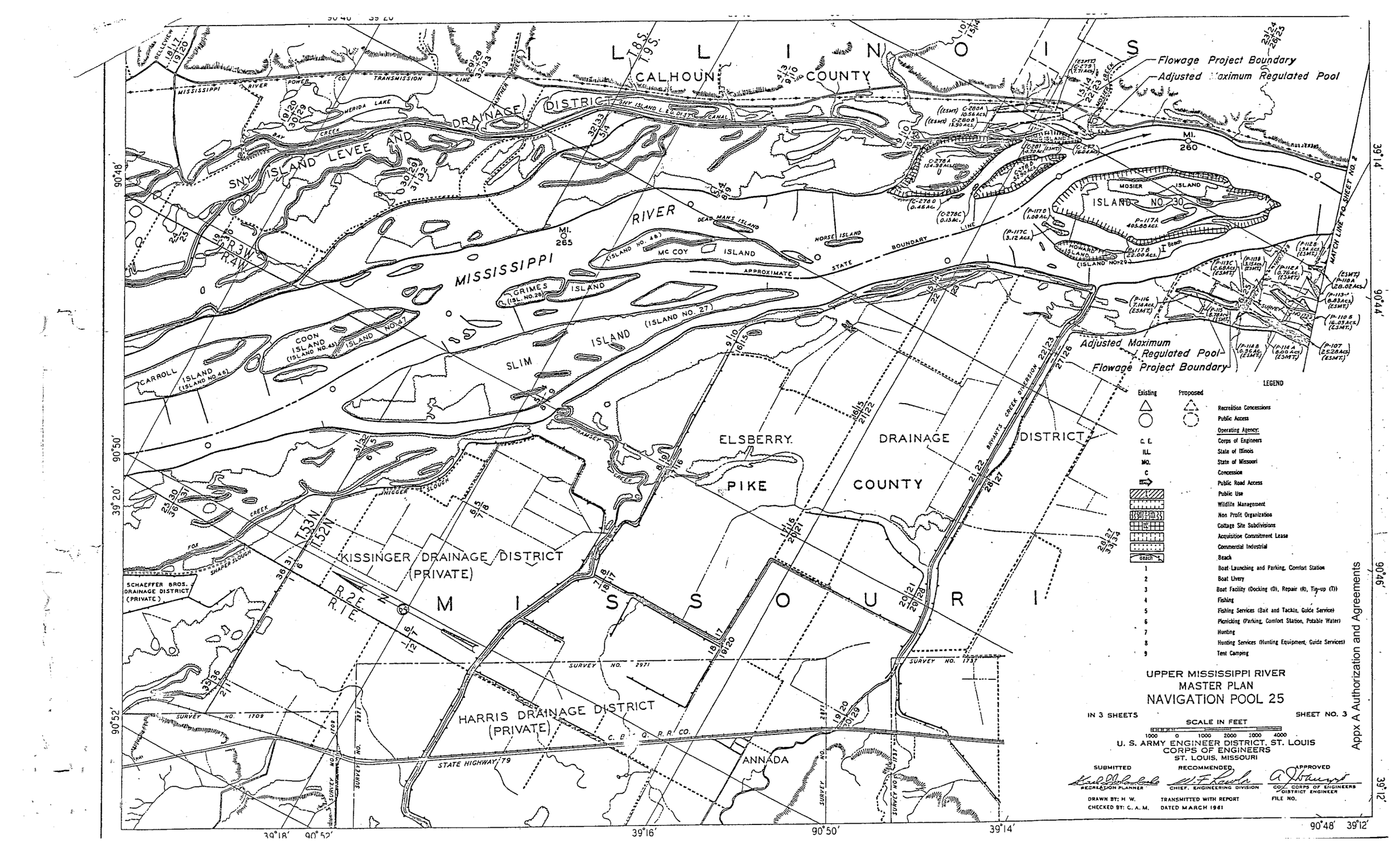
U. S. ARMY ENGINEER DISTRICT, ST. LOUIS
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

SUBMITTED	RECOMMENDED	APPROVED
RECREATION PLANNER	CHIEF ENGINEERING DIVISION	COL., CORPS OF ENGINEERS, DISTRICT ENGINEER

DRAWN BY D.T.S. — TRANSMITTED WITH REPORT — FILE NO.
CHECKED BY L.A.M. — DATED JUNE 1960


ILLINOIS
CALHOUN COUNTY
BATCHTOWN
COCKEREL HOLLOW
Adjusted Maximum Regulated Pool
Flowage Project Boundary
WEST POINT LANDING
MLO 240
MAPLE ISLAND
KEETON ISLAND
APPROXIMATE STATE BOUNDARY LINE
CAMPBELLS ISL.
LOCK & DAM NO. 25
SARAH ANN ISLAND
HARLAN-SHAPER ISLAND
CAP AU GRIS
Adjusted Maximum Regulated Pool And Flowage Project Boundary Line Are Coincident
MISSISSIPPI RIVER
HAUSSEN ISLAND
TURNER ISLAND
CROW ISLAND
KING'S LAKE
FISH POND
SUNKEN POND
ELSBERRY DRAINAGE DISTRICT
DRAINAGE DISTRICT
SANDY CREEK DRAINAGE & LEVEE DISTRICT
FOLEY DRAINAGE & LEVEE DISTRICT
CAP AU GRIS DRAINAGE & LEVEE DISTRICT
WINFIELD DRAINAGE DISTRICT
WINFIELD
LINCOLN COUNTY
GRIFFENTAMP
Picker
MLO 245 Jasper
SUR. NO. 1756
SUR. NO. 1817
SUR. NO. 1653
SUR. NO. 1818
SUR. NO. 1819
SUR. NO. 1820
C.E. 4, 6
C.E. 1, 4, 6, 7
C.E. 4, 7
C.B. & Q.R.R.
STATE HIGHWAY 79
FOLEY
MISSOURI
T.50N.
T.49N.
T.11S.
T.12S.
R.2W.
R.3W.
R.3E.
R.2E.
MATCH LINE TO SHEET NO. 2
90°40'
90°42'
90°44'
39°06'
39°04'
39°02'
39°00'
LEGEND
Existing
Proposed
Recreation Concessions
Public Access
Operating Agency:
C. E. Corps of Engineers
Ill. State of Illinois
Mo. State of Missouri
C Concession
Public Road Access
Public Use
Wildlife Management
Non Profit Organization
Cottage Site Subdivisions
Acquisition Commitment Lease
Commercial Industrial
Beach
1 Boat Launching and Parking, Comfort Station
2 Boat Livery
3 Boat Facility (Docking (D), Repair (R), Tie-up (T))
4 Fishing
5 Fishing Services (Bait and Tackle, Guide Service)
6 Picnicking (Parking, Comfort Station, Potable Water)
7 Hunting
8 Hunting Services (Hunting Equipment, Guide Services)
9 Tent Camping
Note:
10092.47 Acres-net FEE AREA as of 1 January, 1943.
947.46 Acres-net EASEMENT AREA as of 1 January, 1943.
ED-BR REZONED TRACT L-24 FROM WILDLIFE MANAGEMENT TO PUBLIC USE 12-66
SYMBOL DESCRIPTION DATE APPROVED
REVISIONS
UPPER MISSISSIPPI RIVER
MASTER PLAN
NAVIGATION POOL 25
IN 3 SHEETS
SHEET NO. 1
SCALE IN FEET
1000 0 1000 2000 3000 4000
U. S. ARMY ENGINEER DISTRICT, ST. LOUIS
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI
SUBMITTED
RECREATION PLANNER
RECOMMENDED
CHIEF, ENGINEERING DIVISION
APPROVED
COL. CORPS OF ENGINEERS
DISTRICT ENGINEER
DRAWN BY: H.W.
CHECKED BY: C.A.M.
TRANSMITTED WITH REPORT
DATED MARCH 1961
FILE NO.
Appx A Authorization and Agreements


39°14'
90°42'
39°12'
39°10'
90°40'
39°08'
ILLINOIS
Adjusted Maximum Regulated Pool
Flowage Project Boundary
CALHOUN COUNTY
HAMBURG
MISSISSIPPI RIVER
APPROXIMATE STATE BOUNDARY LINE
WESTPORT ISLAND
(ISLAND NO. 31)
EAGLE ISLAND
(ISLAND NO. 36)
STERLING ISLAND
(ISLAND NO. 37)
ISLAND NO. 32
ISLAND NO. 33
ISLAND NO. 34
ISLAND NO. 35
ISLAND NO. 17
ISLAND NO. 27
ISLAND NO. 28
ISLAND NO. 29
ISLAND NO. 30
ISLAND NO. 38
ISLAND NO. 39
ISLAND NO. 40
ISLAND NO. 41
ISLAND NO. 42
ISLAND NO. 43
ISLAND NO. 44
ISLAND NO. 45
ISLAND NO. 46
ISLAND NO. 47
ISLAND NO. 48
ISLAND NO. 49
ISLAND NO. 50
ISLAND NO.


ILLINOIS
CALHOUN COUNTY
PIKE COUNTY
MISSOURI
Flowage Project Boundary
Adjusted Maximum Regulated Pool
Adjusted Maximum Regulated Pool
Flowage Project Boundary
MISSISSIPPI RIVER
SNY ISLAND LEVEE AND DRAINAGE DISTRICT
SNY ISLAND L. & D. DIST. CANAL
MISSISSIPPI POWER CO. TRANSMISSION LINE
MERIDA LAKE
BELLEVIEW BAY
BELLEVIEW CREEK
MI. 265
MI. 260
DEAD MANS ISLAND
HORSE ISLAND
MC COY ISLAND (ISLAND NO. 28)
GRIMES ISLAND (ISL. NO. 26)
SLIM ISLAND (ISLAND NO. 27)
COON ISLAND (ISLAND NO. 45)
ISLAND NO. 47
CARROLL ISLAND (ISLAND NO. 46)
MOSIER ISLAND NO. 30
HOWARD ISLAND (ISLAND NO. 29)
APPROXIMATE STATE BOUNDARY LINE
MATCH LINE TO SHEET NO. 2
ELSBERRY DRAINAGE DISTRICT
BRYANTS CREEK DIVERSION
RAMSEY CREEK
NIGGER SLOUGH
FOX CREEK
SHAPER SLOUGH
KISSINGER DRAINAGE DISTRICT (PRIVATE)
SCHAEFFER BROS. DRAINAGE DISTRICT (PRIVATE)
HARRIS DRAINAGE DISTRICT (PRIVATE)
ANNADA
STATE HIGHWAY 79
C. B. & Q. R. R. CO.
SURVEY NO. 2971
SURVEY NO. 1709
SURVEY NO. 173
T.53N.
T.52N.
R.2E.
R.1E.
R.3W.
R.4W.
90°48'
90°50'
90°52'
39°20'
39°18'
39°16'
39°14'
39°12'
90°44'
90°46'
LEGEND
Existing
Proposed
Recreation Concessions
Public Access
Operating Agency:
C. E. Corps of Engineers
ILL. State of Illinois
MO. State of Missouri
C Concession
Public Road Access
Public Use
Wildlife Management
Non Profit Organization
Cottage Site Subdivisions
Acquisition Commitment Lease
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5 Fishing Services (Bait and Tackle, Guide Service)
6 Picnicking (Parking, Comfort Station, Potable Water)
7 Hunting
8 Hunting Services (Hunting Equipment, Guide Services)
9 Tent Camping
UPPER MISSISSIPPI RIVER
MASTER PLAN
NAVIGATION POOL 25
IN 3 SHEETS
SHEET NO. 3
SCALE IN FEET
1000 0 1000 2000 3000 4000
U. S. ARMY ENGINEER DISTRICT, ST. LOUIS
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI
SUBMITTED
RECREATION PLANNER
RECOMMENDED
CHIEF, ENGINEERING DIVISION
APPROVED
COL., CORPS OF ENGINEERS
DISTRICT ENGINEER
DRAWN BY: H. W.
CHECKED BY: C. A. M.
TRANSMITTED WITH REPORT
DATED MARCH 1961
FILE NO.
Appx A Authorization and Agreements

AMENDED
COOPERATIVE AGREEMENT
Between the
Department of the Army, Corps of Engineers
and the
Department of the Interior, U.S. Fish and Wildlife Service

This amendment made and entered into this _____ day of _____, 2001, between the Department of the Army through the Corps of Engineers, hereinafter referred to as the Corps, and the Department of the Interior through the U.S. Fish and Wildlife Service, hereinafter referred to as the Service, amends the Cooperative Agreement between the parties dated February 14, 1963;

WHEREAS the United States through the Corps, has acquired certain lands in fee for the improvement of navigation in the Upper Mississippi River to provide a 9-foot channel from the Missouri River to Minneapolis, and portions of the Illinois River, hereinafter referred to as the Navigation Project, and

WHEREAS, pursuant to Section 3 of the Fish and Wildlife Coordination Act (48 Stat. 401 as amended by 60 Stat. 1080 and 72 Stat. 563; 16 U.S.C. 661 et seq.), lands shall be made available to the Service, consistent with navigation as the primary purpose of the Project, for the conservation, maintenance, and management of fish and wildlife and its habitat. There have been General Plans formulated for the use of lands and waters of the Navigation Project for fish/wildlife conservation and management and the same have been approved by the Secretary of the Army, the Secretary of the Interior, and the heads of the State agencies exercising administration over fish and wildlife resources within the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. Certain segments of the land subject to this Amended Agreement, as indicated in the General Plan, may be allocated to the States of Illinois, Iowa, Missouri, Minnesota, and Wisconsin for conservation management through subsequent agreements between the Service and those states, and

WHEREAS the Corps cannot abrogate its stewardship role for the conservation, maintenance, and management of fish and wildlife and its associated habitats as required by subsequent legislation such as, but not limited to the National Environmental Policy Act, Comprehensive Environmental Response, Compensation and Liability Act, the Forest Cover Act, the Historic Preservation Act, and as directed by Agency policy, guidance and regulations for the Corps' stewardship role for the conservation, maintenance, and management of these natural resources, and

WHEREAS the Corps and the Service shall continue to foster and maintain partnerships through specific regional working groups for addressing Navigation project issues that impact the conservation, maintenance and management of fish/wildlife resources specific to the lands addressed by the Amended Agreement.

Now therefore, in accordance with the aforesaid Section 3 of the Fish and Wildlife Coordination Act and the aforesaid General Plans, the Corps and Service hereby amend the Cooperative Agreement of February 14, 1963.

The Corps pursuant to the language of the third paragraph of the first page of this amendment hereby makes available to the Service the land and water areas of the Navigation Project substantially as identified on the exhibits attached to the General Plans referred to above, and by reference made a part hereof, for the conservation, maintenance, and management of fish/wildlife resources thereof, and its habitat thereon, in connection with the national migratory bird management and other fish/wildlife species programs in accordance with said General Plans. The Service shall manage these lands consistent with the National Wildlife Refuge System. This Amendment to the Cooperative Agreement of February 14, 1963 shall be subject to the provisions and conditions of the said General Plans and to the following additional conditions:

Paragraph 1 of the Cooperative Agreement is amended to read:

1. The Corps reserves all rights in and to the lands above described, which are not herein specifically granted, including, but not limited to, the operation and maintenance of the Navigation Project for its primary purpose of navigation. The Corps agrees that in fulfilling this primary purpose and other stewardship roles, as required by law and defined within Corps policies and regulations, that operation and maintenance activities will be carried out in accordance with current approved documents such as Master Plans, Operational Management Plans and Channel Maintenance Plans, and any future agency directive or legal requirement specific to the continued operation and maintenance of the Navigation Project.

Paragraph 2 of the Cooperative Agreement is amended to read:

2. The use and occupation of the said premises shall be without cost or expense to the Corps, under the general supervision of the Division Engineer, U.S. Army Division, Mississippi Valley Division, Vicksburg, Mississippi, herein after referred to as the "Division Engineer," and subject also to such rules and regulations in the interest of navigation and flood control as the Corps may from time to time prescribe.

Paragraph 3 of the Cooperative Agreement is amended to read:

3. Any damage to the property above described which results as an incident to the exercise of the privileges herein granted, shall be promptly corrected by the Service to the satisfaction of the Division Engineer. The Service will post appropriate project boundary lines, while the Corps will provide survey data, to the extent that it is available, for this purpose. The Service shall also take appropriate action to prevent and resolve minor trespass or unauthorized use of said property. The Service shall immediately report instances of unauthorized land use or serious trespass to the appropriate Corps Project Office. The Corps and Service shall coordinate enforcement efforts or legal actions taken against those responsible.

Paragraph 4 of the Cooperative Agreement is amended to read:

4. The exercise of the privileges granted shall in no way interfere with navigation and shall be subject at all times, without approval of the Service, to the occupation and use by the public for specific and related Navigation Project purposes and by the Corps for navigation, flood control, and all other Navigation Project related purposes, including, but not limited to, change in water surface elevations, dredging and placement of dredged material there from, and construction of training works, bank protection, and navigation aids.

Paragraph 5 of the Cooperative Agreement is deleted.

Paragraph 6 of the Cooperative Agreement is deleted.

Paragraph 7 of the Cooperative Agreement is amended to read:

7. It is understood that the privileges hereby granted do not preclude the necessity of obtaining from the Corps permits for work and structures in, under or over navigable waters as may be required under the provisions of Section 404 of the Clean Water Act of 1977, or Section 10 of the Rivers and Harbors Act of 1899, as amended,

Paragraph 8 of the Cooperative Agreement is amended to read:

8. No significant additions to or alterations of the premises, such as buildings, bridges, pump stations, roads, etc., shall be made by the Service without prior written consent of the appropriate District Engineer unless included in the Refuge Comprehensive Conservation Plan approved by the agencies.

Paragraph 9 of the Cooperative Agreement is amended to read:

9. In accordance with the aforesaid General Plans, authority to administer the lands and waters covered by this agreement may be delegated to the heads of the State agencies exercising administration over the wildlife resources of the aforesaid

States by cooperative agreements entered into pursuant to the provisions of Sections 1 and 4 of the said Fish and Wildlife Coordination Act. Copies of each such agreement, revisions, or amendments shall be furnished to the Division and District Engineers, respectively, promptly upon execution.

Paragraph 10 of the Cooperative Agreement is amended to read:

10. In development of lands described for public and agency use, as identified on the exhibits attached to the general plans referenced above, the Corps may in accordance with approved management plans and other appropriate agency documents, develop public use facilities or issue leases, licenses, and easements for the same purpose, issue special use licenses authorizing non-exclusive private uses which do not interfere with public use of areas involved, maintain and construct access roads, and issue outgrants. As appropriate, these actions will be coordinated with the Service and appropriate States to insure agency involvement and input into the Corps processes for implementation of these actions. During the development and implementation of these actions, the Service and States will be given the opportunity to provide recommendations regarding perceived impacts of the actions on the lands and waters defined by this amended agreement. The instruments provided for in this condition shall be issued only by the Corps and shall contain appropriate provisions prescribed by the Service regarding fish/wildlife management, including the continuing rights of the Service to post and patrol to enforce hunting regulations; however, the Service shall not have the right to deny access to or use of planned and developed, Corps-managed public use areas. Any planned developments for public and agency use shall address appropriate provisions prescribed by the Service regarding fish/wildlife management

Paragraph 11 of the Cooperative Agreement is deleted.

Paragraph 12 of the Cooperative Agreement is deleted.

Paragraph 13 of the Cooperative Agreement is amended to read:

13. The use of all agricultural treatments on lands covered hereunder shall be in compliance with laws, rules, and regulations administered by the Department of Agriculture and applicable to this type of land; provided that no part of the foregoing shall be construed as prohibiting the use of sharecrop agreements. All agricultural crops accruing to the Service or the pertinent States shall be used exclusively for wildlife, or wildlife habitat management purposes on the described lands, and for no other purpose. In the event that all the yield thus made available for wildlife or habitat management is not used for that purpose, the Service or the States shall, in order to avoid waste, sell for cash the remainder thereof in such a manner as to protect the public interest. Pursuant to Section 4 of the Act of Congress approved 22 December 1944, as amended (76 Stat. 1195; 16 U.S.C. 460d), all proceeds from the disposal of surplus production may be used by the Service or States in the development, conservation, management, and utilization of such lands; provided, that any balance of proceeds, not so utilized shall be paid to the Division Engineer at five-year intervals. In connection therewith, the Service shall establish and maintain adequate accounts and render statement of receipts and expenditures to the Division and District Engineers in an annual report that will be furnished not later than 30 calendar days prior to the scheduled annual meeting.

Paragraph 14 of the Cooperative Agreement is amended to read:

14. The Service shall administer and maintain the premises made available for wildlife conservation and management in accordance with current approved management plans for both agencies. An annual coordination meeting shall be organized by the Service each year on or before April 1 with each of the three Corps Districts (St. Louis, Rock Island, and St. Paul) and the states managing General Plan lands subject to this Agreement (Illinois, Iowa, and Missouri). The contents of the meeting shall include information specific to any changes and activities during the previous calendar year and information concerning proposed future projects. Issues covered shall include, but not be limited to, those management issues listed below:

(a) Boundary Management problems, including actions to address trespass or unauthorized uses;

(b) Report of completed construction and improvements, including project costs;

(c) Report of planned future construction, as approved in existing management plans;

(d) Report of conceived changes in management strategy;

(e) Cropland acreage utilized; amount of crop that was deemed excess to wildlife management needs including amount of receipts for sale of such crops; and amount and nature of expenditures derived from surplus crop funds;

(f) The Service liaison for the Agreement will consolidate a concise written annual report from the material presented at the meeting for submission to the Corps;

Paragraph 15 of the Cooperative Agreement is amended to read:

15. This agreement may be suspended or revoked at the discretion of the Department of the Army in case of national emergency or disaster declared by the President of the United States. In the event that problems are identified in compliance with any of the terms and conditions of this agreement, the following dispute resolution procedures will be followed:

(a) Service Refuge Managers and Corps District Operations Managers will meet to discuss the pertinent issue and seek resolution;

(b) In the event that informal efforts to resolve the issue at the field level are not successful, the appropriate Service Assistant Regional Director will meet with the appropriate District Engineer to seek written resolution; and

(c) Finally, if the matter remains unresolved, it will be referred to the Division Engineer whose decision will be final.

Paragraph 16 of the Cooperative Agreement is amended to read:

16. This agreement may be relinquished by the Service at any time by giving to the Division Engineer at least one-year's notice in writing.

Paragraph 17 of the Cooperative Agreement is amended to read:

17. If this agreement is relinquished or revoked as provided above, the Service shall vacate the premises, remove all property of the Service there from, and subject to the availability of funds, restore the premises to a condition satisfactory to the Division Engineer, ordinary wear and tear and damages beyond the control of the Service excepted, within such time as the Secretary of the Army may designate.

Paragraph 18 of the Cooperative Agreement is deleted.

The following paragraph is added to the Cooperative Agreement :

19. The Corps retains responsibility to provide protection of forest or other vegetative cover on reservoir areas, including navigation projects, in compliance with P.L. 86-717, the Forest Cover Act, and to establish and maintain other conservation measures on these areas. Corps management programs are to promote future resources and to increase the value of such areas for conservation, recreation, and other beneficial uses, provided that management is compatible with other uses of the project. The development of plans or other natural resource management activities will be coordinated with the Service for input and review of impacts of proposed actions on wildlife management use of the project. The Service will identify forest habitat goals and objectives in Refuge Comprehensive Conservation Plans to provide guidance to the Corps in this partnership effort. Revenue from sale of any timber in conjunction with the Forest Cover Act Program shall be credited to the Corps.

The following paragraph is added to the Cooperative Agreement :

20. The Corps retains the right to use and/or improve existing roads as a means of ingress and egress to and from the Mississippi River and to any areas that the Corps administers.

5 Jul 01
(Date)

By EDWIN J. ARNOLD, JR.
Brigadier General, U. S. Army
Division Engineer
Mississippi Valley Division

7/31/01
(Date)

By WILLIAM F. HARTWIG
Regional Director, Region 3
U.S. Fish And Wildlife Service
Department of the Interior

Marvin E. Moriarty
Acting Regional Director for

3. USFWS & IDNR Cooperative Agreements with 4 Amendments (1957, 1985, 1988, 2012)

5-3-54

"Cooperative Agreement"

U.S. F & W. Service & State of Illinois

May 3, 1954

+ Amendments 1 Feb 5, 1957

2 Jan 10, 1985

3 Aug 3, 1988

COOPERATIVE AGREEMENT
between the
DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE
and
THE ILLINOIS DEPARTMENT OF CONSERVATION

THIS AGREEMENT made and entered into this 3rd day of May, 1954, between the United States Department of the Interior, through the Fish and Wildlife Service, hereinafter referred to as the "Service," and the Illinois Department of Conservation, hereinafter referred to as the "State," witnesseth that:

WHEREAS THE UNITED STATES, through the Department of the Army, has acquired certain lands in fee for the improvement of navigation in the upper Mississippi River to provide a 9-foot channel from the Missouri River to Minneapolis, hereinafter referred to as the "Navigation Channel Project," and

WHEREAS, pursuant to Section 3 of the Act of August 14, 1946 (60 Stat. 1080, 16 U.S.C. 661), there has been formulated a GENERAL PLAN FOR THE USE OF CERTAIN LANDS OF THE NAVIGATION CHANNEL PROJECT FOR WILDLIFE CONSERVATION AND MANAGEMENT and the same has been approved by the Secretary of the Army, the Secretary of the Interior, and the Director of the Illinois Department of Conservation, and

WHEREAS, pursuant to the provisions of section (a) of the GENERAL PLAN for the State of Illinois, the lands described herein have been made available to the Service by the Department of the Army through a Cooperative Agreement dated January 21, 1954:

NOW, THEREFORE, in accordance with Section 4 of the aforesaid Act of Congress approved August 14, 1946, and the aforesaid GENERAL PLAN and said

Cooperative Agreement, the parties hereto hereby enter into this Cooperative Agreement.

All communications between the State and the Service as to activities under this Cooperative Agreement will be addressed to the Regional Director, Fish and Wildlife Service, Minneapolis, Minnesota, and the Director, Illinois Department of Conservation.

The Service hereby makes available to the State, for use in the conservation and management of wildlife, resources thereof, and its habitat thereon, in connection with the national migratory bird management program, the following-described parts of those land and water areas as are shown substantially outlined in red on Exhibits A through TT which are attached to the GENERAL PLAN for the State of Illinois referred to above, and by reference made a part hereof:

Pool 26

All lands shown outlined in red on Exhibit A.

On Exhibit B, the following-described parts of these lands outlined in red: all that part lying east of the Illinois River in sections 32 and 33, T. 7 N., R. 13 W., 3rd P.M., and in sections4, 5, 8, and 9, T. 6 N., R. 13 W., 3rd P.M., and all lands including the Islands lying south of the Illinois River and east of the road which runs north to the Illinois River from the corner of sections 2, 3, 10, and 11, T. 13 S., R. 1 W., 4th P.M., and runs southerly from the same corner through sections 10, 15, and 22.

On Exhibit C, all lands shown outlined in red.

On Exhibit D, all lands shown outlined in red except those parts located in sections 19 and 24, Ts. 12 S., Rs. 1 and 2 W., 4th P.M.

All lands shown outlined in red on Exhibits E and F.

Pool 25

On Exhibit G, all lands shown outlined in red on the mainland within Ts. 12 S., Rs. 2 and 3 W., 4th P.M. except those parts of tracts C-225 and C-226 in section 6, T. 12 S., R. 2 W., lying northeasterly of the road; and also all of Turner Island and three small islands lying east of Turner Island, Sarah Ann Island and the island designated as tract C-205C.

All lands shown outlined in red on Exhibit I.

Pool 24

All lands shown outlined in red on Exhibits J through N inclusive.

Pool 22

All lands shown outlined in red on Exhibits O through R inclusive.

Pool 21

All lands shown outlined in red on Exhibit S.

On Exhibit T, all lands shown outlined in red on Willow and Hog Back Islands and all land shown on the mainland in section 16, T. 1 S., R. 9 W., 4th P.M.

On Exhibit U, all lands shown outlined in red except the following: all of tracts IIs-39, 40, 37 (Swan Island), all of Island 419, all lands shown on Shandrew Island, all of tracts IIs-30 to 35, inclusive, all lands shown on Long Island and Flannigan's Island, and tracts IIs-10D, 15, 19, and 20.

Pool 18

All lands shown outlined in red on Exhibits V and W.

On Exhibit X, all land including islands shown outlined in red and lying southerly of the Minneapolis and St. Louis Railroad.

On Exhibit Y, all lands shown outlined in red except that part lying southeasterly of the northwesterly right of way boundary of the Keithsburg District Levee and of the line of same extended southwesterly to the Missis-sippi River, said right of way boundary being a part of the boundary of tract

FI-105 and located in the S½S½ of sections 4 and 5, in T. 13 N., R. 5 W., 4th P.M.

Pool 17

All lands shown outlined in red on Exhibits Z, AA, and BB.

Pool 16

All lands shown outlined in red on Exhibits CC, DD, and EE.

This Cooperative Agreement is subject to the following conditions:

1. There is reserved in the Department of the Army all rights, in and to the lands above described, which are not herein specifically granted, including, but not limited to, those reservations in the United States required under the Atomic Energy Act, approved August 1, 1946, the harvesting and selling of merchantable timber, and the right to use existing roads as a means of ingress and egress to and from the Mississippi River and to any areas which the Department of the Army administers. In those cases where no roads exist, the Department of the Army reserves the right to designate, construct, maintain, and use roads or routes across said lands. No part of the foregoing shall be construed as a commitment by the Department of the Army to construct, improve, or maintain any road or route.

2. The use and occupation of the said premises shall be without cost or expense to the United States and shall be subject to such rules and regulations in the interest of navigation and flood control as the Division Engineer, Upper Mississippi Valley Division, Corps of Engineers, St. Louis, Missouri, may from time to time prescribe.

3. Any damage to the property above described which results as an incident to the exercise of the privileges herein granted, shall be promptly corrected by the State to the satisfaction of the Service.

4. The exercise of the privileges herein granted shall in no way interfere with navigation and shall be subject at all times, without notice to or approval of the Service or the State, to the occupation and use by the public for navigation and by the Department of the Army for navigation, flood control, and all other related purposes, including, but not limited to, change in water-surface elevations, dredging and deposition of spoil therefrom and construction of training works, bank protection, and navigation aids. There is reserved in the Department of the Army the right to dispose of lands covered by this agreement for commercial and industrial sites; however, such disposal shall be contingent upon the payment of the current appraised value, approved by the said Division Engineer, of any improvements made by the Service or the State on the site.

5. It is understood that the privileges hereby granted do not preclude the necessity of obtaining from the Department of the Army permits for work and structures in, under, or over navigable waters as may be required under the provisions of Section 10 of the Act of March 3, 1899 (30 Stat. 115; 33 U.S.C. 403).

6. No additions to or alterations of the premises shall be made without the prior written consent of the Service. The State will submit to the Service proposals under this section for the purpose of requesting the required consent.

7. The rights and privileges herein granted may not be assigned or delegated.

8. The State agrees to refer to the Regional Director of the Service any application for an instrument granting rights-of-way for roads,

telephone lines, power lines, and other similar uses over, across, in, and upon the above-described lands. With such referral the State will indicate its recommendation as to the application, with a statement that such proposed uses will or will not interfere with the purposes for which these lands are made available to the State. No entry will be allowed by the State on such lands for these purposes until the State receives notice that permission is granted. If applications for such rights-of-way are received firsthand by the Division Engineer or the Service, they will be referred to the State for such recommendations as it may care to make relative to issuance of a permit.

9. Leases to concessionaires for the use of the premises above described for the purpose of providing accommodations, facilities, and services needed by the public in connection with the use of land for the purposes set out in this agreement will be issued by the Department of the Army. Any applications therefor received by the State will be referred to the Service for processing.

10. All of the lands covered by this agreement which are suitable for agricultural purposes shall be used for the production of crops. All crops accruing to the State shall be used exclusively to provide food for wildlife and for no other purpose. However, in the event that all the yield thus made available for wildlife food is not used for that purpose, either by the State or the Service, the State shall, in order to avoid waste, sell for cash the remainder thereof in such manner as to protect the public interest and shall remit the proceeds from such sale to the Service for further disposition. Any agricultural lands not so used shall revert to the Service without further action by the parties hereto.

11. The State shall administer and maintain the premises made available for wildlife conservation and management in accordance with an annual management program prepared and submitted to the Service each year on or before February 1. Such annual management program shall include information as to all areas designated for public hunting, wildlife refuges, the production of food for wildlife, or other purposes; nature, site, and layout of proposed construction and improvements; estimated cost of construction of planned improvements; and plans for other such activities on lands made available under this agreement as well as information as to previous or intended non-use or abandonment of any of these lands. The annual management program may be amended from time to time as may be necessary, but the Service shall be informed thereof prior to the effective date of any change.

The State will manage public hunting and fishing on all areas it designates for this purpose in such a manner as to provide equal opportunities for all who wish to participate in these forms of recreation.

No individual or group of individuals will be permitted to enjoy any special privileges on these hunting and fishing areas that are not accorded the general public, and no individual or group of individuals shall acquire or be granted exclusive hunting and fishing rights.

In areas managed by the State where problems develop or are likely to develop because of interdependence with adjacent areas managed by the Service, such problems will be mutually resolved by the State and the Service in the best interests of wildlife and the annual management program will be amended accordingly.

12. This agreement is subject to revocation if required by the Department of the Army in case of national emergency declared by the President, or in event of violation of any of the terms and conditions of agreement, which violation is continued for a period of thirty (30) days after notice in writing by the Service, or for non-use for a period of two consecutive years. This agreement may further be revoked by the Service in whole or in part at any time all or any part of the above-described lands are abandoned or are not utilized for the purposes described herein.

13. This agreement may be relinquished by the State at any time by giving to the Service at least thirty (30) days' notice in writing.

14. If this agreement is relinquished or revoked as provided above, the State shall vacate the said premises, remove all property of the State therefrom, and restore the premises to a condition satisfactory to the Service, ordinary wear and tear and damage beyond the control of the State excepted, within such time as the Service may designate.

15. The following permits from the Service to the State shall be and are hereby terminated as of the effective date of this agreement:

Permit dated June 13, 1946 and accepted July 11, 1946 and expiring on October 10, 1954.

Permit dated April 5, 1948 and accepted April 19, 1948 and expiring on October 10, 1954.

Permit dated October 22, 1951 and accepted October 3, 1951 and expiring on October 10, 1954.

No member of or delegate to Congress or resident Commissioner shall be admitted to any share or part of this agreement, or to any benefit to arise therefrom, separate and apart from any benefit accruing to the general public.

This agreement shall become effective as of the date of a letter of notice from the Service informing the State that execution of the agreement has been completed and that the above-described lands are available for use by the State.

IN WITNESS WHEREOF, the parties have executed this Cooperative Agreement on the day, month, and year opposite their signatures thereto.

The State of Illinois

April 8, 1954

By Vivian E. Malone
Director
Illinois Department of Conservation

The United States of America
Department of the Interior

MAY 3, 1954

By John L. Farley
Director
Fish and Wildlife Service

AMENDMENT NO. 1
to
COOPERATIVE AGREEMENT
between the
DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE
and
ILLINOIS DEPARTMENT OF CONSERVATION

Section 6 of the Cooperative Agreement, dated May 3, 1954, between the United States Department of the Interior, through the Fish and Wildlife Service, hereinafter referred to as the Service, and the Illinois Department of Conservation, hereinafter referred to as the State, covering the administration by the State of lands acquired by the Department of the Army, Corps of Engineers, along the Upper Mississippi River in Navigation Pools 16 through 18, 21, 22, 24 and 26, is hereby amended and revised to read as follows:

6. No additions to or alterations of the premises shall be made without the prior written consent of the Division Engineer. North Central Division, Corps of Engineers, Chicago, Illinois, or his designee. The State may negotiate directly with the Corps of Engineers for permission required under this Section and, when received, forward the same to the Service for approval or may request the Service to obtain the consent of the Division Engineer.

All other terms and conditions of the Cooperative Agreement remain in full force and effect.

The State of Illinois

January 29, 1957 , 19~~5~~7

By _____
Director
Illinois Department of Conservation

The United States of America
Department of the Interior

Feb. 15 , 1957

By _____
~~Director~~
~~Fish and Wildlife Service~~
Acting Director
Bureau of Sport Fisheries and Wildlife

AMENDMENT NO. 2
COOPERATIVE AGREEMENT
DEPARTMENT OF INTERIOR, FISH AND WILDLIFE SERVICE
AND
ILLINOIS DEPARTMENT OF CONSERVATION

The Fish and Wildlife Service (Service) and the Illinois Department of Conservation (State) entered into a Cooperative Agreement dated May 3, 1954, and whereas,

That Cooperative Agreement (CA) cites a date of January 21, 1954, on page one; and whereas that date is hereby changed to read February 14, 1963 to reflect current agreements.

The May 3, 1954, CA between the Service and the State making certain lands and water areas available to the State for use in the conservation and management of wildlife resources thereof, and its habitat thereon, is hereby amended to remove all lands described in Exhibit U, Pool 21, as shown on page three, from the provisions of the CA and the State does relinquish all management rights on said land to the Service.

All other terms and conditions of the CA remain in full force and effect.

The State of Illinois

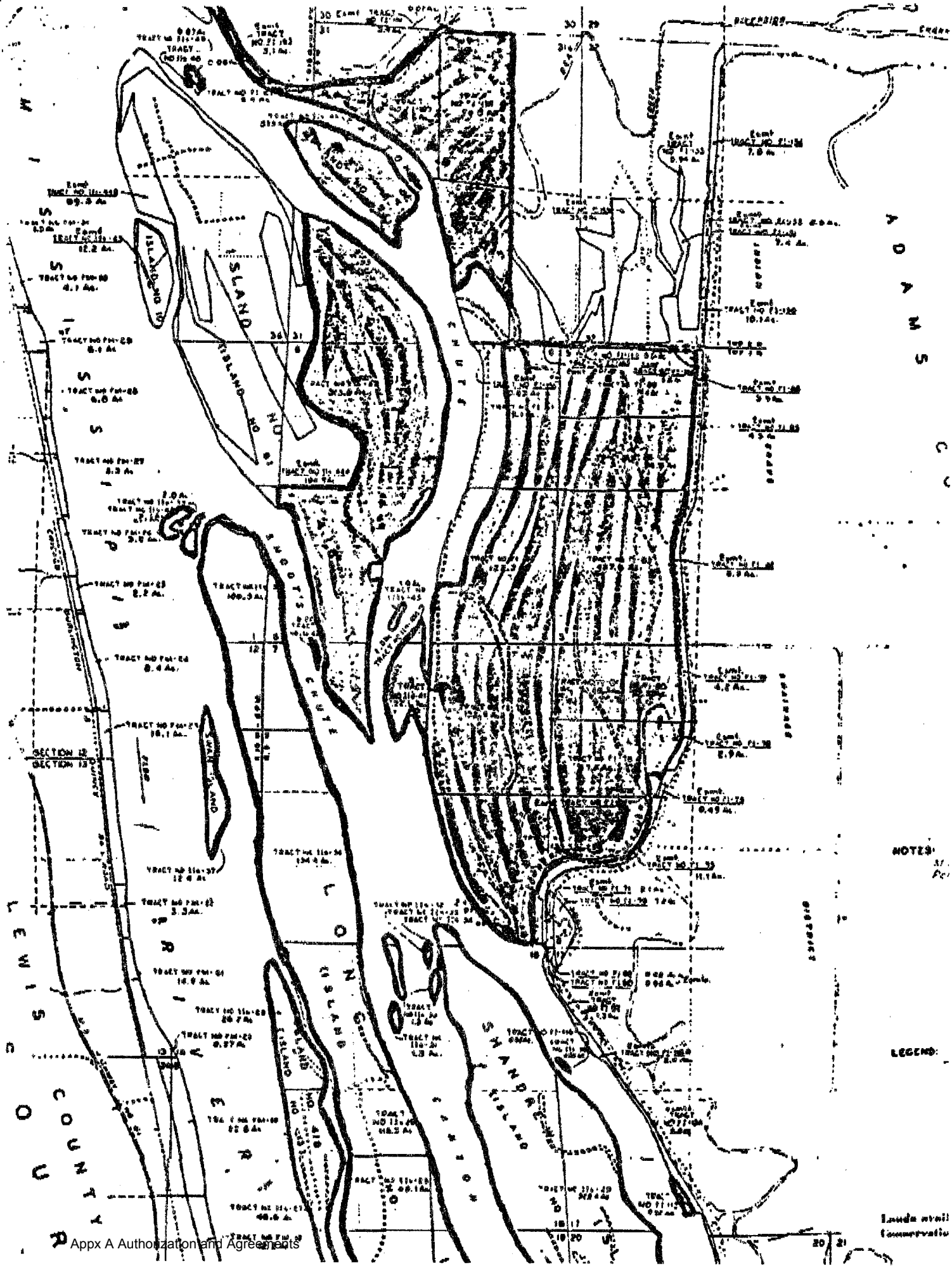
1/10/'85
Date

By _____
Director
Illinois Department of Conservation

The United States of America
Department of the Interior

_____
Date

By _____
Acting Regional Director
Fish and Wildlife Service


ISLAND
CHUTE
SHANNON
LEGEND:
COUNTY

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▸ 15

To Jim Hill	From Mike Andress
Dept./Agency COE	Phone # (217) 224-8580
Fax # 314-899-0514	Fax # (217) 224-8583

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

AMENDMENT NUMBER 3

TO

COOPERATIVE AGREEMENT
BETWEEN THE
DEPARTMENT OF THE INTERIOR, U.S. FISH AND WILDLIFE SERVICE
AND
ILLINOIS DEPARTMENT OF CONSERVATION

The Cooperative Agreement, dated May 3, 1954, between the United States Department of the Interior, through the Fish and Wildlife Service, hereinafter referred to as the Service, and the Illinois Department of Conservation, hereinafter referred to as the State, covering the administration by the State of lands acquired by the Department of the Army, Corps of Engineers, along the Upper Mississippi River in Navigation Pools 16 through 18, 21, 22, 24 and 26 is hereby amended and revised to read as follows:

Page 2-B - All communications between the State and the Service as to activities under this Cooperative Agreement will be addressed to the Regional Director, Fish and Wildlife Service, Minneapolis, Minnesota, and the Director, Illinois Department of Conservation, Springfield, Illinois. The more routine, operational-type communications between the appropriate State Division and the Mark Twain National Wildlife Refuge will be addressed to the appropriate Division Chief and the Project Leader for the refuge.

Page 4-B, No. 2 - The use and occupation of the said premises shall be without cost or expense to the United States and shall be subject to such rules and regulations in the interest of navigation and flood control as the Division Engineer, North Central Division, Corps of Engineers, Chicago, Illinois, and the Lower Mississippi Valley Division, Corps of Engineers, Vicksburg, Mississippi, may from time to time prescribe.

Page 6-B, No. 10 - All lands covered by this Agreement which are suitable for agricultural purposes and which are needed to meet the fish and wildlife management objective shall be used for the production of crops. All crops accruing to the State shall be used exclusively to provide food for wildlife and for no other purpose. However, in the event that all the yield thus made available for wildlife food is not used for that purpose, either by the State or the Service, the State shall, in order to avoid waste, sell for cash the remainder thereof in such manner as to protect the public interest and shall maintain appropriate records for the accountability of these generated funds. These monies shall be used only for wildlife management purposes and their expenditure will be

documented yearly in the Management Plan for review by the Service and the Corps of Engineers.

All other terms and conditions of the Cooperative Agreement remain in full force and effect.

Date: Dec. 5, 1988 The State of Illinois

By Mark Green
Director
Illinois Department of Conservation

Date: August 3, 1988 The United States of America
Department of the Interior

By
Acting Regional Director
U.S. Fish and Wildlife Service

AMENDED COOPERATIVE AGREEMENT
For Management of Corps General Plan Lands
Between the
Department of the Interior, U.S. Fish and Wildlife Service
and the
Illinois Department of Natural Resources

This agreement, effective on the date of last signature, between the Department of the Interior through the U.S. Fish and Wildlife Service, hereinafter referred to as the "Service", and the Illinois Department of Natural Resources, hereinafter referred to as the "State", replaces the Cooperative Agreement between the parties dated 3 May, 1954, as well as its subsequent amendments;

WHEREAS the United States through the Corps of Engineers within the Department of the Army, herein referred to as the "Corps", has acquired certain lands in fee for the improvement of navigation in the Upper Mississippi River to provide a 9-foot channel from the Missouri River to Minneapolis, and portions of the Illinois River, hereinafter referred to as the "Navigation Project", and

WHEREAS, pursuant to Section 3 of the Fish and Wildlife Coordination Act (48 Stat. 401 as amended by 60 Stat. 1080 and 72 Stat. 563; 16 U.S. C. 661 et seq.) certain Corps owned lands have been made available to the Service, consistent with navigation as the primary purpose of the Project, for the conservation, maintenance and management of habitat in support of the National Migratory Bird management program, as well as other fish and wildlife objectives. There have been General Plans (GP) formulated for the use of lands and waters of the Navigation Project for fish/wildlife conservation and management and the same have been approved by the Secretary of the Army, the Secretary of the Interior, and the Directors of the State agencies exercising administration over wildlife resources within the 5 Project states, and

WHEREAS, pursuant to the provisions of the General Plan a Cooperative Agreement exists between the Corps and the Service, as revised 31 July, 2001, for the management of GP lands (attached). Additionally, the Agreement provides authority to be delegated to the head of the State agency exercising administration over wildlife and wildlife resources, by subsequent cooperative agreement (FWS/State), administration of designated GP lands and waters, pursuant to the provisions of Sections 1 and 4 of the said Fish and Wildlife Coordination Act.

WHEREAS, The Illinois Department of Natural Resources is authorized to enter into this Agreement pursuant to the Civil Administrative Code of Illinois, 20 ILCS 805-125; the Intergovernmental Cooperation Act, 5 ILCS 220/1 et seq.; and the Wildlife Habitat Management Areas Act, 520 ILCS 20/1 et seq.

WHEREAS, the Service administers the National Wildlife Refuge System (Refuge System), with a mission, "to administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans", and

WHEREAS, the mission of the Illinois Department of Natural Resources, is to manage, protect, and sustain Illinois' natural and cultural resources; provide resource-compatible recreational opportunities and to promote natural resource-related issues for the public's safety and education.

NOW THEREFORE, in accordance with the Fish and Wildlife Coordination Act and the aforesaid General Plans, the Service hereby makes available to the State the land and water areas of the Navigation Project as identified on the exhibits for the General Plans referred to above, as may be amended or delineated in Corps Master Plans, Land Use Allocation Plans, or Operational Management Plans, for the conservation, maintenance, and management of fish/wildlife resources thereof, and its habitat thereon, in connection with national migratory bird management and other fish/wildlife programs, pursuant to

provisions contained in this Agreement, the attached Corps/Service Agreement, and said General Plans.

The State agrees to manage these Corps fee title lands under the "Coordination Area" designation of the National Wildlife Refuge System and they are therefore not subject to Service administrative and policy standards required of Service managed Refuge units, such as the compatibility policy. However, as a part of the Refuge System, these State administered lands are intended to contribute to the Refuge System mission. The Service does retain the authority to temporarily close migratory hunting on the lands and waters subject to this agreement, if so compelled by emergency (such as chemical spill), flyway population management concerns or quotas.

The Corps, Service, and the State shall continue to represent agency positions and discharge responsibilities related to other Mississippi River System issues independently, and not constrained by this Agreement. Both the Service and State will continue to foster and maintain partnerships with the Corps through specific regional working groups for addressing Navigation project issues that impact the conservation, maintenance and management of fish/wildlife resources throughout the entire Upper Mississippi River System, including the Illinois River.

The authority to operate State wildlife habitat operations and public use management programs on lands under this agreement shall be derived from the State, consistent with the General Plan, Corps regulations contained in CFR 36, and the specific conditions listed below:

1) The Corps reserves all rights to the lands subject to this Agreement, which are not herein specifically granted. The exercise of the privileges granted shall in no way interfere with navigation and shall be subject at all times to the occupation and use by the public for specific and related Navigation Project purposes and by the Corps for navigation, flood control and all other Navigation project related purposes, including, but not limited to, change in water surface elevations, dredging and placement of dredged material there from and

construction of training works, bank protections and navigation aids. The Corps retains the right to use and improve existing roads to and from the Mississippi River or to other areas they administer.

2) No significant additions to or alterations, such as buildings, bridges, pump stations, roads, etc., shall be made by the State without prior written consent of the appropriate District Engineer, coordinated through the Service. The use, occupation, operations and maintenance of these lands shall be without cost or expense to the Service or Corps. Any damage to the property which results from the exercise of the privileges granted shall be promptly corrected by the State, and as approved by the Corps.

3) It is understood that this Agreement does not preclude the necessity of obtaining required Corps permits for management projects or structures, such as Section 404 of the Clean Water Act, or Section 10 of the Rivers and Harbors Act,

4) The State may post needed management area boundary lines for lands designated in this Agreement at its discretion for site management or enforcement purposes. The Corps or Service will provide updated survey data, preferably in electronic format, for this purpose to the extent that it is available from the Corps. The State shall take appropriate action to prevent and resolve minor trespass or unauthorized use of the property. The State shall immediately report instances of unauthorized land use or serious trespass to the Service, which will involve the appropriate Corps Project Office. The State, Service, and Corps shall coordinate enforcement efforts or legal actions taken against those responsible.

5) The use of agricultural treatments and share crop agreements on lands covered hereunder shall ensure that crops accruing to the State are used exclusively for wildlife, or wildlife habitat management purposes on the described lands, and for no other purpose. In the event that all the yield thus made available for wildlife or habitat management is not used for that purpose, the State shall, in order to avoid waste, sell for cash the remaining crop. All

proceeds from such disposal of surplus production may be used by the State in the development, conservation, management, and utilization of these lands. In connection with this provision, if needed, the State shall establish and maintain adequate accounts and render statement of receipts and expenditures to the Service for distribution to Division and District Engineers in the annual management report. The Service and Corps may review this program periodically to ensure that cropland utilization is not consistently excessive to wildlife needs, where other appropriate habitat types would better meet the Refuge System mission.

6) The Corps retains responsibility for management of forest resources on these GP lands. The development of Corps forest management plans are coordinated with the State and Service for input and review to ensure compatibility, as defined by the Forest Cover Act, with wildlife management use of the project. Any specific State or Service plans will be considered in the guidance of Corps forest management activities. Overall, the Corps' forest management program should be viewed as a cooperative component to the State's day to day management of the out-granted General Plan area. Revenue from sale of any timber in conjunction with the Forest Cover Act Program shall be credited to the Corps.

7) The State Director shall designate a liaison for administrative matters pertaining to this agreement by way of letter to the Service Regional Director. The Service liaison for matters relating to this agreement is designated to be the Upper Mississippi River System Refuge Zone Supervisor. The Service liaison shall attempt to handle mutual management concerns regarding lands subject to this agreement at the field level with State Managers/Biologists, while maintaining coordination with the State liaison. The State liaison will act as the interagency point of contact for issues that may arise from provisions of this agreement, and for other issues that require a cross-program response or involvement on the part of the State.

8) The State shall regulate hunting, fishing and trapping activities on these lands, consistent with State resource goals and objectives, Refuge System mission, and Corps conservation responsibilities. The State is also authorized to enforce the provisions of 17 IL. ADM. CODE 110, Public Use of State Parks and other properties of the Department of Natural Resources, and any other state law or administrative rule pertaining to the protection or management of natural resources, on these lands to the extent such is not inconsistent with the purposes of this agreement. Through the yearly reporting process, or as necessary, the State will supply the Service and Corps copies of updated State regulations which apply to these lands, subject to provisions herein, if there are any changes. The State is the lead enforcement agency for State regulations pertaining to lands subject to this agreement. The Corps and/or Service may assist with resource protection by utilizing applicable Code of Federal Regulations (CFR) in instances where State regulations prove to be inadequate to address an issue.

9) By March 1 each year, the State will provide the Service a brief written summation of prior calendar year management activities and relevant issues. This report will also address future plans for capital improvement, etc. addressing the above topics by the scheduled meeting date each year. Topics covered in annual report shall include, but not limited to, management issues listed below:

(a) Boundary management problems, including actions to address trespass or unauthorized uses;

(b) Report of completed construction and improvements, including project costs;

(c) Report of planned future construction, as approved in existing management plans, or identified in new planning effort;

(d) Report of conceived changes in land management strategy;

(e) Cropland acreage utilized; amount of crop that was deemed excess to wildlife management needs including amount of receipts for sale of such crops; and amount and nature of expenditures derived from surplus crop funds;

(f) Any changes to State and Federal regulations that pertain to these lands and responsibilities of each agency.

(g) Any problems or opportunities relating to General Plan land management for interagency coordination or consideration.

The Service liaison will consolidate a concise written annual report from this submitted material for submission to the Corps. An annual coordination meeting will also be organized by the Service each year on or before April 1 with each of the three Corps District (St. Louis, Rock Island, and St. Paul) and the States managing General Plan lands (Illinois, Iowa, and Missouri). The agenda of the meeting shall include information specific to any changes and activities during the previous calendar year and information concerning proposed future projects.

10) This agreement may be relinquished by the State at any time by giving the Service at least one-year's notice in writing, unless a shorter notice period is mutually agreed upon.

11) In the event that problems are identified in compliance with any of the terms and conditions of this agreement, the following dispute resolution procedures will be followed:

(a) State liaison will meet with Service liaison to discuss the matter and attempt to resolve the matter at the lowest administrative level.

(b) If the above step is unsuccessful the State liaison, Service Liaison and Corps District Operation Managers will meet to discuss the pertinent issue and seek resolution;

(c) In the event that informal efforts to resolve the issue at the field level are not successful, the State Division Chief and the Service Regional Refuge Chief will meet with the appropriate District Engineer to seek written resolution; and

(d) Finally, if the matter remains unresolved, it will be referred to the Corps Division Engineer whose decision will be final.

12) The State agrees to confer with the Service on any application for an instrument granting permanent rights-of-way for roads, telephone lines, power lines, and other similar uses over, across, in and upon the above described lands. During such conferral the State will indicate its recommendation as to the

application, with a statement that such proposed uses will or will not interfere with the purposes for which these lands are made available to the State. No entry will be allowed by the State on such lands for these purposes until the State receives notice that permission is granted. If applications for such permanent rights-of-way are received firsthand by the Corps Division Engineer or the Service, they will be referred to the State for such recommendation as it may care to make relative to issuance of a permit.

The provisions above in this Service/State "step-down" agreement have been modified for readability from the list of conditions which pertain to all GP lands, as detailed in the Cooperative Agreement between the Corps and the Service. If any clarifications in Agreement provisions are required, the source Agreement between the Corps and the Service should be utilized.

3-30-12
(Date)

Director
Illinois Dept. of Natural Resources

APPROVED FOR EXECUTION
Date: 3/27/12
Legal Counsel: IDNR

Thomas O. Melius 3.22.12
(Date)

Regional Director, Region 3
U.S. Fish and Wildlife Service
Department of the Interior

Appendix B

Coordination

Contents

1. Draft Fish & Wildlife Coordination Act Report 26 May 2017

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Southern Illinois Sub-Office (ES)
8588 Route 148
Marion, Illinois 62959

FWS/MISO

May 26, 2017

Colonel Anthony P. Mitchell
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attn: Dr. Kathryn McCain, CEMVP-PD-P

Dear Colonel Mitchell:

This letter constitutes our Draft Fish and Wildlife Coordination Act Report (Report) for the Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP) located in Madison and Jersey Counties, Illinois. This report is intended to provide partial compliance with Subsection 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and compliance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*); and, the National Environmental Policy Act (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.). This Report has been reviewed by the Missouri Department of Conservation and the Illinois Department of Natural Resources and their concurrence is noted.

Introduction

The Piasa and Eagle's Nest Islands HREP is a component of the Upper Mississippi River Restoration Program (UMRR), authorized by Section 1103 of the Water Resources Development Act (WRDA) of 1986. The vision of the UMRR is "A healthier and more resilient Upper Mississippi River ecosystem that sustains the river's multiple uses". The Piasa and Eagle's Nest Islands Project consists of the two islands and associated side channel and backwater habitats. Piasa and Eagle's Nest islands are federally controlled lands and are managed in partnership with the Illinois Department of Natural Resources (IDNR). The Project area is located in Pool 26 between Upper Mississippi River Miles 207.5 and 211.5 and is comprised of approximately 1,381 acres of side channel, main channel, island, and backwater habitat.

Threatened and Endangered Species

We have reviewed the Biological Assessment (BA) for this project provided on December 15, 2016. In responding to the BA, we concurred that with implementation of the conservation measures discussed in the BA, the project is not likely to adversely affect any known federally listed threatened or endangered species.

Resource Problems and Opportunities

Human activity over the past two centuries within the Upper Mississippi River System (UMRS) has altered the hydrology, topography, and biotic communities historically present within the project area. Lock and dam construction has had the greatest effect in the lower half of each navigation pool where the floodplain was inundated by the increased water surface elevation. Inundation caused an immediate change in the land-water distribution followed by a long-term change that included the gradual loss of land (e.g., islands). The physical changes created by lock and dam construction produced a significant change in the biological community in the lower reaches of the navigation pools. The original floodplain, which consisted of floodplain forest, wetlands, and isolated lakes, was converted into a large permanently submerged aquatic system that is often categorized as impounded. Since impoundment, the patterns of river habitats have been greatly modified due to sedimentation of backwaters, island loss, and loss of side channels. These alterations have reduced the diversity and quality of aquatic side channel and backwater habitats and caused a decline in the quantity of island habitat.

Within the project area, the side channel habitat has decreased in depth and flow resulting in degraded aquatic habitat, the backwater located within Piasa Island has decreased in depth resulting in loss of connectivity with the main channel during most of the year, and island habitat has been degraded primarily as a result of direct inundation resulting from lock and dam construction. Without action, it is anticipated that the aquatic habitat within Piasa Chute would continue to degrade with sedimentation and reduced flow, the Piasa Island backwater would continue to lose depth and be disconnected from the Mississippi River, and historic islands within the proposed project would continue to be submerged reducing the availability of this habitat for aquatic and wildlife species.

The degraded state of the project area, however, provides a significant opportunity to improve the quality and diversity of aquatic habitats within the proposed project area for the benefit of riverine fish, migratory birds, and other wildlife resources. The primary problems to be addressed by this project include: the loss of depth and flow within Piasa Chute, the loss of depth and connectivity within the Piasa Island backwater, and the loss of island habitat within this portion of the river. Restoring depth and flow within the side channel and restoring depth and connectivity of the Piasa Island Backwater would improve habitat conditions for a large variety of native riverine fish species and restoring island habitat would create additional habitat for a variety of fish and wildlife species.

Goals and Objectives

The goal of the Piasa and Eagle's Nest Islands Project is to restore and improve the quality and diversity of aquatic and island ecosystem resources within the project area to benefit fish and

wildlife resources. To achieve this goal a planning team of biologists from the U.S. Army Corps of Engineers (Corps), Illinois Department of Natural Resources, and Service developed the objectives for the project. The objectives include the following:

- Objective 1: Restore depth (> 8 feet) and increase velocity over existing conditions to improve sediment transport and geomorphic processes within Piasa Chute
- Objective 2: Increase the depth and connectivity between the Piasa Backwater and the Mississippi River, as measured by acres of deep water habitat (>5 feet) and % of year connected.
- Objective 3: Increase the spatial coverage of islands, as measured in acres.

The goals and objectives of the Piasa and Eagle's Nest Islands Project fit well into the system wide objectives for the Upper Mississippi River System (Galat et al., 2007). The system wide objectives include management for:

- a more natural hydrologic regime (hydrology and hydraulics)
- processes that shape a diverse and dynamic river channel (geomorphology)
- processes that input, transport, assimilate, and output materials within UMR basin river-floodplains: water quality, sediments, and nutrients (biogeochemistry)
- a diverse and dynamic pattern of habitats to support native biota (habitat)
- viable populations of native species and diverse plant and animal communities (biota)

Proposed Project Features

To achieve the project objectives, a number of project plans/features were evaluated. The recommended plan (alternative 4) consists of the following:

- Increasing aquatic diversity in Piasa Chute, by constructing a 200-ft braided dredge cut.
- Enhancing aquatic diversity in Piasa Island Backwater by dredging the entrance and reconnecting the backwater to Mississippi River.
- Constructing a notched rock structure between Piasa and Eagle's Nest Islands to enhance flow and sediment transport through Piasa Chute without negatively impacting overall flow within the entire Project Area.
- Restoring islands by beneficially re-using the dredged material and placing stone protection to maintain the islands and promote scour when islands are overtopped.

This plan restores approximately 76 acres of island habitat, enhances approximately 49 acres of backwater by increasing connectivity and depth, and improves depth and flow for approximately 485 acres of side channel habitat within the Project Area.

Methodology to Evaluate Alternatives

The Piasa and Eagle's Nest Islands HREP was analyzed using the Habitat Evaluation Procedures (HEP). The target species for the HEP included the smallmouth buffalo for the backwater aquatic habitat, the striped bass for the side channel aquatic habitat, and the least tern for the island habitat. Existing conditions, future without project conditions and future with project conditions were examined. This analysis was conducted with team members representing the Corps, IDNR, and Service.

The utilized evaluation models produced 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.

Existing, Future without, and Future with Project Conditions

A number of general and site specific assumptions were made as to what the project area and vicinity would be like 50 years in the future with and without the project and can be found in Appendix B of this report.

Side Channel

The habitat suitability for the striped bass improved with the project, while without the project the habitat suitability declined and became unsuitable (Table 1). Habitat quality for the striped bass improved with the project due to increased current velocity during the spawning time period. Over time it was assumed that the quality of habitat with the project would eventually decline due to sedimentation and reduced flow but would remain suitable. Without the project, Piasa Chute would continue to decline due to sedimentation and lack of flow. This will cause the water temperatures and the current velocity during the spawning time period to become unsuitable and result in a lower HSI scores. The proposed project results in a net increase of 18,267.93 habitat units (Table 2)

Backwater

The habitat suitability for the smallmouth buffalo improved with the project, while without the project the habitat suitability declined and became unsuitable (Table 1). Habitat quality for the smallmouth buffalo improved with the project due to improved water temperatures and increased flow/connectivity to the main channel during the summer time period. Over time it was assumed that the quality of habitat would decline due to sedimentation and reduced connectivity to the main channel but would remain suitable. Without the project, the Piasa Island backwater would

likely become disconnected from the main channel and loose depth over time. This will cause the water temperatures during the summer time period to become unsuitable and cause the dissolved oxygen levels during the spring and summer to decline resulting in a lower HSI scores. The proposed project results in a net increase of 474.41 habitat units (Table 2)

Island

The habitat suitability for the least tern improved with the project, while without the project the habitat remains limited (Table 1). Habitat quality for the least tern improved with the project due to increased availability of island/sand bar habitat and improved vegetation cover and quality of nesting substrate. Over time it was assumed that the quality of habitat would decline due to flooding impacts. Without the project, the lack of available nesting habitat and reduced quality of habitat resulted in a low HSI score. The proposed project increases the amount of available habitat from 0.5 to 86 acres and is the primary reason for the difference in habitat units (Table 2).

Summary

The HEP analysis indicates that the side channel dredging results in a net increase of 365.36 AAHUs over the no action alternative and that the backwater dredging results in a net increase of 9.49 AAHUs over the no action alternative. In addition, the creation of the island habitat results in a net increase of 55.26 AAHU over the no action alternative. The combination of habitat features in the preferred alternative will yield a net increase of 430.11AAHUs over the future without project condition.

Conclusions and Recommendations

According to the Incremental Cost Analysis, the preferred alternative ranks 2 out of 9 in costs per AAHU output compared to the other alternatives including the no action alternative. A large portion of the cost for the preferred alternative is attributable to the side channel dredging and subsequent island creation. There are currently limited opportunities to implement side channel restoration and island creation projects in this portion of the UMR. Pool 26 has approximately 3% of the total aquatic and floodplain habitat classified as side channel habitat and approximately 5% of the existing aquatic and floodplain habitat as island habitat (Theiling, et al., 2000). Restoring side channel habitat and island habitats have been identified as habitat needs for Pool 26 (Theiling, et al., 2000) and the loss of side channel connectivity is a major stressor affecting the riverine hydrologic regime and the pattern of riverine habitats. This plan restores approximately 76 acres of island habitat, enhances approximately 49 acres of backwater by increasing connectivity and depth, and improves depth and flow for approximately 485 acres of side channel habitat within the project area. Additionally, it is very difficult to capture the full benefits associated with side channel projects. For purposes of the Incremental Cost Analysis, the model was only able to capture habitat unit benefits associated with the acreage within the immediate project area. However, we believe that the ecosystem benefits of side channel restoration and island creation extend beyond the project area for both aquatic and terrestrial species. Although the preferred alternative has a high cost, we fully support the alternative because it would restore a large component of habitat diversity in this portion of the Upper Mississippi River.

Overall, the proposed project (Alternative 4) 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 improve the quality and diversity of side channel and backwater habitats and will restore island habitat within the project area. Large river fish and other aquatic organisms will gain improved access to important habitats for several life stages, such as spawning, rearing and over wintering. Migratory birds and other terrestrial organisms will have access to improved habitat for resting, feeding, nesting, and escape cover. These areas will also provide an important feeding area for aquatic organisms and serve as a production area for small fish and invertebrates that other terrestrial organisms feed upon. The proposed Piasa and Eagle's Nest Islands HREP will be beneficial to a variety of fish and wildlife resources. The Service fully supports the proposed Piasa and Eagle's Nest Islands HREP.

Thank you for the opportunity to provide this Draft Fish and Wildlife Coordination Act Report. If you have questions, please contact me at (618) 997-3344, ext. 345.

Sincerely,

/s/ Matthew T. Mangan

Matthew T. Mangan
Fish and Wildlife Biologist

cc: IDNR (Atwood)
MDC (Vitello)

Attachments: Table 1
Table 2
Appendix A – Literature Cited
Appendix B – Assumptions

Colonel Anthony P. Mitchell 7

Table 1. Habitat Suitability Index (HSI) scores for Existing, Future with Project (Year 1,5,25 and 50) and Future without Project (Year 1,5,25 and 50), Piasa and Eagle's Nest Islands HREP.

Habitat Type	Species	Existing	Future With				Future Without			
		0	1	5	25	50	1	5	25	50
Side Channel	Striped Bass	0.75	1.00	1.00	1.00	0.84	0.72	0.57	0.00	0.00
Backwater	Smallmouth buffalo	0.80	0.85	0.85	0.80	0.65	0.80	0.80	0.68	0.00
Island	Least Tern	0.80	1.00	1.00	0.80	0.30	0.80	0.00	0.00	0.00

Table 2. Habitat Units for Future with Project (Year 50) and Future without Project (Year 50), Piasa and Eagle's Nest Islands HREP. Net change is the difference between Future with Project and Future without Project.

Habitat Type	Species	Future With	Future Without	Net
Side Channel	Striped Bass	23,297.18	5,029.17	18,267.93
Backwater	Smallmouth buffalo	1,631.41	1,157.00	474.41
Island	Least Tern	3,134.21	1.20	3,133.01

APPENDIX A

LITERATURE CITED

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Theiling, C. H., Korschgen, C., DeHaan, H., Fox, T., Rohweder, J., & Robinson, L. (2000). *Habitat Needs Assessment for the Upper Mississippi River System Technical Report.* La Crosse, WI: U.S. Geological Survey, Upper Midwest Environmental Sciences Center.

USACE (U.S. Army Corps of Engineers). 2017. Upper Mississippi River Restoration, Feasibility Report with Integrated Environmental Assessment, Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project. U.S. Army Corps of Engineers, St. Louis District, St. Louis, MO.

APPENDIX B
ASSUMPTIONS

General and site specific assumptions used in the habitat evaluation. Taken from Appendix G (Habitat Evaluation & Quantification) of the Definite Project Report.

General Assumptions

- It was assumed that target years of 0 (existing condition), 1, 5, 25, and 50 (future without and future with project conditions) are sufficient to analyze HUs and characterize habitat changes over the estimated period of analysis. The period of analysis was determined to be 50 years based on the prediction that some project features (e.g., development of key ecological processes needed to restore ecosystem structure and function) would need a longer period of time to reach maximum benefits; and the accrual of benefits were predicted to level off after 50 years.
- The team assumed that the main channel habitat (as defined by the UMRR-LTRM stratum) would not be affected by the proposed alternatives; therefore, these acres of main channel habitat within he Project Area were not evaluated for habitat benefits.
- The team assumed that existing forested island habitat within the Project Area would not be affected by the proposed alternatives; therefore these acres of forested island habitat within the Project Area were not evaluated for habitat benefits.

Site Specific Assumptions

Side Channel Habitat (*Striped Bass HSI Model*)

The striped bass (*Morone saxatilis*), in the family Moronidae, has been successfully stocked throughout the United States. This fluvial dependent species prefers cool, well-oxygenated water and cannot tolerate poor water quality. Water current is an attractant for striped bass preparing to spawn.

- **Baseline Condition:** Detailed water quality data were collected by the Upper Mississippi River Restoration Program Long Term Resource Monitoring (UMRR-LTRM) element from 1993 to present. These data are randomly stratified and collected throughout the year; therefore, it was assumed that data collected was representative of the entire side channel.
- **Future without Project Condition:** Future conditions of the side channel were based on the average sedimentation rate calculated from an ISOPACH analysis. This analysis estimated that Piasa Chute has lost 0.14 feet per year between 2006 and 2013; therefore, it was assumed this sedimentation rate would continue during the period of analysis. In terms of surface area extent of the side channel, based on historic imagery it was assumed the surface area of the side channel would remain the same throughout the period of analysis, but the quality of the habitat would change through time.
- **Future with Project Condition:** The proposed final depth of Piasa Chute is 10 feet below minimum pool. The team took a conservative approach and assumed the same sedimentation rate of 0.14 feet/year; however, the dredging the side channel is estimated to increase the average depth of Piasa Chute by 6 feet. The team used existing UMRR-LTRM data collected from the Project with the same depth as what is expected with

proposed project depths. These data were used to forecast dissolved oxygen levels and water temperature during the period of analysis. Results from the 2D numeric hydraulic modeling effort (at 159,000 cfs) were used to estimate the average current velocity of the project alternatives. The 2D numerical model results showed that the notched rock structure would provide more velocity within Piasa Chute as compared to alternatives without the rock structure. Rock used to build the notched rock structure would increase habitat structure for fish and macroinvertebrate habitat as well. Most importantly perhaps is the continued structure and function of the side channel complex. With the Proposed Project, some acres of existing side channel habitat would be converted to island habitat (varies between considered action alternatives), depending on the amount of dredge disposal material available to build islands.

Backwater Habitat (*Smallmouth buffalo HSI Model*)

The smallmouth buffalo (*Ictiobus bubalus*), in the family Catostomidae, is an important commercial fish in the Mississippi River drainage basin. This species occurs in deep, flowing water, as well as sloughs, oxbow lakes and other backwaters for resting, spawning, and rearing. They feed on organisms in the substrate of large rivers and backwater lakes. This species was selected because it requires backwaters and off-channel areas to complete important life history stages.

- **Baseline Condition:** Detailed water quality data were collected by the Upper Mississippi River Restoration Long Term Resource Monitoring element from 1993 to present. These data are randomly stratified and collected throughout the year; therefore, it was assumed that data collected was representative of the entire backwater. Using UMRR-LTRM the average depth of the backwater is 1.25-3.5 feet.
- **Future without Project Condition:** Future conditions of Piasa Island Backwater were based on calculated sedimentation rates from a nearby backwater and from historic aerial imagery. The sedimentation rate was calculated by the Corps at Brickhouse Slough/Dresser Island HREP within Pool 26 at 0.5 inches/year (Placeholder2). However, using this sedimentation rate to forecast into the future seems a bit unreasonable based on historic imagery analysis which shows the backwater persisting for more than 25 years with minimal change in surface area. Therefore, the team assumed a more conservative loss of backwater acres over time. From 1993-2013, 37% of all samples collected by UMRR-LTRM were less than 2.0 feet in the backwater. With this information the team assumed that by year 50, 37% of the backwater would be lost (areas less than 2 feet) or approximately 18 acres (or 0.36 acres per year). Consequently, available habitat structure and cover, food production, and potential spawning and rearing habitat for fish would be reduced.
- **Future with Project Condition:** The proposed depth of Piasa Island Backwater is 10 feet below minimum pool, which would provide adequate depths to be present for overwintering fish habitat. The team assumed that dredging the entrance of the backwater would increase circulation of water throughout the backwater improving temperature, slightly increasing velocity, and reducing sedimentation. The team assumed the loss of backwater acres during the period of analysis would be less as compared to the FWOP. Most importantly perhaps is the continued structure and function of the backwater complex.

Island Habitat (*Least tern HSI Model*)

The interior least tern (*Sterna antillarum*) is a federally endangered bird species. Least terns nest on barren to sparsely vegetated sandbars along rivers, sand and gravel pits, lake and reservoir shorelines, and occasionally gravel rooftops. They hover over and dive into standing or flowing water to catch small fish. This species was selected because it requires bare or sparsely vegetated sandbars and islands for nesting habitat, and they are known to nest on artificial habitat within Pool 26.

- **Baseline Condition:** The Project and surrounding areas have numerous different types of wetlands, including forested wetland, emergent wetland, and shallow water areas. Within the Project, Piasa and Eagle's Nest Islands are forested islands with areas of emergent wetlands, and small sand bar islands are currently forming within Piasa Chute. Prior to the construction of lock and dam 26, several islands were present within the complex, but are now inundated. The existing sandbar islands are at low elevations and are comprised primarily of sand, with some silt and larger fragmentary material. One island has established woody vegetation. The head of Piasa Island is at an average elevation of 420.57 feet NAVD88. The team decided to use this existing elevation as the basis for the target elevation of the proposed island restorations. Currently, 0.5 acres of sandbar island habitat exists at > 420.57 feet NAVD88. Based on historic aerial imagery it appears that the sandbar island habitat within Piasa Chute builds up vegetation, but then flood events remove the vegetation periodically.
- **Future without Project Condition:** Without the project, the team assumed that the historic islands would remain inundated; therefore, the Project area would provide minimal sandbar island habitat into the future. The team assumed the existing sandbar islands would remain into the future but be subject to degradation and aggradation based on flood events; but overall it was assumed the total number of acres situated higher than 420.57 feet NAVD88 would remain at that elevation into the future. The team assumed that overtime, the existing vegetated island would continue to capture organic material, and the substrate would become more silt/clay, which is less suitable substrate for least tern nesting activity.
- **Future with Project Condition:** With the project, additional acreage of sandbar island habitat would be constructed at elevation 420.57 feet NAVD88. These islands would be restored to historic locations and in areas of existing low shear stress based on the hydraulic model outputs. Building of the islands would convert existing open water habitat to sandbar island habitat. The team assumed that these newly restored islands would be bare and made of sand. It was recognized that through time vegetation may become established on the islands, but the team assumed periodic flooding and/or physical removal through vegetation management would retain the target characteristics of the islands (e.g., bare, sandy, low vegetation height). The team did assume that some silt and clay would collect on the islands through time. The team assumed that the stone protection on the restored islands would lock the islands in place and allow for the total acres of island habitat to be maintained throughout the period of analysis. Acres of island habitat restored would vary among considered action alternatives based on the amount of dredge disposal material available to build islands.

2. SHPO Coordination

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

October 17, 2016

Engineering and Construction Division
Curation and Archives Analysis Branch (EC-Z)

Ms. Rachel Leibowitz
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62701-1507

Subject: Eagles Nest and Piasa Islands Habitat Rehabilitation and Enhancement Project

Dear Ms. Leibowitz:

The United States Army Corps of Engineers (USACE) is presently planning the Eagles Nest and Piasa Islands Habitat Rehabilitation and Enhancement Project (HREP). The proposed project includes the Mississippi River islands and the surrounding channel in Madison and Jersey counties, Illinois (Figure 1). The project area is in Upper Mississippi River Pool 26 near Alton, IL. We are contacting your office to initiate consultation under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and its implementing regulation 36 CFR 800.

Authority

This project is being carried out under the auspices of the Upper Mississippi River Restoration Program (UMRR), formally known as the Environmental Management Program (EMP), originally authorized by the Water Resources Development Act (WRDA) of 1986. Over the course of its first 13 years, UMRR-EMP proved to be one of this country's premier ecosystem restoration programs, combining close collaboration between Federal and State partners, an effective planning process, and a built-in monitoring process. This success led Congress to reauthorize UMRR-EMP in WRDA 1999 (Public Law 106-53). Section 509 of the 1999 Act made several adjustments to the program and established the following two elements as continuing authorities:

- Planning, construction, and evaluation of fish and wildlife habitat restoration and enhancement projects (known as Habitat Rehabilitation and Enhancement Projects (HREPs)).
- Long-term resource monitoring, computerized data inventory and analysis, and applied research (known collectively as Long Term Resource Monitoring Program (LTRMP)).

1

Project Background

The Piasa and Eagle's Nest Islands HREP covers approximately 1,350 acres of backwaters, side channels, and island habitats. These islands and the surrounding channel are owned by the Corps of Engineers and managed by the Illinois Department of Conservation (IDNR) through a cooperative agreement. They are part of the Mississippi River Fish and Wildlife Area.

The primary resource problems include: sedimentation resulting in loss of depth in the side channels, altered river hydrology, loss of emergent wetlands, and loss of islands and island area within Pool 26 of the Upper Mississippi River. These problems have led to degraded aquatic and wetland ecosystem structures and functions. Potential project features examined to address these problems included: river training structures including, but not limited to, chevron dikes, closure structures, alternating hard points, bullnose dikes, trail dikes, stub dikes, in-stream habitat structure, dredging, beneficial dredge material placement, and revetment.

The overall project goal is to restore and improve the quality and diversity of aquatic and island ecosystem resources within the Project Area. Three main objectives are:

- Restore depth and flow of the side channel to improve sediment transport and geomorphic processes within Piasa Chute
- Increase the depth and connectivity between the Piasa Backwater and the Mississippi River, as measured by acres of deep water habitat and number of days connected
- Increase the areal coverage of islands, as measured in acres

The Tentatively Selected Plan (TSP) includes a notched rock structure located between the two islands, along with dredging of the Piasa Chute and the Piasa Backwater (Figure 1). The dredge material will be used to restore islands within project area. No material is being deposited on either existing island (i.e., Eagles Nest or Piasa).

Project Area History

There is no known prehistoric occupation of the project islands, but they have not been archaeologically surveyed. While Eagle's Nest Island formed in the historical period, Piasa Island is somewhat remarkable as, unlike most islands in the Mississippi River, its location has remained relatively stable since first Euroamerican contact. Archaeological sites are abundant on the floodplain of the Mississippi and its tributaries, and it would not be unlikely that they exist, or once exited, on long-standing islands.

The first Euroamerican claimant to what became known as Piasa Island was Toussaint Cerré. Toussaint was probably the nephew of Jean-Gabriel Cerré. Jean-Gabriel was born in Montreal in 1734 and established a fur trading post at Kaskaskia by the mid-1770s. He quickly became a successful merchant acquiring additional property in both Ste. Genevieve and St. Louis. It's unknown when Toussaint joined his uncle in the area, but in his petition to the French lieutenant governor in January of 1800 for the island he describes himself as "father of a family, ancient inhabitant of this county, and residing at the village of St. Charles of the Missouri" (House Doc. n.d.:71). He asked the governor to grant him the "great island of Payse" given the difficult of

raising cattle in the settlements and the growing scarcity of wood in the region. He assures him that the island is on the Spanish side of the river as the main channel passes between the island and the American side. The governor, Carlos Dehault, granted Cerré and his heirs the island "to possess and enjoy, and dispose of it as their own property" the same day (House Doc. n.d.:71).

After the United States acquired the Louisiana territory in 1803, congress created a board of land commissioners to reject or confirm the French and Spanish colonial grants. On September 13, 1806, Auguste Chouteau went before the board to claim Piasa Island, producing a certified copy of a deed of conveyance from Toussant (House Doc. n.d.:72). Apparently, the board was not convinced and the issue was presented again in 1810, 1832, and finally on November 1, 1833 when their unanimously opinion was the island be confirmed to Toussaint Cerré, or his legal representative.

In 1818 the western portion of Piasa Island was platted as three tracts in T6N R11W S25 (Figure 2). The corresponding map for R6N R10W does not show the eastern portion of the island. Notably, the island was mapped in Illinois, in contrast to Toussaint Cerré's contention that it was on the Missouri side of the river. In 1841 the surveyor's office specifically mapped the island again along with Little Piasa Island (Figure 3). A notation in the margin states that the survey was provided to the Commission of the Land Grants Officer and identifies the islands as No. 60 and No. 61. Again, the western portion of Piasa, in Jersey County, is shown as three tracks, and now the eastern portion in Madison County is shown as two tracks.

Auguste Chouteau died in 1829, but it was 1839 before his probate was filed with the court. In April 1839 there was a St. Charles Circuit Court case for "the Partition of land of Auguste Chouteau, deceased; Piasa Island, also known as Isle de Paysa, in Mississippi River opposite Alton." Seven plaintiffs of the Paul and De Breuil families and eleven defendants of the Chouteau, Lawless, Smith, and Paul families are named. The outcome of the case is unknown, but at some point the island reverted to the Federal Government. Perhaps the initial Cerré claim was disallowed given the island's location in Illinois verses Missouri as he initially contended. Alternately, the Chouteau claim as Cerré's assignee may not have been upheld. It is tempting to associate the 1841 plat's notation about being sent to the Commission of the Land Grants Officer with the land's reversion to Federal ownership.

Three sale-cash patents under the Land Act of 1820 were issued for Piasa (i.e., Island No. 60). The first was for Track 2 in Jersey County to Joel Foster (12/1/1845), the second was for Tracks 1 and 3 in Jersey County to Peter Gutzweller (4/10/1848), and the third was to Lewis Moore for the rest of the island in Madison County (4/25/1871). There is also a patent for Little Piasa Island to Louis Stritz (3/19/1874).

One of the earliest topographic maps of the Middle Mississippi is the 1866 Warren map series. Sheet No. 18 shows the two Piasa Islands along with a small, perhaps nascent, Eagle's Nest Island (Sheet No. 18) (Figure 4). The earliest detailed topographic representation and hydrographic chart of the project area is that of the Mississippi River Commission (1890 hydrology) (Figure 5).

By the end of the 19th century Piasa island was better known locally as "Scotch Jimmy's Island," sometimes spelled "Scotch Jimmie's Island" (e.g., Alton Evening Telegraph, May 17, 1906). Less frequently, it was also known as "Silver Island" (Alton Evening Telegraph, October 29, 1930:20). Scotch Jimmy was the nickname of James Powrie, a civil war veteran who had served in the 144 Illinois Infantry. The 1870 census for Jersey County lists him living with Ellen and Jane Powrie in Township 6N, Range 11W, which includes Piasa Island.

Piasa Island was the location of considerable Corps of Engineers work during the last quarter of the 19th century. Between 1875 and 1877 a submergible dam was built between the island and the Missouri shore (Report of the Chief 1881:1566). The intent was to force waterflow into the northern chute and thus create a good navigation channel during all flood stages. The presence of rock in the upper part of the chute prevented the necessary scour, however, and the structure was a failure (Report of the Chief 1895:1677). Moreover, the northern chute became increasingly difficult to navigate and eventually, during the high water of 1882, a large bar moved over its mouth and closed it off completely (Report of the Chief 1883:1183).

Steamboats were forced to use the southern chute by finding any depression that existed over the dam. In an emergency effort, using funding originally intended for the improvement of Alton Harbor, the Corps decided to breach the dam next to the Missouri shore. An initial effort using a hydraulic excavator failed, but a second with a conventional dredge was successful. A 385 foot cut was made to a depth of six feet at low water. These efforts cost the government $2,750. Ironically, it was another break in the dam caused by winter ice that opened and became the main channel. In 1889, the Corps raised the remaining dike to six feet above low water, but left the two gaps in the hope that scour would further deepen the channel. For that effort, 2,505 cubic yards of stone was placed and $5,580 spent (Report of the Chief 1890:1966).

Accumulations of sand behind the dam, however, continued to make navigation dangerous and in 1893 1600 feet of dam structure was removed entirely, with the rock being used to create a number of wing dams and for shoreline reinforcement (Report of the Chief 1895:1678). Additional work was performed to raise and repair the wing dams and to expand the shoreline revetment in subsequent years (e.g., Report of the Chief 1907:1562).

The 1880 MRC map shows that approximately 26 acres of Piasa Island were under cultivation, while the remainder was forested (Figure 5). Interestingly, the same lot is still under cultivation in 1930 (Figure 6). In 1880 Eagle's nest island is mainly mud and sand flats. Its landmass, however, grows in size and the island becomes forested by 1931. There is no indication it was ever cultivated.

While Piasa Island has existed in relatively the same place since at least the 19th century, it has undergone changes in extend and shape. The current backwater (which will be dredged during this project) only formed during the middle of the 20th century. Previously, its location was covered by landmass.

As part of the construction of Lock and Dam 26 and the creation of Pool 26, Piasa and the other islands in the project area were acquired by the government (Figure 7).

Potential Effect on Cultural Resources

The notched structure will be constructed and modified/removed via barge, without recourse to land access; therefore, any effects are limited to submerged cultural resources (as are the dredge and dredge placement activities). Primary among these are historic period shipwrecks. Given the continual river flow and associated sedimentary erosion, deposition, and reworking, it is highly unlikely that any more ephemeral cultural material remains on the river bed.

Shipwrecks

Between July and December of 1988, when the Mississippi River was at its lowest level on record, the St. Louis District Corps of Engineers conducted aerial surveys of exposed wrecks between Saverton, Missouri, and the mouth of the Ohio River. Thirty four (34) historic wrecks were documented at that time. Since then, the Corps database has been updated several times when new wrecks are reported or when research provides new information on wreck location. A separate database of modern (i.e., metal) wrecks which may pose a risk to navigation is also maintained by the Corps. The combined total of mapped locations is ninety (90). The nearest known historic wreck is over nineteen (19) miles from the project area. The nearest known modern wreck is over twelve (12) miles away.

The river bed in the project area is surveyed every year or two, with the latest processed survey having been completed in 2015. The single-beam survey was conducted with range lines spacing of 250 feet. No topographic anomalies suggesting wrecks are visible on the resulting bathymetric map (Figure 8). Additional, pre-construction bathometry will also be examined when available.

Conclusion

Given the project features' location and construction/excavation method (with no land impact), the previous disturbance of the riverbed outlined above, the channel geomorphic history, and the lack of any survey evidence for extant wrecks, it is our opinion that the proposed undertaking will have no significant effect on cultural resources.

If you have any questions or comments, please feel free to contact me at (314) 331-8466 or Dr. Mark Smith at (314) 331-8831 (e-mail: mark.a.smith4@usace.army.mil).

Sincerely yours,

FOR
Michael K. Trimble, Ph.D.
Chief, Curation and Archives
Analysis Branch

Enclosure

Figure 1. TSP features.

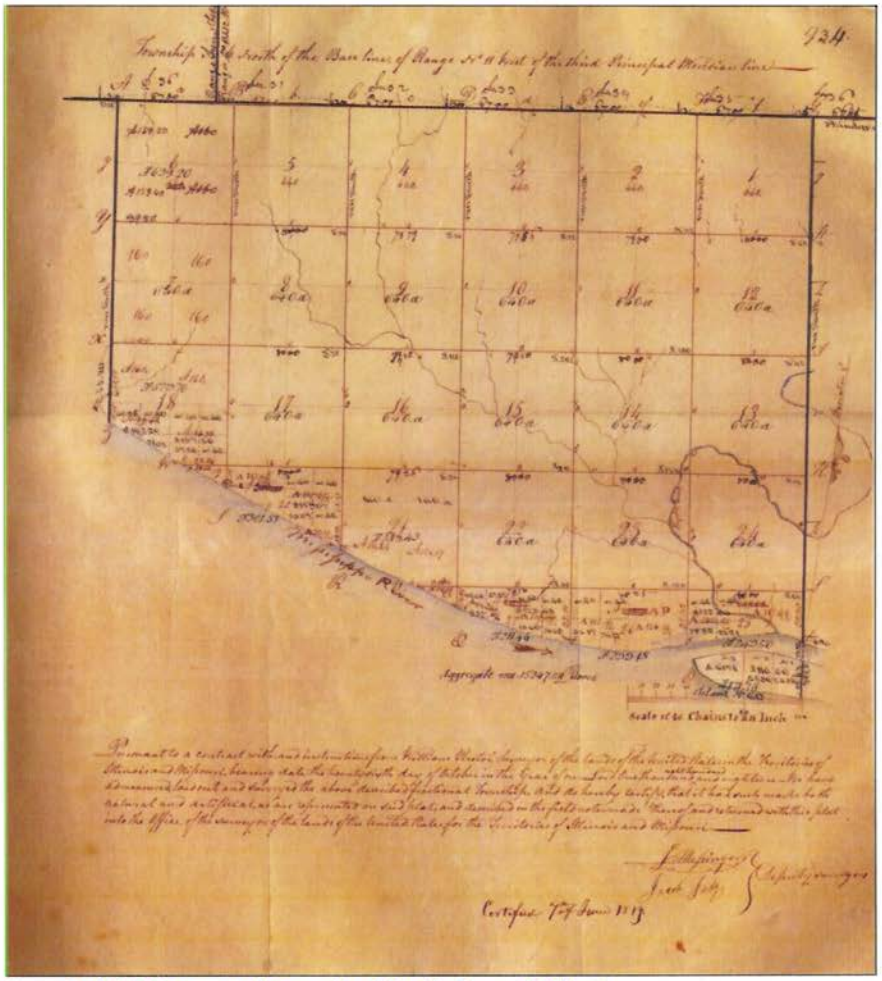


Figure 2. 1818 Plat map of Township 6 North, Range 11 West.

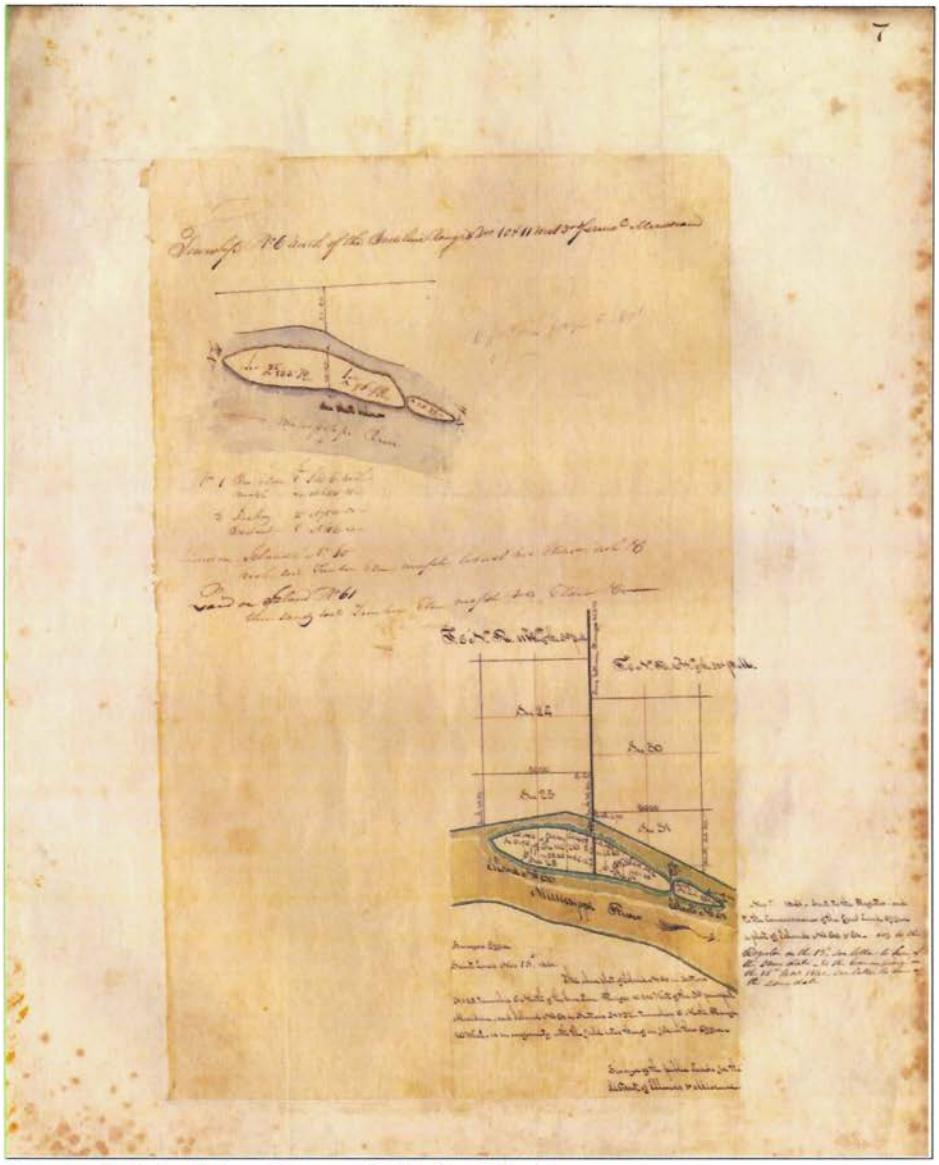


Figure 3. 1844 detail plat of Piasa and Little Piasa Islands.

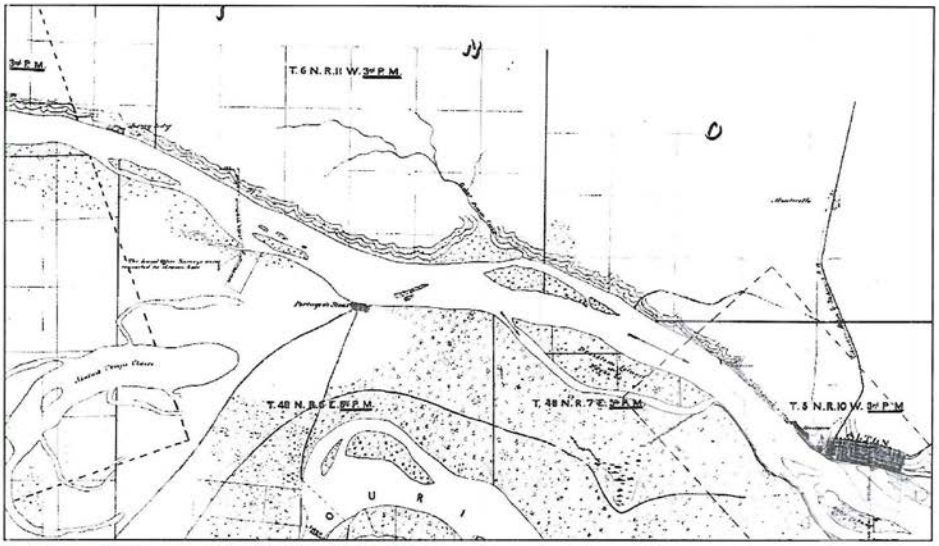


Figure 4. 1866 Warren map, Sheet No. 18.

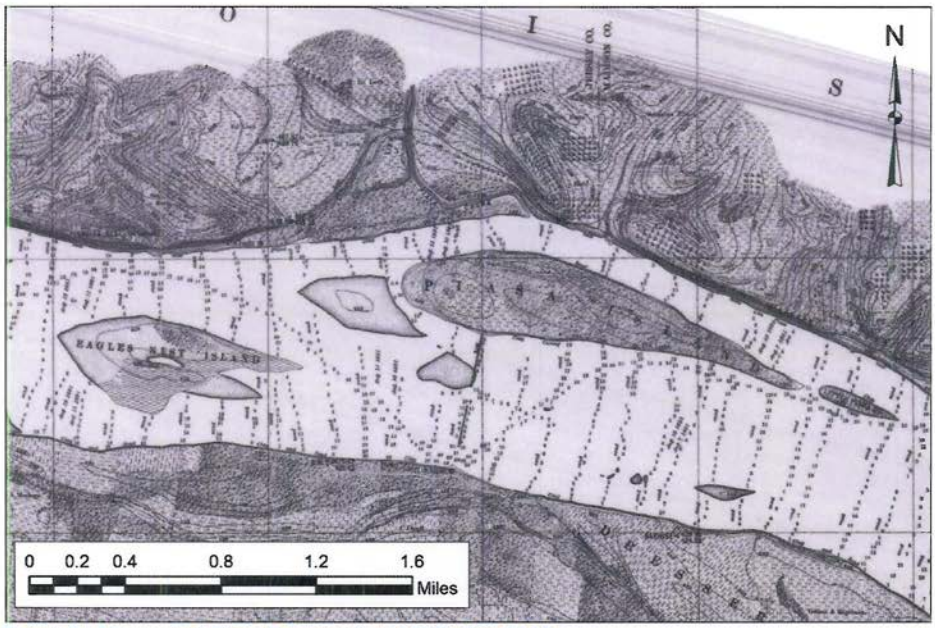


Figure 5. Mississippi River Commission, 1890, Chart 118.

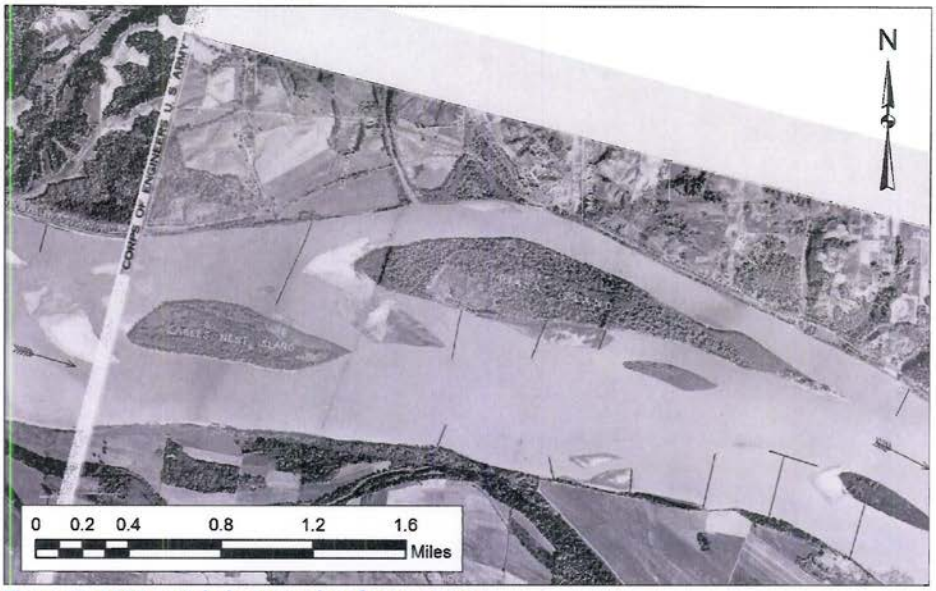


Figure 6. 1931 aerial photographs of project area.

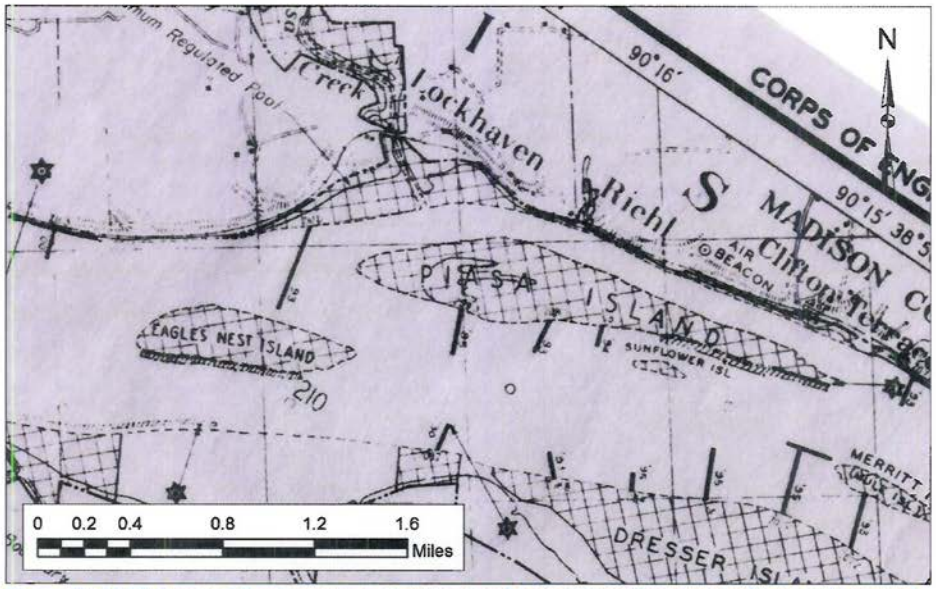


Figure 7. 1942 Corps of Engineer map showing land acquisition (hatches indicate title vested in federal government).

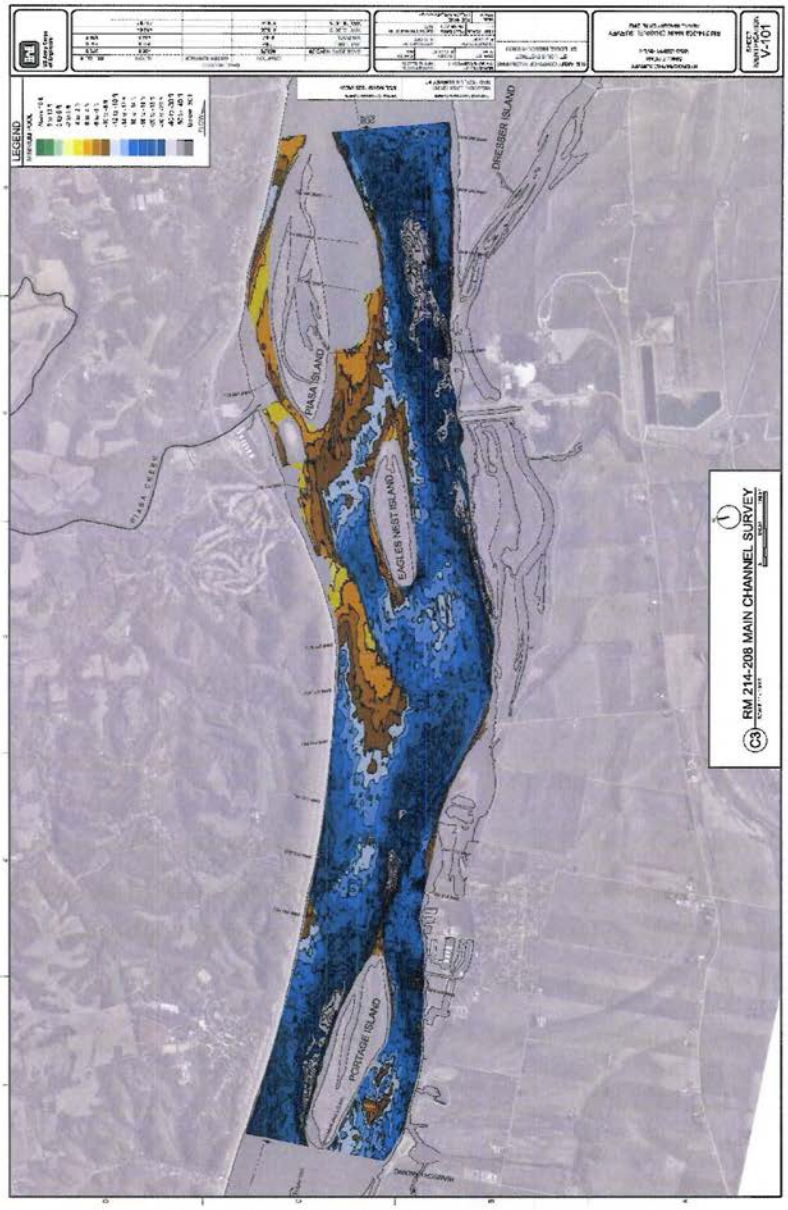


Figure 8. 2015 Bathymetric model of project area.

11

References Cited

House Document, Otherwise Publ. as Executive Documents: 13th Congress, 2d Session-49 Congress, 1st Session. n.d. "Private Land Claims in Missouri (Doc. No. 79)" Government Publishing, Washington D.C.

Report of the Chief of Engineers. 1881. Appendices. Government Printing Office, Washington.

Report of the Chief of Engineers. 1883. Appendices. Government Printing Office, Washington.

Report of the Chief of Engineers. 1890. Appendices. Government Printing Office, Washington.

Report of the Chief of Engineers. 1895. Appendices. Government Printing Office, Washington.

Report of the Chief of Engineers. 1907. Appendices. Government Printing Office, Washington.

Illinois Historic Preservation Agency

1 Old State Capitol Plaza, Springfield, IL 62701-1512

FAX 217/524-7525
www.illinoishistory.gov

Various County PLEASE REFER TO: IHPA LOG #005101916
Alton
Mississippi River Pool 26, Madison & Jersey Counties
COESTL
Habitat Rehabilitation & Enhancement - Eagles Nest & Piasa Islands

November 2, 2016

Michael K. Trimble, Ph.D., Chief
Department of the Army
St. Louis District, Corps of Engineers
Curation and Archives Analysis Branch (EC-Z)
1222 Spruce St.
St. Louis, MO 63103-2833

Dear Chief Trimble:

We have reviewed the documentation submitted for the referenced project(s) in accordance with 36 CFR Part 800.4. Based upon the information provided, no historic properties are affected. We, therefore, have no objection to the undertaking proceeding as planned.

Please retain this letter in your files as evidence of compliance with section 106 of the National Historic Preservation Act of 1966, as amended. This clearance remains in effect for two (2) years from date of issuance. It does not pertain to any discovery during construction, nor is it a clearance for purposes of the Illinois Human Skeletal Remains Protection Act (20 ILCS 3440).

If you are an applicant, please submit a copy of this letter to the state or federal agency from which you obtain any permit, license, grant, or other assistance.

Sincerely,

Rachel Leibowitz, Ph.D.
Deputy State Historic
Preservation Officer

For TTY communication, dial 888-440-9009. It is not a voice or fax line.

3. Tribal Coordination

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

December 2, 2014

Engineering and Construction Division
Curation and Archives Analysis Branch

COPY

Governor Edwina Butler-Wolfe
Absentee-Shawnee Tribe of Indians of Oklahoma
2025 South Gordon Cooper Drive
Shawnee, Oklahoma 74810-9381

Dear Governor Butler-Wolfe:

This letter addresses the Upper Mississippi River Restoration Habitat Rehabilitation and Enhancement Project at Piasa and Eagle's Nest Islands. These two islands are located in Mississippi River, Pool 26, between River Miles 208 and 211 (see Attachment). Both islands are on the Illinois side of the main channel and located in Madison and Jersey Counties. The affected properties are located solely on U.S. Army Corps of Engineers fee-title property and are managed by the St. Louis District Rivers Project Office, with a portion of the land being managed by the Illinois Department of Natural Resources under a partnership agreement.

The 1890 Mississippi River Commission Map of the Piasa and Eagle's Nest Islands area shows two isolated sand bars at the head of Piasa Island and small vegetated islands on the riverside and at the tail end of Piasa Island. The imagery from 1941 (post-Lock 26 construction) shows only the two islands, and the imagery from 2012 show the two islands in the same location as the 1890 map.

The existing habitat conditions, future needs and proposed general actions that are being proposed for habitat restoration on the Upper Mississippi River calls for restoration of secondary channel habitat, island habitat, and contiguous backwater in Pool 26. An opportunity exists to restore depth, reduce erosion, enhance aquatic habitat diversity, and restore some of the historic islands and sand bars. The goals of this project are to restore and improve the quality and diversity of aquatic, island, and wetland ecosystem resources within the project area. This proposed project will seek to enhance secondary channel depth and restore flow diversity, restore a more diverse island complex, enhance backwater depth diversity, and restore emergent aquatic vegetation. The following are some of the potential measures that could be implemented.

Dredging—Dredge channels in the interior backwater of Piasa Island.

Structures—Chevrons and rock dikes.

COPY

Island/Sand bar formation—The dredge material would be placed behind constructed chevrons on the riverside of Piasa Island and between Eagle's Nest and Piasa Islands.

Erosion protection structures—Off-bank rock structures at the head of Eagle's Nest and Piasa Islands to prevent erosion and create.

The place, number, and type of structures, islands, and sand bars is contingent on the results of more testing. A Hydraulic Sediment Response Model will be developed during the remainder of Fiscal Year 2015, which will determine the best location of any river training structures needed to meet the project goal and objectives. Historically, there have been eagles' nests on the two islands. Two mussel beds have been identified during a 2014 mussel survey, and there is a known heron rookery at the head of Eagle's Nest Island. Proposed project features will take into consideration the location of these resources, and all construction guidelines provided by U.S. Fish and Wildlife Service will be followed.

No on-site field inspection of the islands has been conducted as the current plans calls for all work to be conducted from the water. Archaeological site files have been researched, and no sites are listed for the islands. If the plan changes and work will take place on the island, then on-site field inspection of the islands will take place and any potentially significant archaeological properties will be evaluated for National Register eligibility. Should an inadvertent discovery of human remains occur, during dredging or any other activities associated with this project, all work will cease and the St. Louis District will make sure that all laws are followed.

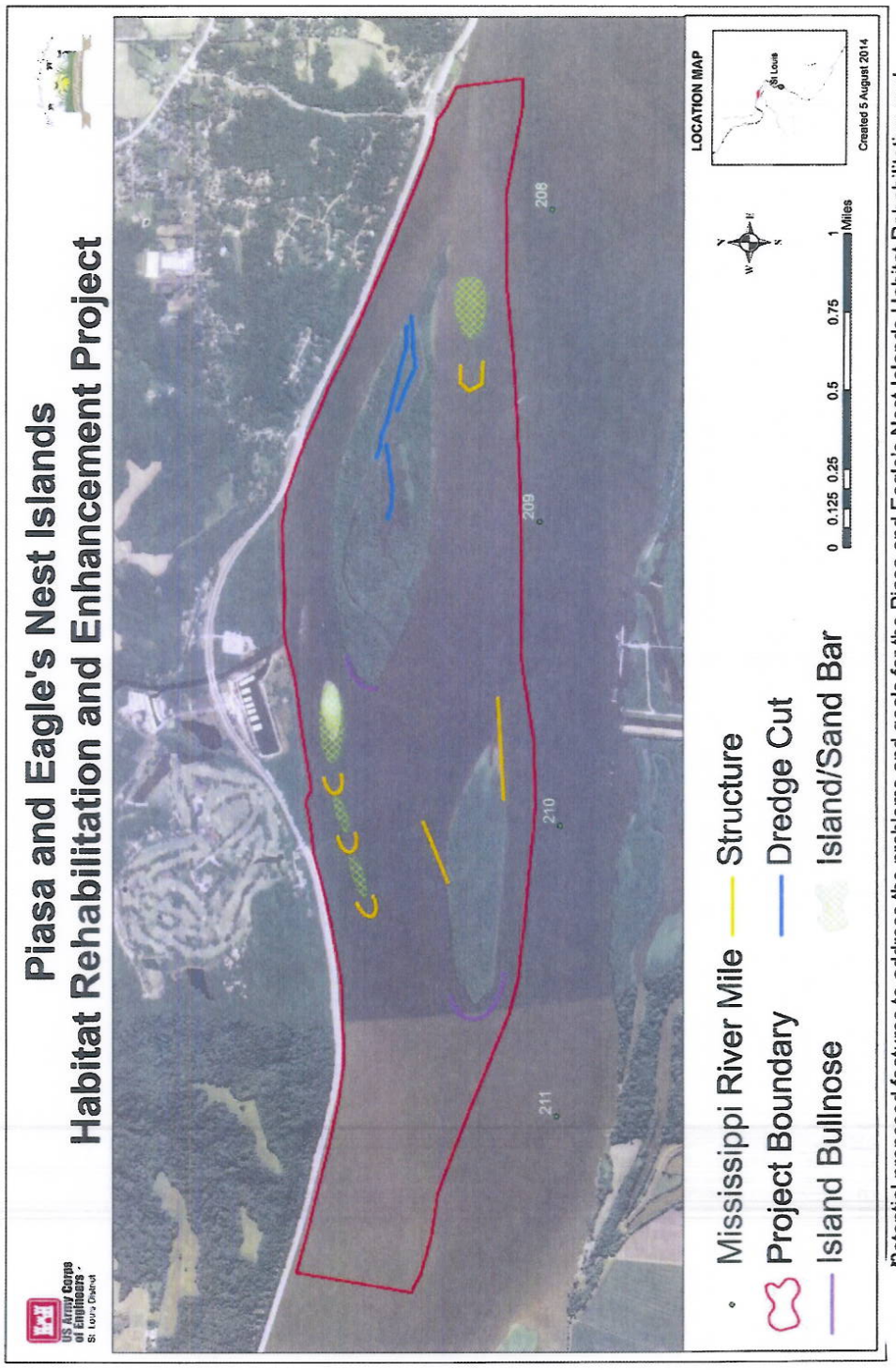
The U.S. Army Corps of Engineers, St. Louis District is requesting that you review the map and information about the project and notify our office if you have any concerns about traditional cultural properties, sacred sites, or other resources that many be located on the islands or on the shores near the islands. Please notify our office no later than January 26, 2015, if you have any areas of concern. If you have questions regarding this matter place contact Ms. Roberta L. Hayworth, Native American Coordinator at (314) 331-8833, or by electronic mail at Roberta.l.hayworth@usace.army.mil. Thank you in advance for your timely review of this request. A copy of this letter has been furnished to Mr. Joseph Blanchard.

Sincerely,

for Michael K. Trimble, Ph.D.
Chief, Curation and Archives
Analysis Branch

COPY

Attachment



Potential proposed features to address the problems and goals for the Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project.

Kickapoo Tribe of Oklahoma

P.O. Box 70
407 N. Hwy 102
McLoud, Oklahoma 74851

Administration Department
Phone: 405-964-7053; Fax: 405-964-7065
Email: kwilson@kickapootribeofoklahoma.com

January 8, 2015

Department of the Army
U.S. Army Corps of Engineers
St. Louis District
ATTN: Ms. Roberta L. Hayworth
1222 Spruce Street
St. Louis, MO 63103-2833

RE: Upper Mississippi River Restoration Habitat Rehabilitation and Enhancement Project at Piasa and Eagle's Nest Islands; Madison and Jersey Counties, Illinois

Dear Ms. Hayworth:

Thank you for consulting with the Kickapoo Tribe of Oklahoma in regard to the above referenced site(s). At this time, the Kickapoo Tribe of Oklahoma has no objections to the proposed project at the intended site(s). However, in the event burial remains and/or artifacts are discovered during the development or construction process, the Kickapoo Tribe of Oklahoma would ask for immediate notification of such findings.

Should I be of any further assistance, please contact me at (405) 964-4227.

Sincerely,

Kent Collier
NAGPRA Contact
Kickapoo Tribe of Oklahoma

Cc: File

TRIBAL HISTORIC PRESERVATION OFFICE

Date: January 15, 2015 **File: 1415-1128IL-1**

RE: DOD, Upper Mississippi River Restoration Habitat Rehabilitation and Enhancement Projecct at Piasa and Eagle's Nest Island, Madison and Jersey Counties

St. Louis District, USACE
Roberta Hayworth
1222 Spruce Street
St. Louis, MO 63103-2833

Dear Ms. Hayworth,

The Osage Nation Historic Preservation Office has evaluated your submission regarding the proposed DOD, Upper Mississippi River Restoration Habitat Rehabilitation and Enhancement Projecct at Piasa and Eagle's Nest Island, Madison and Jersey Counties and determined that the proposed project most likely **will not adversely affect properties of cultural or sacred significance to the Osage Nation. The finding of this NHPA Section 106 review has resulted in a determination of "No Properties."**

In accordance with the National Historic Preservation Act, (NHPA) [54 U.S.C. § 300101 et seq.] 1966, undertakings subject to the review process are referred to in 54 U.S.C. § 302706 (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 the Department of Defense fulfilled NHPA and NEPA compliance by consulting with the Osage Nation Historic Preservation Office in regard to the proposed project referenced as DOD, Upper Mississippi River Restoration Habitat Rehabilitation and Enhancement Projecct at Piasa and Eagle's Nest Island, Madison and Jersey Counties .**

The Osage Nation has vital interests in protecting its historic and ancestral cultural resources. 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 Historic Preservation Office be contacted.**

Should you have any questions or need any additional information please feel free to contact me at the number listed below. Thank you for consulting with the Osage Nation on this matter.

Andrea A. Hunter, Ph.D.
Director, Tribal Historic Preservation Officer

John Fox
Archaeologist

627 Grandview, Pawhuska, OK 74056, (918) 287-5328, Fax (918) 287-5376

4. Stakeholder Meeting Minutes

09 September 2014

Attendees:
Brian Markert (USACE – PM)
Tim Eagan (USACE – PM)
Kat McCain (USACE – Planning)
Charlie Deutsch (USACE – RPO)
John Gineris – Migratory Waterfowl Hunters Inc.
Scott Bryant – Illinois Federation of Outdoor Resources
Butch Atwood – IL DNR Fisheries
Kim Postelwait – IL DNR MRA
Randy Holbrook – IL DNR
Butch Rister – Alton Motorboat Club
Brett Stawar – Alton Regional Convention and Visitors Bureau
Ali Ringhauser – Great Rivers Land Trust

After introductions, Brian Markert provided a brief historical perspective of the Project Area including showing historic aerial images. Historically, the area had a lot more islands. Markert also provided background information from the approved fact sheet.

A tentative project timeline was provided to the group of a 2 year planning effort, and 3-5 years before construction is started.

Since the Project Area is highly visible to the public, this HREP could be an opportunity to educate the public and become an educational point of interest along the Great River Road.

Lower end of Piasa side channel is very shallow. Source of sediment was discussed by the group. Previously sediment from Piase Creek Watershed upland erosion was a source, but large effort of 300+ structures has substantially reduced sediment input from upland erosion. 2007 computer model by Jasen Brown attributed bigger load of sediment coming from up river. Piasa Creek Watershed Study found that main erosion problem within the watershed is from field edge gully erosion. Great Rivers Land Trust has additional information on sediment reduction.

Stakeholder Discussion and Comments

- Historically, Piasa Island was referred to Scott's Jimmy Island
- In the 2007 aerial, what time of year?
- Currently, small sand island within Piasa side channel has willows becoming established
- Stakeholders expressed interest in the HSR Model. As the model is moved forward stakeholders will be asked to participate during model development.
- Maintain flow between islands – do not want a complete closure between the islands; not opposed to a notch structure to maintain flow for mussels and fish
- No concern with moving duck blinds
- Piasa Island Slough:
    - Even in low pool still 2-3 feet deep
    - Sand plug
    - High ridge through middle of island
    - Flocculent/silty bottom at upper end
    - No need for dredge cut through entire island
- Look at idea of placing structures on Piasa Island IL side at lower end of side channel to keep flow ; in terms of recreational access – width at lower end of side channel only needs to be wide enough to maintain boat access
- Prefer chevron idea for island creation and flow diversity

- Use of geotubes was mentioned
- Stakeholders preferred a phased approach for feature construction
- Stakeholders preferred having an adaptive management plan/approach

14 October 2014

Attendees: Randy Holbrook (IDNR), Rob Maher (IDNR), Butch Atwood (IDNR), Kim Postlewait (IDNR), Ashley Cox (USACE – river engineer), Katy Fechter (USACE-RPO), Brian Markert (USACE – UMRR Program Manager), Tim Eagan (USACE – UMRR Project Manager), and Kat McCain (USACE – biologist/planner)

Purpose: Project Delivery Team seeking concurrence from stakeholders on project goals and objectives.

Introduction:

- USACE shared with stakeholders that a Hydraulic Sediment Response model will be conducted during FY15
- Project Sponsor: IDNR

Problem Identification: Ideas shared by stakeholders:

- Within Piasa Island slough, loss/lack of slackwater habitat
- Loss of depth in Piasa side channel
- Loss of diverse island complex
- Loss of emergent wetlands

Opportunities:

- Maintain/enhance existing mussel resources
- Improve flow and depth of Piasa side channel
- Improve slackwater habitat of Piasa Island by providing year-round connectivity with main channel
- Maintain/increase extent of emergent vegetation along island borders
- Increase island/sandbar habitat

Desired Conditions:

- Maintain existing deepwater habitat within side channel along Illinois bankline
- Maintain deepwater between islands
- Increased flow into side channel
- Utilize phased construction
- Year-round connectivity between Piasa Island slough and main channel

Other:

- Mussel beds are good indicators of good fish habitat (Maher)
- If dredging of slough occurs, then disposal should occur behind chevrons or other rock feature—not on islands
- Some discussion on location of historic mussel beds along IL side of Eagle's Nest. This area was not surveyed in the 2014 mussel survey. IDNR looked up historic mussel bed locations…. Past IDNR surveys did not indicate mussel bed along that area (Atwood)
    - Partners desire to have a mussel objective (see below Objective 1.d)
    - Look up other HREP projects from up north in terms of mussel objectives (Kat)
        - Objective 1.d. below is from Bertom McCartney HREP
- 3 cabins still exist on Piasa
- Desire to have low O&M
- North end of Eagle's Nest slightly eroding, but not a major concern
- Maintain unique habitat on lower end of Eagle's Nest
- Other interested stakeholder to be included in the future: Alton Water Ski Club (Eagan will contact)

- In terms of overwintering habitat, Piasa Island slough currently does not have overwintering habitat, but partners desire year-round connectivity. Need to look at Brown's Lake project for parameters used for overwintering habitat (Kat)

Potential Features Discussion:

- Cox provided an introduction on the path forward for the HSR model for the project area
- Some potential features were discussed
    - Bullnose on Eagle's Nest
    - Side Channel Enhancement Dike (SCED)
    - No continuous rock structure between islands
    - Dredging to cut plug out within Piasa Island slough
    - Interior chevron dike on Piasa similar to Bolters Island
- At this point, no potential features have been eliminated from consideration

DRAFT Problem Statements and objectives

Project Goal: To restore and improve the quality and diversity of aquatic, island, and wetland ecosystem resources within the Project Area

Problem 1: Loss of depth and flow in Piasa side channel.

Objective 1a: During normal pool elevation, provide XXXX acre-feet of deep aquatic habitat greater than 6 feet in depth by Year 50.

Objective 1b: Decrease sedimentation rate to XXX inches per year by Year 50

Objective 1c: Provide a diversity of water velocities within the side channel by Year 50 (NEED specific desired velocities listed)

Objective 1d. Ensure adequate water flow over freshwater mussel beds throughout period of analysis.

Problem 2: Loss of year-round connectivity between Piasa Island slough and main channel of Mississippi River

Objective 2. Provide year-round connectivity with a diversity of water velocities (including <1 cm/sec flow during low flow) and adequate water depths (>5 feet) by Year 50.

Problem 3: Loss of diverse island complex.

Objective 3a: Maintain existing acreage of island habitat with Project Area throughout period of analysis.

Objective 3b. Restore XXX acres of new island habitat within Project Area by Year 50.

Problem 4: Loss of emergent wetland

Objective 4a. Maintain existing acreage of emergent vegetation within the Project Area throughout the period of analysis.

Objective 4b. Restores XXX acres of emergent vegetation habitat by Year 50.

11 March 2015

Meeting Purpose: I The St. Louis District is currently developing a HSR model to study the area as part of the project. The goal of this meeting is to coordinate with all parties during the model development and gain insight on the project site.

Attendees:

USACE: Brian Markert (PM), Tim Eagan (PM), Ashley Cox (AREC), Kat McCain (PD), Dawn Lamm (H&H), Robert Cosgriff (RPO); Ben McGuire (RPO); Charlie Deutsch (RPO)

USFWS: Matt Mangan, Jason Wilson, Ken Dalrymple

INHS: Ben Lubinski, Eric Ratcliff, Eric Gittinger
IDNR: Butch Atwood, Rob Maher, Tim Krumwiede, Kim Postelwaite, Kenny Scott, Randy Holbrook
MWHI: John Gineris
Alton Motorboat Club: Butch Rister
Alton Waterski Club: Jonathon Wolff
Great Rivers Land Trust: Alley Ringhausen (+ 2 board members)
IFOR: Scotty Bryant
Brad Mahrer
Brett Stawar
Bernie Heroff

Meeting Notes

Eagan provided a brief overview of the project

McCain provided a brief overview of the status of the project in terms of the feasibility study

Cox provided an overview of the status the HSR model . She also provided the status the of existing structures in the project area (most were not found with side-scan survey; see last page for field notes)

Large Group discussed the problems that have been identified thus far, and had group concurrence that these problems are the ones this project will look to address:

1) Loss of depth and flow in paisa chute
2) Loss of year-round connectivity and depth within Piasa Island Backwater
3) Loss of diverse island complex
4) Loss of wetlands

Large group discussed the goal and objectives identified thus far, and had group concurrence that the overall project goal and objectives (which still need a bit more fine tuning to make SMART) were correct

Small Breakout Group Discussion: After large group discussions, each table brainstormed on what types of features could be used to help solve the identified problems and meet the project goal and objectives. Below are the summaries by table:

<u>INHS TABLE/Eagan :</u>

- Want to increase flow and depth of Piasa Chute
- Want increased connectivity of the Piasa Island Backwater
- One question: where did the sediment come from? Past 8 years high flows = pool on tilt = so what is the source of sediment?
- Should buried structures be completely discounted? (Ashley has these in the model but they are buried, so they are accounted for in the model)
- Potential features:

<u>Bryant/Gineris/Atwood/Lamm/Mangan/McCain Table:</u>

1) Something to keep flow going through Piasa Chute
2) Keep access/flow into Piasa Island Backwater
3) Maintain the existing mussel/fish habitat
4) Maintain the "horseshoe" wetland on Eagle's Nest Island
5) Maintain deep habitat along Eagle's Nest Island
6) Keep other deep water habitat along MO bank (even though outside of scoped Project Area)

7) Should constructability be a constraint? Construction needs 9 feet… most likely will need to dredge for access
8) Throat of Piasa harbor has an eddy development that could be influencing sedimentation
9) What are the impacts of the Piasa Creek flooding? Hillside sedimentation?

IDNR/RPO/USFWS Table (McGuire):

- Increase flow and depth of Piasa Chute
- J Hook/chevrons on Piasa to increase emergent wetlands
- Dredge paisa backwater

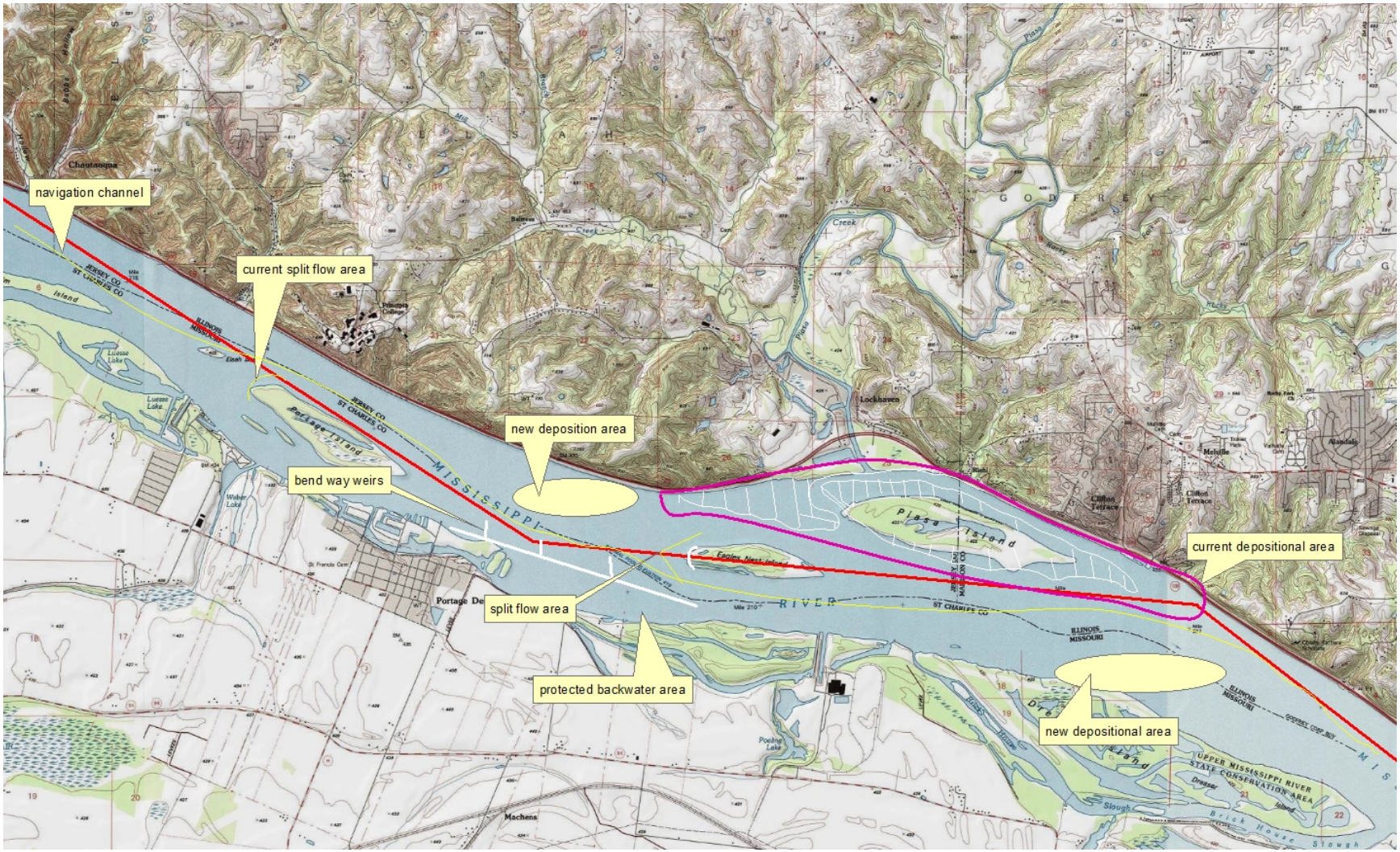
Overall small group discussions on features to look at for the HSR:

1) Chevrons for habitat and flow
2) Use of pile dikes vs. rock
3) Possibly use a chevron/bullnose on Piasa Island to protect and deflect flow
4) J-hooks on outside/main channel side of Piasa Island to increase island diversity
5) Hard points in Piasa Chute
6) Potential rock ledge that goes upstream around RM 211.2L – may be how the water had maintained the depth around Eagle's Nest Island Bullnose on islands
7) Piasa Island slough enhancement
8) Restore island diversity on nav side of Piasa
9) Consider raising existing structures

Additional Notes from Matt Mangan (USFWS) email; dated 11 March 2015

* Modifying Dikes from 211 to 212 RM - Recommend using rootless dikes or offset dikes to direct flow to the side channel. These structures may be more likely to create an additional island/bar while still getting flow to the side channel. May be some risk about pushing material into the side channel but the model should give us a good idea. Otherwise could look at MRS's which may create more fish habitat and direct the flow to the side channel?
* If bullnose structures are proposed for either island I would recommend that they be off bank to allow fish access behind the structures. In addition, if there are opportunities to incorporate woody debris into the structures that would be beneficial also.
* There may be opportunity to do something adjacent to Piasa Island at river mile 209ish (shallow water habitat or island). A chevron was mentioned for this location; however, I have concerns that a chevron may have the opposite effect. i.e. blow out the sand bar. Recommend looking at a rootless dike in this location also.
* Side channel structure (s) at 208.5 to maintain opening to backwater of Piasa Island. Would a small MRS work here? Otherwise recommend incorporating woody debris into structure if possible. This is where it would be good to still have the pile dike capability. This would be a good location for one or a pile/rock combo dike

Additional ideas from Ken Dalrymple (USFWS)



Site Visit/Side Scan: Feb 11, 2015, Max Pool

River Mile	Primary Material	Dike Type/ID	Length	Field Notes
212.90R	Rock	Spur	800	Saw it at the bank all the way to the end, was about 8-9 ft tall and tapered off to about 5 ft towards the end
212.70L		Spur	265	Couldn't see
212.40R	Rock	Spur	435	saw it all the way, was approximately 10 ft tall
212.20R	Rock	Trail	980	found it all the way
212.30L	Rock	Spur	960	This was a wide dike, approximately 10-11 ft tall, goes all the way to the end
212.00L	Rock	Spur	1330	This dike was not straight, exists all the way to the end,not very wide
211.60L	Rock	Spur	800	on the bankline side, dike was about 18 ft wide, there was about a 2.5-3 ft height difference between the dikes (one notch) - the riverward portion was short and covered in sediment at end toward main channel (this was notched more than once in old ENC)
211.60L	Rock	Spur	465	
211.30L	Rock	Spur	770	Not very long (maybe 100 ft?), approximately 13 ft deep and was about 2.5 ft higher than the bar/bed
211.20L		Spur	165	Couldn't see
210.00L		Spur	820	Couldn't see
210.00L		Spur	1315	Couldn't see
209.20R	Pile/Rock	Spur	640	couldn't tell how deep/high it was - in deep scour
209.20L		Closure	945	never found - lots of fish around that spot
209.30L		Spur	1240	Couldn't see
208.90L		Spur	1020	Couldn't see
208.80R	Rock	Spur	700	It was notched on the ENC, hard to tell if it was in field, approximately 10 ft off bed
208.50L		Spur	1200	Couldn't see
208.40R	Rock	Spur	950	approximately 6 ft off bed
208.30L		Spur	240	Couldn't see
208.00R	Rock	Spur	1370	it was notched on the ENC, about 4-4.5 ft off the bed
207.60R	Rock	Spur	620	exists by the bankside, but towards channel does not

*Note: No rock was seen above the water surface: compared to the EGIS Dike shapefile
-Structures more accurate according to the old ENC charts that survey group had on computer

26 August 2015

Meeting Purpose: The US Army Corps of Engineers – St. Louis District has finished calibrating the Hydraulic Sediment Response Model and will be presenting the model to the partners and stakeholders. The team will also

present findings from the development of the model. Lastly, the St. Louis District will solicit ideas for potential measures for the problems and opportunities of the project

Location: Applied River Engineering Center

Attendees:

USACE: Tim Eagan (PM), Kat McCain (PD), Dawn Lamm ,(H&H), Charlie Deutsch (RPO), Brad Krischel (AREC), Jasen Brown (H&H), Rob Davinroy (AREC), Mike Rodgers (H&H), Monique Savage (PD)
USFWS: Ken Dalrymple
INHS: Ben Lubinski, Eric Ratcliff
IDNR: Butch Atwood, Rob Maher, Kenny Scott, Randy Holbrook, Regan Ramsey
MWHI: John Gineris
MDC: Sarah Peper
Alton Motorboat Club: Butch Rister
Alton Waterski Club: Jonathon Wolff, Norm Rhea
Great Rivers Land Trust: Alley Ringhausen

Agenda

1) Introductions
2) Project Brief
3) HSR Discussion
4) Project Timeline
5) Questions

Meeting Notes

Eagan provided a brief overview of the project

The problems and opportunities as outlined in the draft report were shared with the group again, and the group concurred that these are still the problems and opportunities the project should address.

Krischel provided brief on HSR model:

- Background on what an HSR model is
- Discussed how the model was calibrated
- Shared new data that was collected to assist in calibrating the model
- Group had some discussion on what the unknown "mystery" feature just upstream of Eagle's Nest Island. Thus far have had no luck collecting sediment grabs in this area. Davinroy shared that this "mystery" structure is acting like a river training structure and appears to be holding material back. No one present knew what the "mystery" structure is. There is an abrupt drop so that should mean there is something there – not just sand deposition. This "mystery" structure appears to be a dominant feature influencing the project area.
- Krischel discussed the additional historical records that were found that showed additional river training structures that were not in USACE's historic database. The 1932 georeferenced map was shown to the group. Multi-beam survey does confirm that these structures do exist.
- ADCP of the Project Area was also shown to the group. Piasa Chute has minimal flow at all depths. In terms of the "mystery" structure the deeper ADCP readings did show a flow split around the structure
- In terms of the 2015 bathymetry surveys, Eagan shared that areas with no data does not necessarily mean it was too shallow to survey. The survey boat was unable to survey some of these areas due to large amounts of woody debris.
- Krischel shared the prototype scans, model replication scans, and one "EXTREME" alternative scan. The "Extreme" alternative consisted of an appx 2 mile long SCED just downstream of the "mystery " structure.

This alternative was able to get some energy back into Piasa Chute, but shared that the cost of constructing a 2 mile long rock structure would be expensive.

Group Discussed Potential Ideas to be ran in the HSR Model:

1) Diverter Dike
2) Traditional Structures
3) Remove "mystery" structure
4) Simulated dredge cuts (how long would these last?)
5) Manipulate existing structures
6) Use of wood pile dikes
7) Use of flexible dredge pipe and beneficial use of dredged material to restore sand bar islands
8) Island bullnoses
9) Mimic "St. Paul" islands
10) Desired depth of side channel 5-6 feet during drawdown
11) Dredge Piasa backwater slough area

The following were things identified that the team shared that will be kept in mind as we move forward:

1) Location of existing mussel beds
2) Constructability – will most likely have to dig a channel for construction access, even to dredge

Project timeline was briefly shared with a target of the HSR model complete in October. HSR alternative meeting with the partners in November. TSP in March 2016. Public Review in 2017. Approved report in July 2017, and potential construction in 2018.

9 September 2016 (Tentatively Selected Plan Discussion with Sponsor)

Attendees: Tim Eagan (USACE-PM), Brian Markert (USACE-PM), Randy Holbrook (IDNR), Kenny Scott (IDNR), Mark Phipps (IDNR-Natural Heritage), Charlie Deutsch (USACE – RPO), Shelby Korhmann (USACE-PM), Kat McCain (USACE-PD), Butch Atwood (IDNR- Fisheries), Rob Maher (IDNR Fisheries), Tim Krumwiede (IDNR Wildlife), Brad Krischel (USACE-EC), Jasen Brown (USACE-EC)

Agenda:

- Project Status Update
- Go over Cost Effectiveness/Incremental Cost Analysis Best Buy Alternatives
- USACE PDT TSP Selection Recommendation
- DECISION POINT: Sponsor concurrence on TSP Selection

Meeting Minutes:

- Eagan (PM) provided brief project overview and status update
    - USACE PDT provided maps of each of the alternatives (minus the no action alternative)
    - Krischel and Brown discussed project measures and AdH model outputs for each alternative
    - IDNR comments:
        - Are the notches necessary in the rock structure?
            - USACE: No notches was ran in the model, but minimal increase in flow within Piasa Chute but overall loss in flow entering the whole complex, USACE this loss of overall flow would be detrimental and the no notch option was screened out
        - Are the notch number and placement finalized?
            - USACE: No, this is at a 25% level for planning design. The placement of the notches can be optimized. The planning study will provide a 35% level of design that will than go into plans and specs for 100% level design after the report is

approved. The planning study seeks to capture intent and function of the proposed measures.

- In terms of the backwater dredging, just removing the sediment plug but not deepening the interior would not provide additional fisheries benefit. The sediment plug has accelerated into the side channel- not so much into the backwater.
    - USACE: Dredging the entire backwater to 10 feet was found not to be worth it due to the very high cost with little added habitat output. The shape of the dredge cut for the minimum backwater dredging option will be optimized with further design.
- In terms of fisheries habitat, the Project should benefit all native riverine fishes. Lake Sturgeon have been collected in the vicinity. No adverse effects are anticipated for any of the state-listed fishes
- Are there any legal concerns with the island building?
    - USACE: The new islands are designed to 421 to match the head of Piasa Island. We will discuss the need for further modeling to ensure why comply with no increased flood heights.

DECISION POINT: The Project Sponsor, IDNR, had unanimous concurrence that Alternative 4 as the Tentatively Selected Plan. Which includes the following measures:

Measure	**Quantity**	**Unit**
200 ft Braided Dredge Cut		
Stone for 3 braided islands	60,7000	TN
Stone for Upstream Rootless Island ("blob")	56,000	TN
Stone for Riverside Piasa Island	29,900	TN
Dredging – disposal 3 braided islands	177,000	CY
Dredging – disposal rootless island	233,000	CY
Dredging – disposal Riverside Piasa Island	475,000	CY
Notched Rock Structure between Piasa & Eagles Nest	42,400	TN
Backwater Dredging*	156,000	CY

*material assumed to be finer material and will be used to cap newly constructed islands; approximately raise the newly constructed islands by 1 additional foot (422); no substantial increase in surface area of new islands. Total acres of constructed island habitat = 76.43 acres

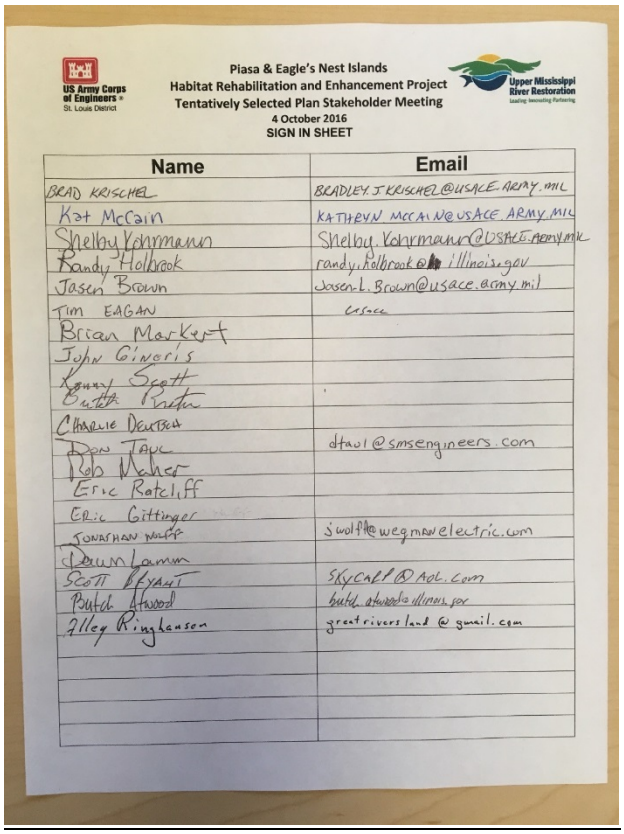
NEXT STEPS: USACE will set up meeting with NGOs/other stakeholders to discuss the TSP; USACE will optimize the minimum backwater dredging design, and rock structure design.

04 October 2016 (Tentatively Selected Plan Discussion with Stakeholders)

Agenda:

- Feasibility Study Status Update
- Overview of each Alternative
- Tentatively Selected Plan Selection and Feedback from Stakeholders

Attendees:



US Army Corps of Engineers
St. Louis District

Piasa & Eagle's Nest Islands
Habitat Rehabilitation and Enhancement Project
Tentatively Selected Plan Stakeholder Meeting
4 October 2016
SIGN IN SHEET

Upper Mississippi River Restoration

Name	Email
BRAD KRISCHEL	BRADLEY.J.KRISCHEL@USACE.ARMY.MIL
Kat McCain	KATHRYN.MCCAIN@USACE.ARMY.MIL
Shelby Kohrmann	Shelby.Kohrmann@USACE.ARMY.MIL
Randy Holbrook	randy.holbrook@illinois.gov
Jasen Brown	Jasen.L.Brown@usace.army.mil
TIM EAGAN	USACE
Brian Markert	
John Ciavaris	
Kenny Scott	
Curtis Pinder	
CHARLIE DEUTSCH	
Don Tape	dtaul@smsengineers.com
Rob Maher	
Eric Ratcliff	
Eric Gittinger	
JONATHAN WOLFF	jwolff@wegmanelectric.com
Doug Lamm	
SCOTT BRYANT	SKYCAR1@AOL.com
Butch Atwood	butch.atwood@illinois.gov
Greg Ringhausen	greatriversland@gmail.com

Meeting Minutes:

Introductions

Eagan provided project overview and update to the group.

Additional technical information provided by technical team (Krischel, Brown, McCain, and Markert) as needed.

- Islands built to 421 feet
- Rock Structure built to 421 feet
- All dredging (Piasa Chute & backwater) cut to 10 feet below minimum pool (415.5 ft)
- Notches in rock structure are 400ft each and increase flow and bathymetric diversity currently lacking in the Project Area
- All new islands will be keyed in with rock

Eagan provided tentative schedule and cost

Some discussion on the benefits/costs for the 200 ft vs. 300 ft Piasa Chute Dredge Cut

Overall, the sponsor stakeholders provided positive/supportive comments about the proposed project

No controversial or negative comments received

DUE OUTS:

- Eagan to send out draft tentatively selected plan to the attendees
- Brown/Jasen/Guntren to update alternative maps showing rock placement on the new islands

5. USACE Project Delivery Team Meeting Minutes

The USACE Project Delivery Team held weekly to monthly meetings during the course of the feasibility study. The team meeting minutes are part of the electronic administrative record and are available upon request.

6. IDNR ITAC

From: Skufca, Jenny
To: Emily Grossman; Mccain, Kathryn MVS
Cc: Heidi Dunn
Subject: [EXTERNAL] RE: FW: IL threatened mussel collected (UNCLASSIFIED)
Date: Wednesday, August 20, 2014 10:31:38 AM

Emily,

Thank you very much for providing scans of your permits. Specific site authorization is not necessary. However, the permit folks appreciate receipt of any reports generated under the E/T permit, so that the IDNR is able to track potential cumulative impacts to species by location.

Dr. McCain,

Thank you for notifying the IDNR of the event. Since handling a State-listed species in Illinois is statutorily considered a form of take, I am required to confirm that such handling was performed under a current permit. Please keep the IDNR apprised of your project, if you believe that State-listed species could be impacted by any project actions.

Thanks, all.

Jenny

Jenny Skufca

Incidental Take Authorization Coordinator

Illinois Department of Natural Resources

One Natural Resources Way

Springfield, IL 62702

(217)557-8243

From: Emily Grossman [mailto:egrossman@ecologicalspecialists.com]
Sent: Monday, August 18, 2014 11:06 AM
To: Mccain, Kathryn MVS; Skufca, Jenny
Cc: Heidi Dunn
Subject: Re: FW: IL threatened mussel collected (UNCLASSIFIED)

Kat & Jenny,

Attached are scans of T&E permits for me and Heidi Dunn (we both worked on this project). We did not see anything on the permits requiring us to get site-specific authorization for this project. If, in the future, we do need to get site-specific authorization for Illinois surveys, please let me know what the appropriate procedure is/who to contact and we would be happy to do so.

We collected 2 Ellipsaria lineolata during the course of this project. Both individuals were returned to the locations where they were found. I sent a reporting form to Tara Kieninger for inclusion in the IL Natural Heritage Database, and can provide any additional information if you would like it. Please let me know if this answers your questions.

Thank you,

Emily Grossman

Ecological Specialists, Inc.

On Mon, Aug 18, 2014 at 10:44 AM, Mccain, Kathryn MVS <Kathryn.Mccain@usace.army.mil> wrote:

Classification: UNCLASSIFIED
Caveats: NONE

Can you help me out with the request below? Coordination with IDNR for the state-listed mussel collected at Piasa

Thanks!

-----Original Message-----
From: Skufca, Jenny [mailto:Jenny.Skufca@Illinois.gov]
Sent: Monday, August 18, 2014 10:32 AM
To: Mccain, Kathryn MVS
Subject: [EXTERNAL] FW: IL threatened mussel collected (UNCLASSIFIED)

Dr. McCain,

Thank you for your message regarding the collection of the State-threatened butterfly mussel during a survey for a proposed ecosystem restoration project. Was the mussel returned to the location where it was found, relocated to another location, or vouchered? If the individual was not vouchered, could you please provide a GPS location for the State-listed species to be added to the Illinois Natural Heritage Database? I was unable to locate either an E/T permit or an Incidental Take Authorization for this work between RM 207.5 and 211.5. Can you provide a scan of the permit held by the USACOE or the consultant for this work? Please let me know if further clarification is needed. Thank you for your assistance.

Jenny

Jenny Skufca
Incidental Take Authorization Coordinator
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702
(217)557-8243

-----Original Message-----
From: Mccain, Kathryn MVS [mailto:Kathryn.Mccain@usace.army.mil]
Sent: Monday, July 28, 2014 9:53 AM
To: Szafoni, Robert
Subject: IL threatened mussel collected (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Robert,

We recently had a mussel survey conducted on the Mississippi River between RM 207.5 and 211.5 (Madison and Jersey counties) for a proposed ecosystem restoration project at Piasa and Eagle's Nest Island under Upper Mississippi River Restoration (formerly known as Environmental Management Program). The draft report states two individuals of Ellipsaria lineolata were collected near the toe of Piasa Island. The project is still in early planning, and the project team is pursuing a project objective of enhancing mussel habitat in the project area.

In terms of the state-listed species, what requirement/documentation is needed, so I can incorporate this information into the project planning process.

Thank you!

cheers,

Kat McCain

Dr. Kathryn N.S. McCain
Ecologist
Regional Planning and Environment Division North - Environmental Planning Branch (CEMVP PD-P) St. Louis District, U.S. Army Corps of Engineers
1222 Spruce St.
St. Louis MO 63103-2833
314-331-8047
Kathryn.McCain@usace.army.mil

"In the end, we will conserve only what we love. We will love only what we understand. We will understand only what we are taught." - Baba Dioum

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

7. IDNR EcoCAT

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Applicant:	U.S. Army Corps of Engineers	*IDNR Project Number:*	1703666
Contact:	Kat McCain	*Date:*	10/14/2016
Address:	1222 Spruce Street St. Louis , MO 63103	*Alternate Number:*	1405192

Project: Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project
Address: Route 100, Godfrey

Description: The proposed project is in the feasibility phase under the Upper Mississippi River Restoration Program. Potential project measures include dredging Piasa Chute, dredging Piasa Island backwater, notched rock structure, and beneficially re-using the dredged material to build islands with stone protection.

Natural Resource Review Results

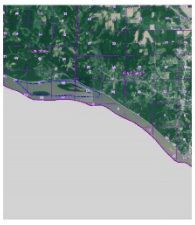
The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Principia Hill Prairies East INAI Site
Principia Hill Prairies - East Natural Heritage Landmark
Gray Bat *(Myotis grisescens)*
Indiana Bat *(Myotis sodalis)*
Indiana Bat *(Myotis sodalis)*
Timber Rattlesnake *(Crotalus horridus)*

An IDNR staff member will evaluate this information and contact you to request additional information or to terminate consultation if adverse effects are unlikely.

Location

The applicant is responsible for the accuracy of the location submitted for the project.



County: Jersey	*County:* Madison
Township, Range, Section:	*Township, Range, Section:*
6N, 11W, 25	, ,
6N, 11W, 26	, ,
6N, 11W, 27	, ,
6N, 11W, 36	, ,
, ,	6N, 10W, 31

IL Department of Natural Resources Contact
Nathan Grider
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction
U.S. Army Corps of Engineers

IDNR Project Number: 1703666

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

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3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

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Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

Privacy

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.

From: Grider, Nathan
To: McCain, Kathryn N CIV USARMY CEMVP (US)
Subject: [EXTERNAL] RE: Piasa and Eagle"s Nest Islands Habitat Rehabilitation and Enhancement Project 1703666
Date: Monday, November 28, 2016 1:33:53 PM

You can just send me the EA and I will review and make recommendations as needed. I can refer to this EcoCAT information request for the project area. No new one is needed.

Thanks
Nathan Grider
Biologist
Impact Assessment Section
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702
(217) 524-0501
Fax: 217-524-4177
nathan.grider@illinois.gov

-----Original Message-----
From: McCain, Kathryn N CIV USARMY CEMVP (US) [mailto:Kathryn.Mccain@usace.army.mil]
Sent: Monday, November 28, 2016 12:41 PM
To: Grider, Nathan
Subject: [External] RE: Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project 1703666

The EA is integrated into our feasibility planning study, and will be going to public review in the spring. So I'll be sure to get you on our distribution list when it becomes available for review. So I'd go with an information request for now. Will I have to do another EcoCAT request later or just send you the feasibility report with integrated EA when it becomes available for review?

Thanks!

cheers,

Kat McCain

Dr. Kathryn N.S. McCain
Chief, Environmental Planning Section
Regional Planning and Environment Division North (CEMVP PD-P) U.S. Army Corps of Engineers
1222 Spruce St.
St. Louis MO 63103-2833
office: 314-331-8047
BB: 314-296-1104
Kathryn.McCain@usace.army.mil

"In the end, we will conserve only what we love. We will love only what we understand. We will understand only what we are taught." - Baba Dioum

-----Original Message-----
From: Grider, Nathan [mailto:Nathan.Grider@Illinois.gov]
Sent: Monday, November 28, 2016 11:48 AM
To: McCain, Kathryn N CIV USARMY CEMVP (US) <Kathryn.Mccain@usace.army.mil>

Subject: [EXTERNAL] Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project 1703666

Hi Kat,

Do you have an EA and scoping request document ready for this yet? I recommend I comment when that is available and using the EcoCAT report to consider the resources in your document. Thus, I can terminate this review as an "information request" for now.

Sound good?

Thanks

Nathan Grider

Biologist

Impact Assessment Section

Illinois Department of Natural Resources

One Natural Resources Way

Springfield, IL 62702

(217) 524-0501

Fax: 217-524-4177

nathan.grider@illinois.gov <mailto:nathan.grider@illinois.gov>

8. Piasa Public Comments from Rivers Project Master Plan Public Review April 2014

Public Comments Card Received at Public Open House for Rivers Project Master Plan at National Great Rivers Museum on April 16, 2014

#1 Project > Piasa Ck. EMP
#2 Audubon Center Master Plan
Priority for implementation

Anonymous

Comments Received via Email Concerning the Rivers Project Master Plan Update
(A few comments may seem like duplicates, but they were sent from different email addresses)

Date: February 5, 2013

Our names are Edward and Lois Davis. We are members of the Alton Motorboat Club, the Alton-Wood River Sportsmen's Club, Ducks Unlimited and Migratory Waterfowl Hunters.

We are concerned about the access to the Mississippi River, especially via Piasa Creek. It is almost impossible to launch our boat because of the siltage that has built up at the mouth of the creek.

We pay for hunting and fishing licenses, trailer license, boat registration and boat and trailer insurance yet we do not get to enjoy our beautiful river because of the siltage.

We would appreciate your influence in putting the dredging of Piasa Creek access at the top of your priority list as the funds have been alloted for a study by President Obame.

Thank you for your consideration.

Mr. and Mrs. Edward E. Davis
Godfrey, IL 62035

Date: February 6, 2013

Ms Miller,

I am emailing you as a boater and fisherman having concerns over the access to Piasa Creek and the siltation in the Mississippi River in the area of Piasa Creek. This situation is cutting off our access from the creek to the river. What can be done to clean up this siltation and blockage from the creek to the river and visa versa, from the river into the creek.

Any assistance is very much appreciated.
Mike Lawhon
Alton Motor Boat Club Member

Date: February 6, 2013

Sarah,

My husband & I am a boat owner and have some concerns about the siltation in the Mississippi River at Piasa Creek in Jersey County. We already have limited access to the river via our public areas and with all the silt in the area, it will be extremely hard to access the river at all this Spring . Any attention you can give this you could give this issue, would be greatly appreciated.

Anonymous

Date: February 6, 2013

Hello,
I am a boater and fisherman wanting to give my concerns regarding the siltation issues on the Mississippi River at the mouth of Piasa Creek. This issue needs to be addressed by the Corp as soon as possible. The situation is going to continue to get worse if something isn't done. We will not have access to the river for recreational purposes or to put food on our tables. We are trying to get folks to come to our area, not run them off.
Regards,
Karen M. Pearson
Godfrey, IL 62035

Date: February 7, 2013

Good Morning
I use the creek to gain access to the river 4 or 5 times a week during boating season for fishing in the Mississippi. I'm retired and love to catfish as often as possible. I know from past the corp builds models to study the effects of such actions and then takes it under advisement then nothing ever happens but here's hoping this time!
Cordially John Brandt

Date: February 7, 2013

Sarah Miller & whom also be concerned;
I love to fish and have a couple different boats. I use the creek a lot. Access to the creek at low water is a growing fear that one day we would not be able to get up the creek or into the river.
The shallow at the mouth of the creek could clog causing dramatic flooding up creek, it really wouldn't take much considering the amount of driftwood I witnessed flowing down the creek last year during a heavy rain.
Silting at the mouth is a growing problem for boaters.
Thanks for listening...

Bobby Jenkins

Date: February 7, 2013

being an active boater and fisherman I am very concerned about the Mississippi River access from the Piasa Creek area being cut off because of siltation, the island is moving down cutting off Piasa Creek I would appreciate anything the Army Corps of Engineers could do to insure river access. Thank you

Sent from my iPad

Date: February 7, 2013

Sarah,
My wife & I are boat owners and have some concerns about the siltation in the Mississippi River at Piasa Creek in Jersey County. We already have limited access to the river via our public access areas and with all the silt in the area,

it will be extremely hard to utilize the river at all this Spring. Any attention you could give this issue, would be greatly appreciated.

Dan Cronin

Date: February 8, 2013

Sarah,
I am a boat owner and have some concerns about the siltation in the Mississippi River at Piasa Creek in Jersey County. We already have limited access to the river via our public access areas and with all the silt in the area, it will be extremely hard to utilize the river at all this Spring. Any attention you could give this issue, would be greatly appreciated. Linda

Linda Johnson-Petterson
Industry-Wide Supply
PO Box 624
Alton, IL 62002-0624

Date: February 8, 2013

Good Morning Sarah,

I am writing you in regards to a long standing issue that affects boaters trying to access the Mississippi River from Piasa Creek. We have battled the build-up of silt in this area while trying to make our way out on to the Mississippi for a number of years. When we are unable to get out onto the river it also has an affect on local businesses, whom we support by purchasing such things as fuel, groceries, stopping at restaurants in towns like Grafton, Hardin, Kampsville, etc. located on our beautiful scenic water ways.

Please encourage the Corps of Engineers to appropriate funds to address this crucial area in Piasa Creek as well as the public access area nearby.

Thank you in adavance for any assistance you may be able to provide.

Jeff Davis
Dow, IL

Date: February 8, 2013

Hi Sarah,

I feel compelled to write to you about the status of Piasa creek and the amount of silt that continues to build. If the situation worsens we will find ourselves unable to get our boat out of the creek. Please pass this along to the proper person who is taking a look at upcoming projects and ask them to take a serious look at our situation.

Thanks,

Tom Williams
FINAL-Quest 90
Email: tom@quest-cs.com | www.quest-cs.com

Date: February 8, 2013

I am concerned about the siltation in the Mississippi River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river.
Anonymous

Date: February 8, 2013

To whom it may concern,

I am writing in regards to the continuing issue of silt build up in Piasa creek and the effect it will have on local boating and economy. Please review current projects being considered for the river and take a look at the issue we are facing.

thanks,

John Walters

Date: February 8, 2013

Good morning Sarah.

As a boater, I am concerned about the siltation in the Mississippi River, in the area of Piasa Creek. This siltation is cutting off our access to the river, from the creek.

Please take this into consideration, when looking at future projects.
Sincerely,

Amy Williams

Date: February 8, 2013

Dear Ms Miller,
as a concerned fisherman and boater i would like to draw your attention to the silting problem at the mouth of Piasa Creek. the area outside the creek has gotten appreciably worse in recent years to the point where there are many times i am unable to make it over the power plant to fish. the area by piasa island seems to be getting more and more shallow.

i would like to appeal to the corps to help in addressing the river access from piasa creek.

thank you

mike

Date: February 8, 2013

Sarah,

As a long time boater, I have gradually noticed the increase of siltation at the location of Piasa Creek and the Mississippi River. The siltation continues to worsen as the years progress. There have been several weekends within the last 2-3 years where this location is impassable with my 22ft open bow ski boat while other locations have no issues (Marquette Park, Hardin, Grafton, Alton, ETC). This will require me to remove my boat from my lift and

transport it to the nearest public ramp (Grafton, IL – 9 miles from Piasa Creek). Any help with this situation would be greatly appreciated by many.

Thanks,

Casey Stutz

Date: February 8, 2013

To whom it may concern,

I am a frequent boater of the Mississippi river near the Alton-Godfrey area. I gain access to the Mississippi river through the mouth of the Piasa creek. I am concerned about the land build up and low water levels of the Mississippi River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river. Please consider investing in correcting this ongoing issue in order to keep boat traffic active through this passage.

Sincerely,

Chad Stutz

Date: February 8, 2013

As a boater , I am concerned about the siltation in the Mississippi River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river.

Thanks for your help,

Chris Beiser
crbeiser@charter.net

Date: February 8, 2013

As a hunter, I am concerned about the siltation in the Mississippi River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river.
Anonymous

Date: February 8, 2013

As a hunter, I am concerned about the siltation in the Mississippi River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river.
Anonymous

Date: February 9, 2013

Hello,

Being a fisherman, I am concerned about the siltation in the Mississippi River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river.

Is there anything the corp can do to keep the mouth of Piasa creek open? I and many of my friends would appreciate it.

Thank you,

Mark Manis
Godfrey, IL

Date: February 9, 2013

I am a boater out of pasia creek. I some times can not get out of the creek do to the silting in of mud and sand. I love the river. If there is anything you could do so we could have better excess I would be very thank full.

Sent from my iPhone

Date: February 10, 2013

As a recreational boater, hunter, and fisherman, I am concerned about the siltation at the mouth of Piasa Creek where it joins the backwater at the Mississippi river. This has been occurring over many years and is close to closing the access to the river. There are two marinas and a State of Il leased ramp access at this location. It would be tragic if this were not available in the future. I am urging the Core look at this situation and see if anything can be done to rectify it. Thanks for your attention to this memo.

Richard Boyer

Date: February 11, 2013

Sarah, Our friends at Alton Motor Boat Club have asked us for our help in resolving an issue with silt build up in the Piasa Slough area! As fellow boaters and members of the IRBBA we feel it's our duty to help them with this issue. The River belongs to all of us! Our home port is Heritage Harbor in Ottawa. We are a new harbor and don't have a silt issue yet! Most of our members have been down river whether to the peoria pool or beyond we know there is a problem with silt build up! I hope just by letting you know that other clubs are aware of this issue and we care about the well being of our fellow boaters at Alton Motor Boat club that you will do everything in your power to resolve this matter!

Joe Baller
Commodore H2O Boat Club

Date: February 11, 2013

As a boater fisherman and hunter, I am concerned about the siltation in the Mississippi River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river. I have been using this access for 40 years it is the worst I have seen in a long time. Any help would be appreciated.
Thanks

Kevin Gryzmala

Date: February 12, 2013

I am a boater on the mississippi river. I berlong to the Alton Motor Boat Club. At this point we are having a big problem of getting in and out of the creek from the river. It is next to impossible at this point in time. Even at normal

pool, it is still a big chance to get in and out. We would appreciate if this matter could be addressed. Thank You very much. Patrick Brogan

---

Date: February 12, 2013

As a family boater and duck hunter.I would like to see the sand bar be addressed at the mouth of Piasa Creek.It gets harder and harder every year to take the family out in the boat.Also it's an added danger in the dark going duck hunting early in the mornings.Thank you Steve Kelly

Sent from my iPad

Date: February 12, 2013

As a boater, I am concerned about the situation in the Mississippi River in the area of Piasa Creek. The situation is cutting off our access from the creek to the river.
Anonymous

Date: February 12, 2013

As a boater, I am concerned about the situation in the Mississippi River in the area of Piasa Creek. The situation is cutting off our access from the creek to the river.
Anonymous

Date: February 12, 2013

As a boater, I am concerned about the situation in the Mississippi River in the area of Piasa Creek. The situation is cutting off our access from the creek to the river.
Anonymous

Date: February 12, 2013

Thanks Sarah for continuing to read. I have been a boater for nearly thirty years on the Mississippi river from Alton to Havana to Peoria, but primarily in the Alton pool.

The concerns about the silt at Piasa creek are not new and would be greatly appreciated if this area could be dredged clear.

The surrounding bussinesses in the area would benefit from the increased boating traffic and revenue created by us boaters if this area could be navigated but if boats can't get to the river, no boating could be done.

Thanks much for your time

Ken Hillier
Average boating guy
Granite City Illinois

Date: February 13, 2013

As a boater, I am concerned about the situation in the Mississippi River in the area of Piasa Creek. This situation is cutting off our access from the creek to the river.

Date: February 13, 2013

Sarah
I am very concerned about the filling in of Piasa creek.
This has been access for boaters to the mississippi for as long as I can remember.
There are two marinas , two public boat ramps,and many cabins and houses on the filling in Piasa creek.
boaters fisherman and hunters cant get to the river any more.
Please restore our access to the great Mississippi river.
sincerely
JON MILLER

Date: February 13, 2013

As a boater, I am concerned about the siltation in the Mississippi River in the area of Piasa Creek. This siltation is cutting off access from the creek to the river. I believe it's the Corp. of Engineers duty to keep the waterways open, for all boats, including pleasure boats. We as tax payers, pay a great deal of money to the Federal Government every year for these services.

Steven C. Jones

Date: February 13, 2013

Concerned...pool 26 Piasa creek entrance and surrounding waterways are in grave danger
Of closing off for pleasure boating..silt , logs, and sunken items are a major issue...Piasa harbor public ramp itself is almost unusable...these are tax dollars???? As a boater we pay the state for tags. We own a 33 ft cruiser harbored at Alton motor boat club...we need 2 ft of water under our boat...the only passage way to get out is Piasa creek...when you get to the access at river you best know the way to cross... Have seen many nice boats become beached at this point. PLEASE HELP Pool 26 is a very beautiful area PLEASE KEEP PIASA CREEK ACESS OPEN. Thank you
Sent from my iPad

Date: February 13, 2013

Sarah,

I am an avid boater and fisherman that uses Piasa Creek to access the Mississippi River. I am concerned the active silt deposition at this access area and am hopeful this is something the Corps is interested in addressing. I know I am among many other boaters and fisherman that have strong feelings on this issue. Please let me know if there is anything citizens such as myself can do to help expedite action on this issue.

Thanks,

D. Tim Arnold
Godfrey, IL

Date: February 13, 2013

Dear Sarah,

As a boater, I am concerned about the siltation in the Mississippi River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river.

Please help us to save Piasa Creek!!

Thank you,
Laura

Date: February 13, 2013

As a boater I am very concerned about the condition at the mouth of Piasa Creek where it enters the Mississippi it needs to be dredged to allow entrance to the river every year it gets worse. Thank you for your attention to this issue.
Judy NAUGHTON

Sent from my iPad

Date: February 13, 2013

As a boater, I am concerned about the siltation in the mississippi river in the area of piasa creek.This siltation is cutting off our access from the creek to the river.

Please address this issue to save PIASA CREEK and make boating on the Mississippi River enjoyable again.

Thank you,

Vicki Miller
vampog@charter.net

Date: February 14, 2013

As Commodore of the Illinois River Boating Association, it has come to my attention that on of our clubs, Alton Motor Boat Club is having trouble trying to keep there access to the Mississippi River. The silting in of the Piasa creek is becoming a concern. We would appreciate it if in your planning for future work on the waterway, you would address this problem.

THANK YOU
JOHN FUSINETTI
COMMODORE I.R.B.B.A.

Date: February 14, 2013

As a long time member of the Alton Motorboat Club, I am very concerned with the silt in the Mississippi River at Piasa Creek. It continues to build up and causes many problems for all boaters gaining access from the creek to the river. Piasa Creek also has a public boat ramp and there are the two marinas on the creek. If this problem is not resolved in the near future, all of those recreational boaters, fisherman and hunters would no longer have access to the river from the creek.

Thank you for considering my plea to resolve the siltation at Piasa Creek.

Susie Siatos
Manager
Community Title & Escrow, Ltd.
2600-D State Street
Alton, IL 62002

Date: February 14, 2013

Good morning Sarah

I am sending you this email in hopes that you can help to address the siltation build up where Piasa creek enters the Mississippi This area continues to get worse every year and as a boat owner it threatens to close the enter and exit to the creek and the harbors and public launches it this area it also created allot of maintance issues and wear on me boat.
I would hate to see the harbors suffer and additional loss of revenue due to the decreasing access to the creek

Thank you for your attention to this issue

Greg Naughton

Date: February 13, 2013

Sarah,

I have been an avid boater all my life and a member of the Alton Motorboat Club located in Jersey County IL on Piasa Creek. I would like to see the Corps continue to proceed with the Alton Pool/Piasa Creek Project to dredge the creek opening so that ALL BOATERS can continue to enjoy this scenic area of our river. It has become dangerous for boaters to proceed through this area due to the silting of the creek mouth and the head of the Alton Lake.

Thank you for your time and efforts at keeping our river accessible to everyone.

Patrick Wrischnik
4602 Levis Ln
Godfrey, IL 62035

Date: February 14, 2013

Dear Ms. Miller,

I have used Piasa Creek Public Launch area for 30+ years for access to the Mississippi River and the Alton Lake created by Lock and Dam 26.

I have since moved from powerboats to a sailboat and even with a retractable keel I can no longer use Piasa Creek to access the launch, marinas, or fuel that is available. The situation at the mouth of the creek is inhibiting public access of all kinds to the river system.

I would like to encourage you and the USACE to make improving the mouth of Piasa Creek a priority. Allowing access to the river systems allows sportsmen of all types (hunters, fishermen, boaters, etc.) to enjoy the wonderful natural resource we have from the Alton Dam to the confluence of the Mississippi and the Illinois Rivers.

I am in the insurance business and I am sure there is an economic impact of increased boating (fuel, supplies, insurance cost, boat end equipment purchases) but I am contacting you as an individual boater, hunter, and fisherman.

Thank you for your consideration.

Jeff Luken, CPCU
The Luken Agency, Inc.
120 West Third Street
P. O. Box 8006
Alton, IL 62002

Date: February 14, 2013

As a boater, I am concerned about the siltation in the Mississippi River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river. Please help us who love the river and enjoy its beauty.

Thanks
Donna Fisher

Date: February 15, 2013

As a user of the Piasa Creek public launch facility, I am deeply concerned about the silting at the mouth of the creek making it nearly impossible and somewhat dangerous to access the Mississippi.

John Thompson
Godfrey, Il

Date: February 15, 2013

My husband and I were in hopes to attend your meeting however we both had work obligations. We have lived on the "river"side of Godfrey all of our lives and have enjoyed public access into the creek and now are active with the alton motor boat club.

As an avid water family we are very upset about the situation of the Mississippi River especially in the area of Piasa Creek. With today's technology and mass media tools, people just don't get outside like they used to. We hate seeing this happen for our grandchildren and others. We are in hopes that you take into consideration that area to resolve the issue as Corps Planning.

In addition, I would ask that you look at the area of Clarksville Damn area where the island splits. We always fished that the corp had dikes to help the flow. It is not accessible anymore. My husband could pin point the area better if further assistance is needed in the area I am speaking about.

Thank you for any and all considerations,

RESPECTFULLY,

Debbie K. Wedding
Office Administrator
Contract Services Group
American Water Enterprises - EMC
4725 Brecht Lane

P. O. Box 54
Godfrey, IL 62035

Date: February 16, 2013

As a family of boaters, we are concerned about the situation in the Mississippi River in the area of Piasa Creek.

This situation is cutting off access from the creek to the river.

Your consideration would be greatly appreciated in this matter.

The Snyder Family

Rebecca Snyder, QMRP/RSD

Date: February 17, 2013

Sarah,

As a boater I am concered about the situation in the Mississippi River in the area of Piasa Creek.
The situation is cutting of our access from the creek to the river. WHAT ARE YOUR PLANS?

Sincerely,

Scott E Fowler
bryant454@charter.nett

Date: February 18, 2013

I (and my family) boat and fish on the Mississippi River. Due to siltation, my access to the River by way of Piasa Creek is hampered, and gets worse each year. This access is shallow at best and worse at other times. Any help you could provide
with this situation would be appreciated.
Noel "Butch" Rister

Date: February 18, 2013

Hi Sarah

As a boater I am concerned about the situation in the Mississippi River in the Piasa Creek area. The access from the creek to the river is being endangered.

I hope you can help!

Thank you,

Tom Spain

Date: February 19, 2013

I have been boating out of Piasa Creek for over 30 years and over the past several years the mouth of the creek has been filling in to the point that we will be cut off from getting to the river. A few people have marked a very small channel which enabled us to get out last year! Please consider dredging the this area for the benefit of Piasa Harbor, Alton Motor Boat Club and all the people who use the public ramp.
Anonymous

Date: February 19, 2013

Good morning Sarah

My husband and I are boaters that thoroughly enjoy boating on the Mississippi River. We boat from March to November, we enjoy the relaxation of it all. I am however concerned about the siltation in the River in the area of Piasa Creek. This siltation is cutting off our access from the creek to the river. I seems to have gotten worse in the last few years. If funds come available to dredge this area of Piasa Creek, it would be appreciated not only by me & my husband but also by the hundreds of other boaters who use Piasa Creek to access the Mississippi River.

If you have any questions please feel free to contact me. Thank you for your time.

Sincerely
Shelley Ragan

Date: February 19, 2013

Ms. Miller...I have been accessing the Mississippi from Piasa Creek for over 50 years as a fisherman, hunter and pleasure boater. I am very concerned about the siltation cutting off access to the river and would appreciate Corps action in this regard.
Cordially,
Larry Brown

Date: February 19, 2013

Dear Sarah

The siltation that is building up in the area of Piasa Creek on the river is causing concern for me as a boater. This siltation is cutting off my access from the creek to the river. Not only does this effect me, it is worrisome to hundreds of other boaters who use the creek to get to the Mississippi River. I hope something can be done about removing this silt build up.

Thank you for you time.

Sincerely
Nolan Ragan

Date: February 19, 2013

Please favorably consider and highly prioritize the Alton Pool/Piasa Creek Project to dredge so boaters (pleasure, fishermen, hunters) can enjoy this scenic area of our great Mississippi River. It has become dangerous to proceed through this area due to the siltation of the Piasa Creek's mouth and head of Alton Lake.
Thank you

Date: February 19, 2013

Sara
Please push the Piasa project to dredge the creek and river access so all kinds of people can enjoy the area.
thanks

--
Scott Dorris

Date: February 19, 2013

I travel from Starved Rock to Alton by boat. I enjoy traveling to Alton. Please work with the Boat Club. I will not continue my trips. I travel with several boats and we spend a lot of money in many towns along the river. The Alton Motor Boat Club must be protected!

Sincerely,

Pat Feehan
Political Action Officer of the Illinois River Basin Boating Association

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Date: February 20, 2013

To Whom It May Concern,

As a life long boater on the Alton Pool who uses Piasa Creek I am asking that the Corp please dredge the entrance to the creek as every year it is getting more and more difficult to get in and out of this area! It is now to the point that in the near future we will not be able to navigate this area anymore. Please consider this request!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Anonymous

Date: February 20, 2013

As a boater and member of the Alton Motorboat Club, I am concerned about the silting in of piasa creek. The siltation is cutting off access to the river. In times of low water an emergency boat would have a hard time getting out the mouth of the creek.

Rich Kortkamp

Date: February 20, 2013

Dear Sarah
Our family is a third generation boater of the Alton pool and we are very concerned about the situation at the mouth of Pisistratus
Anonymous

Date: February 21, 2013

Dear Ms Miller,
i am writing to draw your attention to the silting problems at teh mouth of piasa creek. there has been a progressive problem silting problem as you exit the creek. there have been numerous times when i have had to help unsuspecting boats off the sand and mud as they go straight out of the creek.
this is a significant hazard and needs to be addressed before someone gets hurt seriously.

thank you

mike

Date: February 22, 2013

Sarah -

I just wanted to say I am concerned about the amount of siltration in the Mississippi River at Piasa Creek. The buildup is making it hard to access the river from the creek.

Thanks,
Jim Brown

Date: February 22, 2013

Dear Ms. Miller,

As a boater, fisherman, and hunter, I am concerned about the situation in the Mississippi River in the area of Piasa Creek and other areas. This siltation is cutting off our access from the creek to the river. I feel wrong placement of dredged material is the cause i.e. Grafton Ferry Crossing.

Sincerely,

Ed Amburg

Date: February 24, 2013

Sarah, I am an avid boater, fisherman and hunter and I am concerned with river access out of Piasa Creek. The siltation in the chute just outside the creek has limited access to the river.

Any help in this concern would be appreciated.

Sincerely, Michael Reese

Date: February 26, 2013

Being a pleasure craft boater using the Illinois Waterway, I am asking you and the office of the Army Corp of Engineer's to consider keeping open the mouth of Piasa Creek.

We have traveled to Alton Motor Boar Club and would like to be able to keep doing that in the future, via the Illinois waterways.

I respect the time and concideration in this matter.

Respectfully,

William J. Parrott
member of Starved Rock Yacht Club of Ottawa Ottawa, IL. 61350

Date: February 27, 2013

Hello Sarah,
I live in Godfrey and work in Alton. My family and I enjoy getting outside for exercise and to view the area's landscapes and especially birds. As a Godfrey resident the best new feature is the Piasa Harbor project where we can enjoy views of the river and see a great variety of birds. I think the average citizen would most appreciate the Corps continuing these projects, working with local organizations and land trusts to establish and preserve our natural features for public use.

I think if you asked the average citizen what the Corps does they would say you run the lock and dam and the river. While I enjoy the educational displays at the lock and dam and realize it is a great place for visitors to the area it is not a place I visit regularly like a park.
The bike trails are also a wonderful feature of the area and are enjoyed by many. The new research center is also very promising.
Please keep me posted on your Rivers Project!
Jim

Date: February 27, 2013

Hello Sarah

My name is Darlene Seidler, and I am sending you this email because I am concerned about the Piasa Creek access. I have been a boater and fisherman my whole life, and would like to continue to access the river from Piasa Creek. Please help.

Thank You
Darlene

Date: February 27, 2013

As a Mississippi River boater I would like to express my concern with the Piasa Creek entrance from the River. Watching the demise of Piasa Creek over the last several years is a little dissapointing being that it main cause is the silting in from the River. I am hoping to see something done by the Corp in the near future. I understand that money is tight in all areas of Government at this time. It is also tight in our family as with many others. We spend much of our vacation time on this part of the river during the summer months along with many of our friends. We would truly like to keep access to our club available for years to come along with the public access located in the creek. We do

what we can to enjoy one of the most beautiful parts of the Mississippi and to help keep it clean. Please help us keep it useable.

Thank you

Cory, Vicki, Hallie, and Brady Schilling

Date: February 27, 2013

Good afternoon,

As boaters, we are concerned about the situation in the MIssissippi River in the area of Piasa Creek.
This situation is cutting off our access from the creek to the river.

Looking forward to spring, when we can hopefully enjoy our beautiful Mississippi.

Vic & Vicki Christian
5004 Terry Dr.
Alton, IL 62002

Date: February 28, 2013

I am concerned about the situation in the Mississippi River in the area of Piasa Creek. The situation is cutting off access from the creek to the river. I urge you to address this situation as funds become available. Thank you,

Judy Boyd

Date: March 2, 2013

Dear Ms. Miller,

I understand that you are taking input on the river projects in and around the Alton pool. As a frequent user of the Alton pool I believe that the Piasa Creek/Piasa Slough area should be on the top of your list of projects. The underwater structures places upstream adjacent to the river road may have helped keep the channel clear, but they have significantly changed the flow and siltation in and near the mouth of Piasa Creek.

I consider that the Corps fixing the Pisas Creek area only as an extension of the original project to build structures upstream to benefit the channel.

Thank you,
Bob Sullivan

Date: March 2, 2013

In 2012 I logged more than 30 round trips through the Piasa Creek access in various boats from a canoe to a cruiser. I am very concerned with the contined silt build up in the middle of the slough near the mouth of Piasa Creek. In my cruiser which draws only ~32" of water, I frequently bumped the bottom when the pool was pulled down. Please put this project at the top of your list for the Alton Pool area. The Piasa Creek access is home to many boaters. The

closure of the slough due to silt build up will deprive many people from using pool 26. The next decent access open to the public is at Marquette Park on the Illinois.

Thanks you,

Bob Sullivan

Date: March 2, 2013

Sarah,

I am a member of the Alton Motorboat Club and the Alton Waterski Club so we regularly use piasa creek to access the Alton Pool. The build up of silt is causing problems not only to access the river but also in the ski area between Clifton Terrace and piasa creek. Please make this issue a priority for projects in the near future.Thank you.

Brad Maher

Date: March 2, 2013

As a sportsman utilizing Piasa Creek access I am very concerend that this area is silting in to the extent that is almost impossiabe to use the facalities at this location. In past years this area has seen considerable use by pleasure boaters, fisherman, and hunters but as time has past the silitation has continued and made access to the river near impossiable. If this continues I am concerned for the Alton Motor Boat Club which leases property from the Corps of Enginers and Piasa Marina and the public ramps at this location being viable recreation outlets for local residents and the many tourist that flock to this area to utilize the unique sights and amenities supported by the Sierria Club The Great Riverlands Land Trust The Alton Motor Boat Club The Illlinois American Water Co. just to name a few. I would hope that you would visit the Piasa Creek area the facailities there have expended considerable monies to make there facalities top notch it would be ashame to see this all go for not.
Thank you for any support in this matter it would be greately appreciated by many.

Cordialy Yours
Art Tomerlin
Past president East Side Industrial Rivermans Past Commodore Alton Motor Motor Boat Club

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9. Comments Received During Public Review May 2-June 1, 2018

USEPA Comments on EA 30 May 2018

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAY 3 0 2018

REPLY TO THE ATTENTION OF:

Dr. Kat McCain
Environmental Planning Section
U.S. Army Corps of Engineers – St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Re: Upper Mississippi River Restoration Feasibility Report with Integrated Environmental Assessment – Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project, in Pool 26, Madison and Jersey Counties, Illinois

Dear Dr. McCain:

The U.S. Environmental Protection Agency reviewed the above-mentioned draft feasibility report and integrated environmental assessment (hereafter, Draft EA) dated April 2018 regarding a proposed aquatic habitat enhancement project. This letter provides EPA's comments on the Draft EA, pursuant to our authorities under the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

The Draft EA indicates that human activity over the past two centuries within the Upper Mississippi River (UMR) basin, floodplain, and channel has altered the hydrologic regime and biotic communities historically present in the study area within Pool 26. The alterations have reduced the quality and diversity of side channel and backwater habitat, as well as reducing the acreage of island habitat. The stressors and decline of the quality of aquatic and island habitat are likely to continue.

The backwater fishery habitat under consideration for this study area includes the backwater located within Piasa Island. Observations made by Illinois Department of Natural Resources (IDNR) conclude that Piasa Island backwater has decreased in depth and a sediment plug has formed at the mouth of the backwater reducing connectivity with the main channel. Based on water quality data, the average depth of the backwater ranges from 1.25 feet to 3.5 feet; depths of greater than 5 feet are typically desired to maintain seasonal conditions (e.g., water temperature and dissolved oxygen concentrations) to sustain backwater fish communities throughout the year. Additionally, limited aquatic vegetation occurs within the backwater.

Restoring island habitat has been identified as a habitat need for Pool 26[1]. Existing island habitat is approximately 5 percent of the existing aquatic and floodplain habitat in Pool 26. Within the study area, island habitat has been degraded primarily because of direct inundation resulting from lock and dam construction and operation. Without action, the Draft EA indicates that historic islands

[1] Upper Mississippi River System Habitat Needs Assessment (Theiling, et al., 2000)

would continue to be submerged, reducing the availability of this habitat for aquatic and wildlife species. The River Resources Action Team, an interagency coordination team of state, federal and nongovernmental representatives, recommended and supported action in the study area, because it provides opportunities for significant island and aquatic ecosystem benefits.

The scope of the study and purpose of the proposed project are to improve the quality and diversity of aquatic and island ecosystems within the study area. The study area is comprised of 1,381 acres of side channel, main channel, island, and backwater habitat. The objectives to meet this goal, as identified in the Draft EA, are to:

- increase aquatic side channel habitat with depth and flow diversity;
- increase connected backwater habitat with depth diversity for enhanced backwater fisheries habitat benefits; and
- restore diverse island mosaic.

Cost-effectiveness and incremental cost analyses (CE/ICA) was applied to nine alternatives. The CE/ICA resulted in the identification of five cost-effective alternatives[2], two of which (Alternatives 4 and 8) are considered "best buy" plans:

- Alternative 1: No Action;
- Alternative 4: 200-foot braided dredge cut, notched rock structure, minimum backwater dredging, and island diversity; and
- Alternative 8: 300-foot braided dredge cut, notched rock structure, maximum backwater dredging, and island diversity.

The action alternatives would result in positive long-term benefits to approximately 76 acres of island habitat and approximately 76 acres of backwater habitat by increasing connectivity and depth and improving and flow for approximately 485 acres of side channel habitat in and around Piasa and Eagle's Nest Islands. The action alternatives would also result in some conversion of cover types, but the resulting changes would provide habitat for a greater diversity of species.

The Draft EA compared these three alternatives based on their anticipated environmental effects. Along with that information, the Project Delivery Team and IDNR evaluated the best buy alternatives in their ability to meet the study objectives. Alternative comparison and evaluation led to identification of a Tentatively Selected Plan (TSP) – Alternative 4. The Draft EA indicates Alternative 4 best meets the study objectives via the restoration of approximately 76 acres of island habitat, and approximately 49 acres of backwater by increasing connectivity and depth. Alternative 4 also improves depth and flow for approximately 485 acres of side channel habitat within the study area. Alternative 4 includes: 1) excavating Piasa Chute with a 200-foot braided dredge cut 10 feet below the minimum pool water elevation; 2)excavating Piasa Island Backwater to 10 feet below the minimum pool water elevation to improve entrance conditions to restore connectivity and fisheries habitat; 3) constructing a notched rock structure to improve flow and bathymetric diversity within the study area; and constructing islands using the dredge material with stone protection to restore historic island mosaics. Materials removed from Piasa Chute would be beneficially re-used to construct the island restoration measures.

[2] A cost-effective alternative is defined as one where no other alternative can achieve the same level of output (net AAHU) at a lower cost, or a greater level of output at the same or less cost.

IDNR has agreed to be the Non-Federal Sponsor, and the U.S. Fish and Wildlife Service (USFWS) would serve as the Federal project sponsor.

EPA recommends the following issues be addressed before a decision is made.

Backwater Fisheries
As stated in the Draft EA, "Suitable backwater habitat is needed to support a healthy backwater fish assemblage. … Based on water quality data collected by UMRR-LTRM (Upper Mississippi River Restoration Program – Long Term Resource Monitoring), the average depth of the backwater ranges from 1.25 feet to 3.5 feet, which is not adequate to sustain a healthy backwater fish assemblage. Depths of greater than 5 feet are typically desired to maintain seasonal conditions (e.g., water temperature and dissolved oxygen concentrations) required to sustain backwater fish communities throughout the year. In addition, limited-to-no aquatic vegetation occurs within the backwater.

Alternative 4 **may** provide additional opportunities for emergent vegetation within Piasa Island Backwater. The measure of island restoration included in all considered action alternatives **may** also provide opportunities for emergent vegetation to develop. Therefore, the considered action alternatives **may** have a positive effect on submersed aquatic vegetation." (emphasis added)

Recommendations: Because aquatic vegetation is an important food source for migratory waterfowl and habitat for fish, EPA recommends the EA analyze and discuss how the problem of limited aquatic vegetation will be addressed as part of the proposed project.

Invasive Species
As stated in the Draft EA "Reed canary grass and Japanese hops (invasives) are present on Piasa and Eagle's Nest Islands. With or without the project, these plants are expected to continue to be prevalent on the islands. Therefore, the no action and considered action alternatives would have no effect on reed canary grass and Japanese hops compared to existing conditions.

Probable and unavoidable adverse impacts could occur relating to any of the preceding discussed resources. These impacts would be minimized by implementation of avoidance, minimization, and use of best management practices during construction."

Recommendations: The Draft EA does not include proposed measures to control invasives. EPA recommends treatment actions and objectives for invasives control and/or for native vegetation cover (e.g., maximum invasives coverage of 15 percent) should be included in the Draft EA. Without aggressive treatment of invasives, the proposed project's benefit (habitat units) will likely be diminished.

Floodplain Habitat
As stated in the Draft EA, "Impacts of No Action Alternative: Without the project, open water would likely be the dominant land features within the floodplain landscape. The forested islands, which fall within lower land surface elevations, would continue to support flood-tolerant tree species. Nut-producing trees would continue to be a minor component of the overall forest

inventory of these islands. Piasa Island Backwater is likely to convert from aquatic habitat to land through time, which may provide additional wetland habitat, but at a trade-off of losing valuable backwater habitat within Pool 26. Therefore, this alternative would have a negative effect on floodplain habitat.

Impacts of Considered Action Alternatives: The forested islands of Piasa and Eagle's Nest would continue to be distinctive features within the floodplain landscape, and the newly restored islands would add additional complexity and diversity within the study area. Piasa Island Backwater is expected to be maintained as aquatic habitat rather than convert to terrestrial habitat. Alternative 4 would allow for floodplain habitat diversity on Piasa Island with forest, emergent wetland and aquatic habitats, while Alternative 8 would have less opportunity for emergent wetlands due to the larger area of the dredge cut. Therefore, the considered action alternatives would have a positive effect on floodplain habitat."

Recommendations: If USACE anticipates that additional nut-producing trees will naturally recolonize the project area, EPA recommends the EA discuss: 1) whether this habitat type could be increased by planting native woody species; and 2) whether USACE will commit to planting nut-producing trees, and if so, in what quantities. Without the planting of native tree species, the proposed project's benefit (habitat units) will likely be diminished, especially given the potential spread of invasives.

Maintenance Considerations

As stated in the Draft EA, "The proposed measures have been designed to ensure low annual maintenance requirements. Maintenance will include removing vegetation and debris from the notched rock structure and the stone protection on the restored island."

Recommendations: EPA strongly recommends USACE commit to disposing of vegetation in a manner other than burning, as burning vegetation increases air impacts.

Air Impacts

While EPA recognizes that de minimis impacts to air quality are expected, implementation of the TSP is expected to have short-term, temporary impacts to air quality from diesel emissions.

Recommendations: Diesel emissions and fugitive dust from project construction may pose environmental and human health risks and should be minimized. In 2002, EPA classified diesel emissions as a likely human carcinogen, and in 2012 the International Agency for Research on Cancer concluded that diesel exhaust is carcinogenic to humans. Acute exposures can lead to other health problems, such as eye and nose irritation, headaches, nausea, asthma, and other respiratory system issues. Longer term exposure may worsen heart and lung disease.[3] EPA recommends USACE consider the protective measures listed on the enclosure – *Construction Emission Control Checklist* and commit to applicable measures in any decision documents and contracts.

[3] https://www3.epa.gov/region1/eco/diesel/health_effects.html

Lastly, the Draft EA indicates the TSP best meets the study objectives and is deemed acceptable by the non-federal sponsor, IDNR, as well as by USFWS, non-governmental organizations, and the public. EPA values the inclusion of relevant resource agency determinations concerning the proposed actions.

EPA appreciates the opportunity to review and comment on this proposed project. Please send future NEPA documents concerning this proposed project to our office. If you have any questions about this letter, please contact Kathy Kowal of my staff at 312-353-5206 or via email at kowal.kathleen@epa.gov.

Sincerely,

Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Enforcement and Compliance Assurance

Enclosure: *Construction Emission Control Checklist*

cc: (via email)
Heidi Woeber, Rock Island District, USFWS
Marshall Plumley, Rock Island District, USACE
Adam Rawe, Division of Ecosystems and Environment, Illinois Department of Natural Resources

U.S. Environmental Protection Agency
Construction Emission Control Checklist

Diesel emissions and fugitive dust from project construction may pose environmental and human health risks and should be minimized. In 2002, EPA classified diesel emissions as a likely human carcinogen, and in 2012 the International Agency for Research on Cancer concluded that diesel exhaust is carcinogenic to humans. Acute exposures can lead to other health problems, such as eye and nose irritation, headaches, nausea, asthma, and other respiratory system issues. Longer term exposure may worsen heart and lung disease.[1] We recommend USACE consider the following protective measures and commit to applicable measures in the Draft EA.

Mobile and Stationary Source Diesel Controls

Purchase or solicit bids that require the use of vehicles that are equipped with zero-emission technologies or the most advanced emission control systems available. Commit to the best available emissions control technologies for project equipment in order to meet the following standards.

- On-Highway Vehicles: On-highway vehicles should meet, or exceed, the EPA exhaust emissions standards for model year 2010 and newer heavy-duty, on-highway compression-ignition engines (e.g., long-haul trucks, refuse haulers, shuttle buses, etc.).[2]
- Non-road Vehicles and Equipment: Non-road vehicles and equipment should meet, or exceed, the EPA Tier 4 exhaust emissions standards for heavy-duty, non-road compression-ignition engines (e.g., construction equipment, non-road trucks, etc.).[3]
- Marine Vessels: Marine vessels hauling materials for infrastructure projects should meet, or exceed, the latest U.S. EPA exhaust emissions standards for marine compression-ignition engines (e.g., Tier 4 for Category 1 & 2 vessels, and Tier 3 for Category 3 vessels).[4]
- Low Emission Equipment Exemptions: The equipment specifications outlined above should be met unless: 1) a piece of specialized equipment is not available for purchase or lease within the United States; or 2) the relevant project contractor has been awarded funds to retrofit existing equipment, or purchase/lease new equipment, but the funds are not yet available.

Consider requiring the following best practices through the construction contracting or oversight process:

- Establish and enforce a clear anti-idling policy for the construction site.
- Use onsite renewable electricity generation and/or grid-based electricity rather than diesel-powered generators or other equipment.
- Use electric starting aids such as block heaters with older vehicles to warm the engine.
- Regularly maintain diesel engines to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance (e.g., blue/black smoke indicates that an engine requires servicing or tuning).
- Retrofit engines with an exhaust filtration device to capture diesel particulate matter before it enters the construction site.
- Repower older vehicles and/or equipment with diesel- or alternatively-fueled engines certified to meet newer, more stringent emissions standards (e.g., plug-in hybrid-electric vehicles, battery-electric vehicles, fuel cell electric vehicles, advanced technology locomotives, etc.).

[1] https://www3.epa.gov/region1/eco/diesel/health_effects.html
[2] http://www.epa.gov/otaq/standards/heavy-duty/hdci-exhaust.htm
[3] http://www.epa.gov/otaq/standards/nonroad/nonroadci.htm
[4] http://www.epa.gov/otaq/standards/nonroad/marineci.htm

- Retire older vehicles, given the significant contribution of vehicle emissions to the poor air quality conditions. Implement programs to encourage the voluntary removal from use and the marketplace of pre-2010 model year on-highway vehicles (e.g., scrappage rebates) and replace them with newer vehicles that meet or exceed the latest EPA exhaust emissions standards.

Fugitive Dust Source Controls

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative, where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Occupational Health

- Reduce exposure through work practices and training, such as maintaining filtration devices and training diesel-equipment operators to perform routine inspections.
- Position the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, reducing the fume concentration to which personnel are exposed.
- Use enclosed, climate-controlled cabs pressurized and equipped with high-efficiency particulate air (HEPA) filters to reduce the operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any incoming air is filtered first.
- Use respirators, which are only an interim measure to control exposure to diesel emissions. In most cases, an N95 respirator is adequate. Workers must be trained and fit-tested before they wear respirators. Depending on the type of work being conducted, and if oil is present, concentrations of particulates present will determine the efficiency and type of mask and respirator. Personnel familiar with the selection, care, and use of respirators must perform the fit testing. Respirators must bear a NIOSH approval number.

NEPA Documentation

- Per Executive Order 13045 on Children's Health[5], EPA recommends the lead agency and project proponent pay particular attention to worksite proximity to places where children live, learn, and play, such as homes, schools, and playgrounds. Construction emission reduction measures should be strictly implemented near these locations in order to be protective of children's health.
- Specify how impacts to sensitive receptors, such as children, elderly, and the infirm will be minimized. For example, locate construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.

[5] Children may be more highly exposed to contaminants because they generally eat more food, drink more water, and have higher inhalation rates relative to their size. Also, children's normal activities, such as putting their hands in their mouths or playing on the ground, can result in higher exposures to contaminants as compared with adults. Children may be more vulnerable to the toxic effects of contaminants because their bodies and systems are not fully developed and their growing organs are more easily harmed. EPA views childhood as a sequence of life stages, from conception through fetal development, infancy, and adolescence.

USFWS Comments on EA Letter 1 June 2018

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Southern Illinois Sub-Office (ES)
8588 Route 148
Marion, Illinois 62959
(618) 997-3344

FWS/SISO

June 1, 2018

Colonel Bryan K. Sizemore
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attn: Mrs. Kat McCain, CEMVS-PD-P

Dear Colonel Sizemore:

Thank you for the opportunity to review the May 2018, Feasibility Report (FR) with Integrated Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for the proposed Piasa and Eagle's Nest Island Habitat Rehabilitation and Enhancement Project (HREP) located between Upper Mississippi River miles 207.5 to 211.5, Madison and Jersey Counties, Illinois. The goal of the project is to restore and improve the quality and diversity of aquatic side and island ecosystem resources within the project area. The proposed project consists of a 200-ft wide braided channel excavation of Piasa Chute, excavation of the entrance of Piasa Island backwater, construction of a notched rock structure between Piasa and Eagle's Nest Islands, and construction of islands. These comments are prepared 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.); the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*); and, the National Environmental Policy Act (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.).

Threatened and Endangered Species

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service (Service) information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. In the EA you provided an updated list of species which may be present within the proposed project area that was obtained from the Service's ECOS-IPaC website on January 16, 2018. That list includes the Indiana bat (*Myotis sodalis*), endangered least tern (*Sterna antillarum*), endangered pallid sturgeon (*Scaphirynchus albus*), endangered spectaclecase mussel (*Cumerlandia monodonta*), threatened decurrent false aster (*Boltonia decurrens*), threatened

eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*), threatened eastern prairie fringed orchid (*Platanthera leucophaea*), and threatened northern long-eared bat (*Myotis septentrionalis*). There is no designated critical habitat in the project area at this time.

The Corps prepared a Biological Assessment (BA) and submitted it to the Service on December 15, 2016. In the BA, the Corps indicated that suitable habitat does not exist within the proposed project area for the decurrent false aster, eastern massasauga, eastern prairie fringed orchid, and spectaclecase mussel. In addition, the proposed project area is outside the known distribution of the pallid sturgeon; therefore, the Corps determined that the proposed project will have no effect on these species. This precluded the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended for these species. The Corps indicated that the proposed project area does contain suitable known summer habitat for the Indiana bat; however, no tree clearing is required for the proposed project, thus the Corps determined the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. Based on this information, the Service concurred that the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. The Corps also indicated that least terns have been observed in the vicinity the project area and that the proposed island construction would potentially provide sandbar habitat for least tern nesting. In addition, the work would be conducted during the winter season to avoid construction during the least tern nesting season; thus the Corps determined the proposed project is not likely to adversely affect the least tern. Based on this information, the Service concurred that the proposed project is not likely to adversely affect the least tern. Should this project be modified or new information indicate listed or proposed species may be affected, consultation or additional coordination with this office, as appropriate, should be initiated.

Conclusion

Based on information in the FR and 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, the Service has no objection to a Finding of No Significant Impact for this activity. The Service fully supports the completion of planning for this proposed project, and its subsequent construction. Thank you for the opportunity to provide comment on the FR, EA, and Draft FONSI. For additional coordination, please contact me at (618) 998-5945.

Sincerely,

/s/ Matthew T. Mangan

Matthew T. Mangan
Fish and Wildlife Biologist

cc: MDC (Vitello)
IDNR (Atwood)

St. Louis Post Dispatch Article 2 June 2018

BUSINESS

http://www.stltoday.com/business/local/corps-closing-in-on-river-restoration-plans-and-even-island/article_2fc1cc82-5602-52d3-af03-809bf747f9c2.html

Corps closing in on river restoration plans — and even island building — near Alton

By Bryce Gray St. Louis Post-Dispatch Jun 2, 2018

Silt and downed trees disrupt river traffic and water flow in the Mississippi River near Piasa Cre

1, 2018 in Godfrey, Illinois. Last month, the U.S. Army Corps of Engineers held a public meeting
restore stronger flows of water through a side channel of the Mississippi River called the Piasa
rmichalesko@post-dispatch.com

Managing the Mississippi River is a constant struggle for control — often requiring drastic measures to maintain static banks and channels that defy the river's age-old tendency to shift and meander as it deposits sediment along some banks and eats away at the shorelines of others.

Mark Twain — drawing from his younger days piloting riverboats — wrote of the immensity of that struggle in "Life on the Mississippi."

"One who knows the Mississippi will promptly aver — not aloud, but to himself — that ten thousand River Commissions, with the mines of the world at their back, cannot tame that lawless stream, cannot curb it or confine it, cannot say to it, Go here, or Go there, and make it obey; cannot save a shore which it has sentenced; cannot bar its path with an obstruction which it will not tear down, dance over, and laugh at."

Despite the challenge, the task of reining in the river generally falls to the U.S. Army Corps of Engineers, which is close to finalizing ambitious plans for river control — and even island creation — near Alton.

The project in question would redirect flow from the main stem of the Mississippi through an increasingly silted-up side channel as part of a plan to restore and

The Mississippi River hasn't flooded this much in 500 years

improve habitat in an area encompassing Piasa and Eagle's Nest Islands, about six miles northwest of Alton. Although ecological benefits are cited as the primary motivation behind the project, it has also generated considerable support from local boaters and those who use the river for recreation.

The main side channel the project targets is Piasa Chute, between Piasa Island and the Great River Road on the Illinois side of the river. There, the toll exacted by accumulated sediment from the ever-changing river is most pronounced, according to local recreational users.

Today, logs and wooden snags sit visibly mired in the chute's shallow waters, which are largely impassable for boaters. But many longtime residents of the area fondly recall times, years ago, when that swath of the river supported not only more diverse habitats, but also a wide range of recreational pastimes.

"It used to be a workable part of the river. People waterskied out there," said Butch Rister, of Alton, a member of the Alton Motorboat Club since 1981, which recently hosted a public open house about the corps' project.

"It's just filled in so bad that it's ruined for everybody's use, really," he added. "Not just boaters, but duck hunters, fishermen, mushroom hunters ... Every year it gets worse."

The corps' project would cut a 200-foot-wide channel through the chute, dredged to a depth of about 10 feet. Dredged material would then be used to restore islands in the immediate vicinity, and even form new ones which had been lost over time.

"That island that they're going to replace out there hasn't been there since I was a kid," said Scott Bryant, president of the

Illinois Federation for Outdoor Resources, an organization based in nearby Godfrey that has pushed for the project.

Corps officials said that island-building efforts are rare around St. Louis, but have been done in other stretches of the Upper Mississippi River.

The public comment period on the corps' draft plan ended June 1. After years of studies and analysis, the agency hopes to get final approval for the project in late summer. The goal is to complete the project by 2025, and to have it serve at least a 50-year lifespan.

The project's $26.7 million upfront cost will be covered by the corps. But the last major hurdle facing the plan is the need for another entity to become a sponsor that assumes operational maintenance costs 10 years after it is completed — estimated to average $5,850, annually.

Right now, corps officials said that the Illinois Department of Natural Resources is poised to emerge as the sponsor, though an agreement has yet to be finalized. Bryant, who has served as a liaison with state officials, expressed confidence that even if a deal with IDNR faltered, some other organization would step forward as a sponsor.

"It's been basically 15 or 18 years in the making," he said. "We're going to get this project done, one way or another."

Rister looks forward to the day that the boat ramps and parking lots near Piasa Chute are "filled up again" with cars and boaters — something he and others said could anchor tourism and provide a jolt to the local economy.

"I think tourism would be the big thing," he says. "It opens the river back up so we can be a boating community again."

Bryce Gray

Reporter covering energy and the environment for the St. Louis Post-Dispatch.

From the General Public

I live in Stoneledge Ct, Godfrey. My questions are: 1) will work be done daytime and nighttime? 2) Since I live on the bluff above the River Road and my view is Piasa Island, I am very concerned about the noise level of the construction since I'm right on top of it. How loud will construction be? 3) What is the percentage that this project will not happen? The noise level, day & night, is of great concern to me.

Received: 23 May 2018 by C. Frew

Appreciated the update! Sorry to hear the news concerning IDR. Guess to be expected. Maybe a focus on plan B that will work for Corp.

Received: 23 May 2018 by M. Kichline

Please move this project ahead ASAP. It is way past due. It has already caused many problem for many people.

Received 23 May 2018 by J. Almeter

We (our family) has lived here since the 1860s and have pictures of the river from that time. In the 1950s and 1960s the side channel was abuzz with motorboats and skiers. The Piasa public launching ramp was functional and popular. Now the side channel has progressively closed in as we see more sand bars turning into islands. Sometimes it almost seems as if we could walk to Piasa Island. I've wondered how long it would take for the side channel to fill in completely. So I'm thrilled to hear the rumors of dredging look to be coming true!

Received 23 May 2018 by J. Riehl

The side channel improvements are important for the safety of recreational boaters and sportsmen. The proposed modifications should create and protect critical aquatic habitat. Clearing the side channel could also provide economic benefits to the region through increases in eco-tourism, making the region a destination for recreational water sports. This project seems to be encountering delays and setbacks. It should be a priority for the Corp.

Received 23 May 2018 by A. Ringhausen

I support this project

Received 23 May 2017 by W. Smith

Appendix C

Hydrology & Hydraulics

US Army Corps of Engineers®

St. Louis District

Piasa & Eagle's Nest Islands HREP HSR and AdH Model Study

November 2016

Jasen L. Brown, P.E.

Bradley J. Krischel, P.E.

Table of Contents

1 Introduction

1.1 Study reach

Between September 2015 and June 2016 the United States Army Corps of Engineers, St. Louis District (USACE) conducted a Hydraulic Sediment Response (HSR) model study and an Adaptive Hydraulics (ADH) model study of the Upper Mississippi River at the Piasa Island Complex, River Miles 216.0 – 205.0. These studies were intended to develop and evaluate alternatives to restore ecosystem structure and function by constructing project features to improve side channel, island, and wetland habitats. The results of the modeling were utilized to determine the efficacy of various alternative measures. These measures were then utilized in a planning model to determine the suite of measures to be included in the Tentatively Selected Plan (TSP) for this project.

The Piasa Island Complex study area is located within Pool 26, a 40-mile reach of the Upper Mississippi River System (UMRS), beginning below Lock and Dam 25 (RM 241.4) near Cap au Gris, Missouri, and ending at Melvin Price Locks and Dam (RM 200.8) at Alton, Illinois. Excluding entrance and exit conditions in the model, the study area encompasses Piasa Island and Eagle's Nest Island including Piasa Chute (the side channel located between Piasa Island and the Illinois bankline), and the unnamed chute between Piasa Island and Eagle's Nest Island. At the time of the study, the 11-mile reach had a total of 33 dikes. For a general project location please see Figure 1-1.

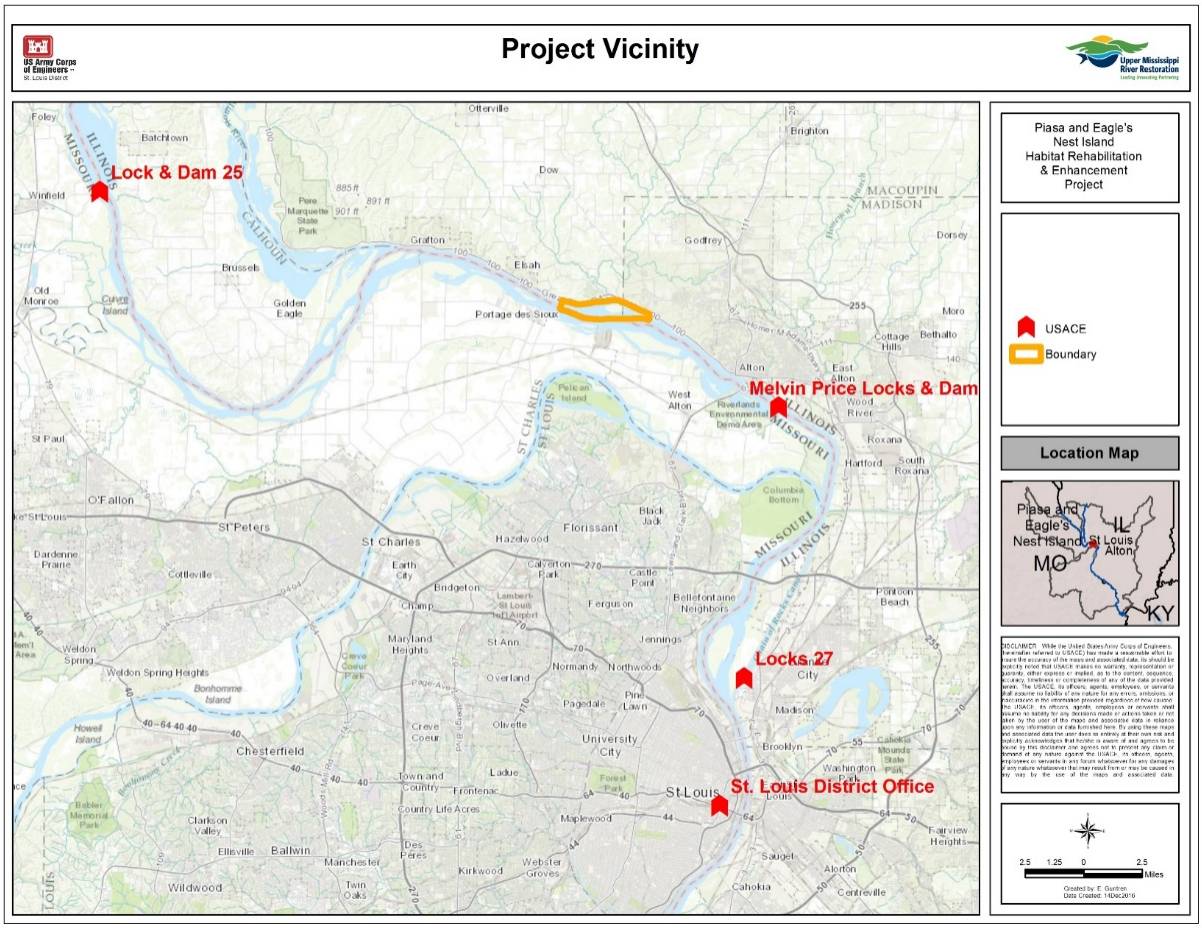


Figure 1-1. Piasa and Eagle's Nest Islands Project Location

1.2 Historical Information

The Project consists of two islands (Piasa and Eagle's Nest Islands) and associated side channel and backwater habitats. The area is bounded on the north by the State Highway 100 and bluffs that run along the Mississippi River. The southern portion of the site is bounded by the alluvial floodplain located in Missouri. Most of this floodplain is cut-off from the river by levees. Prior to settlement, the area to the south of the Project was a mosaic of terrestrial and aquatic habitats. The area to the north of the Project was a mix of forest and upland prairie. The Project site itself was a dynamic area of continuous changing formations of islands, wetlands, sand bars, side channels, and backwaters with varying depths.

Since the mid-19th century, the Army Corps of Engineers has been charged by Congress to improve the Mississippi River for navigation through dredging, snagging and clearing, and channel constriction. The latter procedure began with authorization of the 4-foot channel in 1866, 4 ½-foot channel in 1878, and continued with 6-foot channel in 1907. Between 1930 and 1940, the Corps constructed the Upper Mississippi River and Illinois Waterway 9-Foot Channel Project. Today, the 9-Foot Channel Project

includes 37 locks and 1,200 miles of nine-foot deep navigable waterway in Illinois, Iowa, Minnesota, Missouri, and Wisconsin. Levee construction began on the UMRS in the 1880s. By 1890, much of the surrounding area to the Project, including a portion of Piasa Island itself, had been cleared for agriculture purposes. Approximately 30 acres of Piasa Island were under cultivation, while the remainder was forested (Figure 2-1). At that time, Eagle's Nest Island was mainly mud and sand flats, but by 1932 it was forested. There is no indication that Eagle's Nest Island was ever cultivated. While conversion of native habitat to agriculture affected the surrounding area, the impacts of constructing a stable and reliable navigation channel had greater impacts to the Project.

In order to address complaints related to shallow water from steamboaters, a submergible dam was built in 1875-1877 between Piasa Island and the Missouri shore for the purpose of moving more water through the channel north of Piasa Island and deepening that channel for navigation. However, after dam construction, a continuous rock ledge extending from the head of Piasa Island to the Illinois shore was discovered, which prevented the desired outcome to be achieved. The dam was abandoned and the decision was made to close the channel north of Piasa Island, and adopt the southern channel as the navigation channel. The dam was removed and additional dikes, including a dike from the Illinois shore to the head of Eagle's Nest Island, were constructed to direct flow into the southern channel (USACE, 1881). Over time, these historic dikes and closing structures led to increased sedimentation at the upstream end of Piasa Chute (i.e., the northern channel), and decreased depth diversity within the chute. Today, the navigation channel still runs south of both Piasa and Eagle's Nest Islands.

As part of the construction of Lock and Dam 26 and the creation of Pool 26, Piasa and the other islands in the Project were acquired by the government (Figure 2-2). Construction of Lock and Dam 26 was completed in 1939. The dam raised the water level in the vicinity of the Project inundating much of the wetlands and smaller islands surrounding Piasa and Eagle's Nest Islands. Figure 2-3 provides a series of aerial photographs of the Project from 1932 (pre-lock and dam), 1941 (post- lock and dam), 1979, and 2007. The gage data (Grafton gage located at RM 218.0) in 1932 was much lower as compared to the post-lock and dam photos which have more similar gage readings (Figure 2-3). These raised gage data post-lock and dam are expected due to the inundation. The raising of the water level frequently or permanently inundated parts of Piasa Island, which directly led to island loss and creation of more open water habitat. In addition, several of the smaller islands were permanently inundated.

Lock and Dam 26 was later replaced by the construction of Mel Price Locks and Dam (RM 200.5), located approximately 2 miles downstream of the original Lock and Dam 26. Mel Price became operational by 1990, and the original Lock and Dam 26 was removed. Lock and Dam 26 was later replaced by the construction of Mel Price Locks and Dam (RM 200.5), located approximately 2 miles downstream of the original Lock and Dam 26. Mel Price became operational by 1990, and the original Lock and Dam 26 was removed.

1.3 Project Purpose and Need

The Corps of Engineers proposes to rehabilitate and enhance Piasa and Eagle's Nest Islands through restoring ecosystem structure and function by constructing project features to improve side channel,

island, and wetland habitats. This study is being conducted by the U.S. Army Corps of Engineers (USACE) with the Illinois Department of Natural Resources (IDNR) serving as the non-federal project sponsor.

In order to understand the fluvial processes leading to the shallowing of Piasa Chute, the U.S. Army Corps of Engineers, St. Louis District, conducted an investigation to evaluate the existing conditions and the hydrographic survey records between River Miles (RM) 216.0 and 208.0 (Brown 2007). The bathymetric analysis included surveys from 2004, 1998, 1987, 1983, 1977, 1971, and 1956. Overall, the main river channel upstream of Piasa Chute remained unchanged, which can be explained by its location within the navigation pool and having adequate width and depth. However, one change worthy of note is the scour hole (appx. 40 feet deep, 1 mile long, 1,000 ft wide) located 2 miles upstream of the entrance to Piasa Chute (RM 213.0-214.0) which switched back and forth from the right descending bank to the left descending bank between 1956 and 2004. Brown (2007) concluded that based on the scour hole's characteristics it can be considered to have direct consequences to the bathymetry of Piasa Chute. A line of scour near the north side of Eagle's Nest Island is present in the surveys. This scour line suggests a substantial amount of energy entering Piasa Chute complex exits between Piasa Island and Eagle's Nest Island, leaving less energy to pass through the remainder of Piasa Chute (Brown 2007). In addition, the 2015 hydrographic survey discovered a large sediment wave at RM 211 upstream of Eagle's Nest Island along the Illinois bankline that previous surveys missed or only captured a portion of. Sediment grab samples in the area of the sediment wave determined there was a mix of coarse sand, hardened clay, and woody debris. This feature was observed through aerial photography (Figure 1-2) and through field observations in 2015 during lower water conditions.

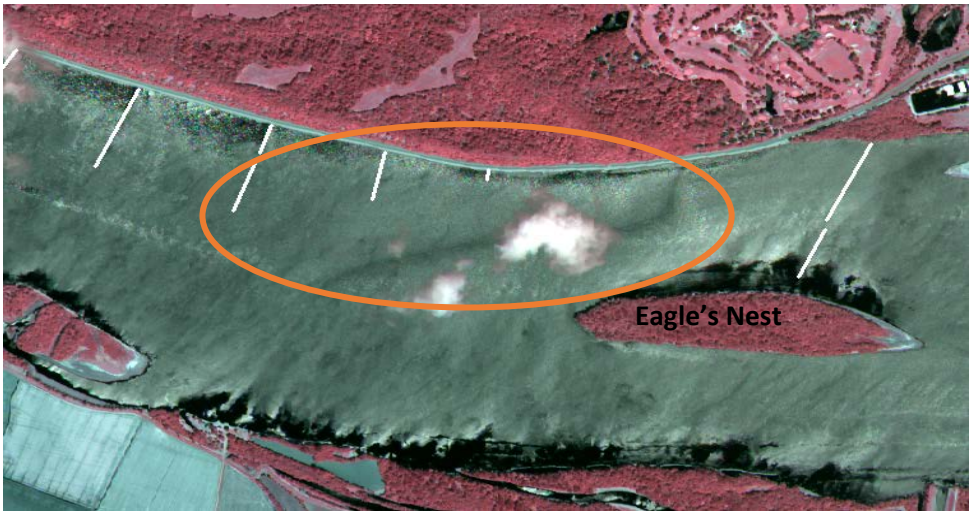


Figure 1-2. Satellite Image Showing Surface Effects of Sediment Wave

This feature appears to influence the entrance conditions into Piasa Chute by causing the flow to come into Piasa Chute at almost 90 degrees. This "shelf" drops off approximately 10 feet on the downstream edge. Acoustic Doppler Current Profiler (ADCP) data were collected in May 2015 (Plate 12) to document the flow (feet per second) within the Project. It appears that flow entering the Piasa Chute complex hugs the northern side of Eagle's Nest Island with slightly faster flows being closer to Eagle's Nest Island.

Within Piasa Chute the flows are very slow. The ADCP data support the conclusion from Brown (2007) that the majority of flow entering the Piasa Chute complex exits between Eagle's Nest Island and Piasa Island, leaving less flow (energy) to pass through the remainder of the side channel. This low energy in Piasa Chute has caused deposition to occur, leading to a lack of environmental diversity over time.

2 HSR Modeling

2.1 Introduction

In September 2015 the United States Army Corps of Engineers, St. Louis District (USACE) conducted a Hydraulic Sediment Response (HSR) model study of the Upper Mississippi River at the Piasa Island Complex, River Miles 216.0 – 205.0, to develop and evaluate alternatives to restore ecosystem structure and function by constructing project features to improve side channel, island, and wetland habitats. Plate 1 is a location and vicinity map of the Piasa Island Complex.

Excluding entrance and exit conditions in the model, the study area en-compassed Piasa Island and Eagle's Nest Island including Piasa Chute (the side channel located between Piasa Island and the Illinois bankline), and the unnamed chute between Piasa Island and Eagle's Nest Island. At the time of the study, the 11-mile reach had a total of 33 dikes. Plate 2 details the planform and nomenclature of the reach. Figure 2-1 shows the layout of the HSR model.

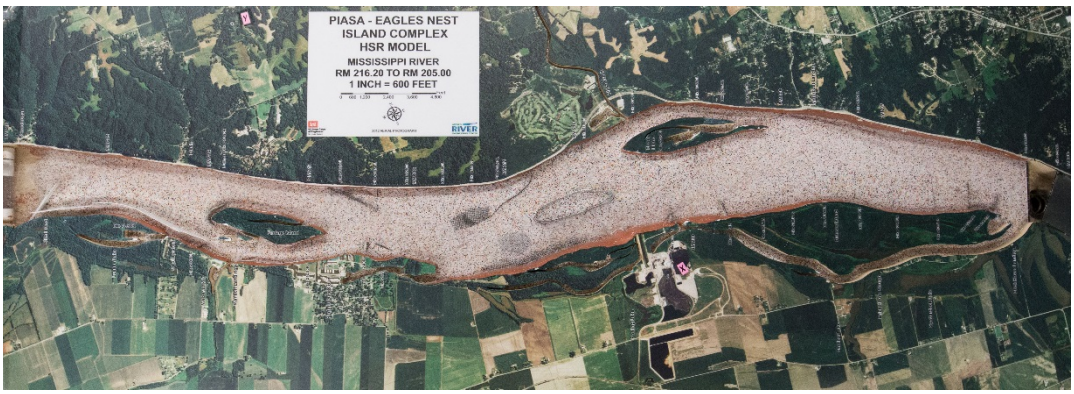


Figure 2-1. Piasa & Eagle's Nest Island Complex HSR Model

2.2 Model Calibration and Replication

The HSR modeling methodology employed a calibration process designed to replicate the general conditions in the river at the time of the model study. Replication of the model was achieved during calibration and involved a three step process.

First, planform "fixed" boundary conditions of the study reach, i.e. banklines, islands, side channels, tributaries and other features were established according to the most recent available high resolution aerial photographs. Various other fixed boundaries were also introduced into the model including any channel improvement structures, underwater rock, clay and other non-mobile boundaries.

Second, "loose" boundary conditions of the model were replicated. Bed material was introduced into the channel throughout the model to an approximate level plane. The combination of the fixed and

loose boundaries served as the starting condition of the model.

Third, model tests were run using steady state discharge. Adjustment of the discharge, sediment volume, model slope, fixed boundaries, and entrance conditions were refined during these tests as part of calibration. The bed progressed from a static, flat, arbitrary bed into a fully-formed, dynamic, three dimensional mobile bed response. Repeated tests were simulated for the assurance of model stability and repeatability. When the general trends of the model bathymetry were similar to observed recent river bathymetry, and the tests were repeatable, the model was considered calibrated and alternative testing began.

Observed recent prototype bathymetry trends were determined using single beam and multibeam hydrographic surveys of the Mississippi River from 2006 to 2015. Main channel surveys included years 2007, 2011, 2014, and 2015 (Plates 3 – 6) while side channel surveys included years 2006 and 2013 (Plates 7 and 8). A multibeam survey was conducted to verify the elevation and condition of existing river training structures located within the reach (Plate 9). Furthermore, ADCP surveys from April 2013, July 2013, and May 2015 can be found on Plates 10 – 12. The most recent surveys were used as they showed the most recent construction and the resultant river bed changes. After comparison of the hydrographic surveys, the following bathymetric trends remained relatively consistent from 2006 to 2015:

Table 2-1. Prototype Bathymetric Trends

River Miles	Description
216.0 - 214.0	The thalweg was located along the Left Descending Bank (LDB) with depths between -40 ft and -20 ft MINPOOL.
214.0 - 213.0	Scour was observed on the main channel side of Portage Island with depths ranging between -40 ft and -30 ft MINPOOL. A crossing from the LDB to the Right Descending Bank (RDB) was observed between RM 214.0 and RM 213.0.
213.0 - 212.0	The thalweg remained along the RDB of the main channel with confluence scour observed where the Portage Island side channel meets the main channel flow.
212.0 - 211.0	The thalweg continued along the RDB while higher bed elevations ranging from -15 ft to 0 ft MINPOOL were observed in the dike field along the LDB.
211.0 - 209.5	The thalweg remained along the Missouri bankline with depths ranging between -40 ft and -20 ft MINPOOL. The area immediately upstream of Eagle's Nest Island and between Eagle's Nest and the Illinois bankline had elevations ranging between -15 ft to -5 ft MINPOOL. A large amount of the flow entering the side channel complex between Eagle's Nest Island and the Illinois bankline returns to the main channel flow between Eagle's Nest and Piasa Islands.
209.5 - 207.5	A crossing from the RDB to the LDB was observed between RM 209.0 and RM 207.5 with depths ranging between -35 ft to -10 ft MINPOOL. Higher elevations, ranging between -10 ft to +5 ft MINPOOL were observed along the main channel side of Piasa Island and within Piasa Chute.
207.5 - 205.0	The thalweg remained along the LDB with depths ranging between -45 ft and -20 ft MINPOOL while higher elevations ranging between -15 ft to 0 ft MINPOOL were observed among the dike field located on the RDB.

2.3 Scales and Bed Materials

The model employed a horizontal scale of 1 inch = 600 feet, or 1:7,200, and a vertical scale of 1 inch = 65 feet, or 1:780, for a 9 to 1 distortion ratio of linear scales. This distortion supplied the necessary forces required for the simulation of sediment transport conditions similar to those observed in the prototype. The bed material was granular plastic urea, Type II, with a specific gravity of 1.40.

2.4 Appurtenances

The HSR model planform insert was constructed according to the 2012 high-resolution aerial photography of the study reach. The insert was then mounted in a standard HSR model flume. The riverbanks of the model were routed into dense polystyrene foam and modified during calibration with clay. Rotational jacks located within the hydraulic flume controlled the slope of the model. The measured slope of the insert and flume was approximately .012 inch/inch. River training structures in the model were made of galvanized steel mesh to generate appropriate scaled roughness.

2.5 Flow Control

Flow into the model was regulated by customized computer hardware and software interfaced with an electronic control valve and submersible pump. This interface was used to control the flow of water and sediment into the model. For all model tests, flow entering the model was held steady at 2.6 Gallons per Minute (GPM). This served as the average expected energy response of the river. Because of the constant variation experienced in the river, this steady state flow was used to replicate existing general conditions and empirically analyze the ultimate expected sediment response that could occur from future alternative actions.

2.6 Data Collection

Data from the HSR model was collected with a three dimensional (3D) laser scanner. The river bed in the model was surveyed with a high definition, 3D laser scanner that collects a dense cloud of xyz data points. Using ArcGIS computer software, these xyz data points were then georeferenced to real world coordinates and triangulated to create a 3D surface. The surface was then color coded by elevation using standard color tables that were also used in color coding prototype surveys. This process allowed a direct comparison between HSR model bathymetry surveys and prototype bathymetry surveys.

2.7 Model Replication

Once the model adequately replicated general prototype trends, the resultant bathymetry served as a benchmark for the comparison of all future model alternative tests. In this manner, the actions of any alternative, such as new channel improvement structures, realignments, etc., were compared directly to the replicated condition. General trends were evaluated for any major differences positive or negative between the alternative test and the replication test by comparing the surveys of the two and also carefully observing the model while the actual testing was taking place.

Bathymetric trends were recorded from the model using a 3-D Laser Scanner. Calibration was achieved after numerous favorable bathymetric comparisons of the prototype surveys were made to several surveys of the model. The resultant bathymetry served as the bathymetry base test for the model. Plate 13 compares the model replication, or base test, to a prototype hydrographic survey.

The model was considered calibrated between RM 212.5 and RM 207.0, which excluded entrance and exit conditions of the model. Results of the HSR model base test bathymetry and a comparison to the 2006 through 2015 prototype surveys indicated that the model replication and prototype bed responses were within the natural variation observed in the river and produced the following trends:

Table 2-2. HSR Bathymetric Trends

River Miles	Description
212.5 - 212.0	The thalweg was located along the RDB of the main channel with confluence scour observed where the Portage Island side channel meets the main channel flow.
212.0 - 211.0	The thalweg continued along the RDB while higher bed elevations ranging from -15 ft to 0 ft MinPool were observed in the dike field along the LDB.
211.0 - 209.5	The thalweg remained along the Missouri bankline with depths ranging between -20 ft and -40 ft MINPOOL. The area immediately upstream of Eagle's Nest Island and between Eagle's Nest and the Illinois bankline had elevations ranging between -15 ft to -5 ft MINPOOL. A large amount of the flow entering the side channel complex between Eagle's Nest Island and the Illinois bankline returns to the main channel flow between Eagle's Nest and Piasa Islands.
209.5 - 207.5	A crossing from the RDB to the LDB was observed between RM 209.0 and RM 207.5 with depths ranging between -35 ft to -10 ft MINPOOL. Higher elevations, ranging between -10 ft to +5 ft MINPOOL were observed along the main channel side of Piasa Island and within Piasa Chute.
207.5 - 207.0	The thalweg remained along the LDB with depths ranging between -45 ft and -20 ft MINPOOL while higher elevations ranging between -15 ft to 0 ft MINPOOL were observed among the dike field located on the RDB.

2.8 Design Alternative Testing

The testing process consisted of modeling alternative measures in the HSR model followed by an analyses of the bathymetry results. The goal was to identify the most effective and economical plan to enhance environmental diversity in the Piasa Island Complex reach while having no negative impact to the existing navigation channel. Evaluation of each alternative was accomplished through a qualitative comparison to the model replication test bathymetry. Plates 14 -36 compare the alternative bathymetric results with the base test bathymetry of HSR model. See Chapter 4 for the full list of plates.

2.9 HSR Results and Path Forward

Throughout testing, a number of alternative measures visibly increased the amount of flow entering the side channel, but the shear stress forces, which determines bed scour, were not great enough to create any significant bathymetry changes. After testing 23 alternatives and repeatedly seeing an increase in flow but little bathymetric changes with alternative tests, engineers determined the HSR model's calibrated flowrate was lower than Piasa Chute's channel forming discharge. In other words, the calibration of the Piasa HSR model accurately replicated the bathymetry within the overall study reach, but a higher model discharge rate was necessary to see bathymetric changes due to alternative designs within Piasa Chute.

HSR models are calibrated by manipulating entrance and exit conditions, flow rate, model slope, tail gate height, and sediment volume until the model bathymetry replicates the prototype river. Furthermore, HSR models are qualitatively analyzed in that the bathymetric trends in the model match average bathymetric trends of the prototype over the course of multiple years. Simply, the HSR model replicates an average condition of the reach, not a high discharge event, which occurs much less frequently. Site visits confirmed that during typical stages, there is very little flow entering the side channel complex, which is what the calibrated HSR model replicated.

In order to test alternatives at a higher flowrate, or higher channel forming discharge, the PDT decided to utilize an Adaptive Hydraulics (AdH) numerical model. AdH is a finite element modeling package that evaluates two-dimensional shallow water calculations and was designed to solve water problems within riverine systems and estuaries. AdH works in conjunction with Surface Water Modeling System (SMS), which is used for mesh generation and visualization of results calculated in AdH. AdH model development, calibration, and results are discussed in Chapter 3. The AdH model allowed the PDT to analyze alternatives at different flow conditions as well as quantitatively measure discharge through Piasa Chute, changes in bed shear, and changes in velocity.

3 AdH Modeling

3.1 Geometry

The elevation data used to create the AdH computational mesh was compiled using several datasets that covered both above and below the waterline. The sources include a combination of Light Detection and Ranging surveys (LiDAR) and hydrographic surveys, which consisted of single beam and multi-beam survey data. LiDAR data is collected above the water surface while hydrographic or bathymetric surveys are used to collect elevation data below the water surface. Data in NAVD88 was converted to NGVD29 using a datum shift of approximately +0.5 feet. The surveys were merged together to create a single elevation dataset representing all areas above and below the waterline within the numerical model mesh domain. Table 3-1 lists the elevation datasets used to create the mesh. The merged elevation data is shown in Figure 3-1.

Table 3-1. Source of Elevation Datasets

Survey	Survey Type	Vertical Datum	Year
Structure Survey	Multi Beam Hydrographic Survey	(NGVD29)	2015
Piasa Chute Side Channel Survey	Multi Beam Hydrographic Survey	(NGVD29)	2013
Main Channel Survey	Single Beam Hydrographic Survey	(NGVD29)	2011
Upper Mississippi River LiDAR	LiDAR	(NAVD88)	2013

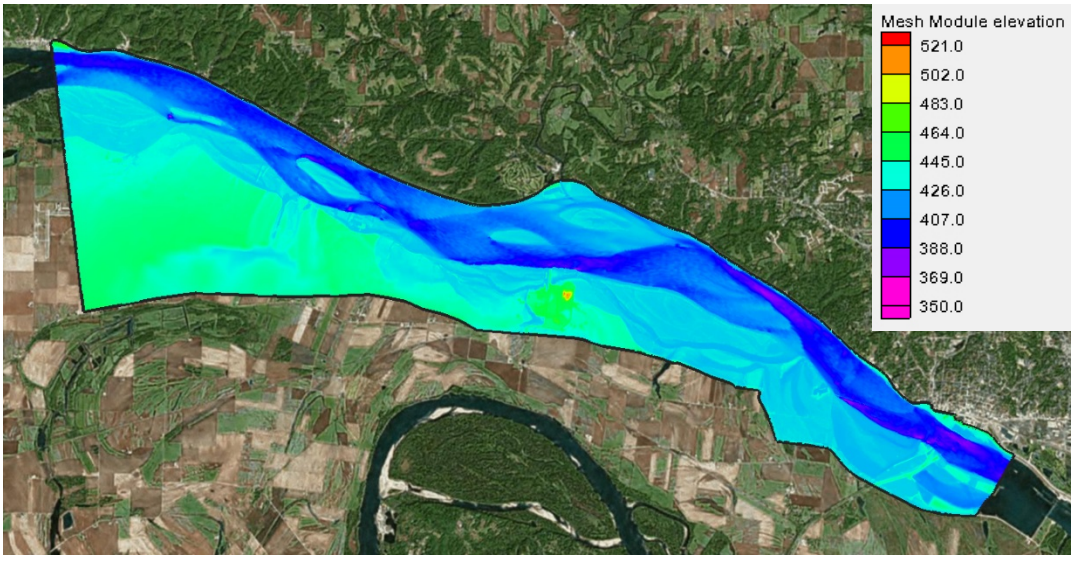


Figure 3-1. Piasa Island Complex AdH Elevation Map

3.2 Calibration

To develop and calibrate an AdH model, multiple items are necessary. These items include boundary conditions, a numerical mesh file, a hot start file, roughness values, a computational environment, and calibration results.

3.2.1 Boundary Conditions: Discharge and Water-surface Elevation Data

The Piasa & Eagle's Nest Islands HREP AdH model included the reach between the gage at Grafton, Illinois (UMR 218.6) and the gages at Alton Marina (UMR 203.0) and Mel Price (Pool, UMR 201.1) near Alton, Illinois (RM 218.60-201.50). However, the gage at Grafton, Alton, and Mel Price (Pool) were not rated for discharge. In order to determine discharge through the study reach, a calculation was made by subtracting the Herman, MO gage discharge on the Missouri River from the St. Louis, MO gage discharge on the Mississippi River. Furthermore, there is a time lag of approximately 1 day between the Herman, MO gage and the St. Louis, MO gage, so this was also factored into the discharge calculations. Engineers chose a range of discharges based on historical hydrograph data that represented a range of river conditions including normal pool, pool drawdown, and flood flows. Table 3-2, Table 3-3, and Table 3-4 show the relevant gage information, discharge data, and stage data, respectively.

Table 3-2. Gage Locations

Gage Name	River	River Mile	Gage Latitude	Gage Longitude	Gage Zero (elevation – feet NAVD88)	Minimum Pool (elevation – feet NAVD88)
Grafton	Mississippi	218.60	38°58'05"	90°25'44"	403.22	417.43
Mel Price Pool	Mississippi	201.10	38°52'18"	90°09'27"	395.04	412.06
Alton	Mississippi	203.0	38°53'14"	90°11'02"	399.66	413.66
Herman	Missouri	97.9	38°42'35"	91°26'19"	481.50	-
St. Louis	Mississippi	179.60	38°37'44"	90°10'47"	379.94	-

Table 3-3. Discharge Data

River Condition	St. Louis Gage Discharge (ft^3/s)		Hermann Gage Discharge (ft3/s)		8AM Difference (ft3/s)	5PM Difference (ft3/s)	Average Discharge (ft3/s)
Pool	3-20-14		3-19-14		158,300	159,500	3-20-14
	8AM	5PM	8AM	5PM			158,900
	203,000	204,000	44,700	44,500			
Pool	4-24-14		4-23-14		202,900	201,600	4-24-14
	8AM	5PM	8AM	5PM			202,250
	257,000	255,000	54,100	53,400			
Pool Drawdown	5-15-14		5-14-14		245,900	249,700	5-15-14
	8AM	5PM	8AM	5PM			247,800
	304,000	307,000	58,100	57,300			
Flood	7-03-14		7-02-14		301,000	302,000	7-03-14
	8AM	5PM	8AM	5PM			301,500
	427,000	429,000	126,000	127,000			
Flood	4-21-13		4-20-13		386,000	403,000	4-21-13
	8AM	5PM	8AM	5PM			394,500
	591,000	600,000	205,000	197,000			
Flood	4-25-13		4-24-13		447,000	453,000	4-25-13
	8AM	5PM	8AM	5PM			450,000
	652,000	650,000	205,000	197,000			

Table 3-4. Stage Data

Date	Grafton Gage Reading (elevation in feet NAVD88)	RM 201.5 WSE (elevation in feet NAVD88)
3-20-14	419.08	416.57
4-24-14	419.31	413.36
5-15-14	421.29	413.37
7-03-14	424.16	416.24
4-21-13	429.43	423.98
4-25-13	432.64	426.93

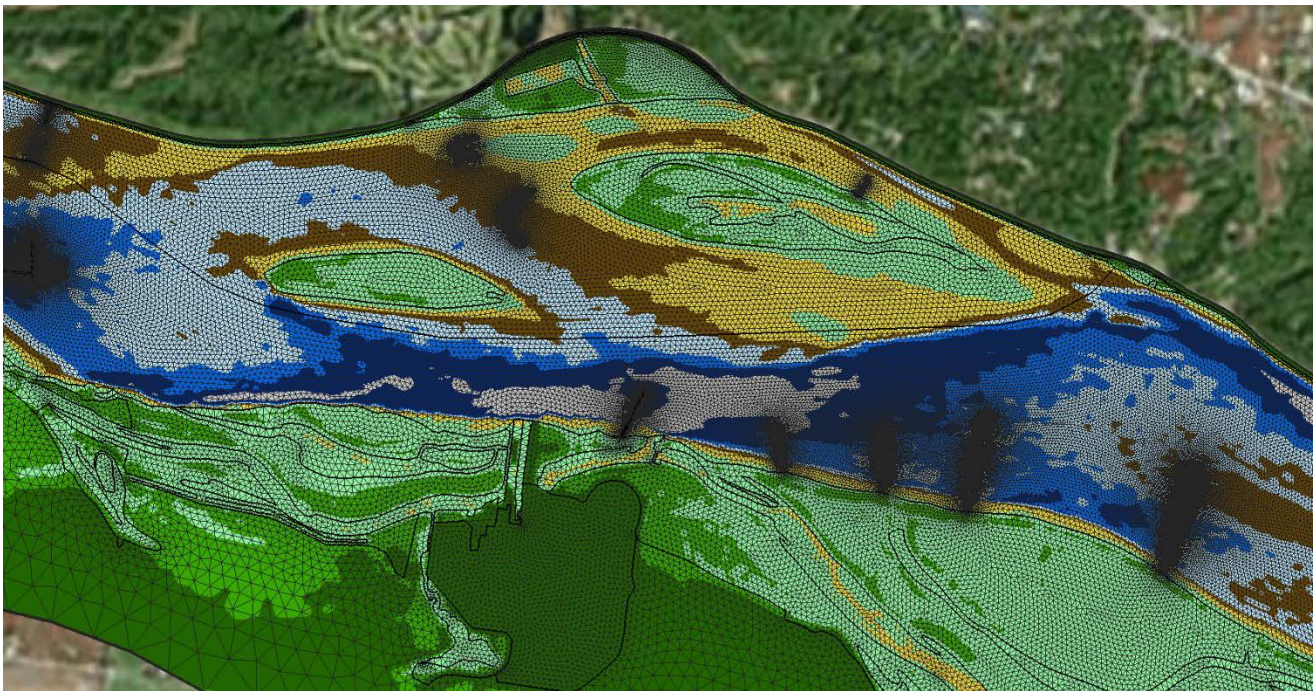
Table 3-5. Grafton Gage Flow Frequency

Frequency	Discharge (cfs)	Stage (elevation in feet NAVD88)
2 yr	212,000	423.92
5 yr	271,000	429.12
10 yr	312,000	430.92

25 yr	372,000	433.82
50 yr	406,000	436.32
100 yr	445,000	438.62
200 yr	491,000	440.72
500 yr	547,000	442.52

3.2.2 Mesh Development

A numerical model mesh was created in order to utilize an AdH model. The mesh file was generated using SMS 11.1.16. The mesh covers the extents of the area being evaluated and is used to define the surface and all features. The extents of the mesh were from approximate RM 218.00 – 201.50. The mesh is generated by using triangular elements and nodes at various spacing. Then, the mesh elements are draped onto an elevation data set to create a surface mesh. The space between nodes were adjusted to



change the size of the triangular elements, thus increasing detail as needed in areas such as the structures in the river. The upstream and downstream limits of the mesh were far enough away from the study area so effects of boundary conditions would be dissipated before reaching the study area. See Figure 3-2 and Figure 3-3 for an image of the AdH mesh and an example of triangular elements and nodes created in SMS, respectively.

Figure 3-2. Piasa Island Complex AdH Mesh

Figure 3-3. Surface Mesh Elements

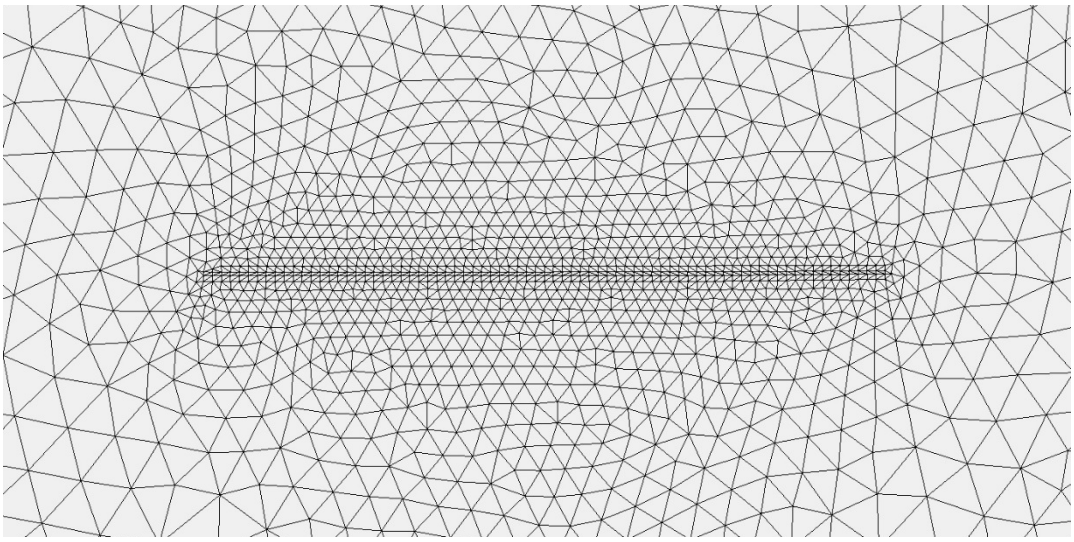
3.2.3 Hot Start Initial Conditions

The hot start initial conditions is used for initial setup and stability of the model. The hot start establishes an initial depth of water and velocity when available. The hot start file used initial depth of water and was established by interpolating between the gage at Grafton and the interpolated WSE at RM 201.5.

3.2.4 Roughness Values

Following the creation of the numerical model mesh file, roughness values were assigned to all elements based on the element's corresponding prototype material type. The material boundaries were based on aerial photography, LiDAR elevation data, and hydrographic survey data. Two roughness types were used to define the friction within the reach: unsubmerged rigid vegetation (URV) and Manning's n-values.

URV is used to compute a shear stress coefficient for computing shear stress through a rigid, unsubmerged vegetation. URV takes into account roughness height, average stem diameter, and



average stem density per unit area.

The initial Manning's n-values were obtained from Open-Channel Hydraulics, (Chow 1959), and were adjusted within acceptable ranges to achieve model calibration. The roughness values used in the model study can be seen in Table 3-5 and Table 3-6, and a map of the materials used in the study can be seen in Figure 3-4 (note: dike rock, revetment rock, road, and bridge pier are difficult to see in the image due to the features' small size).

Table 3-6. Unsubmerged Rigid Vegetation

AdH Material	Roughness Height (ft)	Average Stem Diameter (ft)	Average Stem Density (stems/ft^2)
Trees	0.5	1.5	0.02

Table 3-7. Manning's n-values

AdH Material	Manning's n Roughness Coefficient	Equivalent Roughness Height (feet)
River Channel	0.028	N/A
Backwater Area	0.04	N/A
Farmland	0.028	N/A
Residential Development	0.05	N/A
Commercial Development	0.06	N/A
Dike Rock	N/A	3.0
Revetment Rock	N/A	3.0
Road	0.05	N/A
Bridge Pier	0.025	N/A
Side Channel	0.03	N/A

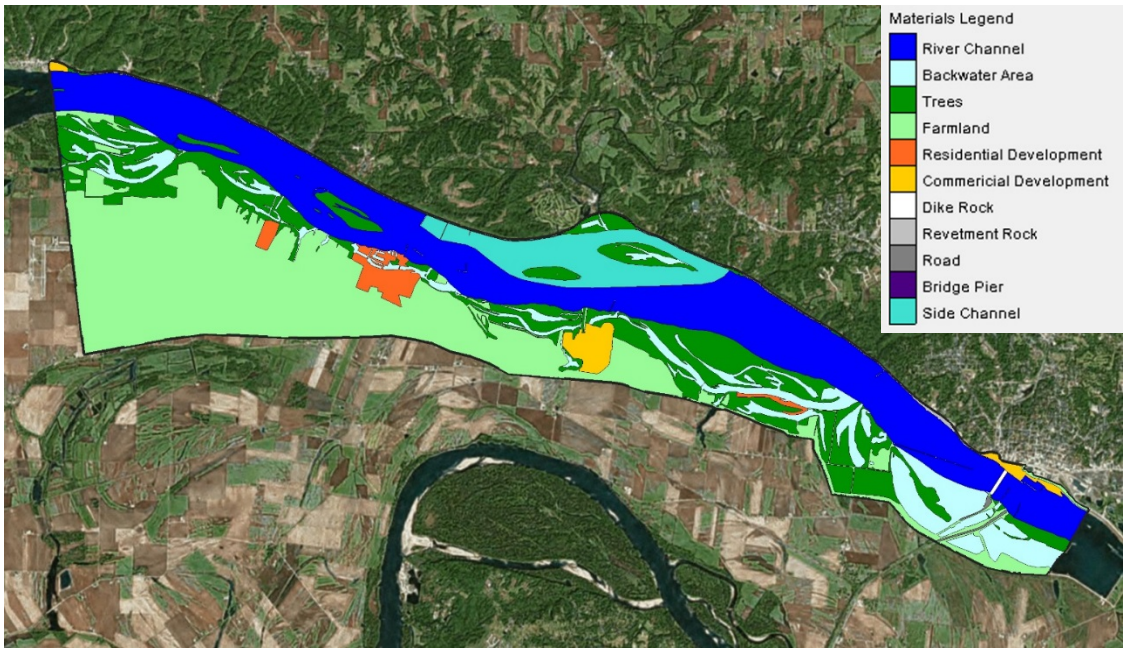


Figure 3-4. Bed Material Map

3.2.5 Computational Environment

The numerical modeling was executed on the U.S. Army Engineer Research and Development Center's (ERDC) High-Performance Computing (HPC) Cray XE6 (Garnet) and SGI ALtix ICE X (Topaz) parallel processing supercomputers. The numerical model was computed with both HPC platforms due to time restrictions and long wait times.

3.2.6 Calibration Results

The AdH model was calibrated by making small adjustments to the roughness values in order to achieve water surface elevations that closely matched those of the prototype. The adjustments to the

roughness values were within the range of acceptable use for a river channel of this type. The elevations were compared at the Grafton gage. This comparison of data was used to verify the calibration of the AdH model. Table 3-7 shows that the AdH model's water surface elevations closely matched the elevations observed in the prototype at the various flow conditions. Plate 37 shows the SMS base test for the model.

Table 3-8. Water Surface Elevation Verification

Discharge (ft^3/s)	Gage	Prototype (elevation – ft NAVD88)	AdH (elevation – ft NAVD88)	Difference (ft)
158,900	Grafton	419.08	419.57	-0.49
202,250	Grafton	419.31	419.64	-0.33
247,800	Grafton	421.29	421.35	-0.06
301,500	Grafton	424.16	423.95	0.21
394,500	Grafton	429.43	429.45	-0.02
450,000	Grafton	432.64	432.12	0.52

3.3 Alternative Testing

The alternative tests for the AdH model were heavily informed from the earlier HSR model tests. Each of the 22 AdH alternatives were run a total of 6 times – one for each flow condition, which were 158,900 cfs, 202,250 cfs, 247,800 cfs, 301,500 cfs, 394,500 cfs, and 450,000 cfs. The goal of each alternative was to utilize dredging, river training structures, and strategic placement of dredge material to create both island and shallow water habitat within the Piasa Chute complex. In order to determine if an alternative was successful, engineers analyzed the increase or decrease of discharge through Piasa Chute. A description of each alternative and the representative results can be found on the following pages.

3.3.1 Alternative 1

Alternative 1 (Plate 38) consisted of a 200 foot wide dredge cut through Piasa Chute, multiple dredge disposal locations, and two river training structures. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.11 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.11 ft elevation of the dredge cut. The dredge material was placed within Piasa Chute where high elevation areas already existed in the prototype leading to island habitat creation. A chevron was placed near RM 209.8 along the LDB at the upper end of Piasa Chute to protect the new island habitat from erosion. Furthermore, a dike was placed along the RDB of Piasa Chute near RM 208.50 to help protect the downstream disposal location within Piasa Chute. Figure 3-5 compares the Alternative and base test discharges within Piasa Chute.

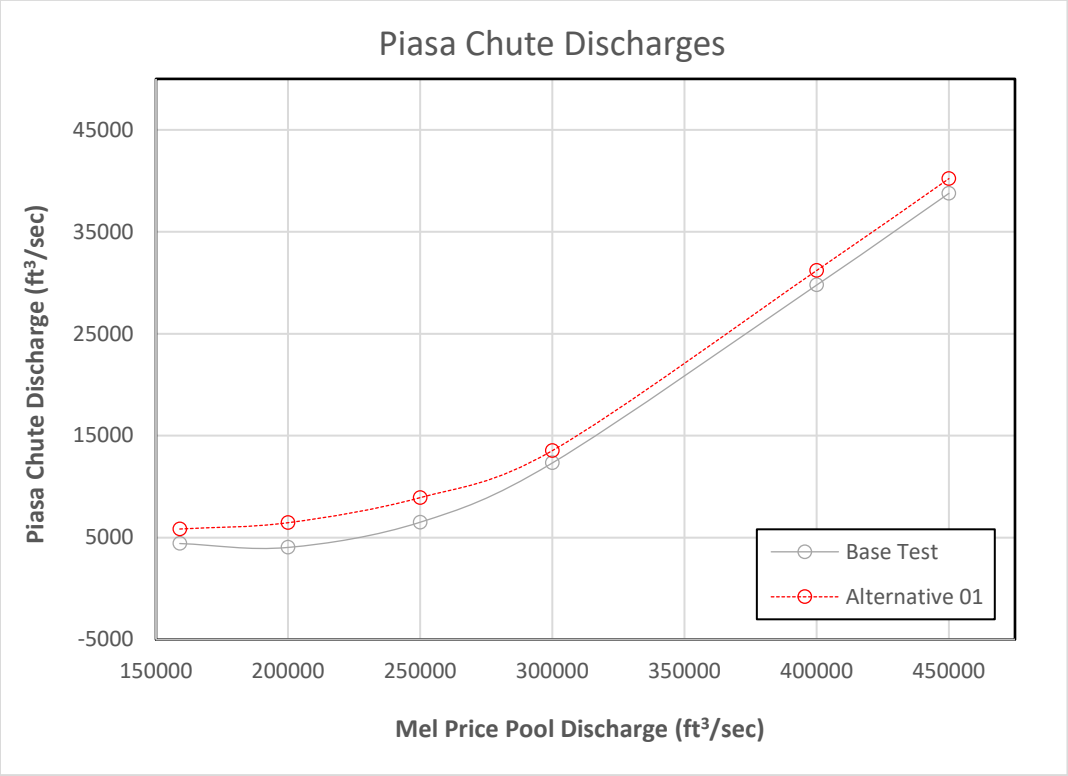


Figure 3-5. Piasa Chute Discharge (Alternative 01 vs Base Test)

3.3.2 Alternative 2

Alternative 2 (Plate 39) consisted of a 200 foot wide dredge cut through Piasa Chute and multiple dredge disposal locations. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The dredge material was placed within Piasa Chute where high elevation bars already existed in the prototype leading to island habitat creation. Figure 3-6 compares the Alternative and base test discharges within Piasa Chute.

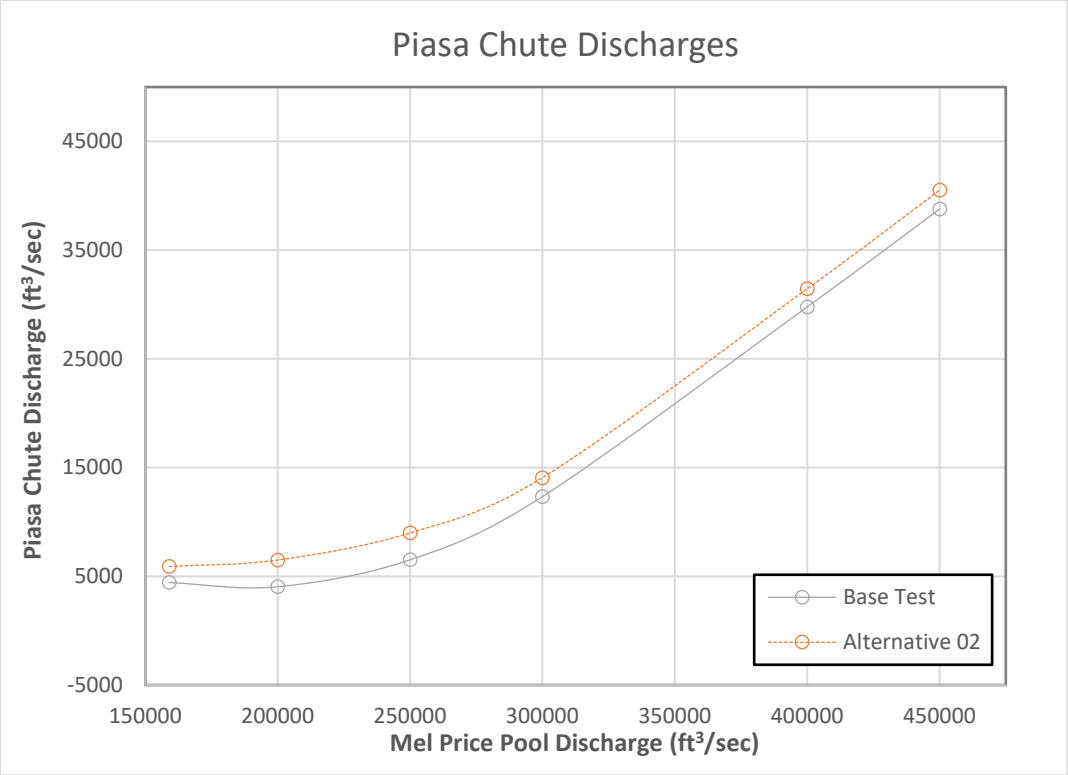


Figure 3-6. Piasa Chute Discharge (Alternative 02 vs Base Test)

3.3.3 Alternative 3

Alternative 3 (Plate 40) consisted of a 200 foot wide dredge cut through Piasa Chute and a single dredge disposal location. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The dredge material was placed between Piasa and Eagle's Nest Islands leading to island habitat creation. A chevron structure was placed upstream of the new island habitat in order to protect it from erosion. Figure 3-7 compares the Alternative and base test discharges within Piasa Chute.

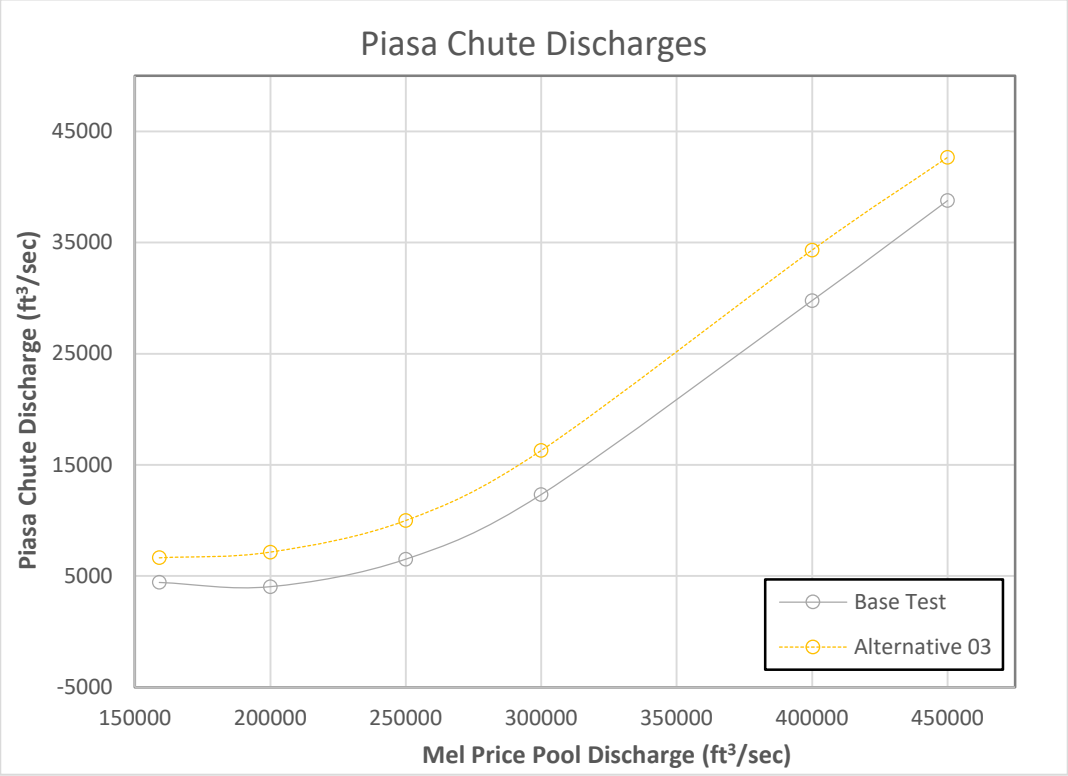


Figure 3-7. Piasa Chute Discharge (Alternative 03 vs Base Test)

3.3.4 Alternative 4

Alternative 4 (Plate 41) consisted of a 200 foot wide dredge cut through Piasa Chute and a single dredge disposal location. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The dredge material was placed on the lower end of the main channel side of Piasa Island leading to the creation of island habitat. Figure 3-8 compares the Alternative and base test discharges within Piasa chute.

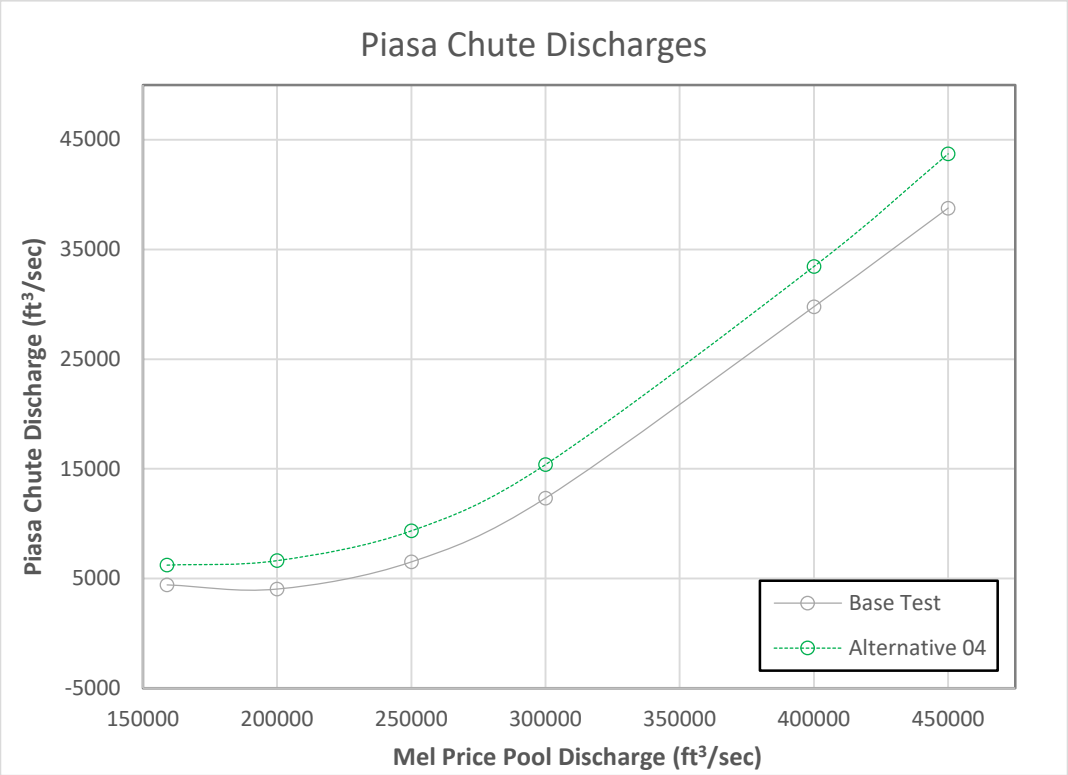


Figure 3-8. Piasa Chute Discharge (Alternative 04 vs Base Test)

3.3.5 Alternative 5

Alternative 5 (Plate 42) consisted of a 300 foot wide dredge cut through the sediment wave located along the LDB upstream of the Piasa Island complex. The dredge cut consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of sediment wave where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The dredge material was placed between Piasa and Eagle's Nest Islands leading to island habitat creation. A chevron was placed upstream of the new island habitat in order to protect it from erosion. Figure 3-9 compares the Alternative and base test discharges within Piasa chute.

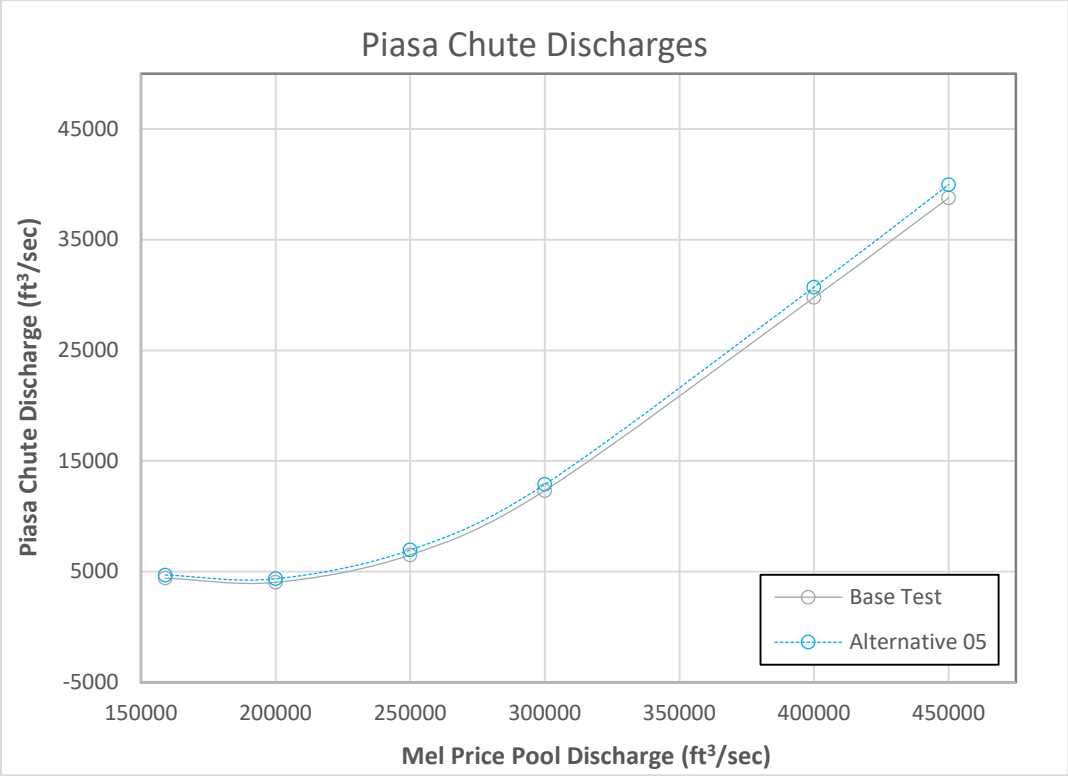


Figure 3-9. Piasa Chute Discharge (Alternative 05 vs Base Test)

3.3.6 Alternative 6

Alternative 6 (Plate 43) consisted of a 300 foot wide braided dredge cut through Piasa Chute and multiple dredge disposal locations. The 'braided' term describes the way the dredge cut exists between high elevation areas creating a more natural braided channel. The dredge cut consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The dredge material was placed to create island habitat in multiple locations: within Piasa Chute where high elevation areas already existed, on the lower end of the main channel side of Piasa Island, and upstream of the Piasa Island complex along the LDB. Structures were placed on the downstream side of the new island habitat on the upper end of the Piasa Island Complex and within Piasa Chute to assist in stabilizing and retaining the shape of the new habitat feature. The island habitat created on the main channel side of Piasa Island was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-10 compares the Alternative and base test discharges within Piasa chute.

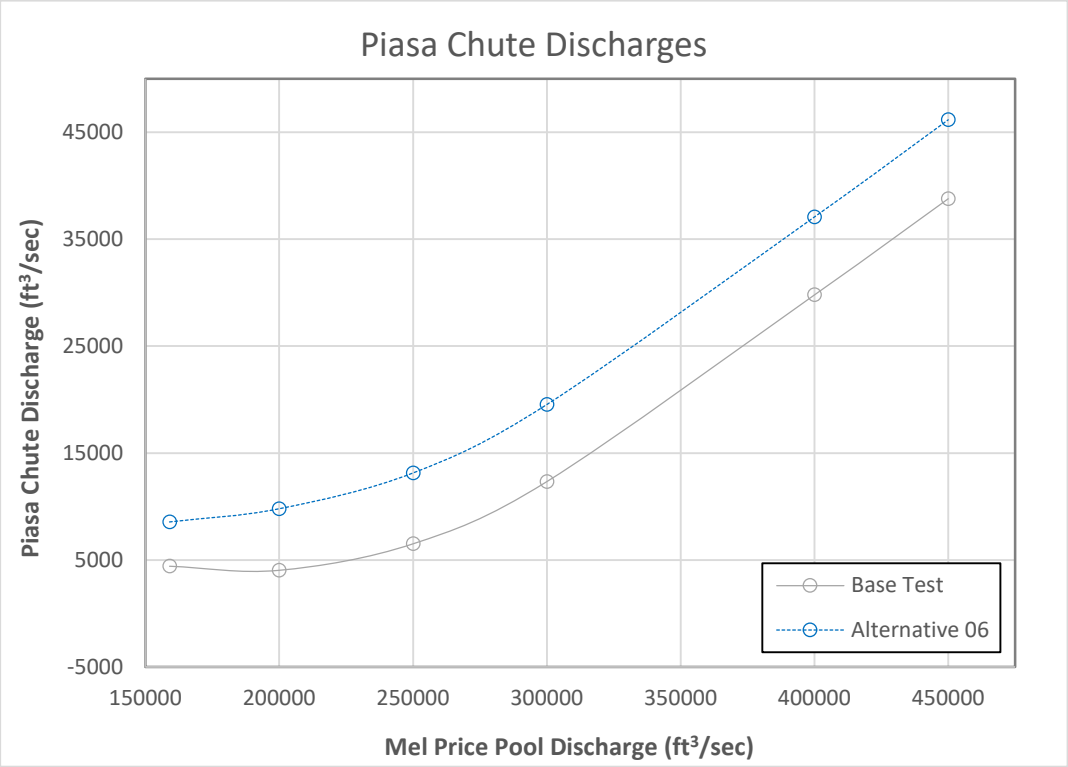


Figure 3-10. Piasa Chute Discharge (Alternative 06 vs Base Test)

3.3.7 Alternative 7

Alternative 7 (Plate 44) consisted of a 200 foot wide braided dredge cut through Piasa Chute and multiple dredge disposal locations. The 'braided' term describes the way the dredge cut exists between high elevation areas creating a more natural braided channel. The dredge cut consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The dredge material was placed to create island habitat in multiple locations: within Piasa Chute where high elevation areas already existed, on the lower end of the main channel side of Piasa Island, and upstream of the Piasa Island complex along the LDB. Structures were placed on the downstream side of the new island habitat on the upper end of the Piasa Island Complex and within Piasa Chute to assist in stabilizing and retaining the shape of the new habitat feature. The island habitat created on the main channel side of Piasa Island was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-11 compares the Alternative and base test discharges within Piasa chute.

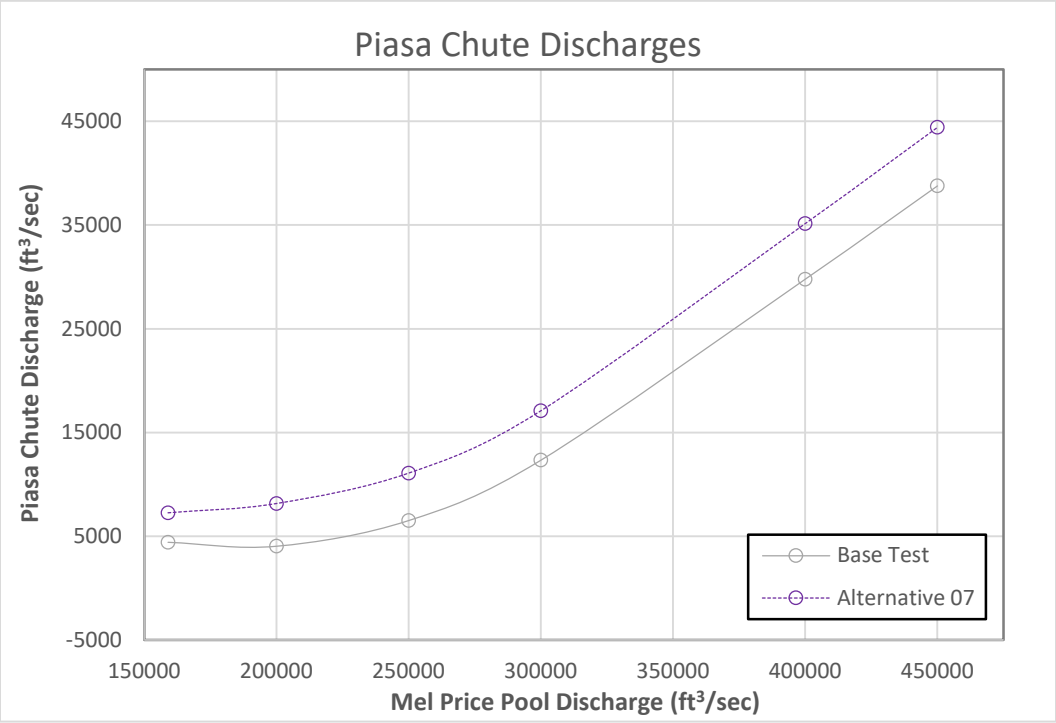


Figure 3-11. Piasa Chute Discharge (Alternative 07 vs Base Test)

3.3.8 Alternative 8

Alternative 8 (Plate 45) consisted of a 300 foot wide dredge cut through Piasa Chute and a single dredge disposal location. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The dredge material was placed on the lower end of the main channel side of Piasa Island leading to the creation of island habitat. The island habitat created was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-12 compares the Alternative and base test discharges within Piasa Chute.

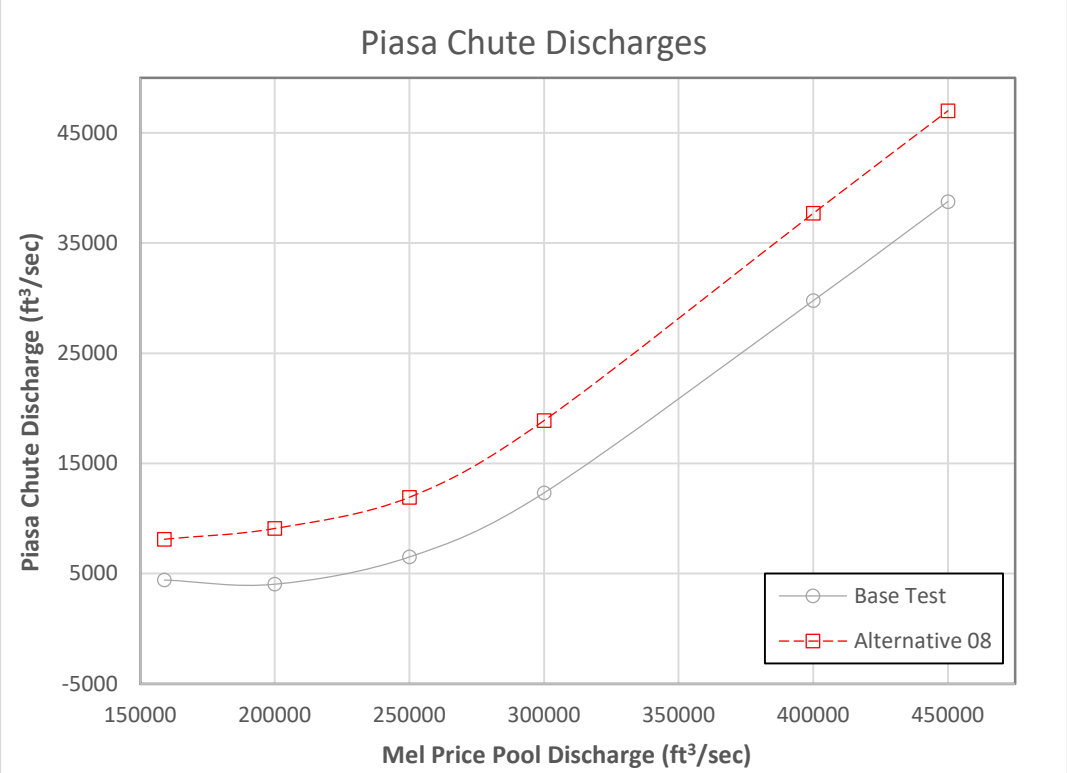


Figure 3-12. Piasa Chute Discharge (Alternative 08 vs Base Test)

3.3.9 Alternative 9

Alternative 9 (Plate 46) consisted of a structure to contain the existing sediment wave upstream of the Piasa Island complex. Furthermore, the structure would provide a disruption to any additional sediment entering the project area in the future. Figure 3-13 compares the Alternative and base test discharges within Piasa Chute.

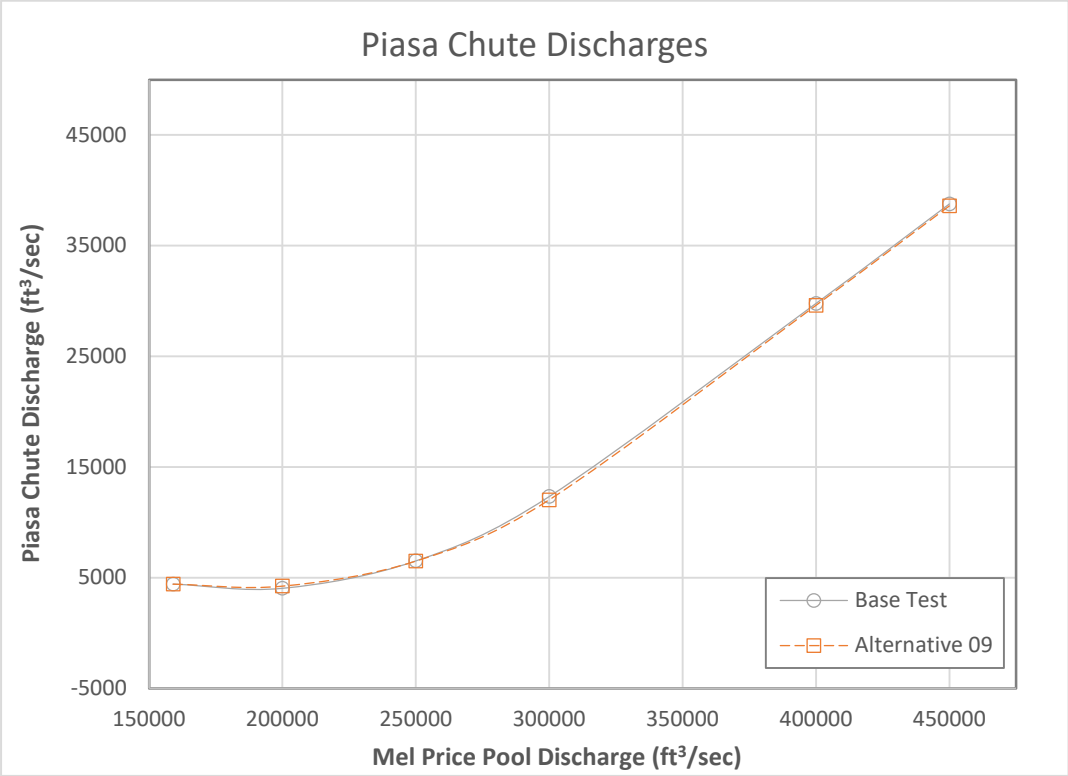


Figure 3-13. Piasa Chute Discharge (Alternative 09 vs Base Test)

3.3.10 Alternative 10

Alternative 10 (Plate 47) consisted of a notched structure between Piasa and Eagle's Nest Islands. A majority of the discharge through the Piasa Island complex exits between the two islands, so the goal of the notched structure was to direct more discharge through Piasa Chute while still allowing a small amount of flow to exit the complex between the islands. Figure 3-14 compares the Alternative and base test discharges within Piasa Chute.

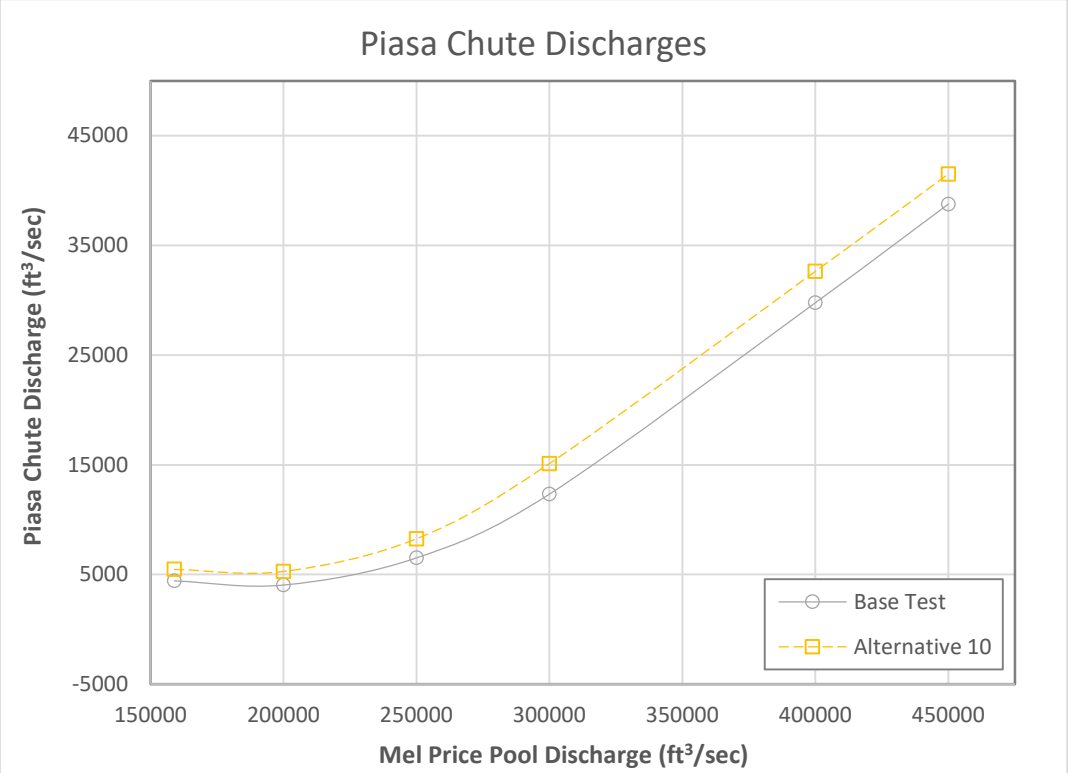


Figure 3-14. Piasa Chute Discharge (Alternative 10 vs Base Test)

3.3.11 Alternative 11

Alternative 11 (Plate 48) consisted of a 200 foot braided dredge cut with multiple dredge disposal locations. The 'braided' term describes the way the dredge cut exists between exist-ing high elevation areas creating a more natural braided channel. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The dredge material was placed to create island habitat in multiple locations: within Piasa Chute where high elevation areas already existed, on the lower end of the main channel side of Piasa Island, and upstream of the Piasa Island complex along the LDB. Structures were placed on the downstream side of the new islands to assist in stabilizing and retaining the shape of the new habitat feature. The island habitat created on the main channel side of Piasa Island was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-15 compares the Alternative and base test discharges within Piasa Chute.

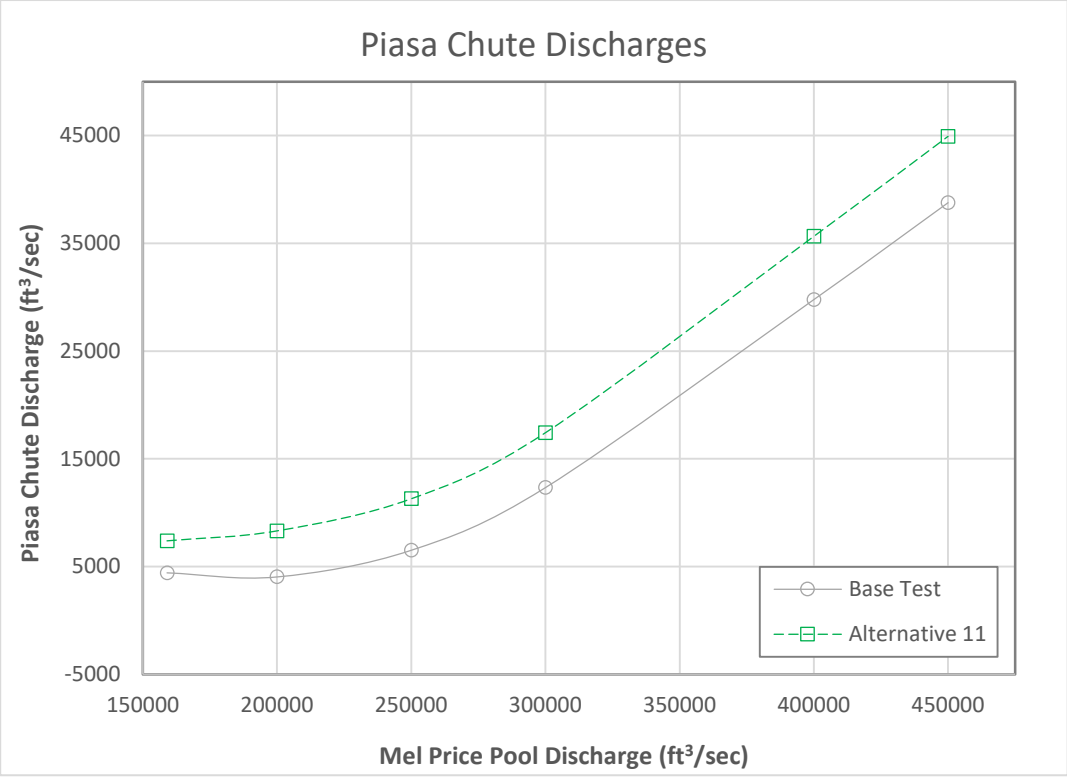


Figure 3-15. Piasa Chute Discharge (Alternative 11 vs Base Test)

3.3.12 Alternative 12

Alternative 12 (Plate 49) consisted of a 300 foot dredge cut within Piasa Chute, a dredge cut within the Piasa Island backwater area, and a disposal location. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved while the dredging in the Piasa Island backwater area was dredged to an elevation of 414.6 ft. The Piasa Chute dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The backwater dredging started from the 414.6 ft elevation in the Piasa Island backwater area and cut through the existing island to meet a 414.6 ft elevation on the main channel side of Piasa Island. The dredge material was placed on the lower end of the main channel side of Piasa Island leading to the creation of island habitat. The island habitat created on the main channel side of Piasa Island was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-16 compares the Alternative and base test discharges within Piasa Chute.

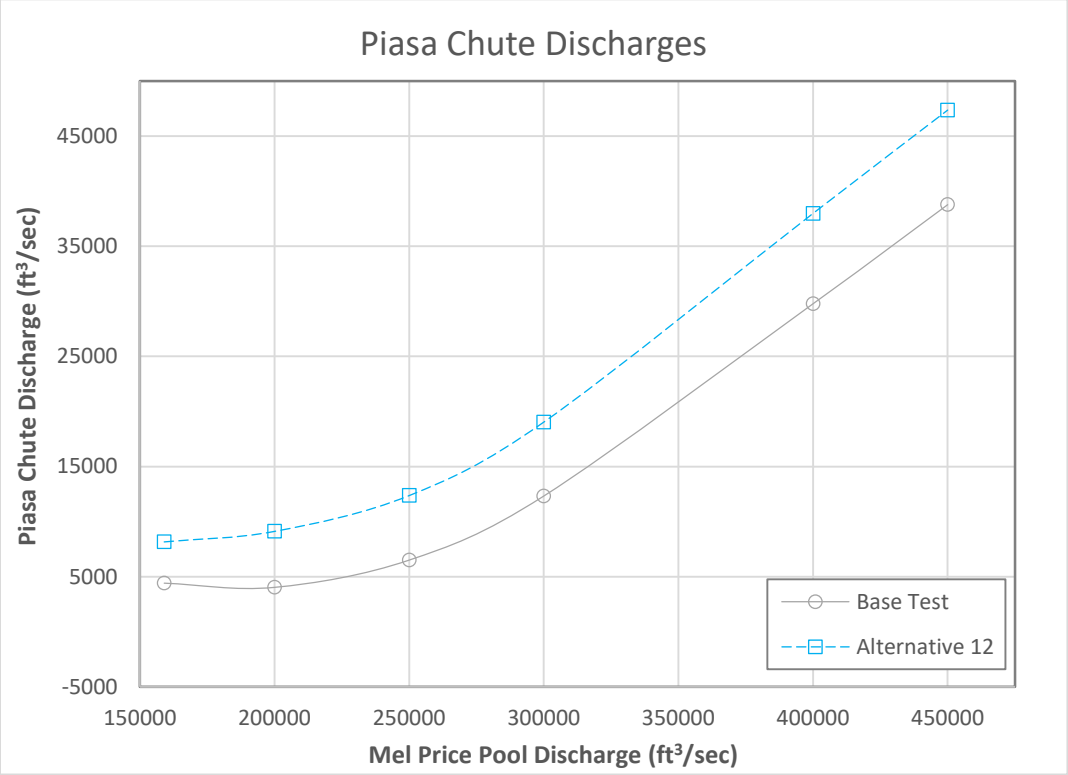


Figure 3-16. Piasa Chute Discharge (Alternative 12 vs Base Test)

3.3.13 Alternative 13

Alternative 13 (Plate 50) consisted of a 300 foot braided dredge cut within Piasa Chute, a dredge cut within the Piasa Island backwater area, and multiple disposal locations. The dredge cut through Piasa Chute and within the Piasa Island backwater area consisted of removing bed material until an elevation of 405.1 ft was achieved. The Piasa Chute dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The backwater dredging started where the backwater area meets the Piasa Chute dredging and continued through the backwater area where backwater is typically present. The dredge material was placed to create island habitat in multiple locations: on the lower end of the main channel side of Piasa Island and upstream of the Piasa Island complex along the LDB. A structure was placed on the downstream side of the upstream island habitat to assist in stabilizing and retaining the shape of the new habitat feature. The island habitat created on the main channel side of Piasa Island was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-17 compares the Alternative and base test discharges within Piasa Chute.

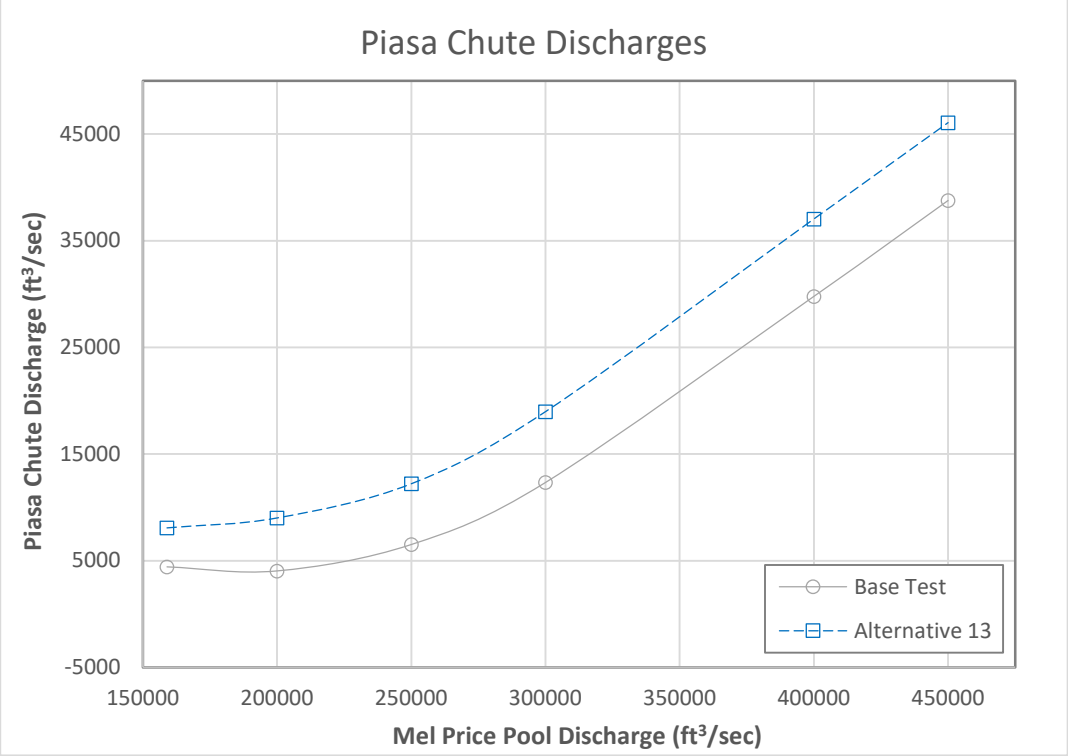


Figure 3-17. Piasa Chute Discharge (Alternative 13 vs Base Test)

3.3.14 Alternative 14

Alternative 14 (Plate 51) consisted of a structure between Piasa and Eagle's Nest Islands. A majority of the discharge through the Piasa Island complex exits between the two islands, so the goal of the notched structure was to direct more discharge through Piasa Chute. Figure 3-18 compares the Alternative and base test discharges within Piasa Chute.

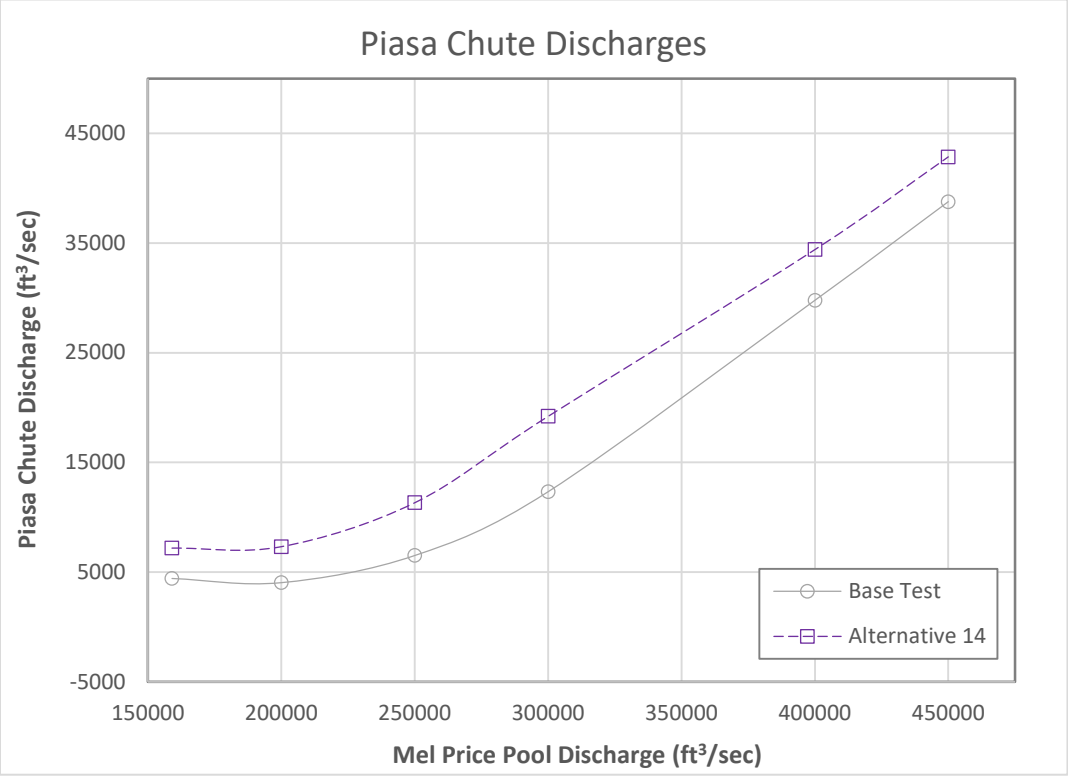


Figure 3-18. Piasa Chute Discharge (Alternative 14 vs Base Test)

3.3.15 Alternative 15

Alternative 15 (Plate 52) consisted of two low elevation structures placed on the side channel side of Eagle's Nest Island. A majority of the discharge through the Piasa Island complex exits between the two islands, so the goal of the low structures was to divert some of the discharge through Piasa Chute while allowing the rest of the flow to continue between the two islands. Figure 3-19 compares the Alternative and base test discharges within Piasa Chute.

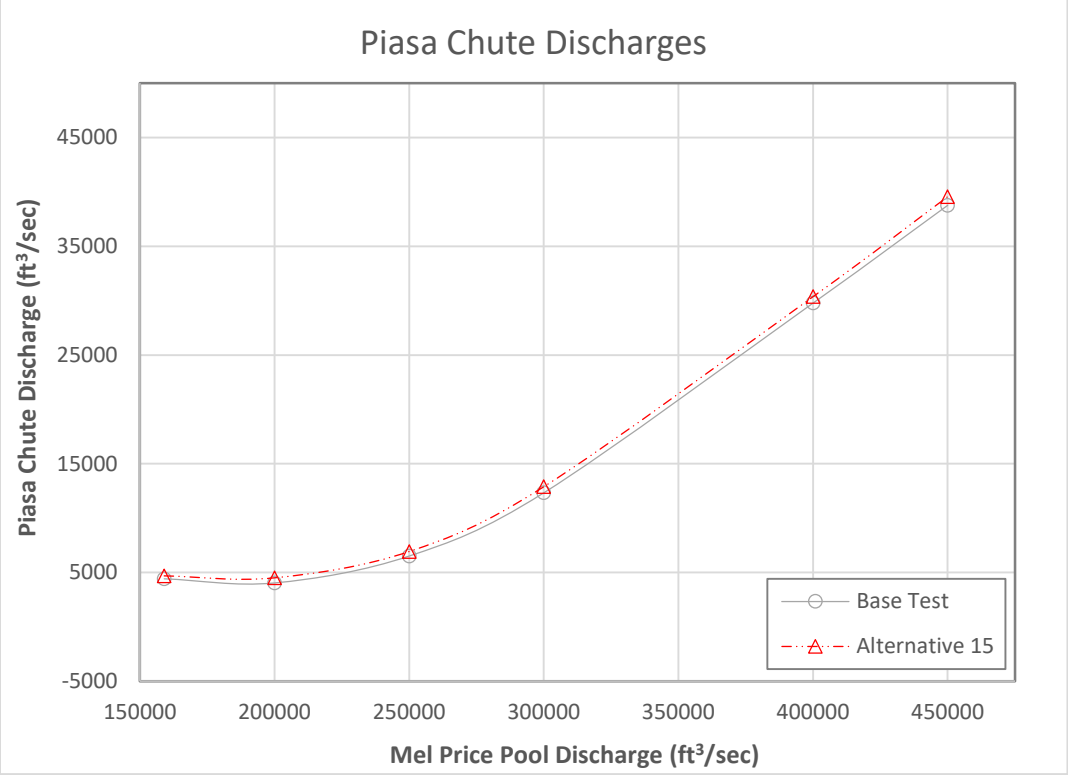


Figure 3-19. Piasa Chute Discharge (Alternative 15 vs Base Test)

3.3.16 Alternative 16

Alternative 16 (Plate 53) consisted of a low elevation structure placed between Eagle's Nest Island and the Illinois bankline. The structure was tested in order to inform the PDT of the discharge impacts through Piasa Chute if a low elevation structure were placed at the entrance to the Piasa Island complex in order to disrupt any future sediment waves entering the project area. Figure 3-20 compares the Alternative and base test discharges within Piasa Chute.

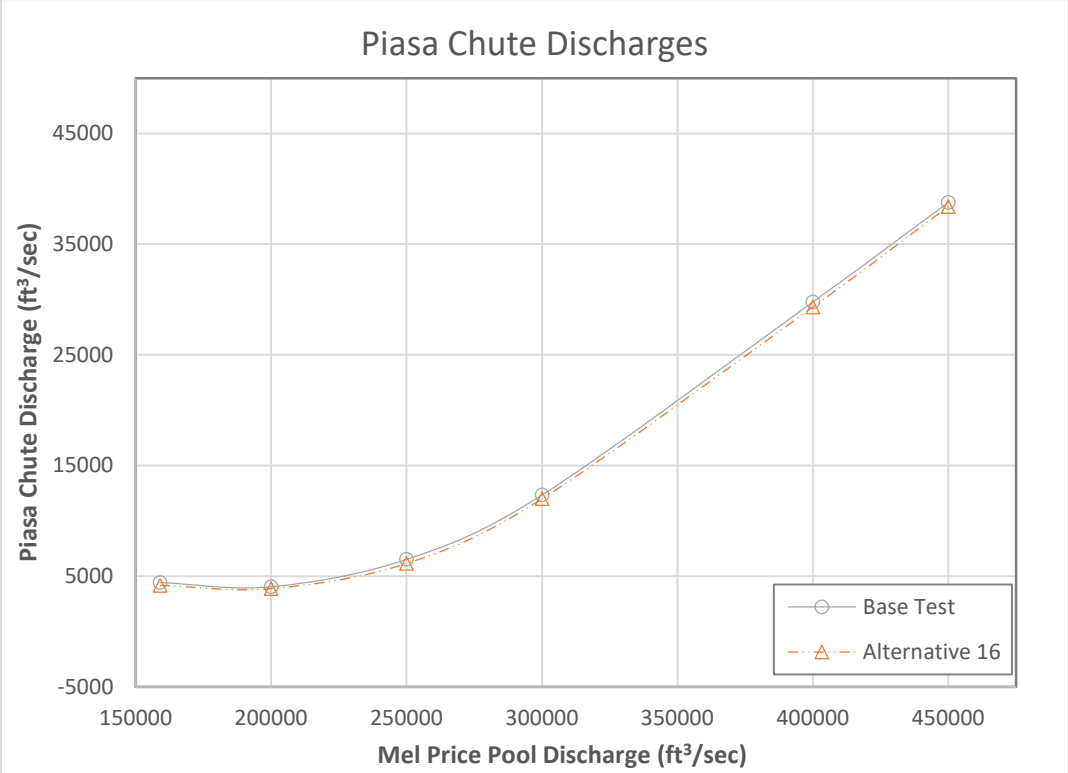


Figure 3-20. Piasa Chute Discharge (Alternative 16 vs Base Test)

3.3.17 Alternative 17

Alternative 17 (Plate 54) consisted of a curved structure placed between the head of Eagle's Nest Island and the Illinois bankline. The structure was placed to create a backwater area in the Piasa Island complex which would block off flow and any sediment entering Piasa Chute. The PDT was determining if a dredge cut in Piasa Chute could be expected to last longer with a drastic change to the amount of flow entering the side channel. However, during the test, water from the main channel entered the side channel complex between Piasa and Eagle's Nest Islands and then went through Piasa Chute. However, the discharge through Piasa chute was less than in the base condition, leading the PDT to believe that any sediment being carried in with the water would fall out in the side channel causing increased elevations. Figure 3-21 compares the Alternative and base test discharges within Piasa Chute.

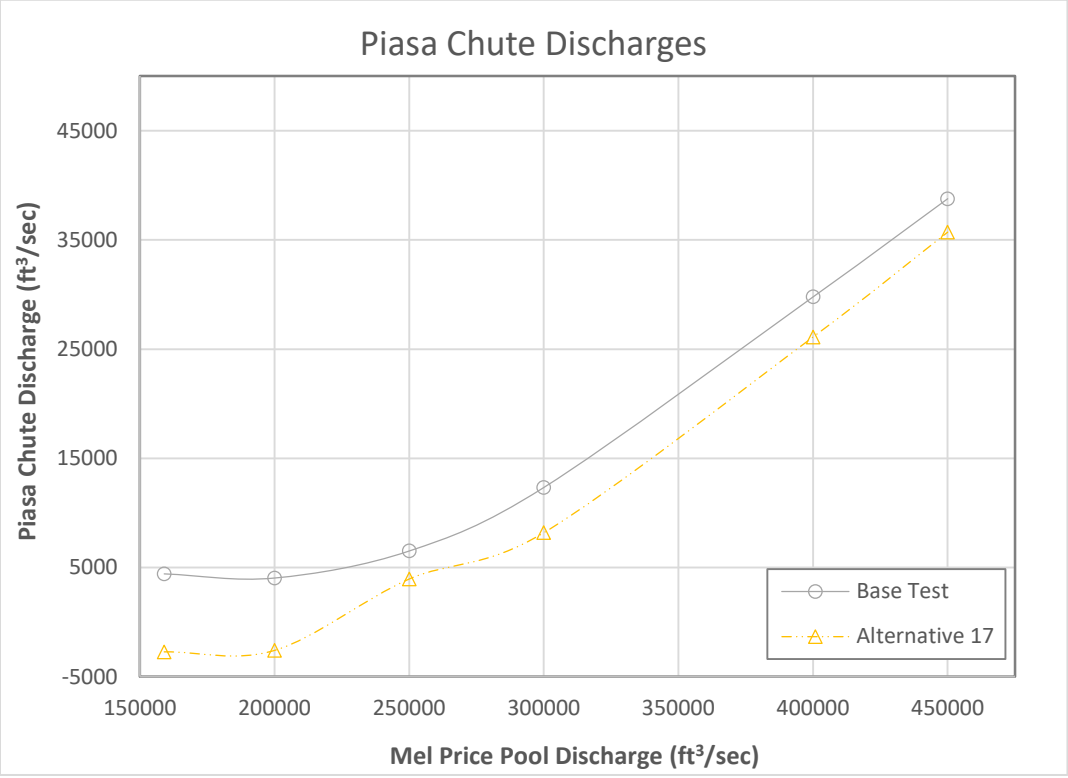


Figure 3-21. Piasa Chute Discharge (Alternative 17 vs Base Test)

3.3.18 Alternative 18

Alternative 18 (Plate 55) consisted of a structure placed between the head of Eagle's Nest Island and the Illinois bankline. The structure was placed to create a backwater area in the Piasa Island complex which would block off flow and any sediment entering Piasa Chute. The PDT was determining if a dredge cut in Piasa Chute could be expected to last longer with a drastic change to the amount of flow entering the side channel. However, during the test, water from the main channel entered the side channel complex between Piasa and Eagle's Nest Islands and then went through Piasa Chute. However, the discharge through Piasa chute was less than in the base condition, leading the PDT to believe that any sediment being carried in with the water would fall out in the side channel causing increased elevations. Figure 3-22 compares the Alternative and base test discharges within Piasa Chute.

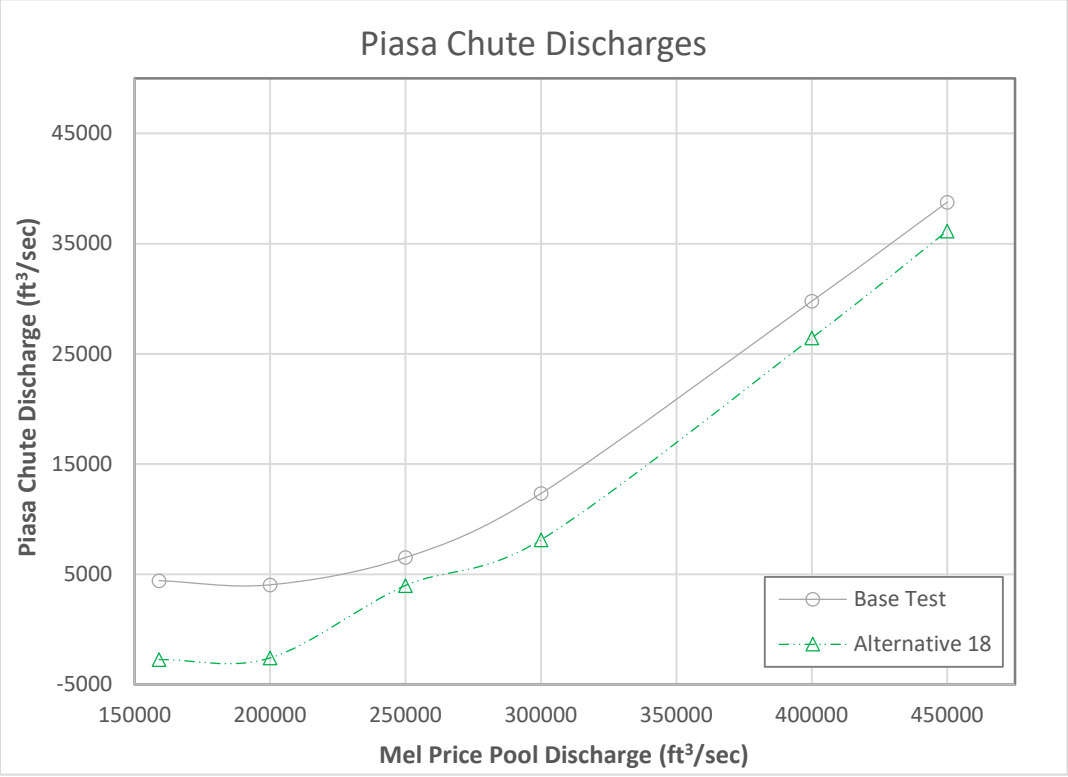


Figure 3-22. Piasa Chute Discharge (Alternative 18 vs Base Test)

3.3.19 Alternative 19

Alternative 19 (Plate 56) consisted of a 200 foot wide braided dredge cut through Piasa Chute, a notched rock structure, and multiple dredge disposal locations. The 'braided' term describes the way the dredge cut exists between existing high elevation areas creating a more natural braided channel. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The notched structure was placed between Piasa and Eagle's Nest Islands to direct more discharge through Piasa Chute while still allowing a small amount of flow to exit the complex between the islands. The dredge material was placed to create island habitat in multiple locations: within Piasa Chute where high elevation areas already existed, on the lower end of the main channel side of Piasa Island, and upstream of the Piasa Island complex tied into the LDB. Structures were placed on the downstream side of the new islands to assist in stabilizing and retaining the shape of the new habitat feature. The island habitat created on the main channel side of Piasa Island was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-23 compares the Alternative and base test discharges within Piasa Chute.

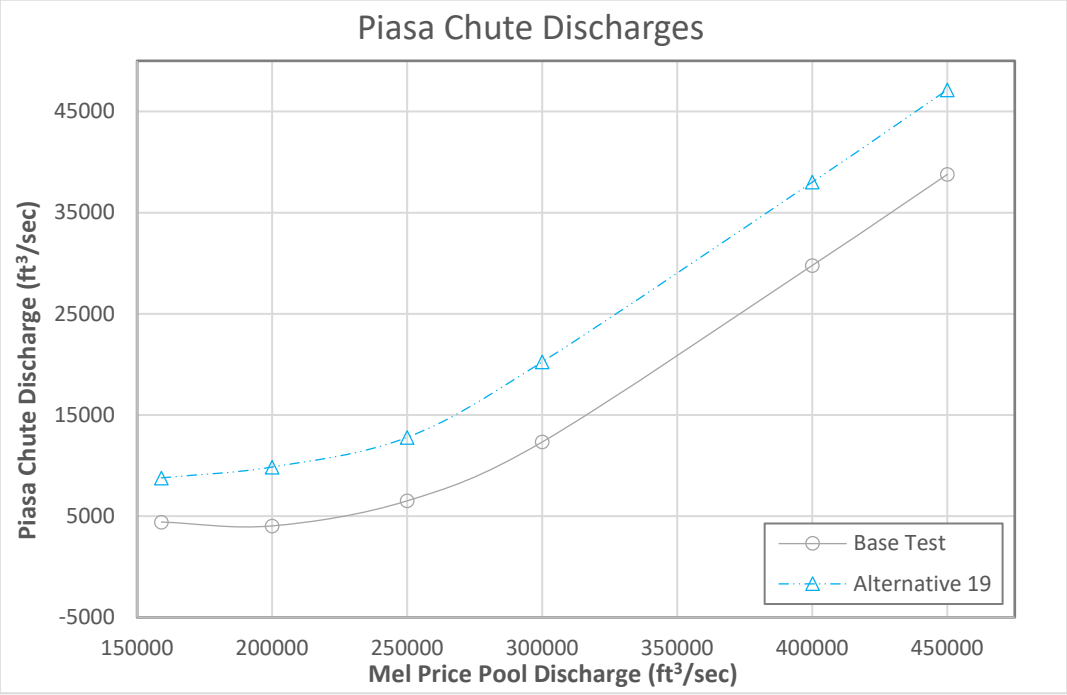


Figure 3-23. Piasa Chute Discharge (Alternative 19 vs Base Test)

3.3.20 Alternative 20

Alternative 20 (Plate 57) consisted of a 300 foot wide braided dredge cut through Piasa Chute, a notched rock structure, and multiple dredge disposal locations. The 'braided' term describes the way the dredge cut exists between existing high elevation areas creating a more natural braided channel. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The notched structure was placed between Piasa and Eagle's Nest Islands to direct more discharge through Piasa Chute while still allowing a small amount of flow to exit the complex between the islands. The dredge material was placed to create island habitat in multiple locations: within Piasa Chute where high elevation areas already existed, on the lower end of the main channel side of Piasa Island, and upstream of the Piasa Island complex tied into the LDB. Structures were placed on the downstream side of the new islands to assist in stabilizing and retaining the shape of the new habitat feature. The island habitat created on the main channel side of Piasa Island was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-24 compares the Alternative and base test discharges within Piasa Chute.

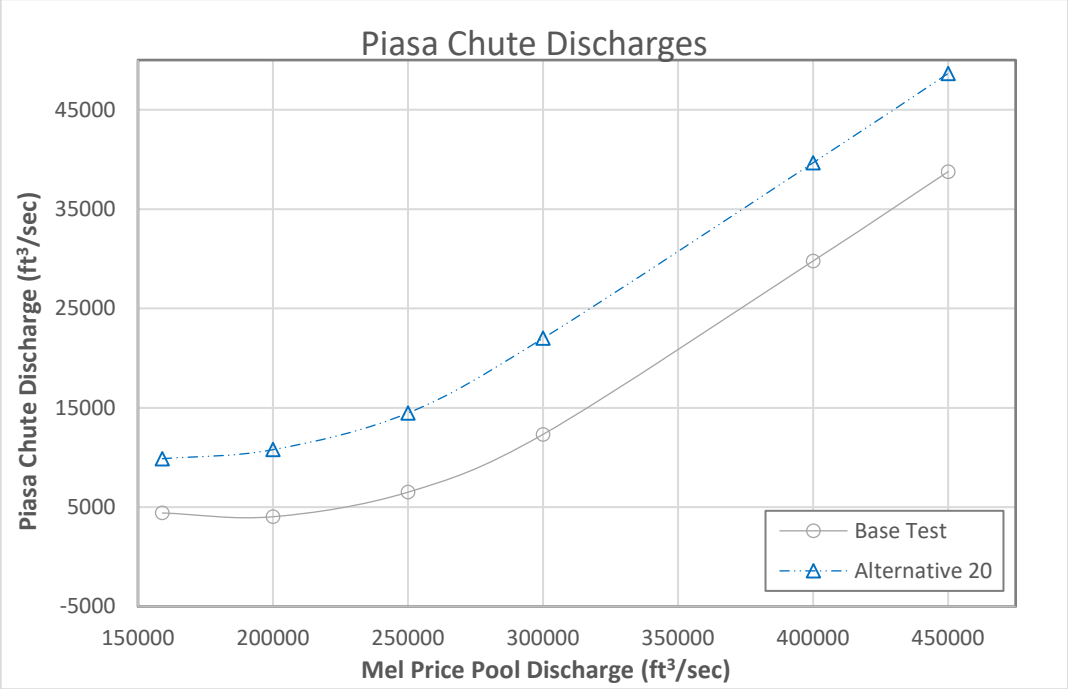


Figure 3-24. Piasa Chute Discharge (Alternative 20 vs Base Test)

3.3.21 Alternative 21

Alternative 21 (Plate 58) consisted of a 200 foot wide braided dredge cut through Piasa Chute, a notched rock structure, and multiple dredge disposal locations. The 'braided' term describes the way the dredge cut exists between existing high elevation areas creating a more natural braided channel. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The notched structure was placed between Piasa and Eagle's Nest Islands to direct more discharge through Piasa Chute while still allowing a small amount of flow to exit the complex between the islands. The dredge material was placed to create island habitat in multiple locations: within Piasa Chute where high elevation areas already existed, on the lower end of the main channel side of Piasa Island, and upstream of the Piasa Island complex along the LDB. Structures were placed on the downstream side of the new islands to assist in stabilizing and retaining the shape of the new habitat feature. The island habitat created on the main channel side of Piasa Island was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-25 compares the Alternative and base test discharges within Piasa Chute.

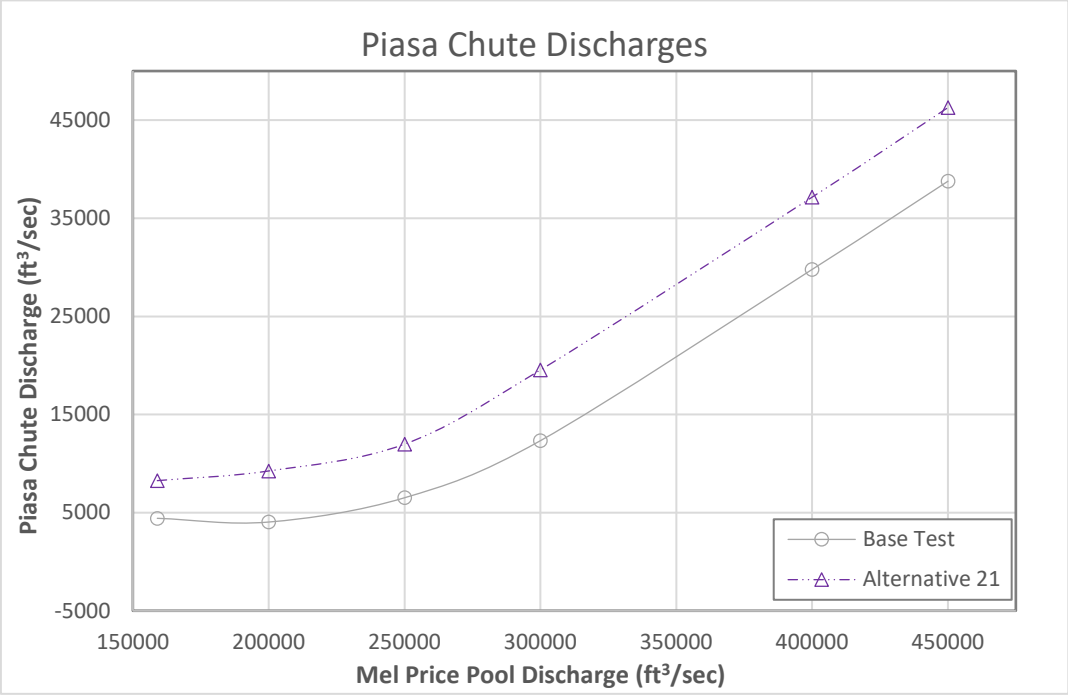


Figure 3-25. Piasa Chute Discharge (Alternative 21 vs Base Test)

3.3.22 Alternative 22

Alternative 22 (Plate 59) consisted of a 300 foot wide braided dredge cut through Piasa Chute, a notched rock structure, and multiple dredge disposal locations. The 'braided' term describes the way the dredge cut exists between existing high elevation areas creating a more natural braided channel. The dredge cut through Piasa Chute consisted of removing bed material until an elevation of 405.1 ft was achieved. The dredge cut started and ended at the upper and lower ends of Piasa Chute where existing bathymetry matched the desired 405.1 ft elevation of the dredge cut. The notched structure was placed between Piasa and Eagle's Nest Islands to direct more discharge through Piasa Chute while still allowing a small amount of flow to exit the complex between the islands. The dredge material was placed to create island habitat in multiple locations: within Piasa Chute where high elevation areas already existed, on the lower end of the main channel side of Piasa Island, and upstream of the Piasa Island complex along the LDB. Structures were placed on the downstream side of the new islands to assist in stabilizing and retaining the shape of the new habitat feature. The island habitat created on the main channel side of Piasa Island was not protected since that location was a low bed shear area, meaning less erosion and scour is expected. Figure 3-26 compares the Alternative and base test discharges within Piasa Chute.

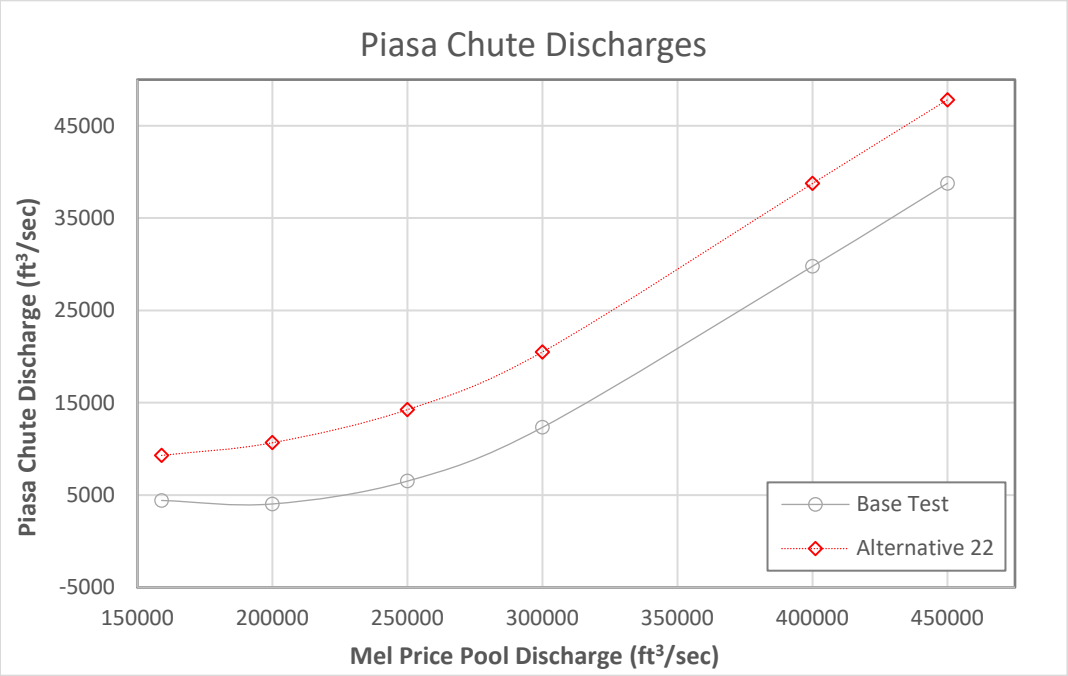


Figure 3-26. Piasa Chute Discharge (Alternative 22 vs Base Test)

3.4 AdH Results

After completing all AdH alternative tests, engineers analyzed the results to determine what measures were most successful in increasing the amount of discharge through Piasa Chute. Figure 3-27 shows a plot of all of the Piasa Chute discharges for the alternative tests.

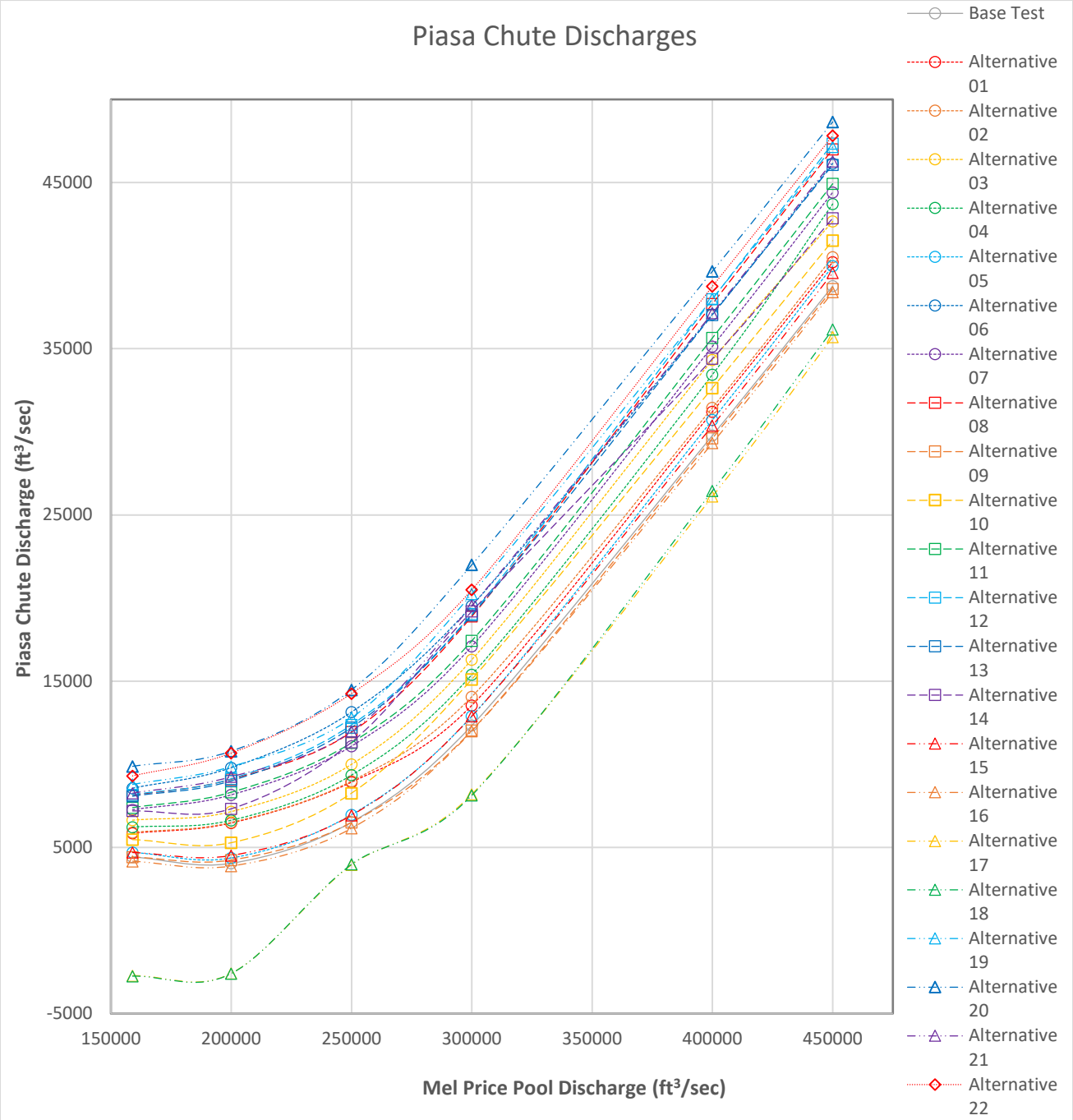


Figure 3-27. Piasa Chute Discharge for all Alternative Tests

There were a number of measures that the PDT determined to be successful. Below is a list of those measures, corresponding alternatives for each measure, and the success of the measure:

1. 200' braided dredge cut

- Alternative 7, Alternative 11
- The braided dredge cut measure provided a significant increase in discharge through Piasa Chute. Without a dredge cut, most other measures would not be as successful. Furthermore, the braided dredge cut by definition creates island habitat within Piasa Chute, but additionally, the dredge material will be used to create additional island habitat elsewhere within the study reach.

2. 300' braided dredge cut

- Alternative 6
- The braided dredge cut measure provided a significant increase in discharge through Piasa Chute. Without a dredge cut, most other measures would not be as successful. Furthermore, the braided dredge cut by definition creates island habitat within Piasa Chute, but additionally, the dredge material will be used to create additional island habitat elsewhere within the study reach.

3. Notched rock structure between Piasa and Eagle's Nest Islands

- Alternative 11
- The notched rock structure measure successfully increased discharge through Piasa Chute by diverting a majority of the flow through Piasa Chute that would normally exit between Piasa and Eagle's Nest Islands. Furthermore, the structure included two 400-ft notches, which will allow some flow to exit between Piasa and Eagle's Nest Islands creating scour holes and additional depth diversity.

4. Minimum backwater dredging

- Alternative 7
- Minimum backwater dredging at the entrance to the backwater area in the middle of Piasa Island didn't have a significant impact on discharges. However, if the PDT selects to dredge in Piasa Chute, dredging to the open the backwater area could yield habitat benefits at minimal additional cost.

5. Maximum backwater dredging

- Alternative 13

- Maximum dredging within Piasa Island didn't have a significant impact on discharges. However, if the PDT selects to dredge in Piasa Chute, dredging to open the backwater area could yield significant habitat benefits.

6. Island Diversity
    - The creation of island habitat and diversity from dredge material is captured as part of the 200' and 300' braided dredge cut measures above.

The measures above were provided to the PDT in order to complete an environmental benefit analysis to determine the magnitude of ecosystem benefits to be expected if the measures were implemented. The evaluation was conducted by a multi-agency team which included representatives from the Illinois Department of Natural Resources (ILDNR), U.S. Fish & Wildlife Service (USFWS), and USACE. Chapter 5 of the Feasibility Report (McCain) details the feasible project measures, cost/environmental analysis, and alternative selection.

The measures the team chose to include in the recommended alternative were:

- 200' braided dredge cut in Piasa Chute
- Minimum Piasa Island backwater dredging
- Notched rock structure between Piasa and Eagle's Nest Islands
- Island creation from dredge disposal: Piasa riverside island and upstream rootless island

The selected measures are represented in the AdH test for Alternative 21 (Plate 34). Plates 60 and 61 show the SMS base test velocities and Alternative 21 velocities, respectively. Plates 62 and 63 show the SMS base test bed shear and Alternative 21 bed shear, respectively.

With implementation of the measures discussed above, including the rock river training structure, stages at average and high flows both in the vicinity of the project area and elsewhere in the Mel Price Pool reach of the Mississippi River are expected to be similar to current conditions. An abundance of research has been conducted analyzing the impacts of river training structures on water surfaces dating to the 1930s. This research includes numerical and physical models as well as analyses of historic gage data, velocity data, and cross sectional data. In addition to continued monitoring and analysis, the U.S. Army Corps of Engineers (Corps) has conducted a literature review of all available literature on the impact of river traning structures on flood levels. A summary of research on the topic is detailed in Appendix A of the *Final Environmental Assessment of the Regulating Works Project, Dogtooth Bend Phase 5, Middle Mississippi River Miles 40.0 – 20.0, Alexander County, IL, Mississippi and Scott Counties, MO* (April 2014). Based on an analysis of this research by the Corps and other external reviewers, the District has concluded that river training structures do not impact flood levels.

4 Climate Change Survey

4.1 Introduction

USACE projects, programs, missions, and operations have generally proven to be robust enough to accommodate the range of natural climate variability over their operating life spans. However, recent scientific evidence shows that in some places and for some impacts relevant to USACE operations, climate change is shifting the climatological baseline about which that natural climate variability occurs, and may be changing the range of that variability as well. This is relevant to USACE because the assumptions of stationary climatic baselines and a fixed range of natural variability as captured in the historic hydrologic record may no longer be appropriate for long-term projections of the climatologic parameters, which are important in hydrologic assessments for inland watersheds, such as the Piasa – Eagles Nest project.

4.2 Phase 1 Climate and Climate Change

4.2.1 Current Climate

Precipitation data obtained from the St. Louis Missouri Lambert International Airport, Network ID GHCND: USW00013994, Latitude 38.7525°, Longitude -90.3736°, Elevation 161.8 m. The period of record for this gage is April 1, 1938 to Jan 1, 2016.

	Precipitation All					Snowfall				
	Average (in)	Maximum (in)	Year	Minimum (in)	Year	Average (in)	Maximum (in)	Year	Minimum (in)	Year
Jan	2.1	9.0	2005	0.1	1986	5.6	23.9	1977	0.1	1989
Feb	2.2	5.0	1951	0.3	1963	4.5	20.8	1993	0.0	-
Mar	3.3	8.4	2008	0.7	1941	3.7	22.4	1960	0.0	-
Apr	3.9	10.3	1994	1.0	1977	0.3	6.5	1971	0.0	-
May	4.1	12.9	1995	0.8	2005	0.0	0.2	1973	0.0	-
Jun	4.3	13.1	2015	0.4	1991	0.0	0.0	-	0.0	-
Jul	3.7	12.7	1948	0.5	1941	0.0	0.0	-	0.0	-
Aug	3.0	14.8	1946	0.1	1971	0.0	0.0	-	0.0	-
Sep	2.9	10.0	1945	0.0	1940	0.0	0.0	-	0.0	-
Oct	2.9	12.4	2009	0.2	1975	0.0	0.0	-	0.0	-
Nov	3.2	10.0	1985	0.1	1949	1.2	11.3	1951	0.0	-
Dec	2.6	11.8	2015	0.0	1955	3.8	26.3	1973	0.0	-
Annual	**38.1**					**19.2**				

Temperature data obtained from the St. Louis Missouri Lambert International Airport, Network ID GHCND: USW00013994, Latitude 38.7525°, Longitude -90.3736°, Elevation 161.8 m. The period of record for this gage is April 1, 1938 to Jan 1, 2016.

	Temperature				
Month	**Average (°F)**	**Maximum (°F)**	**Year**	**Minimum (°F)**	**Year**
Jan	30.7	53.4	1990	6.1	1940
Feb	34.9	55.2	1976	14.0	1978
Mar	44.8	72.1	2012	22.6	1960
Apr	56.6	75.2	2010	39.4	1961
May	66.2	83.7	2012	46.9	1961
Jun	75.4	94.6	1952	59.2	1961
Jul	79.5	98.6	2012	64.8	1950
Aug	77.9	96.1	1947	61.5	1967
Sep	70.0	87.8	1939	52.0	1974
Oct	58.8	79.9	1963	39.0	1976
Nov	45.6	63.9	1999	26.1	1976
Dec	34.9	53.8	2015	13.8	1963
Annual	**56.3**				

4.2.2 Climate Change

US Army Corps of Engineers personnel have authored regional reports summarizing available scientific literature to meet the Corps goal of addressing potential climate change impacts in planning and decision making. Piasa and Eagles Nest Islands fall within Region 7, the Upper Mississippi Region, for the purposes of these reports (USACE, 2015). In the report covering the region, the following is said about the historic trends identified:

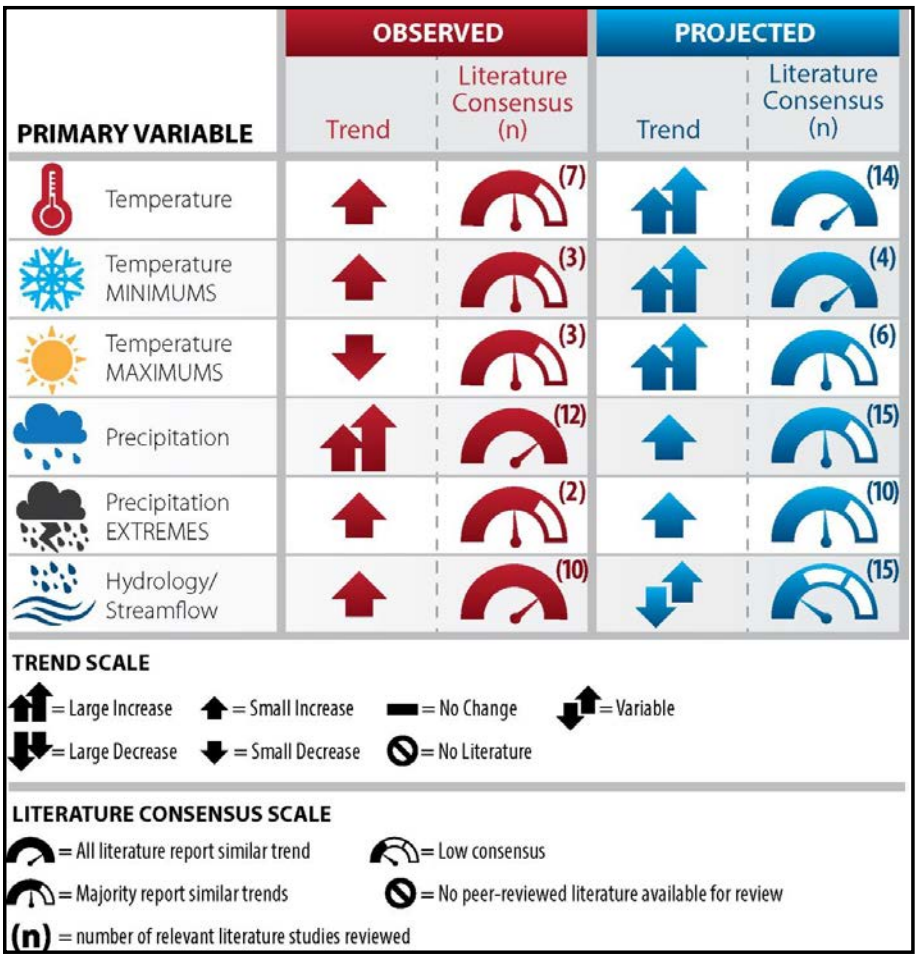


Figure 4-1 Summary matrix of observed and projected regional climate trends and literature consensus (from USACE 2015b).

4.2.3 Summary of Future Climate Projection Findings:

There is strong consensus in the literature that air temperatures will increase in the study region, and throughout the country, over the next century. The studies reviewed here generally agree on an increase in mean annual air temperature of approximately 2 to 6 ºC (3.6 to 10.8 ºF) by the latter half of the 21st century in the Upper Mississippi Region. Reasonable consensus is also seen in the literature with respect to projected increases in extreme temperature events, including more frequent, longer, and more intense summer heat waves in the long term future compared to the recent past.

Projections of precipitation found in a majority of the studies forecast an increase in annual precipitation and in the frequency of large storm events. However, there is some evidence presented that the northern portion of the Upper Mississippi Region will experience a slight decrease in annual precipitation. Additionally, seasonal deviations from the general projection pattern have been presented, with some studies indicating a potential for drier summers. Lastly, despite projected

precipitation increases, droughts are also projected to increase in the basin as a result of increased temperature and [evapotranspiration] rates.

A clear consensus is lacking in the hydrologic projection literature. Projections generated by coupling [Global Climate Models] with macro scale hydrologic models in some cases indicate a reduction in future streamflow but in other cases indicate a potential increase in streamflow. Of the limited number of studies reviewed here, more results point toward the latter than the former, particularly during the critical summer months.

Given the high degree of variability and uncertainty in weather patterns in general and in predictions of future weather patterns in particular, quantifying future Project impacts is inexact. As summarized above, there is no consensus with respect to forecasts for future streamflow in the basin.

4.3 Observed Changes

The USACE Climate Hydrology Assessment Tool was used to examine observed streamflow trends in the vicinity of the example project. At the time of release of this ECB, the tool has capability only to evaluate the annual peak instantaneous streamflow; additional hydrologic variables of interest will be added in the future. The hydrologic time series of annual peak instantaneous streamflow at the gage Mississippi River at St. Louis, MO (7010000) is shown in Figure 4-2. The gage exhibits an increasing trend in annual peak instantaneous streamflow; however, this trend is not statistically significant as indicated by the high p-value. This indicates that overall, there has been no significant change in peak flows over the last 114-year period of record (1900-2014).

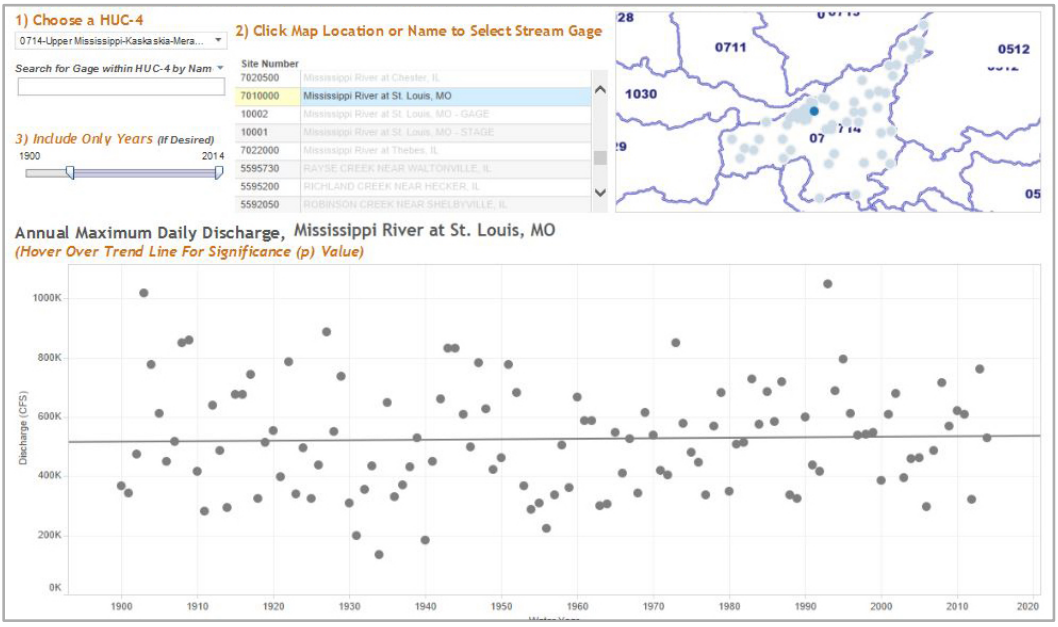


Figure 4- 2 Annual Peak Instantaneous Streamflow, Mississippi River at St. Louis, MO, Trendline Equation: Q = -219.332 * (Water Year) + 126640, p = 0.819679.

The Nonstationarity Detection Tool was also used to examine the hydrologic time series at the St. Louis, MO gage (7010000). No nonstationarity events were detected in the record (Figure 4-3), indicating that no change can be detected in the long term mean, variance, or trend in the maximum annual flow time series. A period of record of 153 years (1862 – 2015) was used. The Smooth Lombard Mood event was determined to not be an indicator of nonstationarity. Generally these 'smooth' type indicators should span at least a few consecutive years if they are genuine, whereas this one occurs very briefly. Also in this particular case, the indicator occurs right at the beginning of the period of record. The results of the nonstationarity detection analysis indicate that overall, there has been no statistically significant change in annual peak flows, as measured.

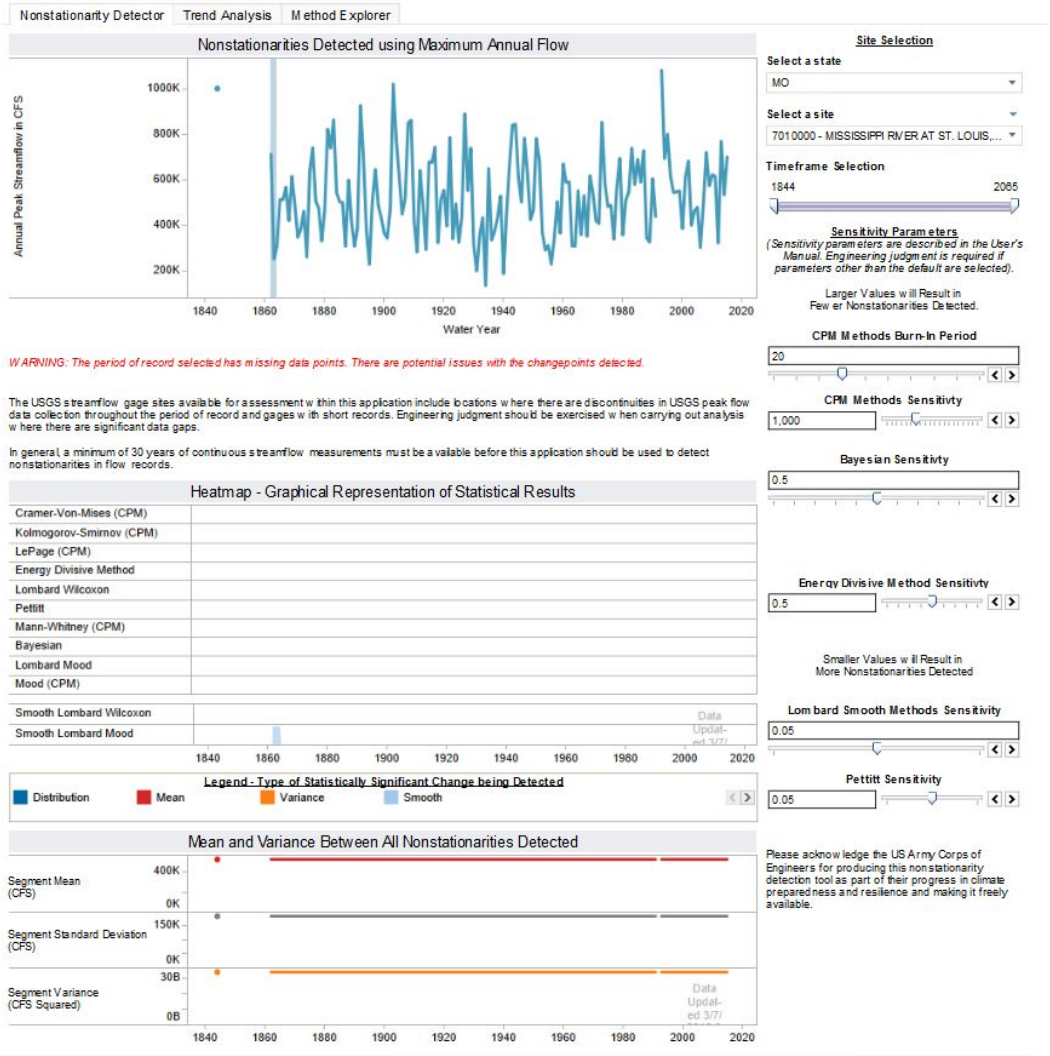


Figure 4-3 Nonstationarity Analysis of Maximum Annual Flow, Mississippi River at St. Louis, MO.

4.4 Phase II: Projected Changes to Watershed Hydrology and Assessment of Vulnerability to Climate Change.

The USACE Climate Hydrology Assessment Tool was used to examine observed and projected trends in watershed hydrology to support the qualitative assessment. As expected for this type of qualitative analysis, there is considerable but consistent spread in the projected annual maximum monthly flows (Figure 4-4), the overall projected trend in annual peak instantaneous streamflow increases over time (Figure 4-5). This increase is statistically-significant (p-value <0.0001). This finding suggests that there may be potential for higher peak streamflows in the future.

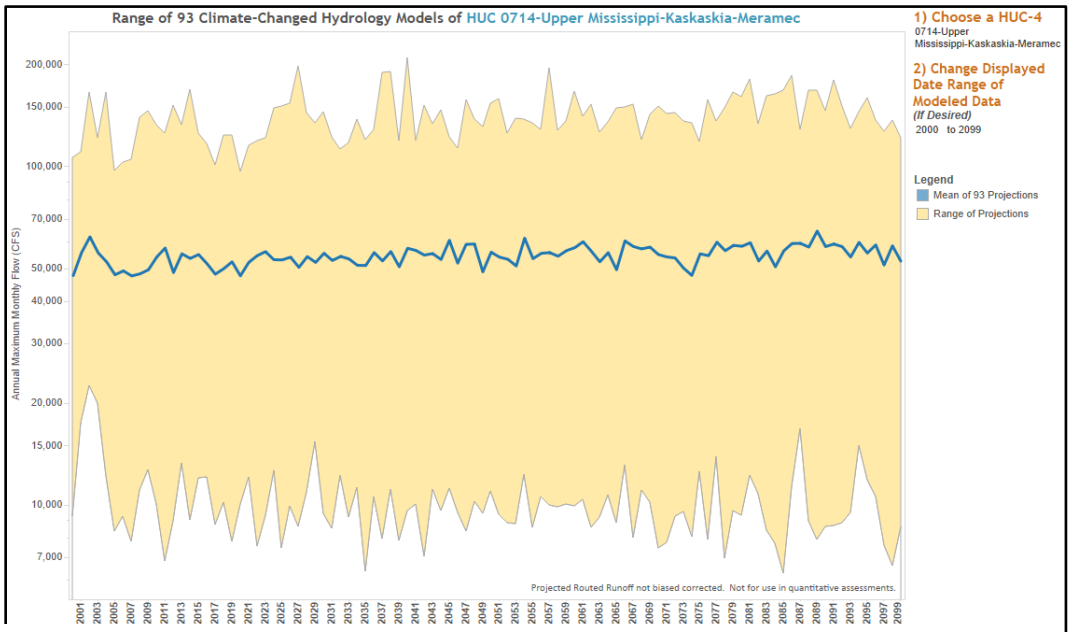


Figure 4-4 Range in the Projected Annual Maximum Monthly Flows, HUC 0714 Upper Mississippi-Kaskaskia-Meramec

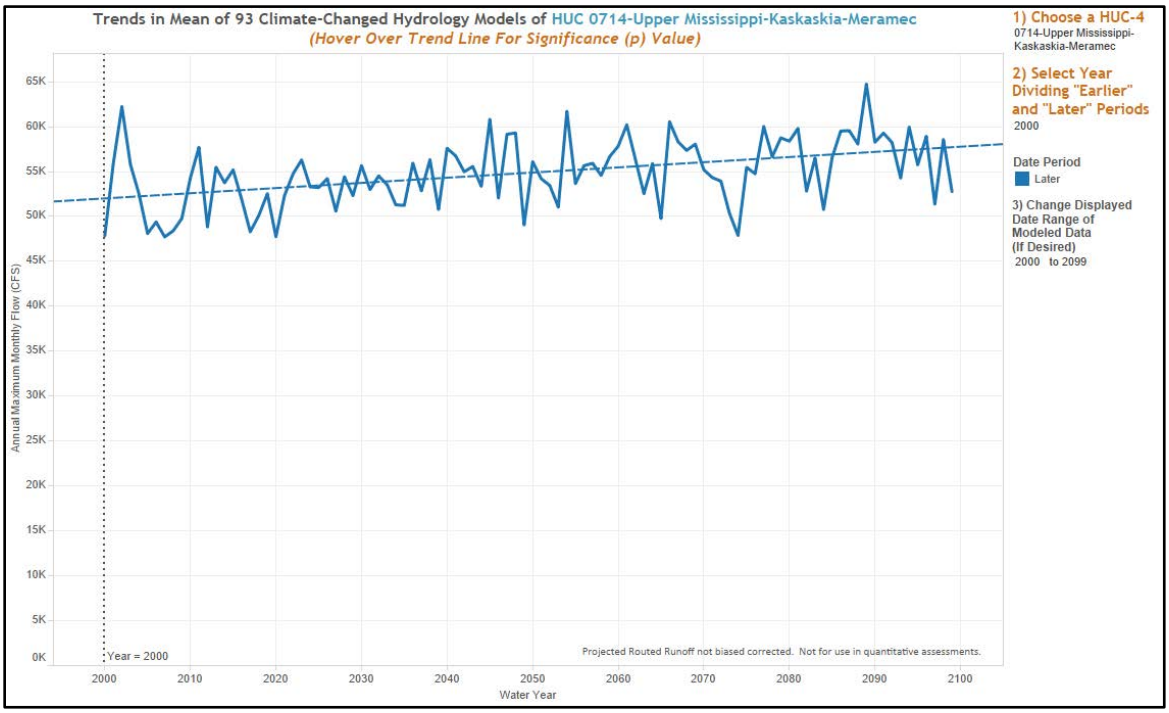


Figure 4-5 Mean Projected Annual Maximum Monthly Streamflow, HUC 0714 Upper Mississippi-Kaskaskia-Meramec. Trendline Equation: Q = 57.5719 * (Water Year) – 63194.8, p < 0.0001

4.5 Observed Changes in Average Daily Flow

USACE climate change tools described in the previous two sections rely on Annual Maximum Streamflow. Observed trends in average daily flows are important for Piasa and Eagles Nest Islands because it is an ecosystem restoration project, not a flood control project. Figure 4-6 shows the maximum, average, minimum and current daily flows at the St. Louis Gage for the period of record which was the best fit gage available used for all other analysis in this report.

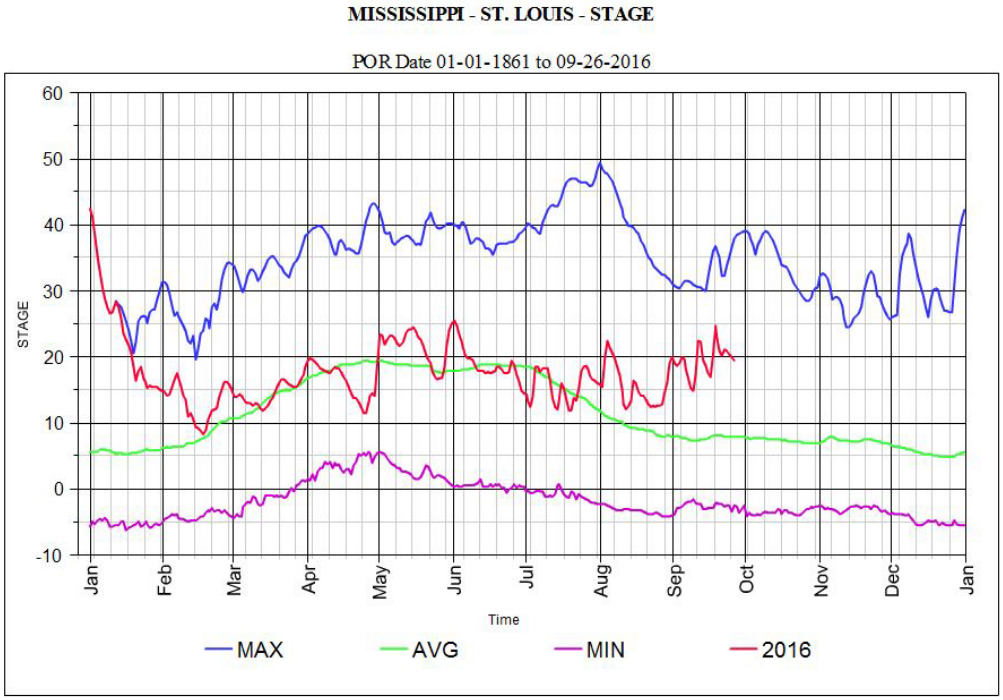


Figure 4-6 Maximum, average, minimum and current daily flows for the St. Louis, MO Gage, period of record 1861-2016.

Figure 4-8 shows the maximum, average, minimum and current daily flows at the Alton, IL Gage, which is the closest gage to the project area. The influence of the Mel Price L&D and the Missouri River which are both located between the two gage locations is evident. Figure 4-7 is the St. Louis Gage during the same time period (1990-2015) as the Alton Gage for comparison purposes.

The influence of the Mel Price L&D and Missouri River can be seen in the variability of the minimum and average results. Overall however, the results are as expected with maximums occurring during typical spring and summer rises.

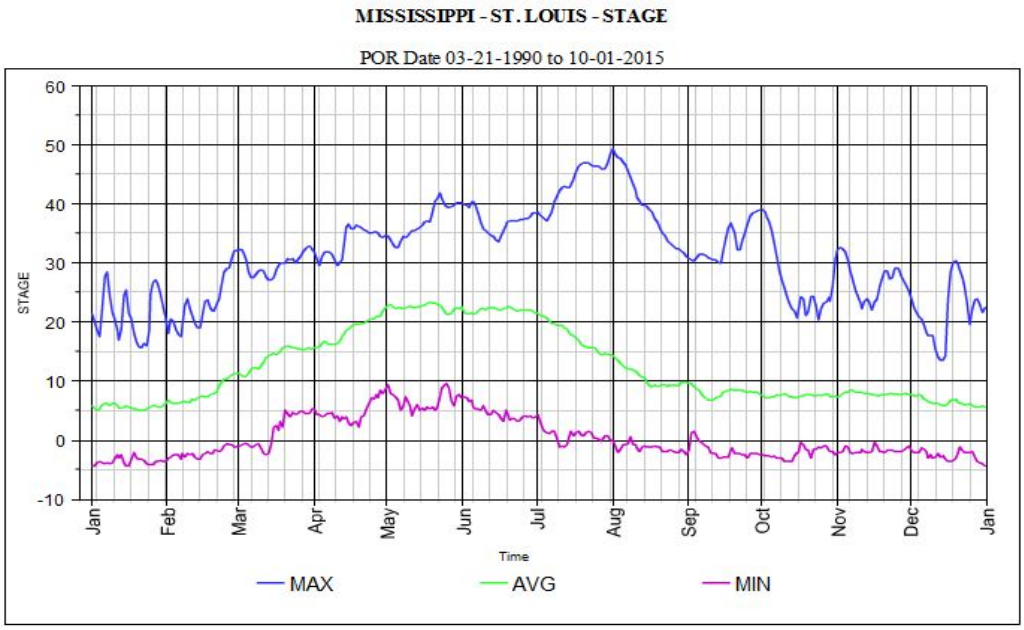


Figure 4-7 Maximum, average, minimum and current daily flows for the Alton, IL Gage period of record 1990-2015

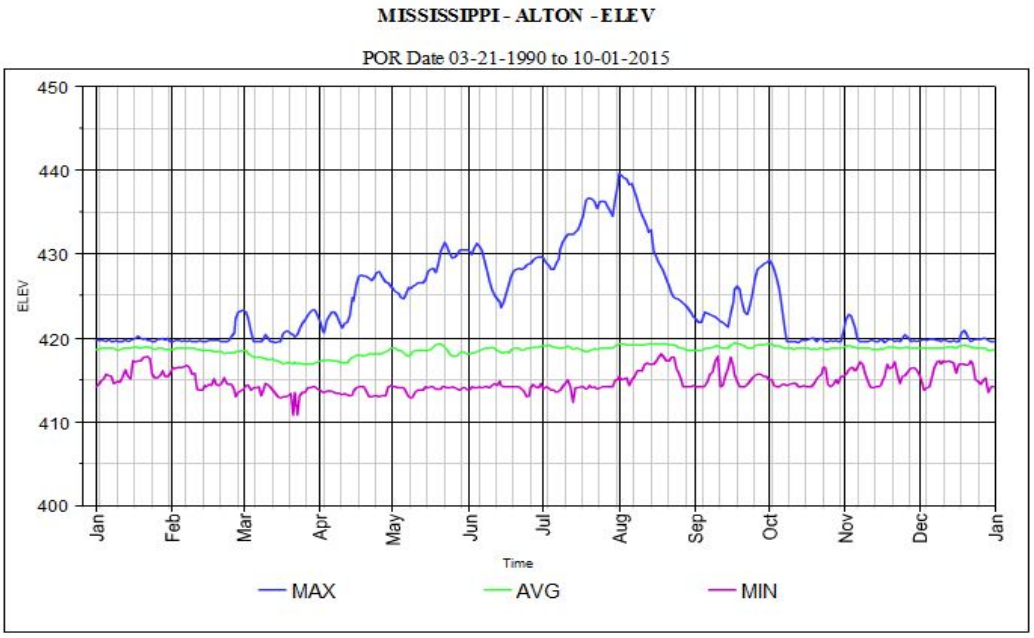


Figure 4-8 Maximum, average, minimum and current daily flows for the St. Louis, MO Gage period of 1990-2015

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6 Acronyms

Acronym	Name
ADCP	Acoustic Doppler Current Profiler
AdH	Adaptive Hydraulics
DNR	Department of Natural Resources
ERDC	Engineer Research and Development Center
GPM	Gallons per Minute
HPC	High Performance Computing
HREP	Habitat Rehabilitation and Enhancement Project
HSR	Hydraulic Sediment Response Model
ILDNR	Illinois Department of Natural Resources
LDB	Left Descending Bank
LiDAR	Light Detection and Ranging
MINPOOL	Minimum Pool Elevation
NAVD88	North American Vertical Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
PDT	Project Delivery Team
RDB	Right Descending Bank
RM	River Mile
SMS	Surface-water Modeling System
UMRS	Upper Mississippi River System
URV	Unsubmerged Rigid Vegetation
USACE	United States Army Corps of Engineers
USFWS	United States Fish & Wildlife Service

7 References

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USACE. (April 2014). *Regulating Works Project Dogtooth Bend Phase 5 Middle Mississippi River Miles 40.0 – 20.0 Alexander County, IL Mississippi and Scott Counties, MO.*

Appendix D

Biological Assessment

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PIASA AND EAGLE'S NEST ISLANDS HABITAT REHABILITATION AND ENHANCEMENT PROJECT

MADISON & JERSEY COUNTIES, ILLINOIS

BIOLOGICAL ASSESSMENT

Contents

1. Introduction

The purpose of this Biological Assessment (BA) is to review the proposed Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP) in sufficient detail to evaluate whether the proposed actions may affect any federally threatened, endangered, proposed, or candidate species identified by the U.S. Fish and Wildlife Service (USFWS). This BA is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (15 U.S.C. 1536 (c)) and applicable guidance documents. The BA includes the description of the project area, proposed actions, species accounts and status, effects of the proposed actions, and effects determinations.

1.1 Study Setting

The U.S. Army Corps of Engineers, St. Louis District, is preparing to implement a habitat rehabilitation and enhancement project at Piasa and Eagle's Nest Islands, located on the left descending bank of the Mississippi River in Madison and Jersey counties, Illinois. The project is in Pool 26 between river miles 207.5 and 211.5, upstream of Alton, Illinois. The study area is approximately 1,381 acres of island, side channel, and backwater habitat (Figure 1).

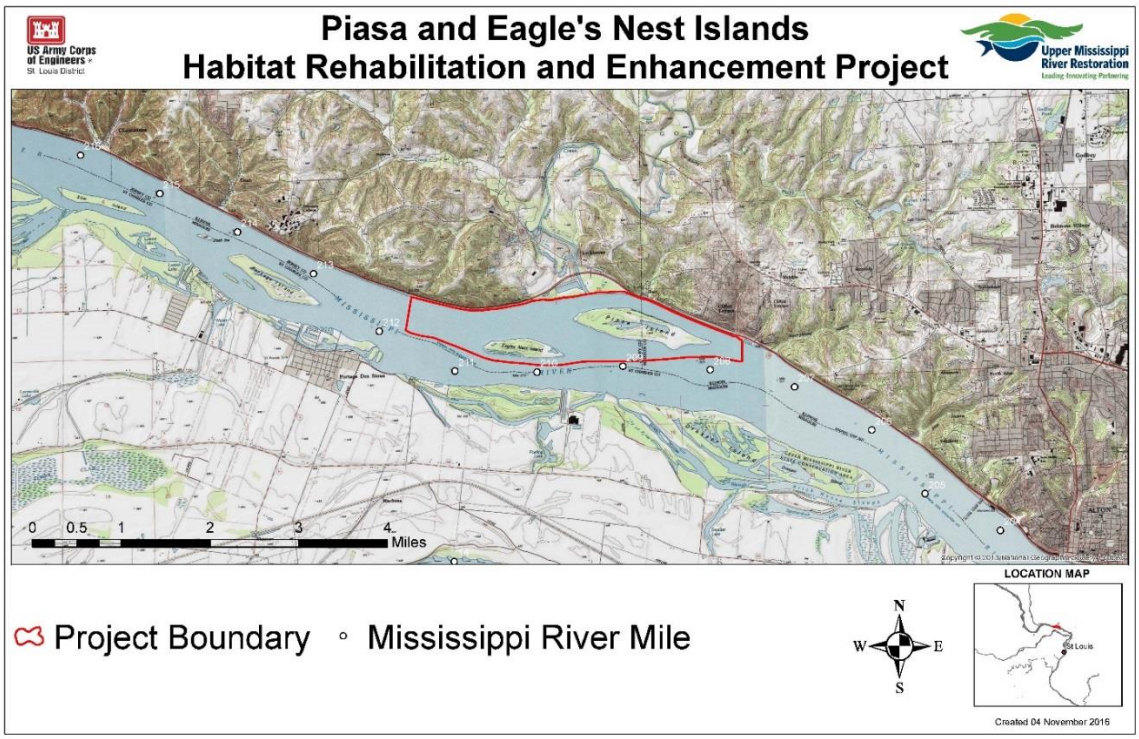

Figure 1. Piasa and Eagle's Nest Islands HREP project location and vicinity

The proposed alternative plan involves dredging material from Piasa Chute and constructing a river training structure to restore approximately 486 acres of side channel habitat, and dredging material from Piasa Island Backwater to restore approximately 49 acres of connected backwater and overwintering fish habitat. The material captured from the dredging along with stone rip-rap would be used to restore approximately 76 acres of island habitat (Figure 2).

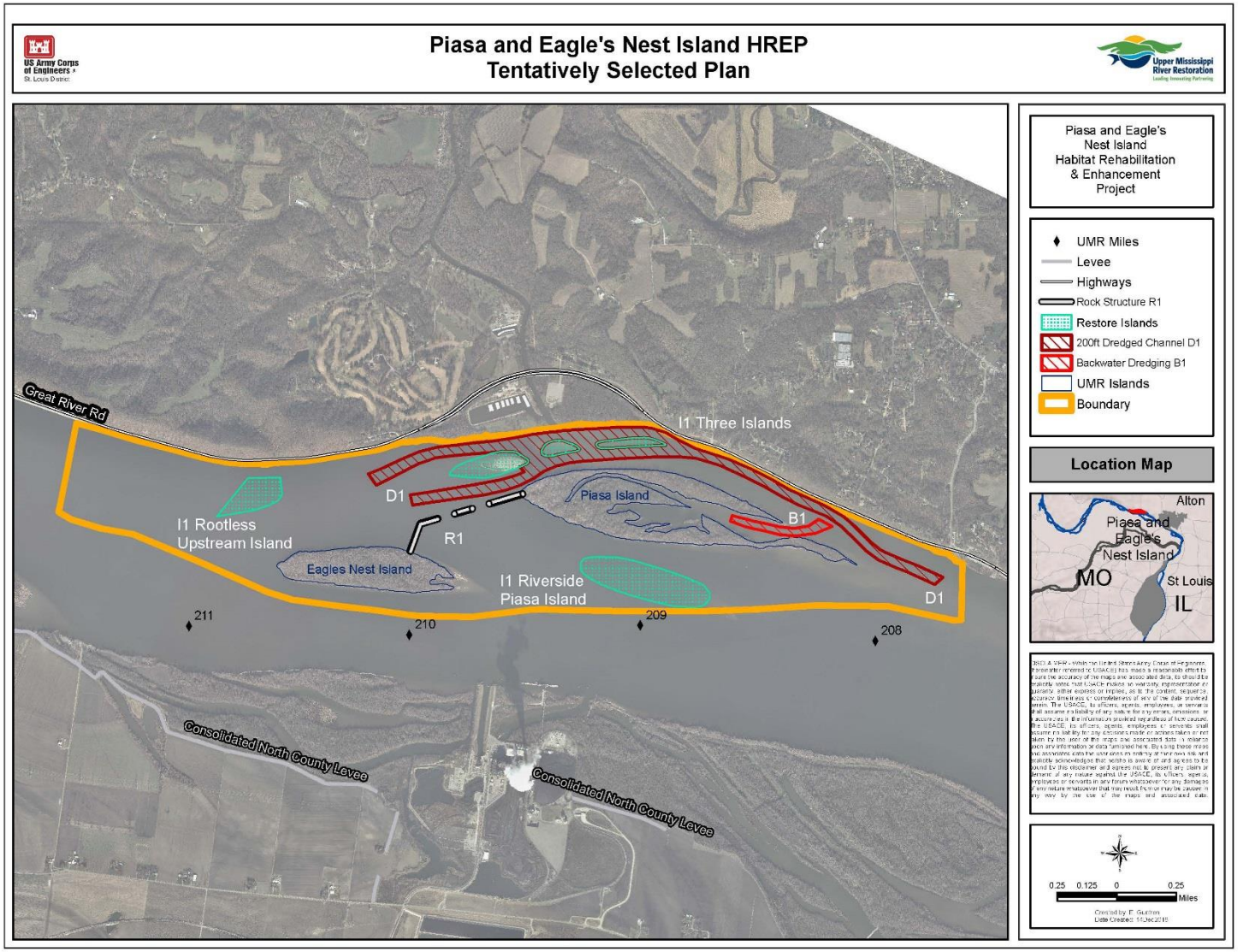

Figure 2. Proposed Plan at Piasa and Eagle's Nest Islands HREP

1.2 Biological Survey Data

In 2012, a summer mist net and acoustic surveys were conducted on Piasa Island (USACE 2012a). A total of 11 bats of 5 species were captured over 2 nights during the mist net survey. The five species included eastern red bat (*Lasiurus borealis*), little brown myotis (*Myotis lucifugus*), Indiana bat (*Myotis sodalis*), evening bat (*Nycticeius humeralis*), and tri-colored bat (*Perimyotis subflavius*).

Four locations of acoustic surveys were conducted on Piasa Island. Seven species were definitely recorded during the acoustic inventory. These species included big brown bat (*Eptesicus fuscus*), eastern red bat, hoary bat (*Lasiurus cinereus*), gray bat, little brown bat, evening bat, and tri-colored bat, and one species (northern long-eared bat) was recorded as "probable".

In 2014, field sampling was conducted to identify and characterize the mussel communities within the Project Area (ESI 2014). Habitat was somewhat variable throughout the Project Area, but was generally characterized by relatively shallow water and soft substrate. Scattered mussels were present in several locations within the study area. A low-density mussel bed (1.92 individuals/m^2) was identified at the head of Piasa Island, and a moderate-density bed (5.56 individuals/m^2) was identified at the toe of Piasa Island. Both beds were dominated by a few common species and recruitment was low. Mussel abundance within Piasa Chute was low. No evidence of federally listed species was observed, and suitable habitat for federally listed species was not identified within the study area.

The Upper Mississippi River Restoration (UMRR) Program integrates habitat restoration with long term resource monitoring (LTRM). The Piasa and Eagle's Nest Islands HREP is located within UMRR-LTRM Great Rivers study reach, which is a 50-mile reach of the Mississippi River and the mouth of the Illinois River. Staff from the Illinois Natural History Survey conduct monitoring of water quality, fish, aquatic vegetation, land cover and land use. These data have been collected since 1986. The UMRR-LTRM data were utilized to describe existing conditions, habitat evaluation and quantification, and species occurrence within the study area.

1.2 Species Covered in this Consultation

The Corps requested the official species via the ECOS-IPaC website (http://ecos.fws.gov/ipac/). U.S. Fish and Wildlife Service provided a list of 8 federally threatened and endangered species that could potentially be found in the area (Madison and Jersey counties, Illinois) via an original letter dated 14 October 2016, and updated on 25 January 2017 and 16 January 2018 (Section 5 below). The letter from 25 January 2017 is included since that was the letter sent to USFWS along with the original biological assessment. No changes in species occurred when updating the species list in 2018. The 8 species, federal protection status, and habitat can be found in Table 1. No critical habitat is located in the study area.

Table 1. Federally listed threatened and endangered species potentially occurring in the work area

Species	Status	Habitat
Least tern (interior population) (*Sterna antillarum*)	Endangered	Large rivers - nest on bare alluvial and dredge spoil islands

Indiana bat (*Myotis sodalis)*	Endangered	Hibernates in caves and mines; maternity & foraging habitat: small stream corridors with well-developed riparian woods; upland & bottomland forests
Northern long-eared bat (*Myotis septentrionalis*	Threatened	Hibernates in caves and mines; swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
Decurrent false aster (*Boltonia decurrens*)	Threatened	Disturbed alluvial soils
Eastern prairie fringed orchid (*Platanthera leucophaea*)	Threatened	Moist, sandy floodplains and prairie wetlands along the Illinois River
Pallid sturgeon (*Scaphirhynchus albus*)	Endangered	Mississippi and Missouri Rivers
Eastern massasauga (*Sistrurus catenatus*)	Threatened	Open to forested wetlands and adjacent upland areas
Spectaclecase (*Cumberlandia monodonta*)	Endangered	Large rivers

2. Description of the Proposed Actions

2.1 Purpose and Need

The U.S. Army Corps of Engineers, St. Louis District is preparing a Feasibility Report with Integrated Environmental Assessment for implementation of the Piasa and Eagle's Nest Islands HREP. The purpose of the feasibility study is to restore ecosystem structure and function by constructing project measures to improve side channel, island, and backwater habitats. The purpose of the draft Feasibility Report with Integrated Environmental Assessment, including the draft unsigned Finding of No Significant Impact (FONSI) is to present a detailed account of the planning, engineering, and construction details of the proposed plan to allow final design and construction to proceed subsequent to approval of the document.

The need to restore side channel, island, and backwater habitats is based on the following factors:

- Through the *Upper Mississippi River System Habitat Needs Assessment* (Theiling, et al., 2000) restoring side channel habitat has been identified as a habitat need for Pool 26. Pool 26 has approximately 3% of the total aquatic and floodplain habitat classified as side channel habitat (Theiling, et al., 2000). Thus, existing side channel habitat is limiting within Pool 26 and the study area. In general existing side channels have shallow depth (e.g., < 5 feet) and limited structural diversity (e.g., cover, depth, and flow) due to sedimentation. Without action, side channel habitat would remain a limiting resource and would continue to decline impacting the survival and recruitment of various aquatic species, including riverine fishes and mussels. The sedimentation rate of 0.14 ft/year has been calculated for Piasa Chute. At this rate, without action, the average depth of Piasa Chute would decrease from 8.6 to 1.6 feet over 50 years (decrease of 83%), resulting in a loss of side channel habitat and quality of habitat.

- Through the *Upper Mississippi River System Habitat Needs Assessment* (Theiling, et al., 2000) restoring contiguous backwater habitat has been identified as a habitat need for Pool 26, and are important habitats required for functional year-round habitat. Existing backwater habitat on Piasa Island is generally shallow, turbid, and has limited connectivity with the main channel due to sedimentation. Without action, the existing backwater habitat would continue to decline impacting the survival and recruitment of riverine fish species. Utilizing the UMRR-LTRM data from 1993 to 2013, the average depth of the Piasa Island Backwater is 1.25 to 3.5 feet. The St. Louis District has modeled a slough outside the study area (Simons, Simons, Ghaboosi, & Chen, 1988) but in close proximity (Brickhouse Slough, which separates Dresser Island at RM 206-209 from the Missouri shore) to Piasa and Eagle's Nest Islands. These estimates indicated the sediment deposition rate to be 0.5 inches per year. Using this rate for Piasa Island Backwater would suggest that the backwater would fill in completely in approximately 60 years; however, based on aerial imagery analysis comparing 1971 to present day, the backwater has persisted in similar surface area (but it has gotten shallower). The team assumed that areas <2 feet in depth currently would convert to land by year 50 which equates to a 37% loss of the existing backwater. However, it is known that sediment loads increase at higher pool elevations so if a series of more severe flood events were to occur, the life expectancy could be much less than that projected. The result of this sedimentation is a rapid conversion of water cover to land cover. This conversion translates to a quantitative loss of habitat for migratory and resident wildlife. In a similar manner, riverine fish are impacted by a loss of backwater spawning and rearing habitat.

- Through the *Upper Mississippi River System Habitat Needs Assessment* (Theiling, et al., 2000) restoring island habitat has been identified as a habitat need for Pool 26. Existing island habitat is approximately 5% of the existing aquatic and floodplain habitat in Pool 26 (Theiling, et al., 2000). Within the study area, island habitat has been degraded primarily as a result of direct inundation resulting from lock and dam construction. Without action, it is anticipated that historic islands would continue to be submerged reducing the availability of this habitat for aquatic and wildlife species.

2.2 Proposed Plan and Action Area

The proposed plan and action area for the Piasa and Eagle's Nest Island HREP includes increasing aquatic diversity in Piasa Chute, improving connectivity and overwintering habitat in Piasa Island Backwater, and restoring island habitat. The details of the plan are further described below.

2.2.1. Piasa Chute Aquatic Diversity

This measure involves hydraulically dredging a braided dredge cut 200 foot wide to 10 feet below minimum pool (415.12 feet NAVD88), which would achieve an additional 5-6 feet of depth and increased flow within Piasa Chute. The braided configuration takes into account the effects of Piasa Creek and provides opportunities to restore islands within the study area. Approximately 885,000 cubic yards of material would be removed and transported within the study area to restore islands.

2.2.2. Piasa Island Backwater Dredging

This measure consists of dredging the entrance of Piasa Island Backwater to improve connectivity of the

backwater to the Mississippi River, increase depth (10 feet below minimum pool), and minimize impacts to existing emergent vegetation. Enhancing the entrance to this backwater would provide immediate access to spawning and rearing habitat, and ingress and egress of fish by way of the main channel. Approximately 156,000 cubic yards of material would be removed and transported within the study area to restore islands.

2.2.3 River Training Structure

This measure consists of constructing a rock structure between Piasa Island and Eagle's Nest Island that has two 400-foot wide notches. The location, size, and configuration of the structure was modeled using a numeric hydraulic model. The model shows the proposed structure increases flow into Piasa Chute, increased potential to sustain the dredge cut, and creates deep scour holes at the notches which enhances bathymetric diversity within the study area.

2.2.4 Island Restoration

This measure consists of restoring islands through placement of dredged material from Piasa Chute and Piasa Island Backwater. The restored island locations were selected due to proximity of proposed dredging areas, historic locations of islands, and existing shallower areas with low shear stress (based on the hydraulic model). The restored island would have stone protection which would tie the islands in place and also allow for scour when islands are overtopped. Average top elevation is 420.57 feet (NAVD88), which corresponds to the average top elevation to the head of Piasa Island currently. Table 2 provides a summary of the amount of dredged material required to restore the three different island locations and acres of island habitat restored.

Table 2. Island Restoration Details

	Quantity			
Item	Three Islands	Riverside Piasa Island	Upstream Rootless Island	**Unit**
Dredged Material	177,000	631,000	233,000	CY
Island Diversity	26	43	8	AC
Stone Protection	60,700	29,900	56,000	TN

3. Impact Assessment

3.1 Least tern (*Sterna antillarum*)

3.1.1 Status

The federally endangered least tern is a colonial, migratory waterbird which resides and breeds along the Mississippi River during the spring and summer. Least terns arrive on the Mississippi River from late April to mid-May. Reproduction takes place from May through August, and the birds migrate to the wintering grounds in late August or early September (USACE, 1999). Sparsely vegetated portions of sandbars and islands are typical breeding, nesting, rearing, loafing, and roosting sites for least terns along the MMR. Nests are often at higher elevations and well removed from the water's edge, a reflection of the fact that nesting starts when river stages are relatively high (USACE, 1999). In alluvial rivers, sandbars are dynamic channel bedforms. Individual sandbars typically wax and wane over time as fluvial processes and the

construction of river engineering works adjust channel geometry according to varying sediment load and discharge. There is limited data on site fidelity for Mississippi River least terns. Given the highly dynamic bed and planform of the historic river, ability to return to previously used colony sites is not likely a critical life history requirement. The availability of sandbar habitat to least terns for breeding, nesting, and rearing of chicks from 15 May to 31 August is a key variable in the population ecology of this water bird. Only portions of sandbars that are not densely covered by woody vegetation and that are exposed during the 15 May to 31 August period are potentially available to least terns (USACE, 1999). The size of nesting areas and the number of nests within a colony depend on water levels and the extent of associated sandbars (Sidle & Harrison, 1990). Sandbars have a greater possibility of colonization by least terns if river levels remain low during the breeding season. Smith and Renken (1991) found that sites were more likely to be used by interior least terns in the Mississippi River Valley adjacent to Missouri if sites were continuously exposed for at least 100 days during the breeding season.

Least terns are almost exclusively piscivorous (Anderson, 1983), preying on small fish, primarily minnows (Cyprinidae). Prey size appears to be a more important factor determining dietary composition than preference for a particular species or group of fishes (Moseley, 1976) (Whitman, 1988) (USACE, 1999). Fishing occurs close to the nesting colonies and may occur in both shallow and deep water, in main stem river habitats or backwater lakes or overflow areas. Radiotelemetry studies have shown that terns will travel up to 2.5 miles to fish (Sidle & Harrison, 1990) (USACE, 1999). Along the Mississippi River, individuals are commonly observed hovering and diving for fish over current divergences (boils) in the main channel, in areas of turbulence and eddies along natural and revetted banks, and at "run outs" from floodplain lakes where forage fish may be concentrated (USACE, 1999).

Least terns have been observed in the vicinity of the study area. Successful nesting of least tern on artificial floating habitat (near river mile 201.7) has also been documented by the U.S. Army Corps of Engineers, St. Louis District, Rivers Project Office near West Alton, Missouri. The goal of the artificial floating habitat project is to provide managed artificial sandbar habitat to Pool 26.

3.1.2 Effects Determination

One of the study objectives is to restore island habitat. The constructed islands would be built with dredged material, composed primarily from sand. Thus, the constructed islands would provide additional sandbar habitat that could be potentially used for least tern nesting habitat. To avoid and minimize impacts to the least tern during the nesting season (which are known to nest in the vicinity of the study area at RM 201.7), construction would occur in the winter months. We conclude the proposed Piasa and Eagle's Nest Island HREP ***may affect but is not likely to adversely affect least tern.***

3.2 Indiana Bat (*Myotis sodalis*)

3.2.1 Status

The Indiana bat is a federally listed, endangered mammal species (USFWS, 2016). The range of the Indiana bat includes much of the eastern half of the United States, including Illinois. Indiana bats migrate seasonally between winter hibernacula and summer roosting habitats. Winter hibernacula include caves and abandoned mines. Females emerge from hibernation in late March or early April to migrate to

summer roosts. During the summer, the Indiana bat frequents the corridors of small streams with well-developed riparian woods, as well as mature upland forests. It forages for insects along stream corridors, within the canopy of floodplain and upland forest, over clearings with early successional vegetation (old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures. Females form nursery colonies under the loose bark of trees (dead or alive) and/or cavities, where each female gives birth to a single young in June or July. A maternity colony may include from one to 100 individuals. A single colony may utilize a number of roost trees during the summer, typically a primary roost tree and several alternates. Some males remain in the area near the winter hibernacula during summer months, but others disperse throughout the range of the species and roost individually or in small numbers in the same types of trees as females.

Disturbance and vandalism, improper cave gates and structures, natural hazards, such as flooding or freezing, microclimate changes, land use changes in maternity range, and chemical contamination are the leading causes of population decline in the Indiana bat (USFWS, 2000) (USFWS, 2004). To avoid impacting this species, tree clearing activities should not occur during the period of 1 April to 30 September.

No suitable hibernation habitat exists within the study area. Suitable summer habitat exists within the proposed study area. Three female Indiana bats (2 non-reproductive; 1 lactating) were captured during the 2012 mist net survey at Piasa Island (USACE, 2012).

3.2.2 Effects Determination

Direct detrimental effects from implementing the proposed study are not anticipated since construction would be performed using water-based equipment and tree clearing is not required. There is minimal chance for indirect effects to Indiana bats through short-term noise disturbance. At this time, tree clearing is not anticipated with the proposed action; however, if that changes during plans and specification then additional consultation with USFWS would be required. If tree clearing is needed then no clearing of trees greater than 3 inches in diameter with loose peeling bark shall be allowed between April 1 and September 30 (during Indiana Bat breeding and rearing season). We conclude the proposed Piasa and Eagle's Nest Island HREP ***may affect but is not likely to adversely affect Indiana bat.***

3.3 Northern Long-Eared Bat (*Myotis septentrionalis*)

3.3.1 Status

The northern long-eared bat is a federally listed, threatened mammal species (Federal Register 4 May 2015). The northern long-eared bat is sparsely found across much of the eastern and north central United States and spends winter hibernating in caves and mines. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. Within hibernacula, they are found in small crevices or cracks (USFWS, 2016a). During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. They have also been found, rarely, roosting in structures like barns and

sheds (USFWS, 2016a). Foraging occurs in floodplain and upland forests. Forest fragmentation, logging and forest conversion are major threats to the species. One of the primary threats to the northern long-eared bat is the fungal disease, whitenose syndrome, which has killed an estimated 5.5 million cave-hibernating bats in the Northeast, Southeast, Midwest and Canada.

The study area does not have suitable hibernation habitat, but many habitats suitable for foraging do exist. No northern long-eared bats were captured during the 2012 mist net surveys; however, the northern long-eared bat was recorded as "probable" during the acoustic inventory (USACE, 2012).

3.3.2 Effects Determination

Direct detrimental effects from implementing the study are not anticipated since construction would be performed using water-based equipment and tree clearing is not required. There is minimal chance for indirect effects to Northern long-eared bats through short-term noise disturbance. At this time, tree clearing is not anticipated with the proposed action; however, if that changes during plans and specification then additional consultation with USFWS would be required. If tree clearing is needed then no clearing of trees greater than 3 inches in diameter with loose peeling bark shall be allowed between April 1 and September 30 (during Northern Long-Eared Bat breeding and rearing season). We conclude the proposed Piasa and Eagle's Nest Island HREP ***may affect but is not likely to adversely affect Northern long-eared bat.***

3.4 Decurrent False Aster (*Boltonia decurrens*)

3.4.1 Status

Decurrent false aster is a federally listed, threatened floodplain perennial plant species that may be found on moist, sandy floodplains and non-forested wetlands along the Mississippi and Illinois Rivers. It requires either natural or human disturbance to create and maintain suitable habitat and remove other plants competing for the same habitat. Without disturbance, other plant species can out-compete decurrent false aster and eliminate it in 3 to 5 years from any given area. Species decline is due to several factors including excessive silting of habitat due to topsoil run-off, conversion of natural habitat to agriculture, drainage/development of wetlands, altered flooding patterns, and herbicide use. No critical habitat rules have been published for the decurrent false aster. This species has not been found within the study area, but has been found along the Mississippi River in Madison County, Illinois and St. Charles County, Missouri.

3.4.2 Effects Determination

Suitable habitat does not exist within the study area; therefore, we conclude the proposed Piasa and Eagle's Nest Islands HREP will have ***no effect on decurrent false aster.***

3.5 Eastern prairie fringed orchid (*Platanthera leucophaea*)

3.5.1 Status

Eastern prairie fringed orchid is a federally listed, threatened perennial plant species found in mesic prairie to wetlands. The historic decline of this species was due mainly to conversion of natural habitats to cropland and pasture. More recent declines are mainly due to the loss of habitat from the drainage

and development of wetlands. This species is not known to occur within the study area.

3.5.2 Effects Determination

Suitable habitat does not exist within the study area; therefore, we conclude the proposed Piasa and Eagle's Nest Islands HREP will have ***no effect on the Eastern prairie fringed orchid*.**

3.6 Pallid Sturgeon (*Scaphirhynchus albus*)

3.6.1 Status

Pallid sturgeon is a federally listed, endangered fish species of the Missouri and Mississippi River drainages. This species has experienced a dramatic decline throughout its range since the mid to late 1960s. Nearly its entire habitat has been modified through river channelization, construction of impoundments, and related changes in water flow. The historic distribution of pallid sturgeon primarily included the Missouri River, the Mississippi River from the mouth of the Missouri River to the Gulf of Mexico and the lower reaches of the Platte, Kansas, and Yellowstone Rivers. Today, the distribution includes the Missouri River, Middle and Lower Mississippi River, the Atchafalaya River, and the lower reaches of the Yellowstone, Platte, Kansas, St. Francis and Big Sunflower Rivers (Constant, Kelso, Rutherford, & Bryan, 1997).

This species has not been observed in the vicinity of the study area, which is located upstream of the confluence with the Missouri River.

3.6.2 Effects Determination

The study area is outside of the known distribution of the pallid sturgeon. We conclude the proposed Piasa and Eagle's Nest Islands HREP will have ***no effect on the pallid sturgeon.***

3.7 Eastern massasauga (*Sistrurus catenatus*)

3.7.1. Status

Eastern massasauga is a federally listed, threatened reptile. This rattlesnake lives in shallow wetlands and adjacent uplands in portions of Illinois, Indiana, Iowa, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin and Ontario. The current range of this species resembles the species' historical range, but the geographical distribution has been restricted due to eradication by people and by loss of wetland habitat. This species has not been observed within the study area.

3.7.2 Effects Determination

Suitable habitat does not exist in the study area; therefore, we conclude the proposed Piasa and Eagle's Nest Islands HREP will have ***no effect on the Eastern massasauga***.

3.8 Spectacelcase (*Cumberlandia monodonta*)

3.8.1 Status

Spectaclecase is a federally listed, endangered mussel species (USFWS, 2016b). This mussel lives in large rivers in sheltered areas (e.g., beneath rock slabs). Historically, this large mussel was found in at least 44 streams of the Mississippi, Ohio, and Missouri river basins in 14 states; however, today it is found only in 20 streams, with the populations fragmented and restricted to short stream reaches. This species is

considered "rare" in Pool 26 (Ecological Specialist Inc, 2014), and no known observations of spectaclecase have occurred within or adjacent to the study area, and suitable habitat for federally listed species is not present within the study area (Ecological Specialist Inc, 2014).

3.8.2. Effects Determination

Suitable habitat does not exist in the study area (Ecological Specialist Inc, 2014); therefore we conclude the proposed Piasa and Eagle's Nest Islands HREP will have ***no effect*** **on the spectacelcase.**

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5. Official Species List – Updated 15 June 2018

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Southern Illinois Sub-Office (ES)
8588 Route 148
Marion, Illinois 62959
(618) 997-3344

FWS/SISO

June 1, 2018

Colonel Bryan K. Sizemore
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attn: Mrs. Kat McCain, CEMVS-PD-P

Dear Colonel Sizemore:

Thank you for the opportunity to review the May 2018, Feasibility Report (FR) with Integrated Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for the proposed Piasa and Eagle's Nest Island Habitat Rehabilitation and Enhancement Project (HREP) located between Upper Mississippi River miles 207.5 to 211.5, Madison and Jersey Counties, Illinois. The goal of the project is to restore and improve the quality and diversity of aquatic side and island ecosystem resources within the project area. The proposed project consists of a 200-ft wide braided channel excavation of Piasa Chute, excavation of the entrance of Piasa Island backwater, construction of a notched rock structure between Piasa and Eagle's Nest Islands, and construction of islands. These comments are prepared 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.); the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*); and, the National Environmental Policy Act (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.).

Threatened and Endangered Species

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service (Service) information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. In the EA you provided an updated list of species which may be present within the proposed project area that was obtained from the Service's ECOS-IPaC website on January 16, 2018. That list includes the Indiana bat (*Myotis sodalis*), endangered least tern (*Sterna antillarum*), endangered pallid sturgeon (*Scaphirynchus albus*), endangered spectaclecase mussel (*Cumerlandia monodonta*), threatened decurrent false aster (*Boltonia decurrens*), threatened

eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*), threatened eastern prairie fringed orchid (*Platanthera leucophaea*), and threatened northern long-eared bat (*Myotis septentrionalis*). There is no designated critical habitat in the project area at this time.

The Corps prepared a Biological Assessment (BA) and submitted it to the Service on December 15, 2016. In the BA, the Corps indicated that suitable habitat does not exist within the proposed project area for the decurrent false aster, eastern massasauga, eastern prairie fringed orchid, and spectaclecase mussel. In addition, the proposed project area is outside the known distribution of the pallid sturgeon; therefore, the Corps determined that the proposed project will have no effect on these species. This precluded the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended for these species. The Corps indicated that the proposed project area does contain suitable known summer habitat for the Indiana bat; however, no tree clearing is required for the proposed project, thus the Corps determined the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. Based on this information, the Service concurred that the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. The Corps also indicated that least terns have been observed in the vicinity the project area and that the proposed island construction would potentially provide sandbar habitat for least tern nesting. In addition, the work would be conducted during the winter season to avoid construction during the least tern nesting season; thus the Corps determined the proposed project is not likely to adversely affect the least tern. Based on this information, the Service concurred that the proposed project is not likely to adversely affect the least tern. Should this project be modified or new information indicate listed or proposed species may be affected, consultation or additional coordination with this office, as appropriate, should be initiated.

Conclusion

Based on information in the FR and 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, the Service has no objection to a Finding of No Significant Impact for this activity. The Service fully supports the completion of planning for this proposed project, and its subsequent construction. Thank you for the opportunity to provide comment on the FR, EA, and Draft FONSI. For additional coordination, please contact me at (618) 998-5945.

Sincerely,

/s/ Matthew T. Mangan

Matthew T. Mangan
Fish and Wildlife Biologist

cc: MDC (Vitello)
IDNR (Atwood)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

In Reply Refer To: June 15, 2018
Consultation Code: 03E18100-2017-SLI-0036
Event Code: 03E18100-2018-E-01169
Project Name: Piasa and Eagle's Nest Habitat Rehabilitation and Enhancement Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project "may affect" listed species or critical habitat. Under the ESA, it is the responsibility of the Federal action agency or its designated respresentative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website

http://ecos.fws.gov/ipac/ at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains step-by-step instructions which will help you determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all wind energy projects and projects that include installing towers that use guy wires or are over 200 feet in height, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act (16 U.S.C. 703 *et seq*), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Southern Illinois Sub-Office
Marion Illinois Sub-office
8588 Route 148
Marion, IL 62959-5822
(618) 997-3344

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
(309) 757-5800

Project Summary

Consultation Code: 03E18100-2017-SLI-0036

Event Code: 03E18100-2018-E-01169

Project Name: Piasa and Eagle's Nest Habitat Rehabilitation and Enhancement Project

Project Type: DREDGE / EXCAVATION

Project Description: The proposed project is the feasibility study under the Upper Mississippi River Restoration program. Project objectives include restoring flow and depth of Piasa Chute, restoring connectivity of the backwater, and restoring the historic island complex that once existed. Proposed project measures include dredging Piasa Chute, dredging Piasa Island backwater, placement of a notched rock structure, and restoring islands through beneficially re-using dredged material with stone protection. Approved feasibility study expected in FY 2018.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.928901217596106N90.28781975773687W

Counties: Jersey, IL | Madison, IL

Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Least Tern *Sterna antillarum* Population: interior pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505	Endangered

Reptiles

NAME	STATUS
Eastern Massasauga (=rattlesnake) *Sistrurus catenatus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2202	Threatened

Fishes

NAME	STATUS
Pallid Sturgeon *Scaphirhynchus albus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7162	Endangered

Clams

NAME	STATUS
Spectaclecase (mussel) *Cumberlandia monodonta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7867	Endangered

Flowering Plants

NAME	STATUS
Decurrent False Aster *Boltonia decurrens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7705	Threatened
Eastern Prairie Fringed Orchid *Platanthera leucophaea* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/601	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
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In Reply Refer To: June 15, 2018
Consultation Code: 03E18000-2017-SLI-0054
Event Code: 03E18000-2018-E-02792
Project Name: Piasa and Eagle's Nest Habitat Rehabilitation and Enhancement Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project "may affect" listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website http://ecos.fws.gov/ipac/ at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at - http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains step-by-step instructions which will help you

determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all wind energy projects and projects that include installing towers that use guy wires or are over 200 feet in height, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.) and Migratory Bird Treaty Act (16 U.S.C. 703 et seq), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
(309) 757-5800

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

Southern Illinois Sub-Office
Marion Illinois Sub-office
8588 Route 148
Marion, IL 62959-5822
(618) 997-3344

Project Summary

Consultation Code: 03E18000-2017-SLI-0054

Event Code: 03E18000-2018-E-02792

Project Name: Piasa and Eagle's Nest Habitat Rehabilitation and Enhancement Project

Project Type: DREDGE / EXCAVATION

Project Description: The proposed project is the feasibility study under the Upper Mississippi River Restoration program. Project objectives include restoring flow and depth of Piasa Chute, restoring connectivity of the backwater, and restoring the historic island complex that once existed. Proposed project measures include dredging Piasa Chute, dredging Piasa Island backwater, placement of a notched rock structure, and restoring islands through beneficially re-using dredged material with stone protection. Approved feasibility study expected in FY 2018.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.928901217596106N90.28781975773687W

Counties: Jersey, IL | Madison, IL

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Flowering Plants

NAME	STATUS
Decurrent False Aster *Boltonia decurrens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7705	Threatened
Eastern Prairie Fringed Orchid *Platanthera leucophaea* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/601	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20

NAME	BREEDING SEASON
Kentucky Warbler *Oporornis formosus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum

probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

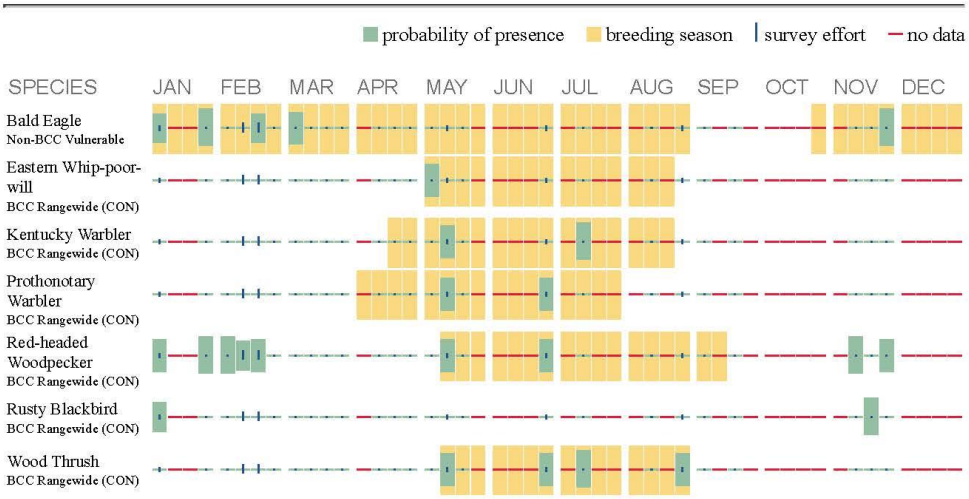
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical

Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1Ah
- PSS1Ch

LAKE

- L1UBHh

For all wind energy projects and projects that include installing towers that use guy wires or are over 200 feet in height, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.) and Migratory Bird Treaty Act (16 U.S.C. 703 et seq), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

6. Correspondence Letter from USACE to USFWS 15 December 2016

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

15 December 2016

Regional Planning and
Environmental Division North

Mr. Matthew Mangan
U.S. Fish and Wildlife Service
Ecological Services
Marion Illinois Sub-Office
8588 Route 148
Marion IL 62959

Dear Mr. Mangan:

The St. Louis District, U.S. Army Corps of Engineers, is submitting the enclosed biological assessment on the potential effects of the Upper Mississippi River Restoration Program Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project, Madison and Jersey counties, Illinois, on federally threatened and endangered species. The biological assessment concludes that the Project may affect but not likely to adversely affect the federally listed interior least tern, northern long-eared bat, and Indiana bat, or their critical habitats. The biological assessment concludes that the Project will have no effect on the federally listed pallid sturgeon, decurrent false aster, eastern prairie-fringed orchid, spectaclecase, eastern massasauga, or their critical habitats.

Pursuant to Section 7 of the Endangered Species Act, as amended, we are requesting your concurrence with this determination. If you have any questions concerning this submittal, please contact Dr. Kat McCain at (314) 331-8047 or email at kathryn.mccain@usace.army.mil.

Sincerely,

Brian L. Johnson
Chief, Environmental Compliance Branch
Regional Planning and Environmental Division North

2 Enclosures

7. Response Letter from USFWS to USACE

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Marion Illinois Sub-Office (ES)
8588 Route 148
Marion, Illinois 62959

FWS/MISO

January 30, 2017

Colonel Anthony P. Mitchell
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attn: Dr. Kathryn McCain

Dear Colonel Mitchell:

Thank you for the opportunity to review and comment on the December, 2016, Biological Assessment (BA) for the proposed Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project located in Pool 26 between Upper Mississippi River miles 207.5 and 211.5, Madison and Jersey Counties, Illinois. The proposed project involves dredging material from Piasa Chute and constructing a river training structure to restore approximately 486 acres of side channel habitat, dredging material from Piasa Island Backwater to restore approximately 49 acres of connected backwater and overwintering fish habitat, and using the dredged material and stone rip-rap to restore approximately 76 acres of island habitat. These comments are prepared 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.); the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*); and, the National Environmental Policy Act (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.).

Threatened and Endangered Species

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service (Service) information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. In the BA you provided a list of species which may be present within the proposed project area that was obtained from the Service's ECOS-IPaC website on October 14, 2016. That list includes the Indiana bat (*Myotis sodalis*), endangered least tern (*Sterna antillarum*), endangered pallid sturgeon (*Scaphirynchus albus*), endangered spectaclecase mussel (*Cumerlandia monodonta*), threatened decurrent false aster (*Boltonia decurrens*), threatened eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*), threatened eastern prairie fringed

orchid (*Platanthera leucophaea*), and threatened northern long-eared bat (*Myotis septentrionalis*). There is no designated critical habitat in the project area at this time.

Information in the BA indicates that suitable habitat does not exist within the proposed project area for the decurrent false aster, eastern massasauga, eastern prairie fringed orchid, and spectaclecase mussel. In addition, the proposed project area is outside the known distribution of the pallid sturgeon; therefore, the Corps has determined that the proposed project will have no effect on these 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 for these species.

Information in the BA indicates that the proposed project area does contain suitable known summer habitat; however, no tree clearing is required for the proposed project, thus the Corps has determined the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. Based on this information, the Service concurs that the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. Information in the BA indicates that least terns have been observed in the vicinity the project area and that the proposed island construction would potentially provide sandbar habitat for least tern nesting. In addition, the work would be conducted during the winter season to avoid construction during the least tern nesting season; thus the Corps has determined the proposed project is not likely to adversely affect the least tern. Based on this information, the Service concurs that the proposed project is not likely to adversely affect the least tern. Should this project be modified or new information indicate listed or proposed species may be affected, consultation or additional coordination with this office, as appropriate, should be initiated.

Conclusion

Thank you for the opportunity to provide comment on the BA. For additional coordination, please contact me at (618) 997-3344, ext. 345.

Sincerely,

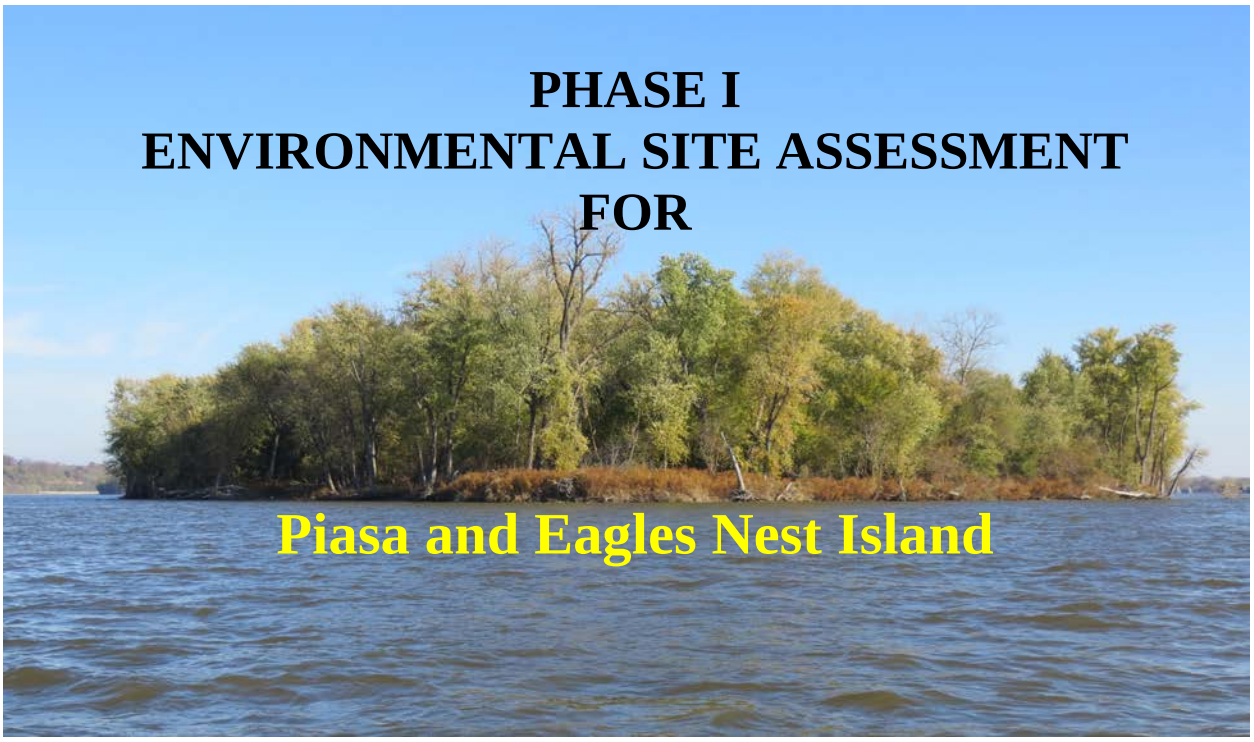
/s/ Matthew T. Mangan

Matthew T. Mangan
Fish and Wildlife Biologist

cc: IDNR (Atwood, Grider)
MDC (Sternberg, Vitello)

Appendix E

Hazardous, Toxic, & Radioactive Waste



PHASE I
ENVIRONMENTAL SITE ASSESSMENT
FOR
Piasa and Eagles Nest Island

November 28, 2016

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

Phase I – Environmental Site Assessment
Piasa and Eagles Nest Islands
Godfrey, IL

Prepared for:
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, MO 63103

Approved by:

_____

Kevin P. Slattery
Chief, Environmental Quality Section

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 40 CFR 312.10. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

_____

Richard D. Archeski
Environmental Engineer

Table of Contents

Appendices **Part of Electronic Administrative Record; Available Upon Request**

Appendix A Environmental Records

Appendix B Historical Data

Appendix C Photographs

Appendix D Threatened and Endangered Species

Appendix E Clean Water Act

Appendix F National Response Center (NRC) Report

Appendix G Interview Questionnaire

Executive Summary

A Phase I Environmental Site Assessment was conducted for the Piasa and Eagles Nest Island Project. The project area is located in Mississippi River Pool 26 along the left descending bank of the Mississippi River, upstream from the city of Alton, IL in Madison and Jersey Counties between Mississippi river miles (RM) 207.5 to 211.5 on USACE fee-owned lands and managed waters. The islands are managed by the St. Louis Corps of Engineer's Rivers Project Office, in partnership with the Illinois Department of Natural Resources. Historically, the proposed project area was a dynamic area of islands, side channels, wetlands, and sand bar habitats. Since the construction of the lock and dams the pattern of habitats within the project area have been greatly modified leading to the loss of depth and flow in Piasa Chute, loss of year round connectivity and depth within Piasa Island backwater, loss of diverse island complex, and the loss of wetlands. The objectives of this project are to: restore and improve the quality and diversity of aquatic life, and island and wetland ecosystem resources.

This due diligence effort is intended to provide the minimum information required to assess potential environmental liabilities associated with this project. The objective of the Phase I is to identify, to the extent feasible pursuant to the process described herein, recognized environmental conditions (RECs) in connection with a given property(s). This assessment revealed low level RECs that should not impact this project.

I. Introduction

1.1 Purpose

The U.S. Army Corps of Engineers (USACE) regulations (ER 1165-2-132 and ER 200-2-3), and District policy requires procedures be established to facilitate early identification and appropriate consideration of potential hazardous, toxic, or radioactive waste (HTRW) in reconnaissance, feasibility, preconstruction engineering and design, land acquisition, construction, operations and maintenance, repairs, replacement, and rehabilitation phases of water resources studies or projects by conducting HTRW Initial Hazard Assessments (IHA). USACE specifies that these assessments follow the process/standard practices for conducting Phase I Environmental Site Assessments (ESA) published by the American Society for Testing and Materials (ASTM).

This assessment was prepared using the following ASTM Standards:

- E1527-13: Standard Practice for Environmental Site Assessments – Phase I Environmental Site Assessment process

- E1528-06: Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (interview questionnaires)

- E2247-08 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property

The purpose of a Phase I ESA is to identify, Recognized Environmental Conditions (REC's) to the extent feasible in the absence of sampling and analysis. A recognized environmental condition is the presence or likely presence of any hazardous substance or petroleum products in, on or at a property. This may be the result of a release to the environment, under conditions indicative of a release, or under conditions that pose a material threat of a future release to the environment. The term hazardous consists of the range of contaminants within the scope of the U.S. Environmental Protection Agency's (EPA) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

The scope of this Phase I consist of the following four components:

a. Records review
b. Site reconnaissance
c. Interviews
d. Report

II. Project/Site Description

2.1 Location Description

Piasa and Eagles Nest Islands are located along the left descending bank of the Mississippi River, upstream from the city of Alton, IL in Madison and Jersey Counties between Mississippi river miles (RM) 207.5 to 211.5 on USACE fee-owned lands and managed waters. The islands are owned by the St. Louis District Corps of Engineers and managed by the Illinois Department of Natural Resources under a cooperative agreement through the U.S. Fish and Wildlife Service. Historically, the proposed project area was a dynamic area of islands, side channels, wetlands, and sand bar habitats. Since the construction of the lock and dams the pattern of habitats within the project area have been greatly modified leading to the loss of depth and flow in Piasa Chute, loss of year round connectivity and depth within Piasa Island backwater, loss of diverse island complex, and the loss of wetlands. The objectives of this project are to:

- Increase deep aquatic habitat within Piasa Chute greater than 5 feet,
- Increase diversity of water velocities within Piasa Chute,
- Ensure adequate flow over existing freshwater mussel beds
- Provide year-round connectivity with Piasa Backwater and the Mississippi River
- Maintain existing acreage of island habitat
- Restore historic island habitat
- Maintain existing and restore wetland vegetation

See figures 1 & 2 for site location.

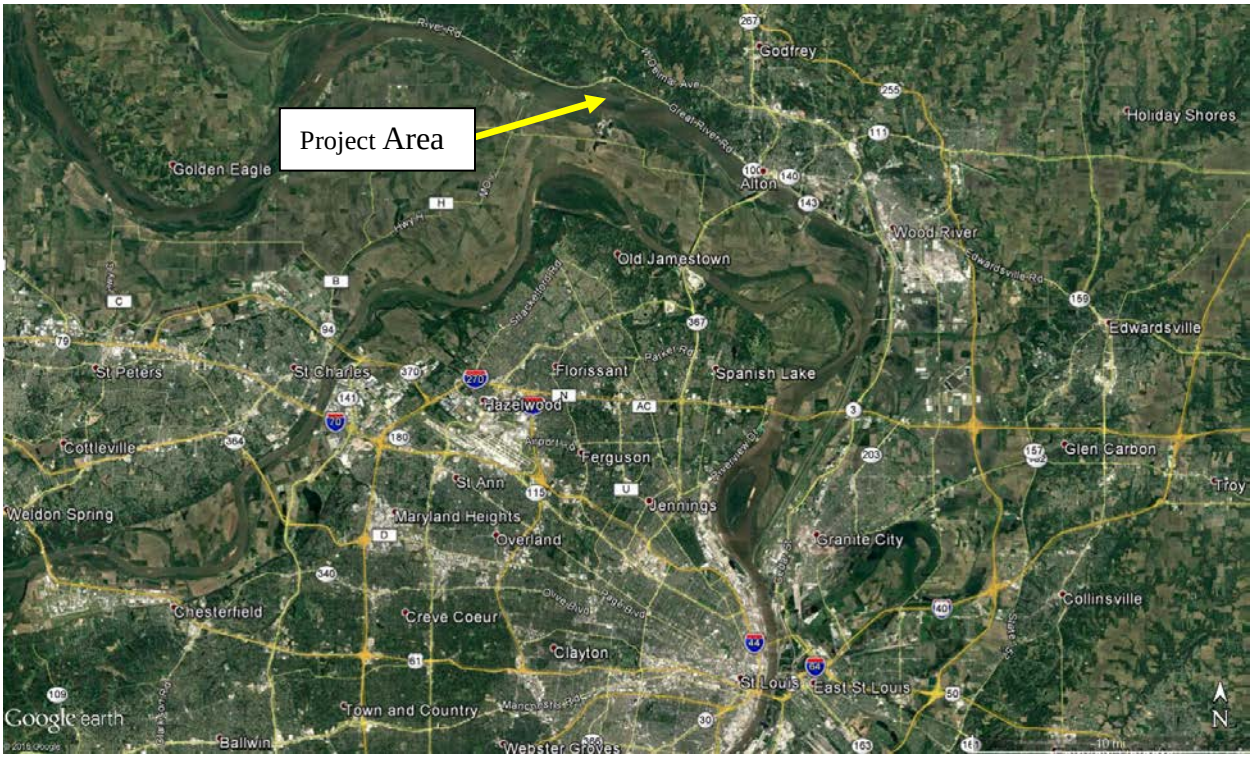


Figure 1
Locator map for Piasa & Eagles Nest Islands

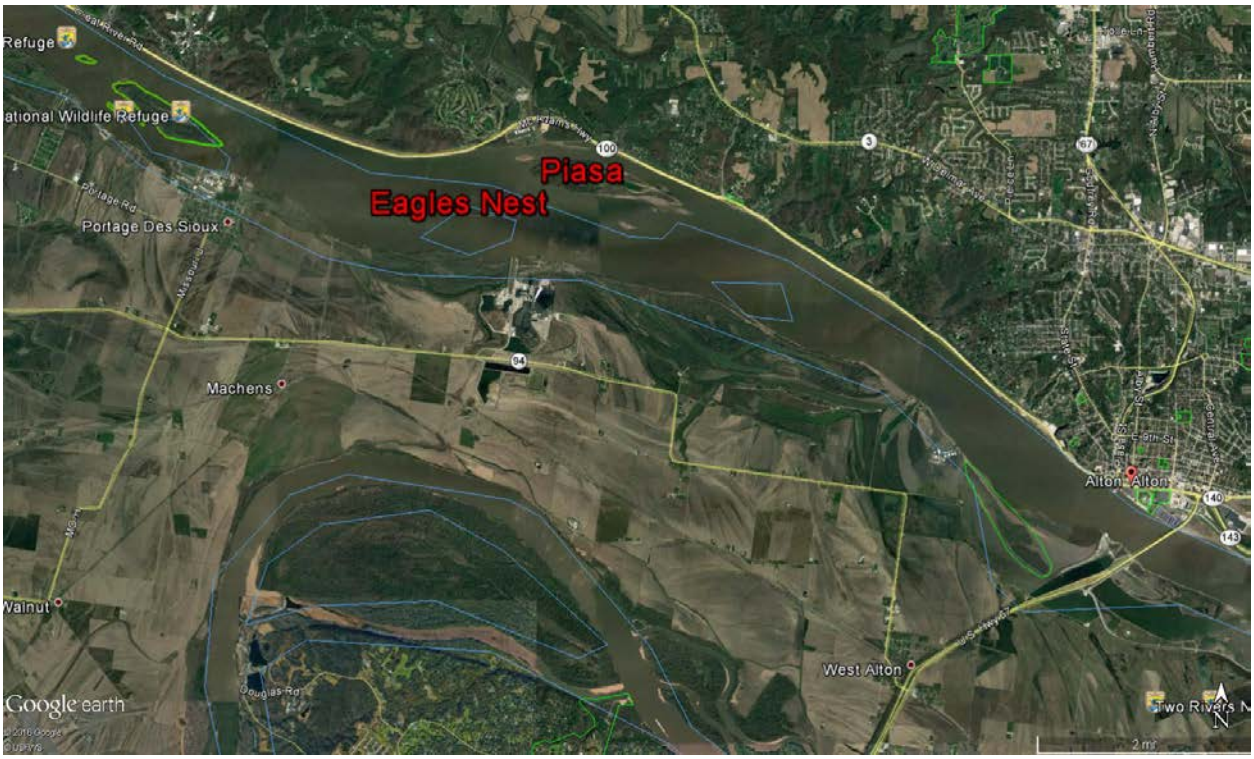


Figure 2
Piasa and Eagles Nest Islands vicinity map

This project will consist of dredging channels in the interior backwater of Piasa Island, dredge material would be placed behind constructed chevrons increasing the likelihood of island or sandbar formation, dike notching, three chevrons and two trail dikes are proposed to be built at the tail end of Eagles Nest Island, and erosion protection structures at the head of Piasa and Eagles Nest Islands. The following reference provides additional details of the project *Piasa and Eagles Nest Islands Habitat Rehabilitation and Enhancement Project*. See figure 3 for locations of structures.

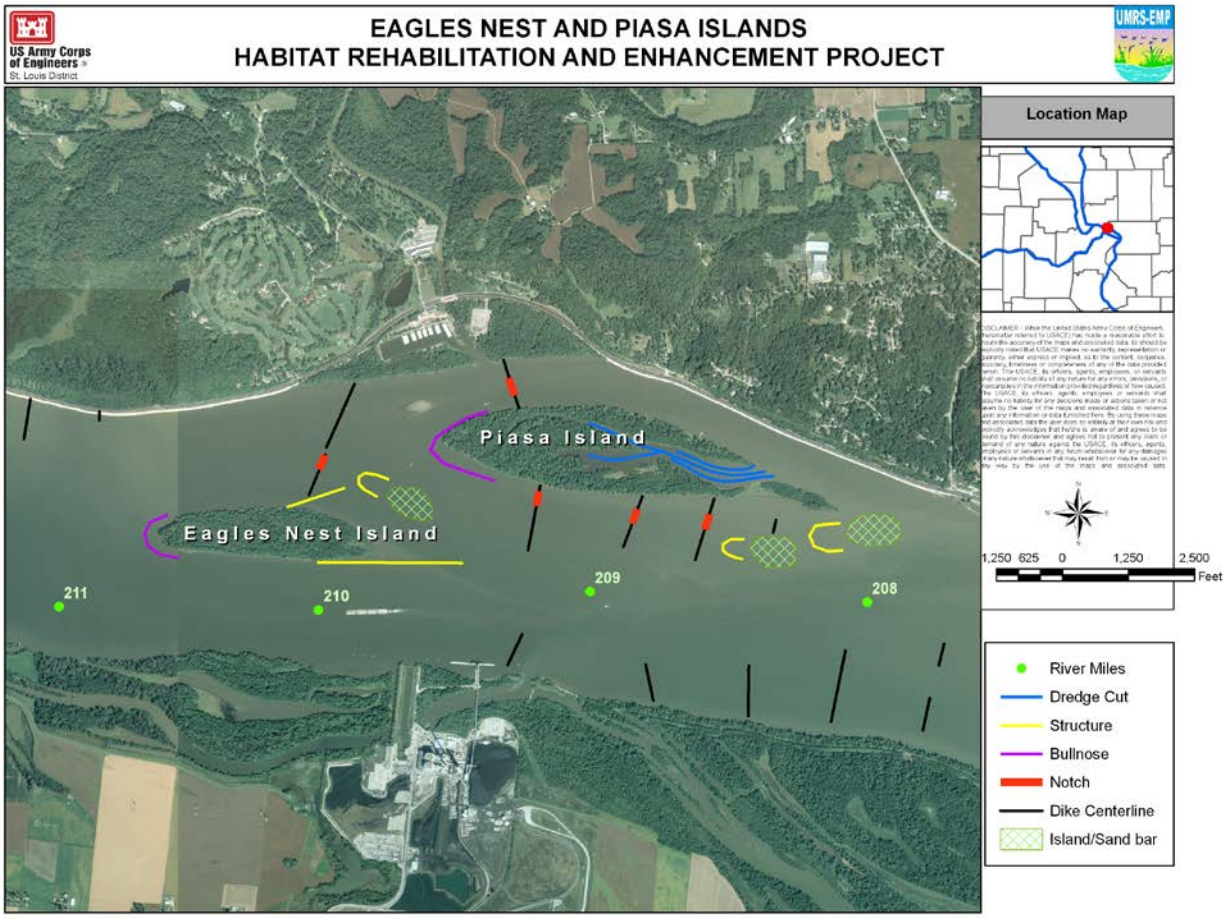


Figure 3
Potential structure locations.

2.2 Site/Vicinity Characteristics

Since the 1930's Piasa and Eagles Nest Islands have been owned by the St. Louis District Corps of Engineers and are currently managed by the Illinois Department of Natural Resources under a cooperative agreement through the U.S. Fish and Wildlife Service. The islands are located in Mississippi River Pool 26 between RM 207.5 and 211.5 near the confluence of Piasa Creek. The topography of both islands consist of flat heavily vegetated sites. The islands are susceptible to routine flooding based on their location in the Mississippi River. Piasa Island is almost exclusively floodplain forest with small pockets of shallow annual marsh and wetland meadows. Land cover on Eagles Nest Island is a mixture of cottonwood forest and mixed floodplain forest. The dominant tree species on both islands are cottonwoods and maples with occasional sycamores. Being that these properties are islands, there is no direct contact with adjoining properties.

III. User Provided Information

Site visits, records search, and personal interviews with persons familiar with the area and local hazardous response personnel revealed the remote possibility of encountering HTRW issues. The environmental impact for the migration of off-site contaminants onto the project property is negligible. A Site Health and Safety Plan, and a Quality Control Plan should be required, discussed ad implemented to avoid any environmental hazards. If any evidence of REC's are discovered during construction activities, operations should cease until the Environmental Quality section of the St. Louis District Corps of Engineers is able to assess the project area.

IV. Records Review

For the purpose of this Phase I, the following standard records sources were obtained and reviewed to assist in the identification of potential REC's in connection with this project:

- National Response Center (NRC)
- Historical Aerial Photographs
- USACE Historical Information
- Historical Topographic Maps

These records assist in meeting the requirements of EPA's Standards and Practices for All Appropriate Inquires (40 CFR Part 312), and the ASTM Standard Practice for Environmental Site Assessments (E 1527-05). For properties that contained inadequate address information for mapping purposes, reasonable efforts were made to identify the approximate location of the sites in relation to the target properties as part of the review process. In addition, the physical setting was assessed for the target properties by reviewing topographic maps to identify conditions in which hazardous substances or petroleum products could migrate.

4.1 Historical Use Information

The following available historic information sources were obtained and reviewed: The following historical aerial photographs were reviewed:

1937, 1941, 1953, 1956, 1968, 1974, 1980, 1988, 1995, 2005, 2007, 2009, 2010, 2011, and 2012

The following historical topographic maps were reviewed:

1933, 1946, 1947, 1954, 1968, 1974, 1995, and 2012

No sanborn maps were available for this area. Review of land use maps reveal as well as interviews indicate that these areas have been forested with no agricultural production. Piasa Island had several recreational cabins in the past, but only two still exist. The cabins appear to be used intermittently. Recent flood events have deposited several inches of mud on the lower level of the cabins. The area around the cabins have

been maintained with the grass mowed and the boat docks useable. See photos of cabins in Appendix C.

No evidence was discovered during the historical research that would indicate that previous land use represents a significant environmental liability.

V. Site Reconnaissance

A site visit to Piasa and Eagles Nest Islands was conducted on 15 November 2016 by Mr. Rick Archeski and Mr. Ben Greeling of CEMVS-EC-EQ. Piasa Island consists of old growth forest. There are 2 recreational cabins located on Piasa. Flood events deposit a range of debris on the island. Several drums where found near one of the cabins and a couple of propane tanks. Plastic bottles and large pieces of styrofoam were scattered about the island. Although in the past there were several cabins on Piasa, only two currently exist. We did not have access to the buildings. The eastern end of Piasa Island was not accessible on foot due to dense vegetation. Eagles Nest Island consists of newer growth forest. It had a larger amount of flood debris than Piasa probably because it is up river from Piasa and catches debris before it reaches Piasa. Photographs documenting the site visit are enclosed as appendix C. In addition, the surrounding adjacent properties which are located across Piasa Chute and the main river channel were also inspected as part of this survey.

VI. Interviews

Interviews were conducted in order to obtain information indicating RECs in connection with this site. The content of the questions asked followed the questionnaire format of ASTM 1528. Interviews were conducted with the following persons:

- Charles Deutsch – USACE St. Louis District, Riverlands Project Office
- Kenny Scott – Illinois Department of Natural Resources
- Ben Greeling – USACE St. Louis District, Environmental Quality, formerly worked at Riverlands Project Office

Interview responses are in Appendix G.

VII. Findings

The following recognized environmental conditions (REC's) have been identified:

- Great Rivers Land Trust have three underground storage tanks (2- 10,000 and 1-12,000 gal.) at the Piasa Marina. This site is approximately 0.5 miles north of the proposed project on the Illinois side of the Mississippi River. These tanks are scheduled to be removed on 30 November 2016. This is a low level REC based on the fact that Piasa Chute is between the marina and Piasa Island as well as the current would take any petroleum product downstream. The site will be monitored during the tank removal to ensure no petroleum product is released into

Piasa Creek and possibly into the Mississippi River. Although any spill or release would be the responsibility of the owners of the Marina.

- Western Boat & Motor (Piasa Marina) had four underground storage tanks (2- 8,000 and 2- 2,000 gal.) that self-excavated during 1993 flood event. This is considered a low level REC based on the fact the flood event occurred 23 years ago and there have been numerous flood events during this time frame which would have flushed any spill residue down river.

- Lockhaven Country Club greater than 0.5 miles from project maintains a NPDES permit for a Sewage Treatment Plant (STP). This facility closed in 2014, but appears to have reopened based on current website and phone message. This is a low level REC based on the distance from the site and the dilution factor of the Mississippi River.

- Alton Boat & Motor Club (11134 Harbor Dell, Godfrey, IL) is listed as an ERNS (Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances). A spill of 28 gallons in 2009 was reported to the National Response Center (NRC). This is not considered a REC due to the numerous flood events that have occurred since 2009.

- Clandestine drug lab (CDL) located on Hazelnut Lane, Godfrey,IL approximately 0.5 to 1 mile from project site. This was a meth lab, but there were no spills associated with this activity. This is not considered a REC.

- Ameren (Union Electric) Portage de Sioux Power Station located in St. Charles County , Missouri approximately 1.75 miles from project site had the following listings:
  RCRA small quantity generator,
  Underground storage tank site (research indicates these tanks were removed in 2003)
  Coal Ash EPA (coal combustion residue surface impoundment),
  MO Coal Ash (power plants with coal ash ponds)
  TRIS (Toxic Chemical Release Inventory System) lists facilities that release toxic chemicals to the air, water and land in reportable quantities under SARA Title III
  SEMS-ARCHIVE (Superfund Enterprise Management System Archive formerly known as the CERCLIS-NFRAP) tracks sites that have no further interest under the Federal Superfund Program based on available information.
  ERNS: A spill of 8 gals of lube oil into the Mississippi River from an intake pump was reported to the NRC in October of 2010.
  Although the listings above are numerous for the Ameren Portage de Sioux Power Station it would be a low level REC based on the distance from the islands and the fact that the current of the river would carry the contaminants down river away from the two islands. As mentioned above if hazardous material did migrate from this site to the islands, the responsible party would be required to remediate the site.

- Flood debris on the islands is considered a low level REC. None of the debris observed was associated with hazardous substances or petroleum products. As mentioned the majority of the debris was plastic or glass bottles, empty drums with no labeling, two empty propane cylinders, and large pieces of Styrofoam.

- The potential for a large pesticide or herbicide spill in the Mississippi River above these islands or in Piasa Creek effecting this project is minimal. Pesticides/herbicides break down in the presence of atmospheric conditions (phyto and biodegradation) and the dilution factor would greatly reduce the amount of pesticides impacting the island. If such a spill would occur the responsible party would be required to fully remediate all properties effected. This is considered a low level REC.

- No transformers are in the immediate vicinity of this project. This is not considered a REC.

See the EDR radius map in Appendix A for full details of findings.

VIII Data gaps

Due to large amount of data only the last 10 years of NRC records for Jersey, Madison Counties in Illinois and St. Charles County in Missouri were reviewed.

Did not have access to the cabins and did not test for asbestos or lead-based paint.

IX. Opinion

An Environmental Site Assessment was conducted in conformance with the scope and limitations of ASTM Practice E 1527 for Piasa and Eagles Nest Islands. There is a potential that future flood debris could create a REC on these islands. However, the possibility is remote. This opinion is based on the fact that no hazardous substances or petroleum contamination was found during the site visit, historical documentation including interviews do not indicate any spills, and the islands are isolated from adjacent properties by the Mississippi River. This assessment revealed low level RECs in connection with these properties that should not have any effect on the project.

X. Conclusions

An Environmental Site Assessment Phase I ESA was conducted in accordance with the scope and limitations of ASTM Practice E 1527 for Piasa and Eagles Nest Islands. The assessment revealed only the potential for low level RECs in connection with these properties. The properties have been under the jurisdiction of the USACE since the 1930's and there are no records indicating any spills, pesticide/herbicide use, or HTRW contamination. There had been several cabins on Piasa Island in the past, only two remain. There was no indication of any spills or contamination around these cabins or on either island. Therefore, no Phase II ESA is necessary for the proposed project.

XI. Limitations

U.S. Army Corps of Engineers, Environmental Quality and HTRW Section should be contacted with any known or suspected variations from the conditions described herein. If future development of the property indicates the presence of hazardous or toxic materials, USACE should be notified to perform a re-evaluation of the environmental conditions.

The scope of this assessment did not include any additional environmental investigation, not outlined herein, or analyses for the presence or absence of hazardous or toxic materials in the soil, ground water, surface water, or air, in on, under or above the subject tract.

This site assessment was performed in accordance with generally accepted practices of consultants undertaking similar studies at the same time and in the same geographical area, and USACE observed that degree of care and skill generally exercised by consultants under similar circumstances and conditions. The findings and conclusions stated herein must be considered not as scientific certainties, but rather as professional opinions concerning the significance of the limited data gathered during the course of the environmental site assessment. No other warranty, express or implied, is made.

Specifically, USACE does not and cannot represent that the site contains no hazardous waste or material, oil (including petroleum products), or other latent condition beyond that observed by USACE during its site assessment.

The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely upon the services described therein, and not on scientific tasks or procedure beyond the scope of described services or the time and budgetary constraints imposed by the client. Furthermore, such conclusions are based solely on site condition, and rules and regulations, which were in effect, at the time of the study.

In preparing this report, USACE relied on certain information provided by state and local officials and other parties referenced therein, and on information contained in the files of state and/or local agencies available to USACE at the time of the site assessment. Although there may have been some degree of overlap in the information provided by these various sources, an attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this site assessment was not made.

Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the site or to structures on the site was unavailable or limited, USACE renders no opinion as to the presence of indirect evidence relating to hazardous waste or material or oil, or other petroleum products in that portion of the site or structure. In addition, USACE renders no opinion as to the presence of

hazardous waste or material, oil or other petroleum products or to the presence of indirect evidence relating to hazardous material, oil, or petroleum products where direct observation of the interior walls, floor, roof, or ceiling of a structure on a site was obstructed by objects or coverings on or over these surfaces.

Unless otherwise specified in the report, USACE did not perform testing or analyses to determine the presence or concentration of asbestos, radon, formaldehyde, lead-based paint, lead in drinking water, electromagnetic fields (EMFs) or polychlorinated biphenyls (PCBs) at the site or in the environment at the site.

The purpose of this report was to assess the physical characteristics of the subject site with respect to the presence in the environment of hazardous waste or material, oil, or petroleum products. Except as otherwise described in this report, no specific attempt was made to check on the compliance of present or past owners or operators of the site with federal, state, or local laws and regulations, environmental or otherwise.

XII References

- *E1527-13: Standard Practice for Environmental Site Assessments – Phase I Environmental Site Assessment Process, ASTM*
- *E1528-06: Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (interview questionnaire), ASTM*
- *E2247-08 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property*
- *Upper Mississippi River Restoration Feasibility Report With Integrated Environmental Assessment, Piasa and Eagles Nest Islands Habitat and Enhancement Project*

XIII Qualifications

USACE EC-HQ has the specific qualifications based on education, training and experience to assess a property of the nature, history, and setting of the subject properties and declare that, to the best of our professional knowledge and belief meet the definitions of Environmental Professionals as defined under 40 CFR 312.

Appendix F

Historical & Cultural Resources

General Cultural and Historical Setting

Documentation of the Mississippi River Valley prehistoric and historical sequence is extensive and only a brief outline is presented here. Prehistoric human occupation of the area is generally broken into four inclusive periods: Paleo-Indian, Archaic, Woodland, and Mississippian. Each period is characterized by differing degrees of social complexity and by changes in subsistence technologies and pursuits. The Paleo-Indian period represents the first populating of North America. The earliest evidence for the occupation of the mid-continental United States appears as fluted points made around 13,500 to 12,700 years ago (Morrow 2014; Fiedel 1999). Paleo-Indians are generally characterized as smaller groups of hunters and gatherers following migrating herds of large game. The period lasted until the end of the Wisconsin glaciation around 8000 B.P. when the stabilizing climate promoted the different ecological adaptations of the Archaic period. While hunting and gathering continued, people began to cultivate native plants. Larger communities formed as increasingly sedentary culture developed. The subsequent Woodland culture (1000 B.C. to 900 A.D.) is characterized by the widespread use of pottery, ever increasing reliance on agriculture, and development of long-distance trade. The socioeconomic traits generally ascribed to the following Mississippian period (900 to 1400 A.D.) include intensive agricultural adaptations, the appearance of large fortified towns, construction of pyramidal mounds, increased interregional trade, and a highly stratified sociopolitical organization. The most elaborate and famous expression of the culture is the extensive settlement of Cahokia Mounds located on the American Bottom near modern Collinsville, Illinois.

The historical period begins with European exploration of the Middle Mississippi and the voyage of Jacques Marquette and Louis Joliet down the river in 1673. A trading establishment and mission were built at "Grand Village of the Illinois" in 1675. Kaskaskia was established in 1703, Sainte Genevieve around 1750, and St Louis in 1764. For much of the 18th and 19th centuries, commerce on the river was driven by the fur trade, and there was some limited traffic in salt and lead. Along with increasing development of the region, the introduction of steamboats in the early 19th century greatly expanded both the volume of trade in general commodities and transportation for people. The number of vessels engaged increased yearly along with their size and the number of round trips each took (Haites and Mak:1971).

Specific Project Area History

There is no known prehistoric occupation of the project islands, but they have not been archaeologically surveyed. While Eagle's Nest Island formed predominantly in the historical

period, Piasa Island predates Euro-American contact. Archaeological sites are abundant on the floodplain of the Mississippi and its tributaries, and it would not be unlikely that they exist, or once exited, on long-standing islands.

The first Euro-American claimant to what became known as Piasa Island was Toussaint Cerré. Toussaint was probably the nephew of Jean-Gabriel Cerré. Jean-Gabriel was born in Montreal in 1734 and established a fur trading post at Kaskaskia by the mid 1770s. He quickly became a successful merchant, acquiring additional property in both Ste. Genevieve and St. Louis. After he moved his family to St. Louis in 1779, his daughter, Marie-Thérèse, married the founder of the city, Auguste Chouteau, thus uniting the two most prominent merchant families in the region.

It's unknown when Toussaint joined his uncle in the area, but in his petition for the island to the French lieutenant governor in January of 1800 he describes himself as "father of a family, ancient inhabitant of this county, and residing at the village of St. Charles of the Missouri" (House Doc. n.d.:71). He asked the governor to grant him the "great island of Payse" given the difficult of raising cattle in the settlements and the growing scarcity of wood in the region. He assures him that the island is on the Spanish side of the river as the main channel passes between the island and the American side. The petition was witnessed by Auguste Chouteau. Lieutenant Governor Carlos Dehault, granted Cerré and his heirs the island "to possess and enjoy, and dispose of it as their own property" the same day (House Doc. n.d.:71).

There are several land surveys conducted for the Surveyor General, Anthoine Soulard, in the Missouri State Archives that document land in St. Charles owned by Toussaint Cerré. Their dates (i.e., 1799, 1800 and 1804), along with that of the Payse Island grant suggest that he moved to the area just before the turn of the century. Interestingly, despite his claim to being a father in his petition, he is recorded as marrying a Julie Doral on 10 August 1806 in St. Charles (Ormesher 1982:41).

After the United States acquired the Louisiana Territory in 1803, congress created a board of land commissioners to reject or confirm French and Spanish colonial grants. On September 13, 1806, Auguste Chouteau went before the board to claim Piasa Island, producing a certified copy of a deed of conveyance from Toussant (House Doc. n.d.:72). Apparently, the board was not convinced and the issue was presented again in 1810, 1832, and finally on November 1, 1833 when their unanimously opinion was that the island be confirmed to Toussaint Cerré, or his legal representative.

In 1818 the western portion of Piasa Island was platted as three tracts in T6N R11W S25 (Figure 1). The corresponding map for R6N R10W does not show the eastern portion of the island.

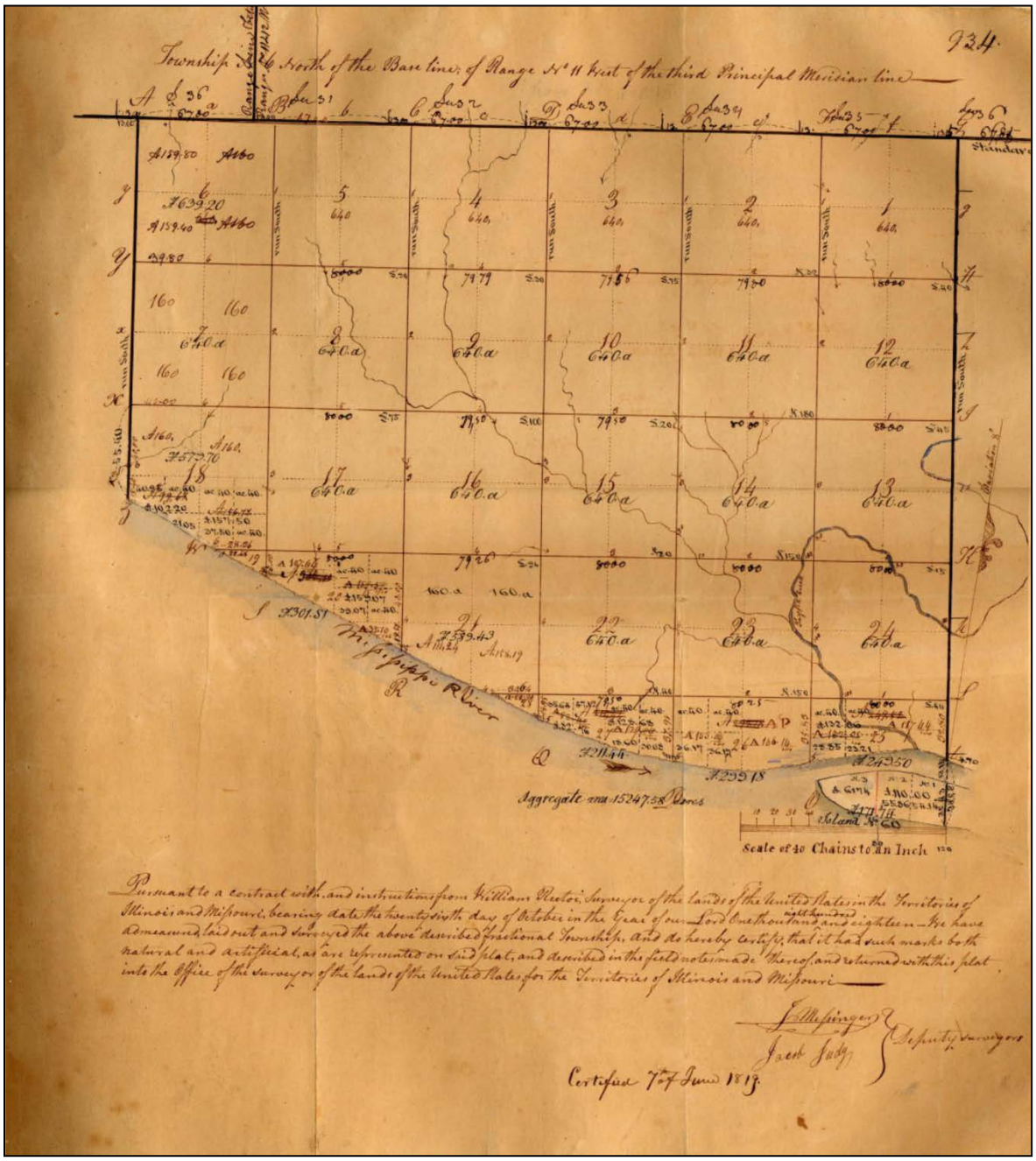


Figure 1. 1818 Plat map of Township 6 North, Range 11 West.

Notably, the island was mapped in Illinois, in contrast to Toussaint Cerré's contention that it was on the Missouri side of the river. In 1841 the surveyor's office specifically mapped the island again along with Little Piasa Island (Figure 2). A notation in the margin states that the survey was provided to the Commission of the Land Grants Officer and identifies the islands as

No. 60 and No. 61. Again, the western portion of Piasa, in Jersey County, is shown as three tracks, and now the eastern portion in Madison County is shown as two tracks.

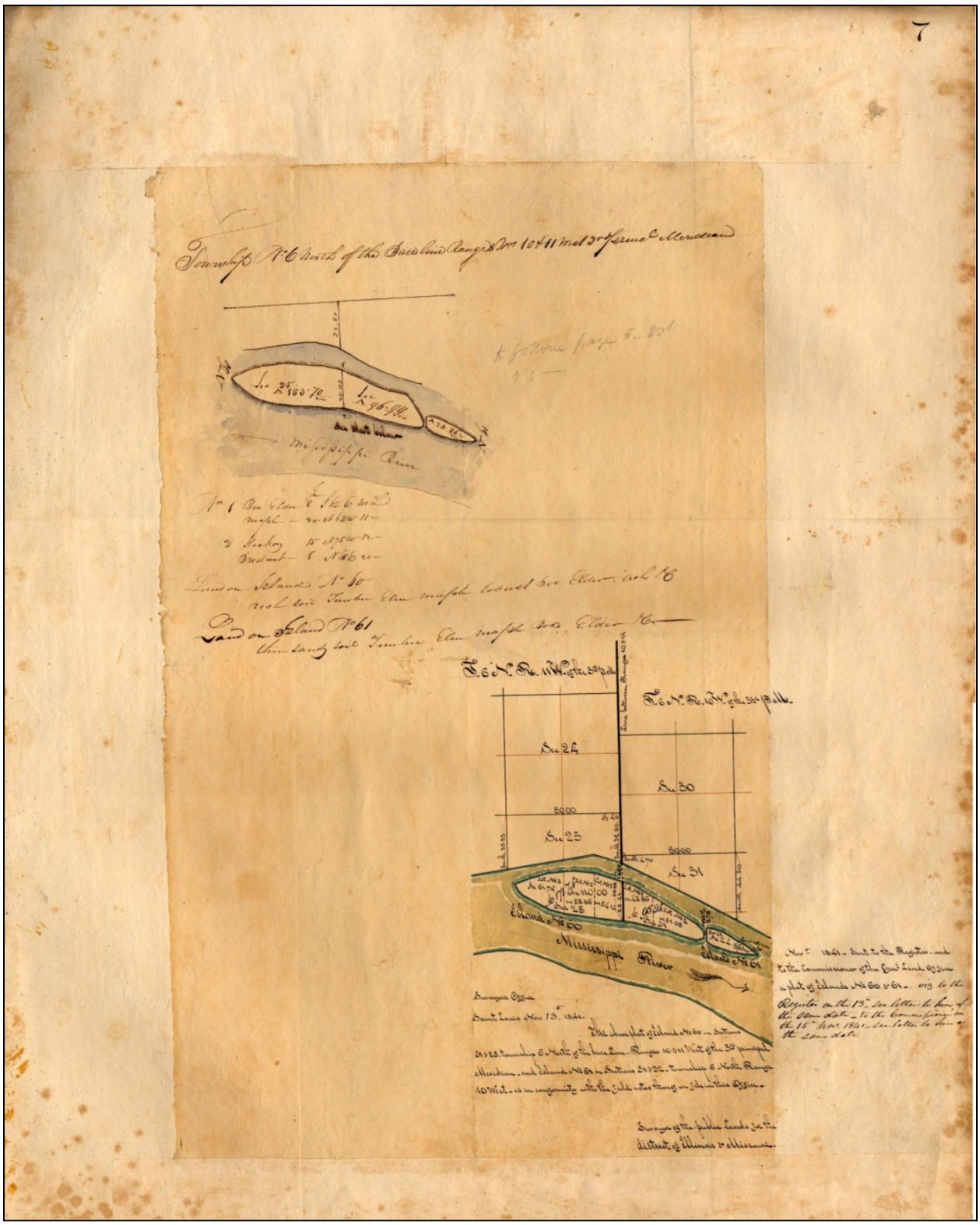


Figure 2. 1844 detail plat of Piasa and Little Piasa Islands.

Auguste Chouteau died in 1829, but it was 1839 before his probate was filed with the court. In April 1839 there was a St. Charles Circuit Court case for "the Partition of land of Auguste Chouteau, deceased; Piasa Island, also known as Isle de Paysa, in Mississippi River opposite Alton." Seven plaintiffs of the Paul and De Breuil families and eleven defendants of the Chouteau, Lawless, Smith, and Paul families are named. The outcome of the case is unknown, but at some point the island reverted to the Federal Government. Perhaps the initial Cerré claim was disallowed given the island's location in Illinois verses Missouri as he initially contended. Alternately, the Chouteau claim as Cerré's assignee may not have been upheld. It is tempting to associate the 1841 plat's notation about being sent to the Commission of the Land Grants Officer with the land's reversion to Federal ownership.

Three sale-cash patents under the Land Act of 1820 were issued for Piasa (i.e., Island No. 60). The first was for Track 2 in Jersey County to Joel Foster (12/1/1845), the second was for Tracks 1 and 3 in Jersey County to Peter Gutzweller (4/10/1848) and the third was to Lewis Moore for the rest of the island in Madison County (4/25/1871). There is also a patent for Little Piasa Island to Louis Stritz (3/19/1874).

One of the earliest topographic maps of the Middle Mississippi is the 1866 Warren map series. Sheet No. 18 shows the two Piasa Islands along with a small, perhaps nascent, Eagle's Nest Island (Sheet No. 18) (Figure 3).

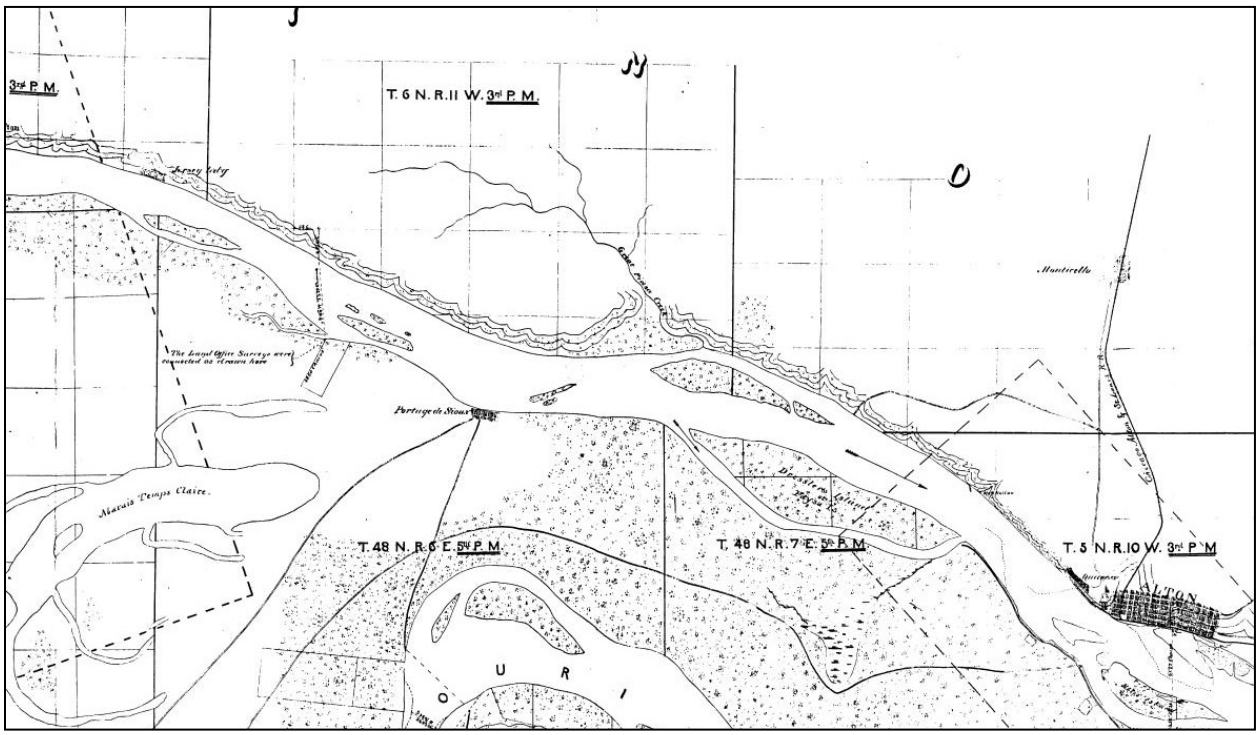


Figure 3. 1866 Warren map, Sheet No. 18.

The earliest detailed topographic representation and hydrographic chart of the project area is that of the Mississippi River Commission (1890 hydrology) (Figure 4).

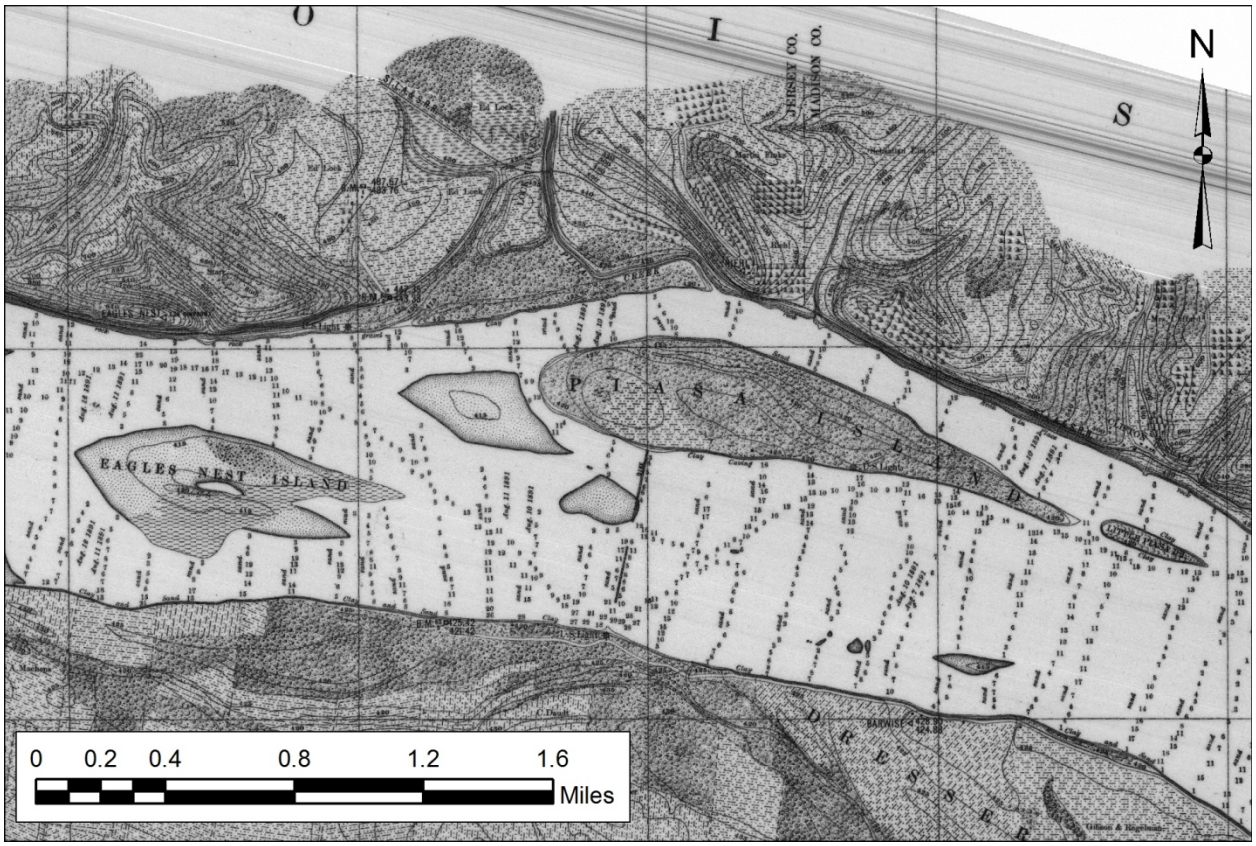


Figure 4. Mississippi River Commission, 1890, Chart 118.

By the end of the 19th century Piasa island was better known locally as "Scotch Jimmy's Island," sometimes spelled "Scotch Jimmie's Island" (e.g., Alton Evening Telegraph, May 17, 1906). Less frequently, it was also known as "Silver Island" (Alton Evening Telegraph, October 29, 1930:20). Scotch Jimmy was the nickname of James Powrie, a civil war veteran who had served in the 144 Illinois Infantry. The 1870 census for Jersey County lists him living with Ellen and Jane Powrie in Township 6N, Range 11W, which includes Piasa Island. He was reportedly born in Scotland in 1828 and died in 1903.

Piasa Island was the location of considerable Corps of Engineers work during the last quarter of the 19th century. Between 1875 and 1877 a submergible dam was built between the island and the Missouri shore (Report of the Chief 1881:1566). The intent was to force waterflow into the northern chute and thus create a good navigation channel during all flood stages. The presence of rock in the upper part of the chute prevented the necessary scour, however, and the structure was a failure (Report of the Chief 1895:1677). Moreover, the northern chute became increasingly difficult to navigate and eventually, during the high water of 1882, a large bar moved over its mouth and closed it off completely (Report of the Chief 1883:1183). Steamboats were forced to use the southern shoot by finding any depression that existed over

the dam. In an emergency effort, using funding originally intended for the improvement of Alton Harbor, the Corps decided to breach the dam next to the Missouri shore. An initial effort using a hydraulic excavator failed, but a second with a conventional dredge was successful. A 385 foot cut was made to a depth of six feet at low water. These efforts cost the government $2,750. Ironically, it was another break in the dam caused by winter ice that opened and became the main channel. In 1889, the Corps raised the remaining dike to six feet above low water, but left the two gaps in the hope that scour would further deepen the channel. For that effort, 2,505 cubic yards of stone was placed and $5,580 spent (Report of the Chief 1890:1966).

Accumulations of sand behind the dam, however, continued to make navigation dangerous and in 1893, 1600 feet of dam structure was removed entirely, with the rock being used to create a number of wing dams and for shoreline reinforcement (Report of the Chief 1895:1678). Additional work was performed to raise and repair the wing dams and to expand the shoreline revetment in subsequent years (e.g., Report of the Chief 1907:1562).

Industry

The need for lumber was cited in Cerré's initial grant application and Piasa Island doubtless continued to be harvested regularly. A 1906 newspaper account, for example, noted that the current owner of the island, Louis Young, had built a raft of 100 soft-timber logs (specifically soft maple, sycamore, and elm) and drifted down to St. Louis (Alton Evening Telegraph, March 9, 1906). Young was reportedly building another raft of 300 logs at the time. The account noted that the trip took eight hours and was accomplished with two rafters.

Another 1906 article lamented the loss of a famous cottonwood tree on the island (Alton Evening Telegraph, May 17, 1906). It had been hit by lightning three years previously and had slowly died. Mr. Young then cut it down for lumber. The account noted the prodigious size of the tree stating that the government officials had measured it and declared it the largest tree, in both height and girth, in the Mississippi Valley. It was over seventy-five feet higher than the other cottonwoods on the island. It had served as a valuable landmark to steamboat pilots and was a well known site of interest in the region.

The 1880 MRC map shows that approximately 26 acres of Piasa Island were under cultivation, while the remainder was forested (Figure 4). Interestingly, the same lot is still under cultivation in 1931 (Figure 5). In 1880 Eagle's Nest Island is mainly mud and sand flats. Its landmass, however, grows in size and by 1931 is forested. There is no indication it was ever cultivated.

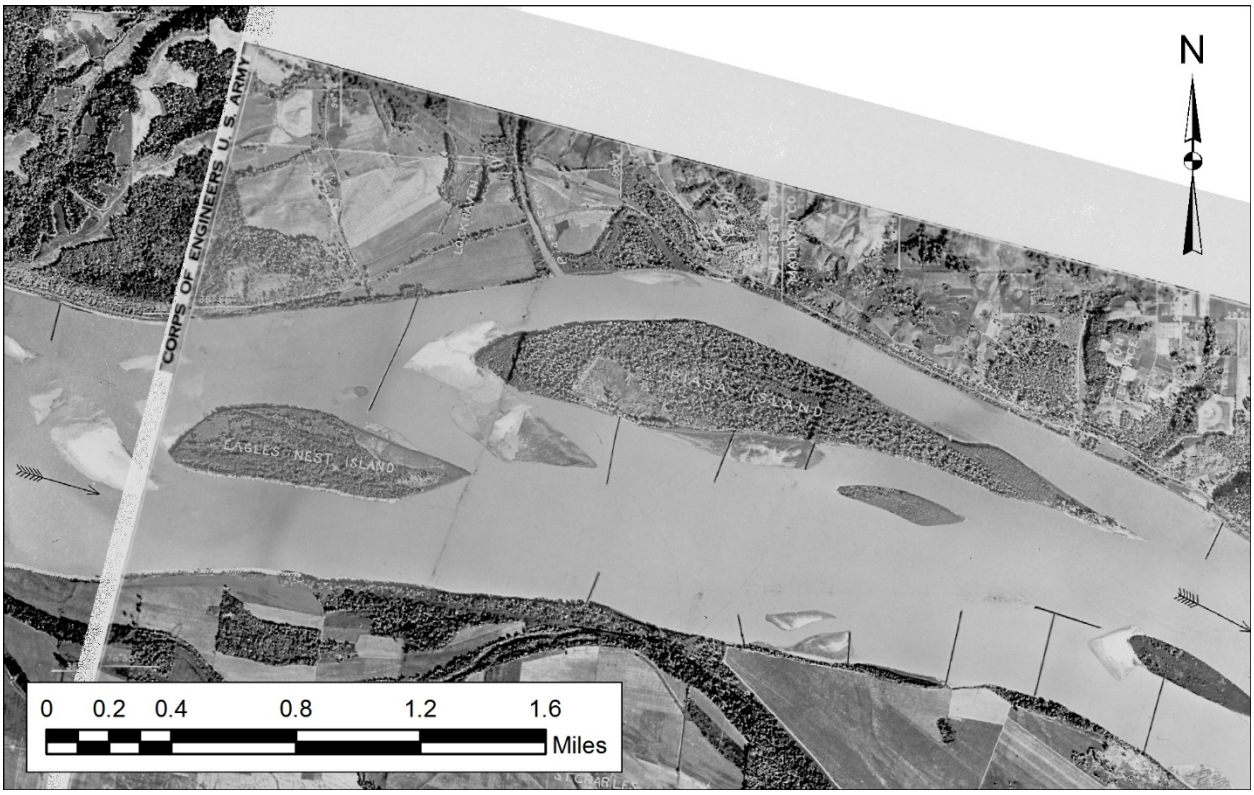


Figure 5. 1931 aerial photographs of project area.

Piasa Island was probably always used for recreation, in some form. In 1898 an outdoors club, the Nessmuck Club of Alton, leased the island for five years for use as a hunting and camping reserve (Forest and Steam 1898: 130).

An unusual use of the island occurred as the crowning feature of the entertainment program for the Illinois Pharmaceutical Association meetings in 1898, when it hosted a, then timely, recreation of the bombardment of Havana. A mock fort was built on "Scotch Jimmy's island" across from the hotel where the conference was held and was manned by students of the Western Military Academy along with two cannons. The island's assailants were members of the Illinois Yacht Club of Alton and twelve row boats manned by Alton Naval Reserves. Over two hundred dollars' worth of fireworks were employed for the occasion (Parsons 1898:851). There are references to a number of clubhouses on the island with a particularly large one at its lower end, the remnants of which were still visible at low water as late as the 1960s (Alton Evening Telegraph, August 13, 1969).

As part of the construction of Lock and Dam 26 and the creation of Pool 26, Piasa and the other islands in the project area were acquired by the government (Figure 6).

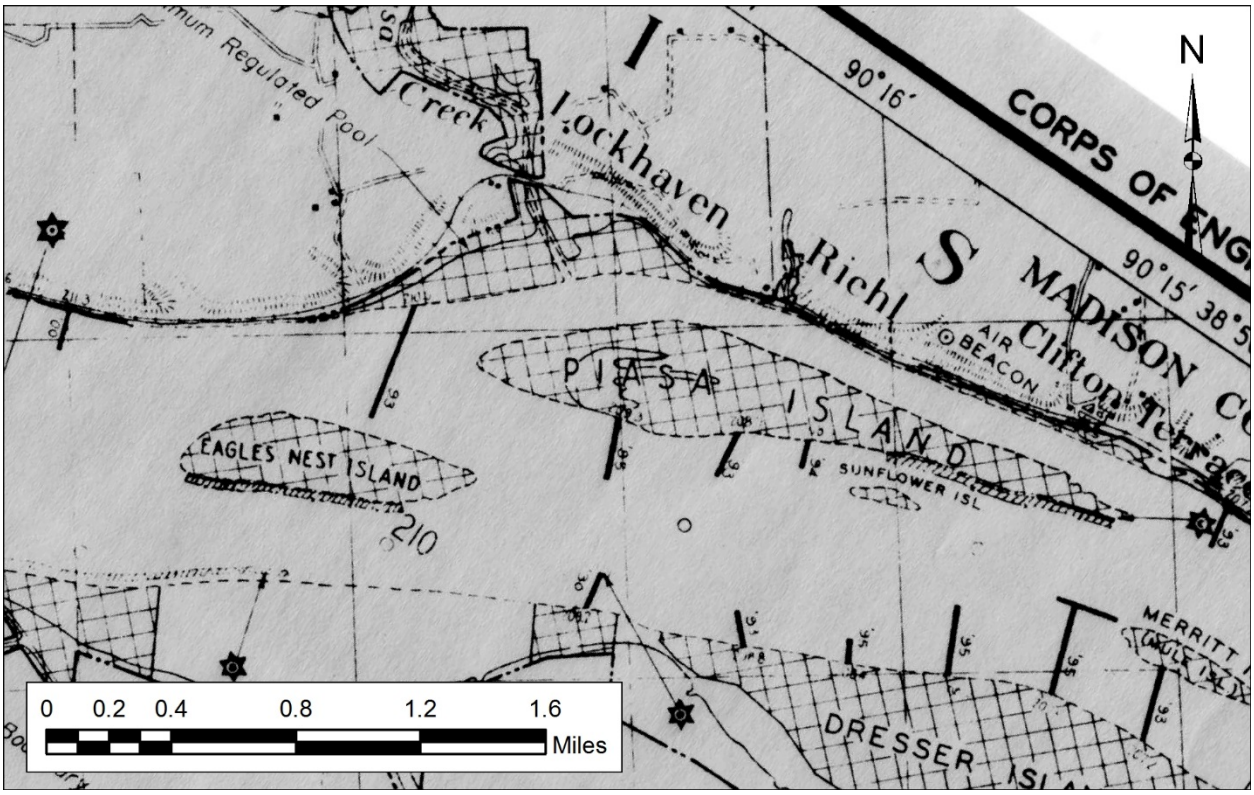


Figure 6. 1942 Corps of Engineer map showing land acquisition (hatches indicate title vested in federal government).

Shipwreck Inventory

Losses among the many steamboats that traveled the Mississippi River were high. Primary reasons for their destruction were snags, fires, and explosions. Indeed, the average longevity for steamboats has been calculated to be only six (Haites and Mak 1971:54) or seven (Hall 1885:181) years. For this reason insurance rates were also high, and many operators carried none; those that did typically only did so for two-thirds or three-quarters the value of the boat (Haites and Mak:1971:55-56).

As part of a 2003 USACE study, archival research documented six hundred and eighty seven (687) ships abandoned or reported lost prior to 1940 between Saverton, Missouri and the confluence of the Mississippi and Ohio Rivers. The information was obtained by James V. Swift from a variety of sources, including unsigned, undated wreck data in the files of the Waterways Journal (St Louis), nineteenth century correspondence and newspaper accounts, insurance records, official government surveys and reports, private accounts, and published research (Norris 2003). Typically, losses were reported within a general location (e.g., Scudder Towhead, Brewer Point), which was researched and when possible converted to approximate river miles.

The yearly mean for reported losses is just over five and half (5.5) with a peak in the 1850s to 1860s.

Between July and December of 1988, when the Mississippi River was at a particularly low level, the St. Louis District Corps of Engineers conducted aerial surveys of exposed wrecks between Saverton, Missouri, and the mouth of the Ohio River. Thirty four (34) historic wrecks were documented at that time. Since then, the Corps database has been updated several times when new wrecks are reported or when research provides new information on wreck location. A separate database of modern (i.e., metal) wrecks, or abandoned barges, which may pose a risk to navigation is also maintained by the Corps. The combined total of mapped locations is ninety (90).

The nearest known historic wreck is over nineteen (19) miles from the project area. The nearest known modern wreck is over twelve (12) miles away. The nearest reported wrecks are off Portage des Sioux and Elsah approximately a mile and a half and three miles upstream respectively. The *Car of Commerce* is reported to have been lost to a snag off Portage des Sioux on 5/8/1832 and the *Julia* reportedly exploded and burned off Elsah on 10/15/1914.

In one source, the steamer *Artemus Lamb* was described as "badly wrecked at Scotch Jimmy's Island" on 3/26/1896 due to a boiler explosion (The Locomotive, 1896:86). Two men were reported scalded, one fatally. The *Artemus Lamb* was built in 1873 and owned and operated by C. Lamb and Son of Clinton Iowa (Figure 7). According to one account she had a tow of eight barges of railroad ties when the boiler "let go" as she was "near the old dike crossing opposite Silver Island" (The Edwardsville Intelligencer, April 3, 1896). The vessel was not lost, however, and was eventually sold in 1898 to the Joy Lumber Company of St. Louis and later to C&EI railroad to handle barges at Joppa on the Ohio River (Blair 1930:178).

Figure 7. The steamer Artemus Lamb with an excursion party.

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Appendix G

Habitat Evaluation & Quantification

28 March 2017

Updated 15 June 2018

1. Introduction

This appendix presents an ecological habitat assessment of the project area and quantification, to the extent possible, of the aquatic and island ecological benefits resulting from the proposed alternatives for the *Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project* (Project). The evaluation was conducted by a multi-agency team of biologists from the U.S. Fish & Wildlife Service (USFWS); the Illinois Department of Natural Resources (ILDNR); and the U.S. Army Corps of Engineers (Corps), St. Louis District.

2. Habitat Benefit Evaluation Methods

The purpose of the habitat benefit evaluation is to evaluate and quantify, to the extent possible, environmental benefits of alternative plans for the aquatic and island habitat improvements within the Project. The evaluation was conducted by a multi-agency team. Aquatic and island benefits were quantified through the use of Engineering Circular 1105-2-412, *Assuring Quality of Planning Models* and habitat suitability index models for the least tern (Carreker, 1985), the smallmouth buffalo (Edwards & Twomey, 1982), and the striped bass (Crance, 1984). All three planning models are approved for regional and nationwide use by the USACE Ecosystem Planning Center of Expertise. The Habitat Suitability Index (HSI spreadsheet calculators for each of these models was reviewed by the Ecosystem Restoration Planning Center of Expertise and were recommended for regional use (Memorandum for CECW-MVD; 15 September 2016; Enclosure 1). The Corps Model Certification Panel concurred and the spreadsheet calculators were approved for use (email dated 4 October 2016; Enclosure 2). Consistent with guidance from the USACE Ecosystem Planning Center of Expertise, the Agency Technical Review (ATR) Team for the Piasa and Eagle's Nest Island HREP will conduct an assessment of the models used for this project. This process will evaluate the technical quality and appropriateness of the models utilized.

2.1 Quantity Component

Traditionally, the Corps has used the quantity and quality of habitat jointly, in the form of habit units, to measure benefits provided by ecosystem restoration projects. The quantity portion is often measured as area (acres of habitat, landform, etc.) or number of species; in some systems, it is measured as length (feet of stream bank). The evaluation conducted for the Project uses acres, delineated by polygons, to represent the quantity. The area associated with each proposed measure must have a clear definition for use as guidance in estimating the area component of the ecosystem output model, and must be applied consistently to all actions evaluated.

For this Project, different scales of area were considered to determine which would be the most suitable area metric to use in the analysis. Table 1 summarizes the capabilities and limitations of each. For this Project it was determined, of the three scales considered, using area of restored process is the optimal approach to estimating ecological benefits beyond the specific action footprint with the least amount of uncertainty. The team determined that the action footprint would grossly underestimate the spatial extent of habitat benefits provided by the Project. Estimating the potential area of influence scale was

considered too uncertain and speculative. Table 2 defines the area of restored process for each project measure at the proposed action locations.

Table 1. Different scales of areas considered for use.

Scale	Description	Capability	Limitation
Action Footprint	Measurement of physical footprint of the project feature	Accurately quantified with a high degree of certainty	Grossly underestimates the spatial extent of ecological benefit
Area of Restored Process	Area directly affected by the restoration process; includes footprint + processes	Accurately quantified with high level of certainty for some measures; and more fully captures the area that would experience ecological benefits	Difficult to quantify with certainty for some measures
Potential Area of Influence	Area that could benefit from the process restoration provided by the action; could extend beyond the area of restored process to the greater ecosystem	Fully captures the area of ecological benefits of a given measure	Not feasible to estimate with any degree of certainty and consistency

Table 2. Process restored and area of restored process for each project feature

Project Feature	Process Restored	Area of Restored Process (Evaluation Location)
Piasa Chute Excavation	Hydrology – flow, velocity, sediment transport, bathymetric diversity	Side Channel habitat delineated from UMRR-LTRM Stratum and the Corps, St. Louis District Master Plan
Notched Rock Structure	Hydrology – flow, velocity, sediment transport, bathymetric diversity	
Piasa Island Backwater Dredging	Habitat connectivity; connected spawning, rearing, and overwintering fish habitat	Excavated area plus area of direct influence from the connected habitat. This includes the entire backwater as delineated from the Corps, St. Louis District Master Plan
Island Diversity	Habitat structure; sediment capture	Direct footprint of non-forested/ sandbar islands at $\geq$ 420.57 feet NAVD88

2.2 Quality of Benefits

The methodology utilized for evaluating benefits to aquatic and island habitat incorporates the Habitat Evaluation Procedures (HEP) format, which was developed by the USFWS. HEP is a habitat-based evaluation methodology used in project planning. The procedure documents the quality and quantity of available habitat for selected fish and wildlife species. The qualitative component of the analysis is known as the habitat suitability index (HSI) and is rated on a 0.0 to 1.0 scale, with higher values indicating better habitat for that species. The HSI for a particular habitat type is determined by selecting values that reflect present and future project area conditions from a series of abiotic and biotic metrics. Each value corresponds to a suitability index for each species. Future values are determined using management plans, historical conditions, and best professional judgment. The quantitative component is the number of acres of the habitat being evaluated. From the calculated qualitative and quantitative values, the standard unit of measure, the habitat unit (HU) is calculated using the formula (HSI × Acres = HUs). Habitat units are calculated for specific target years to forecast changes in habitat values over the life of the project with- and without-project conditions. For the purpose of planning, design, and impact analysis, the period of analysis was established as 50 years. To facilitate comparison, target years were established at 0 (existing conditions), 1, 5, 25, and 50 years. When HSI scores are not available for each year of analysis, a formula that requires only target year HSI and area estimates is used (USFWS, 1980). This formula is:

$$\int_0^T HU\ dt \equiv (T_2 - T_1)\left[\left(\frac{A_1H_1 + A_2H_2}{3}\right) + \left(\frac{A_2H_1 + A_1H_2}{6}\right)\right]$$

Where:

$$\int_0^T HU\ dt = CumulativeHUs$$

T_1= first target year of time interval
T_2 = last target year of time interval
A_1 = area of available habitat at beginning of time interval
A_2 = area of available habitat at end of time interval
H_1 = habitat suitability index at the beginning of time interval
H_2 = habitat suitability index at end of the time interval
3 and 6 = constants derived from integration of HSI × Area for the interval between any two target years

This formula was developed to precisely calculate cumulative HUs when either HSI scores, area, or both, change over a time interval, which is common when dealing with the unpredictable fluctuations found in nature. Habitat Unit gains or losses are annualized by summing the cumulative HUs calculated using the above equation across all target years in the period of analysis and dividing the total (cumulative HU) by the number of years in the period of analysis (i.e., 50 years). This calculation results in the Average

Annual Habitat Units (AAHUs) (USFWS, 1980). AAHUs are used as the output measurement to compare features and alternatives for the proposed Project.

The benefits of each proposed project measure (net AAHUs) are then determined by subtracting with-project benefits from without-project benefits. The effects of various project measure combinations (alternatives) can then be evaluated by comparing the net AAHUs and costs for each alternative considered.

In preparation of using the HSI models, the evaluation team conducted a site visit, reviewed aerial photography, topographic maps, and used the results from physical and numerical hydraulic modeling as well as the long-term data set for water quality and fish courtesy of the Upper Mississippi River Restoration Program Long Term Resource Monitoring element. During the evaluation, assumptions were developed regarding existing conditions and projected with-project conditions relative to habitat changes over time and management practices.

1. **Side Channel Habitat**. The Corps approved (per EC 1105-2-412), striped bass HSI model (Crance, 1984) was used to assess the side channel habitat benefits resulting from the excavation of Piasa Chute and installation of a notched rock structure between Piasa and Eagle's Nest Islands. These Project measures were developed to increase flow, depth, bathymetric diversity, and sediment transport. The striped bass (*Morone saxatilis*), in the family Moronidae, has been successfully stocked throughout the United States. This fluvial dependent species prefers cool, well-oxygenated water and cannot tolerate poor water quality (MDC, 2016). Water current is an attractant for striped bass preparing to spawn (Crance, 1984).

   The following assumptions where made when applying the *Striped Bass HSI Model*. For more detailed descriptions, the excel spreadsheet is available upon request.

   Baseline Condition: Detailed water quality data were collected by the Upper Mississippi River Restoration Program Long Term Resource Monitoring (UMRR-LTRM) element from 1993 to present. These data are randomly stratified and collected throughout the year; therefore, it was assumed that data collected was representative of the entire side channel.

   Future Without Project Condition: Future conditions of the side channel were based on the average sedimentation rate calculated from an ISOPACH analysis. This analysis estimated that Piasa Chute has lost 0.14 feet per year between 2006 and 2013; therefore, it was assumed this sedimentation rate would continue during the period of analysis. In terms of surface area extent of the side channel, based on historic imagery it was assumed the surface area of the side channel would remain the same throughout the period of analysis, but the quality of the habitat would change through time.

   Future With Project Condition: The proposed final depth of Piasa Chute is 10 feet below minimum pool. The team took a conservative approach and assumed the same sedimentation rate of 0.14 feet/year; however, the dredging the side channel is estimated to

increase the average depth of Piasa Chute by 6 feet. The team used existing UMRR-LTRM data collected from the Project with the same depth as what is expected with proposed project depths. These data were used to forecast dissolved oxygen levels and water temperature during the period of analysis. Results from the 2D numeric hydraulic modeling effort (at 159,000 cfs) were used to estimate the average current velocity of the project alternatives. The 2D numerical model results showed that the notched rock structure would provide more velocity within Piasa Chute as compared to alternatives without the rock structure. Rock used to build the notched rock structure would increase habitat structure for fish and macroinvertebrate habitat as well. Most importantly perhaps is the continued structure and function of the side channel complex. With the Proposed Project, some acres of existing side channel habitat would be converted to island habitat (varies between considered action alternatives), depending on the amount of dredge disposal material available to build islands.

2. **Backwater Habitat.** The Corps approved (EC 1105-2-412) smallmouth buffalo HSI model (Edwards & Twomey, 1982) was used to assess the backwater habitat benefits from the Piasa Island Backwater excavation. The smallmouth buffalo (*Ictiobus bubalus*), in the family Catostomidae, is an important commercial fish in the Mississippi River drainage basin. This species occurs in deep, flowing water, as well as sloughs, oxbow lakes and other backwaters for resting, spawning, and rearing. They feed on organisms in the substrate of large rivers and backwater lakes. This species was selected because it requires backwaters and off-channel areas to complete important life history stages.

   The following assumptions in applying the *Smallmouth Buffalo HSI Model* were made. For more detailed descriptions of the assumptions made for each model parameter for a given alternative, the excel spreadsheet is available upon request.

   Baseline Condition: Detailed water quality data were collected by the Upper Mississippi River Restoration Long Term Resource Monitoring element from 1993 to present. These data are randomly stratified and collected throughout the year; therefore, it was assumed that data collected was representative of the entire backwater. Using UMRR-LTRM the average depth of the backwater is 1.25-3.5 feet.

   Future Without Project Condition: Future conditions of Piasa Island Backwater were based on calculated sedimentation rates from a nearby backwater and from historic aerial imagery. The sedimentation rate was calculated by the Corps at Brickhouse Slough/Dresser Island HREP within Pool 26 at 0.5 inches/year (Simons, Simons, Ghaboosi, & Chen, 1988). However, using this sedimentation rate to forecast into the future seems a bit unreasonable based on historic imagery analysis which shows the backwater persisting for more than 25 years with minimal change in surface area. Therefore, the team assumed a more conservative loss of backwater acres over time. From 1993-2013, 37% of all samples collected by UMRR-LTRM were less than 2.0 feet in the backwater. With this information the team assumed that by year 50, 37% of the backwater would be lost (areas less than 2 feet) or approximately 18 acres (or 0.36

acres per year). Consequently, available habitat structure and cover, food production, and potential spawning and rearing habitat for fish would be reduced.

Future With Project Condition: The proposed depth of Piasa Island Backwater is 10 feet below minimum pool, which would provide adequate depths to be present for overwintering fish habitat. The team assumed that dredging the entrance of the backwater would increase circulation of water throughout the backwater improving temperature, slightly increasing velocity, and reducing sedimentation. The team assumed the loss of backwater acres during the period of analysis would be less as compared to the FWOP. Most importantly perhaps is the continued structure and function of the backwater complex.

3. **Island Habitat.** The Corps approved (EC 1105-2-412) least tern HSI model (Carreker, 1985) was used to assess the non-forested/sandbar island habitat benefits resulting from building islands using the dredge disposal material and island stone protection. The interior least tern (*Sterna antillarum*) is a federally endangered bird species. Least terns nest on barren to sparsely vegetated sandbars along rivers, sand and gravel pits, lake and reservoir shorelines, and occasionally gravel rooftops. They hover over and dive into standing or flowing water to catch small fish. This species was selected because it requires bare or sparsely vegetated sandbars and islands for nesting habitat, and they are known to nest on artificial habitat within Pool 26.

   The following assumptions were made when applying the *Least Tern HSI Model*. For more detailed descriptions of the assumptions made for each model parameter for a given alternative, the excel spreadsheet is available upon request.

   Baseline Condition: The Project and surrounding areas have numerous different types of wetlands, including forested wetland, emergent wetland, and shallow water areas. Within the Project, Piasa and Eagle's Nest Islands are forested islands with areas of emergent wetlands, and small sand bar islands are currently forming within Piasa Chute. Prior to the construction of lock and dam 26, several islands were present within the complex, but are now inundated. The existing sandbar islands are at low elevations and are comprised primarily of sand, with some silt and larger fragmentary material. One island has established woody vegetation. The head of Piasa Island is at an average elevation of 420.57 feet NAVD88. The team decided to use this existing elevation as the basis for the target elevation of the proposed island restorations. Currently, 0.5 acres of sandbar island habitat exists at greater than 420.57 feet NAVD88. Based on historic aerial imagery it appears that the sandbar island habitat within Piasa Chute builds up vegetation, but then flood events remove the vegetation periodically.

   Future Without Project Condition: Without the project, the team assumed that the historic islands would remain inundated; therefore, the Project area would provide minimal sandbar island habitat into the future. The team assumed the existing sandbar islands would remain into the future but be subject to degradation and aggradation based on flood events; but overall it was assumed the total number of acres situated higher than 420.57 feet NAVD88

would remain at that elevation into the future. The team assumed that overtime, the existing vegetated island would continue to capture organic material, and the substrate would become more silt/clay, which is less suitable substrate for least tern nesting activity.

Future With Project Condition: With the project, additional acreage of sandbar island habitat would be constructed at elevation 420.57 feet NAVD88. These islands would be restored to historic locations and in areas of existing low shear stress based on the hydraulic model outputs. Building of the islands would convert existing open water habitat to sandbar island habitat. The team assumed that these newly restored islands would be bare and made of sand. It was recognized that through time vegetation may become established on the islands, but the team assumed periodic flooding and/or physical removal through vegetation management would retain the target characteristics of the islands (e.g., bare, sandy, low vegetation height). The team did assume that some silt and clay would collect on the islands through time. The team assumed that the stone protection on the restored islands would lock the islands in place and allow for the total acres of island habitat to be maintained throughout the period of analysis. Acres of island habitat restored would vary among considered action alternatives based on the amount of dredge disposal material available to build islands.

2.3 General Assumptions

1. It was assumed that target years of 0 (existing condition), 1, 5, 25, and 50 (future without and future with project conditions) are sufficient to analyze HUs and characterize habitat changes over the estimated period of analysis. The period of analysis was determined to be 50 years based on the prediction that some project features (e.g., development of key ecological processes needed to restore ecosystem structure and function) would need a longer period of time to reach maximum benefits; and the accrual of benefits were predicted to level off after 50 years.
2. The team assumed that the main channel habitat (as defined by the UMRR-LTRM stratum) would not be affected by the proposed alternatives; therefore, these acres of main channel habitat within he Project Area were not evaluated for habitat benefits.
3. The team assumed that existing forested island habitat within the Project Area would not be affected by the proposed alternatives; therefore these acres of forested island habitat within the Project Area were not evaluated for habitat benefits.

3. Results

Chapter 5 of the main report, *Evaluation of Feasible Project Measures & Alternative Formulation,* describes each potential Project measure in detail. The Project planning team screened several measures and measures were combined based on the 2D hydraulic model before the habitat quantification exercise.

3.1 Total Habitat Benefits

Table 3 provides a summary of the total net AAHUs for each considered alternatives.

Table 3. Net average annualized habitat units (rounded) for each considered alternative

Alt	Alternative Description	Islands Net AAHUs Least Tern	Side Channel Net AAHUs Striped Bass	Backwater Net AAHUs Smallmouth Buffalo	TOTAL Net AAHUs
1	No Action (future without project)	0.0	0.0	0.0	0.0
2	Braided 200 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity	55.3	302.2	9.0	366.5
3	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	62.7	302.2	11.4	376.3
4	Braided 200 Ft Piasa Chute+ Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	55.3	365.4	9.5	430.1
5	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	62.7	355.6	11.9	430.2
6	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity	61.3	346.6	9.4	417.4
7	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	68.7	337.2	11.9	417.8
8	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	61.3	376.5	9.8	447.6
9	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	68.7	366.4	12.3	447.4

3.2 Side Channel Benefits.

Table 4 provides the final suitability index (SI), acres for each alternative, cumulative habitat units, gross AAHUs, and net AAHUs (ecological lift) for each target year under consideration.

3.2 Backwater Benefits.

Table 5 provides the final suitability index, acres for each alternative, cumulative habitat units, gross AAHUs, and net AAHUs (ecological lift) for each target year under consideration.

3.3 Island Benefits

Table 6 provides the final suitability index, acres for each alternative, cumulative habitat units, gross AAHUs, and net AAHUs (ecological lift) for each target year under consideration.

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Table 4. Benefit Evaluation Results for side channel habitat – Striped Bass HSI. The Recommended Plan is highlighted in gray.

Alt	Alternative Description	Condition	Year	SI	Acres	Cumulative HUs	Total Cumulative HUs	AAHUs (Total Cumulative HUs/50 years)	Net AAHUs
1	No Action (future without project)	Existing	0	0.75	562.39		5029.17	100.58	0.00
		FWOP	1	0.72	562.39	411.95			
			5	0.57	562.39	1439.72			
			25	0.00	562.39	3177.50			
			50	0.00	562.39	0			
2	Braided 200 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity	Existing	0	0.75	562.39		20138.44	402.77	302.19
		With Project	1	1.00	485.96	457.06			
			5	1.00	485.96	1943.84			
			25	1.00	485.96	9719.20			
			50	0.32	485.96	8018.34			
3	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	Existing	0	0.75	562.39		20138.44	402.77	302.19
		With Project	1	1.00	485.96	457.06			
			5	1.00	485.96	1943.84			
			25	1.00	485.96	9719.20			
			50	0.35	485.96	8018.34			
4	Braided 200 Ft Piasa Chute+ Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.75	562.39		23297.18	465.92	365.34
		With Project	1	1.00	485.96	457.06			
			5	1.00	485.96	1943.84			
			25	1.00	485.96	9719.20			
			50	0.84	485.96	11177.08			
5	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.75	562.39		22811.68	456.23	355.65
		With Project	1	1.00	475.73	452.37			
			5	1.00	475.73	1902.92			
			25	1.00	475.73	9514.60			
			50	0.84	475.73	10941.79			
6	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity)	Existing	0	0.75	562.39		22360.81	447.22	346.63
		With Project	1	1.00	477.55	453.21			
			5	1.00	477.55	1910.20			
			25	1.00	477.55	9551.00			
			50	0.75	477.55	10446.41			
7	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	Existing	0	0.75	562.39		21886.82	437.74	337.15
		With Project	1	1.00	467.32	448.52			
			5	1.00	467.32	1869.28			
			25	1.00	467.32	9346.40			
			50	0.75	467.32	10222.63			
8	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.75	562.39		23853.16	477.06	376.48
		With Project	1	1.00	477.55	453.21			
			5	1.00	477.55	1910.20			
			25	1.00	477.55	9551.00			
			50	1.00	477.55	11938.75			
9	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.75	562.39		23347.20	466.94	366.36
		With Project	1	1.00	467.32	448.52			
			5	1.00	467.32	1869.28			
			25	1.00	467.32	9346.40			
			50	1.00	467.32	11683.00			

Table 5. Benefit Evaluation Results for backwater habitat – Smallmouth Bass HSI. The Recommended Plan is highlighted in gray.

Alt	Alternative Description	Condition	Year	SI	Acres	Cumulative HUs	Total Cumulative HUs	AAHUs (Total Cumulative HUs/50 years)	Net AAHUs
1	No Action (future without project)	Existing	0	0.80	49.20		1157.00	23.14	0.00
		FWOP	1	0.80	48.84	39.39			
			5	0.80	47.40	153.98			
			25	0.68	40.20	647.87			
			50	0.00	31.20	315.76			
2	Braided 200 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity	Existing	0	0.80	49.20		1608.70	32.17	9.03
		With Project	1	0.85	48.90	40.46			
			5	0.84	47.70	162.92			
			25	0.78	41.70	727.16			
			50	0.64	34.20	678.15			
3	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	Existing	0	0.80	49.20		1728.45	34.57	11.43
		With Project	1	0.82	48.95	39.85			
			5	0.82	47.95	158.93			
			25	0.82	42.95	744.34			
			50	0.76	36.70	785.33			
4	Braided 200 Ft Piasa Chute+ Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.80	49.20		1631.41	32.63	9.49
		With Project	1	0.85	48.90	40.68			
			5	0.85	47.70	164.85			
			25	0.80	41.70	737.21			
			50	0.65	34.20	688.67			
5	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.80	49.20		1753.10	35.06	11.92
		With Project	1	0.83	48.95	40.06			
			5	0.83	47.95	160.81			
			25	0.83	42.95	754.65			
			50	0.77	36.70	797.58			
6	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity)	Existing	0	0.80	49.20		1628.32	32.57	9.43
		With Project	1	0.85	48.90	40.68			
			5	0.85	47.70	164.70			
			25	0.79	41.70	735.77			
			50	0.65	34.20	687.17			
7	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	Existing	0	0.80	49.20		1749.72	34.99	11.85
		With Project	1	0.83	48.95	40.06			
			5	0.83	47.95	160.66			
			25	0.83	42.95	753.17			
			50	0.77	36.70	795.83			
8	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.80	49.20		1647.23	32.94	9.80
		With Project	1	0.85	48.90	40.68			
			5	0.85	47.70	165.03			
			25	0.81	41.70	742.83			
			50	0.66	34.20	698.69			
9	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.80	49.20		1770.84	35.42	12.28
		With Project	1	0.83	48.95	40.06			
			5	0.83	47.95	160.99			
			25	0.84	42.95	760.56			
			50	0.78	36.70	809.23			

Table 6. Benefit Evaluation Results for island habitat – Least Tern HSI. The Recommended Plan is highlighted in gray.

Alt	Alternative Description	Condition	Year	SI	Acres	Cumulative HUs	Total Cumulative HUs	AAHUs (Total Cumulative HUs/50 years)	Net AAHUs
1	No Action (future without project)	Existing	0	0.80	0.50		1.20	0.02	0.00
		FWOP	1	0.80	0.50	0.4			
			5	0.00	0.50	0.8			
			25	0.00	0.50	0			
			50	0.00	0.50	0			
2	Braided 200 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity	Existing	0	0.80	0.50		2764.25	55.28	55.26
		With Project	1	1.00	76.43	35.88			
			5	1.00	76.43	305.72			
			25	0.80	76.43	1375.74			
			50	0.30	76.43	1046.90			
3	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	Existing	0	0.80	0.50		3134.21	62.68	62.66
		With Project	1	1.00	86.66	40.68			
			5	1.00	86.66	346.64			
			25	0.80	86.66	1559.88			
			50	0.30	86.66	1187.03			
4	Braided 200 Ft Piasa Chute+ Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.80	0.50		2764.25	55.28	55.26
		With Project	1	1.00	76.43	35.88			
			5	1.00	76.43	305.72			
			25	0.80	76.43	1375.74			
			50	0.30	76.43	1046.90			
5	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.80	0.50		3134.21	62.68	62.66
		With Project	1	1.00	86.66	40.66			
			5	1.00	86.66	346.64			
			25	0.80	86.66	1559.88			
			50	0.30	86.66	1187.03			
6	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity)	Existing	0	0.80	0.50		3068.39	61.37	61.34
		With Project	1	1.00	84.84	39.81			
			5	1.00	84.84	339.36			
			25	0.80	84.84	1527.12			
			50	0.30	84.84	1162.10			
7	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	Existing	0	0.80	0.50		3438.35	68.77	68.74
		With Project	1	1.00	95.07	44.58			
			5	1.00	95.07	380.28			
			25	0.80	95.07	1711.26			
			50	0.30	95.07	1302.23			
8	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.80	0.50		3068.39	61.37	61.34
		With Project	1	1.00	84.84	39.81			
			5	1.00	84.84	339.36			
			25	0.80	84.84	1527.12			
			50	0.30	84.84	1162.10			
9	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	Existing	0	0.80	0.50		3438.35	68.77	68.74
		With Project	1	1.00	95.07	44.58			
			5	1.00	95.07	380.28			
			25	0.80	95.07	1711.26			
			50	0.30	95.07	1302.23			

Table 1. Net average annualized habitat units (rounded) for each considered alternative

Alt	Alternative Description	Islands	Side Channel	Backwater	TOTAL Net AAHUs
		Least Tern	Striped Bass	Smallmouth Buffalo	
1	No Action (future without project)	0.00	0.00	0.00	0.00
2	Braided 200 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity	55.3	302.2	9.0	366.5
3	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	62.7	302.2	11.4	376.3
4	Braided 200 Ft Piasa Chute+ Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	55.3	365.3	9.5	430.1
5	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	62.6	355.7	11.9	430.2
6	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity	61.3	346.6	9.4	417.4
7	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity	68.7	337.2	11.9	417.8
8	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Notched Rock Structure + Island Diversity	61.3	376.5	9.8	447.6
9	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity	68.7	366.4	12.3	447.4

ENCLOSURE 1

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

REPLY TO
ATTENTION OF:

CEMVD-PD-L 15 September 2016

MEMORANDUM FOR CECW-MVD (Redican)

SUBJECT: Recommendation for Regional Use Approval of 11 Spreadsheet Calculators for Application of Regionally Approved Habitat Suitability Index Models

1. References:
   a. Engineer Circular 1105-2-412: Assuring Quality of Planning Models, dated 31 March 2011.
   b. Final Planning Model Quality Assurance Review Comment Response Record for 11 Habitat Suitability Index Model Calculators, USACE (Encl 1).
   c. Ecosystem Restoration Model Library, Habitat Suitability Index Models

2. The National Ecosystem Restoration Planning Center of Expertise (ECO-PCX) evaluated spreadsheet calculators for the black capped chickadee, bullfrog, creek chub, fox squirrel, gray squirrel, least tern, smallmouth bass, smallmouth buffalo, striped bass, white bass, and wood duck habitat suitability index models following reference 1.a. Based on the review results (Encl 1), the ECO-PCX recommends Regional Use Approval of all spreadsheet calculators for use in the geographic area defined for each model. Please log in this recommendation with the Office of Water Project Review for the Model Certification Team to consider.

3. The black capped chickadee, bullfrog, creek chub, fox squirrel, gray squirrel, least tern, smallmouth bass, smallmouth buffalo, striped bass, white bass, and wood duck habitat suitability index models are approved for regional use per EC 1105-2-412 (Reference 1.c.). However, software was lacking which would allow planners to apply the models in a computational correct fashion for individual projects. Consequently, MVP, MVR, and MVS collaborated to develop a library of Microsoft Excel spreadsheet calculators. Each spreadsheet calculator is an independent spreadsheet built using the same variables, habitat suitability index curves, aggregation equations, and habitat cover types as displayed in the approved model documentation. Furthermore, all spreadsheet calculators employed a similar development scheme to include consistent use of formatting, input requirements, and output display. Each calculator includes user documentation or a link to a user's guide, and employs best spreadsheet practices.

4. The ECO-PCX and biologists from MVP, MVR, and MVS reviewed each spreadsheet calculator independently to assess the degree to which the spreadsheets meet the system quality and usability criteria in accordance with EC 1105-2-412. The spreadsheet development team and the spreadsheet reviewers included individuals with expertise in habitat benefit evaluations, Habitat Evaluation Procedures, plan formulation policies, and software/spreadsheet programming and auditing. Review results are found in the Final Planning Model Quality Assurance Review Comment Response Record for 11 Habitat Suitability Index Model Calculators, USACE (Encl 1).

Review of the spreadsheet calculators resulted in 72 total comments. All comments were related to the system quality and usability of the model, all were of low to medium significance, and all evaluations resulted in concurrence with the comments. The ECO-PCX reviewed the comments, evaluations, and revisions made to the model. All were made to the satisfaction of the ECO-PCX and are in alignment with the requirements of assuring the quality of planning models. The following summarizes the overall review and modifications made to the spreadsheets to improve system quality and usability.

SUBJECT: Recommendation for Regional Use Approval of 11 Spreadsheet Calculators for Application of Regionally Approved Habitat Suitability Index Models

Overall, the calculators were found to function well and included simple and easy-to-use interfaces. Most importantly, the variables, suitability index curves, aggregation equations, and habitat cover types match the technical model documentation. The review resulted in several minor to moderate revisions to improve clarity for the user, reduce potential calculation errors, and improve the quality of the spreadsheets.

- All spreadsheets are locked so only identified input cells are available for modification.
- Requirement to include all inputs prior to population of an overall HSI score.
- Model documentation was made available to the user within the spreadsheet.
- Data validation was included for all input cells.
- HSI curves were added to the user documentation to increase transparency.
- Discrepancies between the variables in the model documentation and those in the calculators were identified and fixed.

5. The spreadsheet calculators have sufficient system quality and usability. The models are all encoded in MS Excel. The spreadsheets are computationally correct and employ best spreadsheet practices including cell locking, highlighting input/calculation/output cells, and data validation. Error messages display appropriately when erroneous inputs are attempted and final scoring is displayed and easy to understand. The models are transparent and would allow for verification of inputs and outputs. User documentation is available and sufficient to implement the technique and use the spreadsheets. The spreadsheets will be maintained by the ECO-PCX on the Ecosystem Restoration Model Library. During application input and output scores should be documented and ATR teams charged with review to ensure the application of the model and its associated parts is appropriate.

6. The ECO-PCX finds the spreadsheet calculators for the black capped chickadee, bullfrog, creek chub, fox squirrel, gray squirrel, least tern, smallmouth bass, smallmouth buffalo, striped bass, white bass, and wood duck habitat suitability index models has sufficient system quality, meets usability criteria, and maintains the already approved technical quality of the models. The ECO-PCX recommends Regional Use Approval of all spreadsheet calculators for use in the geographic area defined for each model. Please notify the ECO-PCX of the Model Certification Panel's findings.

Gregory Miller

Encls (1)

Gregory Miller
Operating Director
National Ecosystem Restoration
Planning Center of Expertise

CF (without enclosures)
CECW-PC (Paynes, Coleman, Matusiak, Trulick, Bee)
CECW-MVD (Brown, Hanneken, Turner)
CEMVD-PD (Chewning, Lachney, Miller, Young)
CEMVP-PD-C (Johnson, Clark, Allen, Jordan, Popkin, McFarlane)
CEMVP-PD-P (Barr, McCain, Herzog, McGuire, Simmons, Ingvalson)
CEMVP-PD-F (Knollenberg, Richards, Opsahl, Savage)

ENCLOSURE 2

From: Richards, Nathan S MVR
To: Redican, Joseph H HQ02; Hanneken, Charles D HQ; Chewning, Brian MVD; Lachney, Fay V MVD; Young, Gary L MVD; Johnson, Brian L MVS; McFarlane, Aaron M MVP; Knollenberg, Camie A MVP @ MVR; Opsahl, Katie MVP; Savage, Monique E MVR; Barr, Kenneth A MVP @ MVR; Mccain, Kathryn MVP @ MVS; Herzog, Kathryn MVP @ MVR; McGuire, Benjamin MVP; Simmons, Shane M MVP @ MVS; Ingvalson, Derek MVP; Turner, Matthew E MVD; Allen, Teri C MVS; Clark, Steven J MVP; Jordan, Joseph W MVP @ MVR; Popkin, Breann; Miller, Gregory B MVD; Hubbell, Marvin E MVR
Subject: RE: Model Recommendation - MVD - 11 HSI Spreadsheet Calculators - Regional Use Approval
Date: Wednesday, October 05, 2016 10:42:31 AM

All --

Good news! The HSI spreadsheet calculators recommended for regional use in the RPEDN were approved by the HQ Model Certification Team. Thank you to all of you in MVP, MVR, and MVS who contributed to the development, review, and documentation of the models. Also, thank you to the MVD RIT for getting the recommendation routed, logged, and on the agenda. This is a significant addition to our model library!

The HQ memo outlining the recommendation is being prepared and will be routed as soon as we receive it. In the meantime, please use October 4, 2016, as the approval date for all official documentation.

Nate

Nathan Richards
U.S. Army Corps of Engineers
Mississippi Valley Division
Regional Technical Specialist
ECO-PCX Model Review Manager
Office: 309-794-5286
Cell: 309-230-3804

-----Original Message-----
From: Miller, Gregory B MVD
Sent: Monday, September 19, 2016 2:27 PM
To: Redican, Joseph H HQ02 <Joseph.H.Redican@usace.army.mil>
Cc: Paynes, Wilbert V HQ <Wilbert.V.Paynes@usace.army.mil>; Coleman, Wesley E Jr HQ02 <Wesley.E.ColemanJr@usace.army.mil>; Matusiak, Mark HQ02 <Mark.Matusiak@usace.army.mil>; Trulick, Jeff HQ02 <Jeff.Trulick@usace.army.mil>; Bee, Patricia L HQ02 <Patricia.L.Bee@usace.army.mil>; Brown, Theodore A SES HQ02 <Theodore.A.Brown@usace.army.mil>; Hanneken, Charles D HQ <Charles.D.Hanneken@usace.army.mil>; Chewning, Brian MVD <Brian.Chewning@usace.army.mil>; Lachney, Fay V MVD <Fay.V.Lachney@usace.army.mil>; Young, Gary L MVD <Gary.L.Young@usace.army.mil>; Johnson, Brian L MVS <Brian.L.Johnson@usace.army.mil>; McFarlane, Aaron M MVP <Aaron.M.McFarlane@usace.army.mil>; Knollenberg, Camie A MVP @ MVR <Camie.A.Knollenberg@usace.army.mil>; Richards, Nathan S MVR <Nathan.S.Richards@usace.army.mil>; Opsahl, Katie MVP <Katie.M.Opsahl@usace.army.mil>; Savage, Monique E MVR <Monique.E.Savage@usace.army.mil>; Barr, Kenneth A MVP @ MVR <Kenneth.A.Barr@usace.army.mil>; Mccain, Kathryn MVP @ MVS <Kathryn.Mccain@usace.army.mil>; Herzog, Kathryn MVP @ MVR <Kathryn.Herzog@usace.army.mil>; McGuire, Benjamin MVP <Benjamin.M.Mcguire@usace.army.mil>; Simmons, Shane M MVP @ MVS <Shane.M.Simmons@usace.army.mil>; Ingvalson, Derek MVP <Derek.S.Ingvalson@usace.army.mil>; Turner, Matthew E MVD <Matthew.E.Turner@usace.army.mil>; Allen, Teri C MVS <Teri.C.Allen@usace.army.mil>; Clark, Steven J MVP <Steven.J.Clark@usace.army.mil>; Jordan, Joseph W MVP @ MVR <Joseph.W.Jordan@usace.army.mil>; Popkin, Breann <Breann.K.Popkin@usace.army.mil>
Subject: Model Recommendation - MVD - 11 HSI Spreadsheet Calculators - Regional Use Approval

Joe - Please see attached recommendation memo covering 11 spreadsheets related to species models used in RPEDN. The ECO-PCX finds the spreadsheet calculators for the habitat suitability index (HSI) models have sufficient system quality, meet usability criteria, and maintain the technical quality of the models. The ECO-PCX recommends Regional Use Approval of all 11 spreadsheet calculators for use in the geographic area defined for each model. Please log in this recommendation with the Office of Water Project Review for the Model Certification Team to consider, and notify the ECO-PCX of the panel's findings. Greg

****

Gregory Miller
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Appendix H

Cost Effectiveness &

Incremental Cost Analysis

1. Purpose

Corps of Engineers guidance requires a cost effectiveness analysis and an incremental cost analysis for recommended environmental restoration and mitigation plans. A cost effectiveness analysis is conducted to ensure that the least cost solution is identified for each possible level of environmental output. An incremental cost analysis of the solutions is conducted to reveal changes in costs for increasing levels of environmental outputs. In the absence of a common measurement unit for comparing the nonmonetary benefits with the monetary costs of environmental plans, cost effectiveness and incremental cost analysis (CE/ICA) are valuable tools to assist in decision making. This appendix presents the results of the CE/ICA of the Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP), Madison and Jersey counties, Illinois.

2. Method

The study area was evaluated using guidance documents and software prepared by the Corps of Engineers' Institute for Water Resources (IWR). IWR - Planning Suite Software (Version 2.0), a USACE-certified model, was used to automate steps in the cost effectiveness and incremental cost analysis. Much of the text of this appendix was borrowed from IWR Report (IWR 94-PS-2), *Cost Effectiveness Analysis for Environmental Planning: Nine EASY Steps*[1]. The cost effectiveness and incremental cost analysis procedures are presented in nine steps, which are grouped into four tasks listed below.

A. Formulation of Combinations
Step 1 Display outputs and costs
Step 2 Identify combinable management measures
Step 3 Calculate outputs and costs of combinations

B. Cost Effectiveness Analysis
Step 4 Eliminate economically inefficient solutions
Step 5 Eliminate economically ineffective solutions

C. Development of Incremental Cost Curve
Step 6 Calculate average costs
Step 7 Recalculate average costs for additional outputs

D. Incremental Cost Analysis
Step 8 Calculate incremental costs
Step 9 Compare successive outputs and incremental costs

The results of these analyses are displayed as graphs and tables at the end of this appendix. They allow the decision makers to progressively compare alternative levels of environmental outputs and ask if the next level is "worth it" – that is, is the additional environmental output in the next level worth its additional monetary costs? It is important to note that these analyses will not usually lead, and are not intended to lead, to a single best solution as in economic cost-benefit analyses. They will improve the quality of decision making by ensuring that a rational, supportable, focused, and

[1] Orth, K. D. 1994. Cost Effectiveness Analysis for Environmental Planning: Nine EASY Steps. No. IWR-94-PS-2. Army Engineers Institute for Water Resources. Ft. Belvoir, VA.

traceable approach is used for considering and selecting alternative methods to produce environmental outputs.

A. Formulation of Combinations

Step 1. Display outputs and costs. Outputs were determined using Habitat Evaluation Procedures and are presented as net Average Annual Habitat Units (for further detail see Appendix G, *Habitat Evaluation and Quantification*). Costs estimates were based on unit price estimates. Costs were annualized over a 50-year period of analysis at an interest rate of 2.875 % for Fiscal Year 2017. These costs include initial construction with mobilization and demobilization, contingency (30%), planning, engineering, and design (15%), and construction management (10%) above the actual estimated cost for construction. Operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) costs for the 50-year period of analysis, and Adaptive Management and Monitoring costs were also calculated for each alternative and included in the total annualized costs used in the CE/ICA. The period of analysis was limited to 50-years accordance based on with Corps Regulations (ER 1105-2-100, p. 2-11), even though project measures are anticipated to continue having beneficial effects beyond 50 years. The base year of 2025 and period of analysis continued until 2075.

Step 2. Identify combinable management measures. The management measures were reviewed to determine which were dependent on other measures. Using the hydraulic model results, the planning team combined measures into feasible alternatives. Alternatives that did not perform in the hydraulic model were not evaluated further. Table 1 describes the measures that were included in each alternative moved forward for detailed evaluation.

Table 1. Alternative Plans

Alternative #	Measures Included	Alternative Description
1	D0B0R0I0	No Action
2	D1B1R0I1	Braided 200 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity
3	D1B2R0I1	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity
4	D1B1R1I1	Braided 200 Ft Piasa Chute+ Minimum Backwater Dredging + Notched Rock Structure + Island Diversity
5	D1B2R1I1	Braided 200 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity
6	D2B1R0I1	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Island Diversity
7	D2B2R0I1	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Island Diversity
8	D2B1R1I1	Braided 300 ft Piasa Chute + Minimum Backwater Dredging + Notched Rock Structure + Island Diversity
9	D2B2R1I1	Braided 300 ft Piasa Chute + Maximum Backwater Dredging + Notched Rock Structure + Island Diversity

Step 3. Calculate output and costs of combinations. Table 2 at the end of this appendix displays the outputs and costs of alternatives.

Table 2. Results of CE/ICA for Alternative Plans.

Alt #	Alternative Code	Output (AAHU)	Construction Cost ($)*	Annualized Construction Cost ($)	Annualized OMRR&R ($)	Annualized AM & Monitoring ($)	Total Annualized Cost ($)	Average Cost Per Unit ($/AAHU)
1	D0B0R (No Action)	0	0	0				-
2	D1B1R0I1	366.5	22,130,000	839,791	5,850	12,000	857,641	2,340
3	D1B2R0I1	376.3	24,500,000	929,728	5,850	12,000	947,578	2,518
4	D1B1R1I1	430.1	23,750,000	901,267	5,850	12,000	919,117	2,137
5	D1B2R1I1	431.2	26,250,000	996,137	5,850	12,000	1,013,987	2,352
6	D2B1R0I1	417.4	27,130,000	1,029,532	5,850	12,000	1,047,382	2,509
7	D2B2R0I1	417.8	29,630,000	1,124,402	5,850	12,000	1,142,252	2,734
8	D2B1R1I1	447.6	28,880,000	1,095,941	5,850	12,000	1,113,791	2,488
9	D2B2R1I1	447.4	31,250,000	1,185,878	5,850	12,000	1,203,728	2,690

**Based on unit price estimates October 2016; 2.875% interest rate for FY2017*

B. Cost Effectiveness Analysis

Steps 4 and 5. Eliminate economically inefficient solutions and economically ineffective solutions. Steps 4 and 5 were carried out using the IWR-Planning Suite software. Step 4 eliminates economically inefficient solutions and identifies the least cost solution for each level of output. *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. For example, if two plans produce two AAHUs and one costs $3,000 while the other costs $4,000, the more expensive plan is eliminated.

Step 5 eliminates the economically ineffective solutions by identifying and deleting those solutions that will produce less output at equal or greater cost than subsequently ranked solutions. *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. For example, if one plan produces 2 AAHUs for $8,000 and the next plan produces 4 AAHUs for $6,000, the first plan would be eliminated because it is not economically effective.

Of the 9 alternatives evaluated, 5 plans were considered cost effective (Table 3; Figure 1).

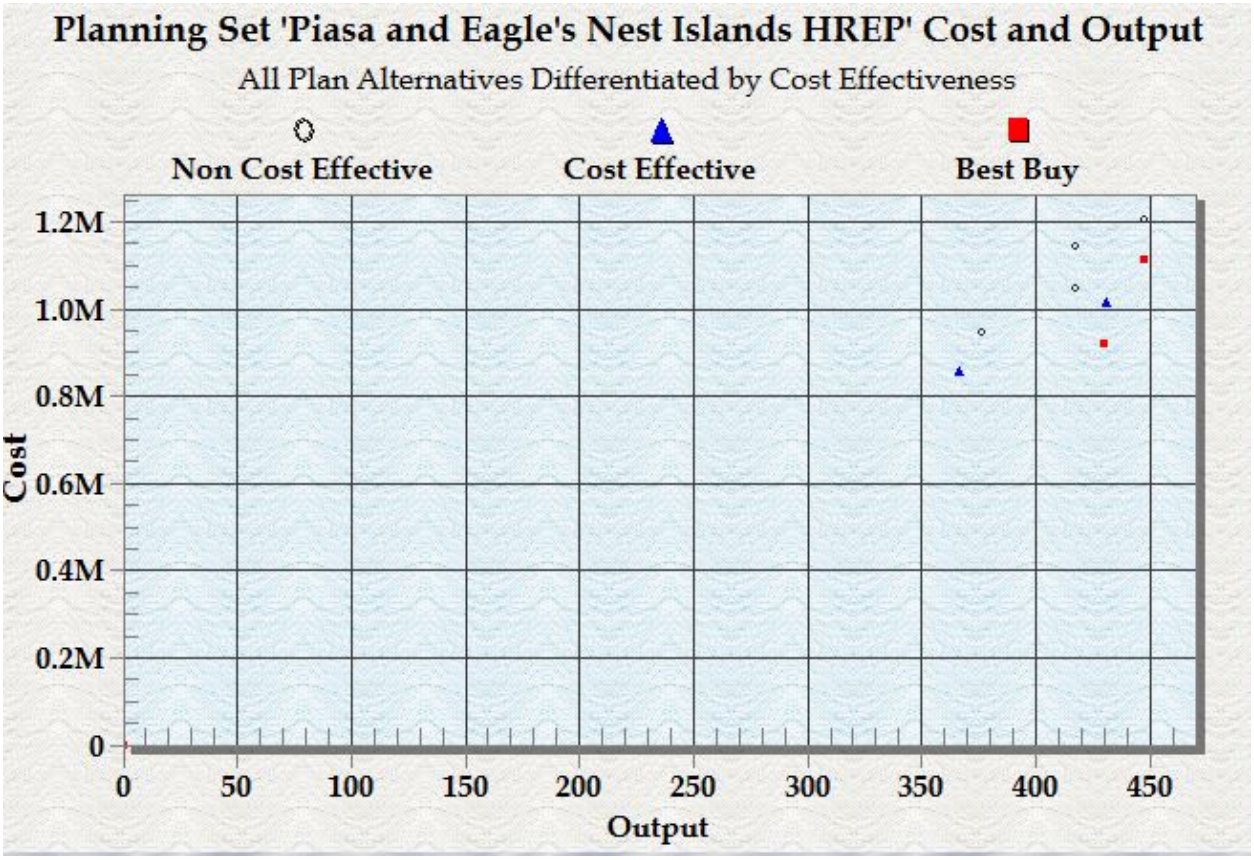

Figure 1. All Alternatives Plans Differentiated by Cost Effectiveness

Table 3. Cost Effective Plans

Alt #	Alternative Code	Output (AAHU)	Cost ($) (Total Annualized Cost)	Average Cost Per Unit ($/AAHU)
1	D0B0R (No Action)	0	0	
2	D1B1R0I1	366.5	857,641	2,340
4	D1B1R1I1	430.1	919,117	2,137
5	D1B2R1I1	431.2	1,013,987	2,352
8	D2B1R1I1	447.6	1,113,791	2,488

C. Development of Incremental Cost Curve

Step 6. Calculate average costs. Average costs for each least-cost, cost-effective plan are determined by dividing the cost of the plan by the output (AAHUs). Average costs are expressed in cost per AAHU ($/AAHU). The plan with the lowest average cost is identified. Plans with less output at a higher average cost are eliminated.

Step 7. Recalculate average costs for additional outputs. This step asks the question: "of the remaining levels of output, which has the lowest additional cost for additional output?" Using levels of output from Step 6, the average annual costs for additional output are calculated. The previous step's lowest average cost level of output is used as the "zero level." Levels of output less than the lowest average cost level are dropped from further analysis, while levels of output greater than the lowest average cost level advance to the next recalculation. Recalculations are then made using the new lowest average cost level as the "zero level" until the highest level of output is reached. Steps 6 and 7 were carried out using the IWR-Planning Suite software. The outcome of this evaluation is displayed in Table 4.

Table 4. Incremental Costs of Best Buy Plans.

Alternative	Incremental Output (Net AAHUs)	Incremental Cost (Annualized Total Cost)	Incremental Output	Incremental Cost	Incremental Cost/Output ($/AAHU)
1 – No Action	0	0	0	0	0
4	430.1	$919,117	430.1	$919,117	$2,137
8	447.6	$1,113,791	17.5	$194,674	$11,124

D. Incremental Cost Analysis

Step 8. Calculate incremental costs. Step 8 was carried out using the IWR-Planning Suite software. Incremental cost is the additional cost incurred by selecting one alternative over another, and is computed by subtracting the cost of one alternative from another. The 3 plans listed in Table 4 are the "best buys," meaning these plans produce the most AAHUs per dollar. The incremental costs shown in Table 4 are calculated by dividing the difference between the different plans output. Figure 2 is a graph of the incremental costs of alternatives as listed in Table 3. As shown in the chart, there are three "best buy" combinations.

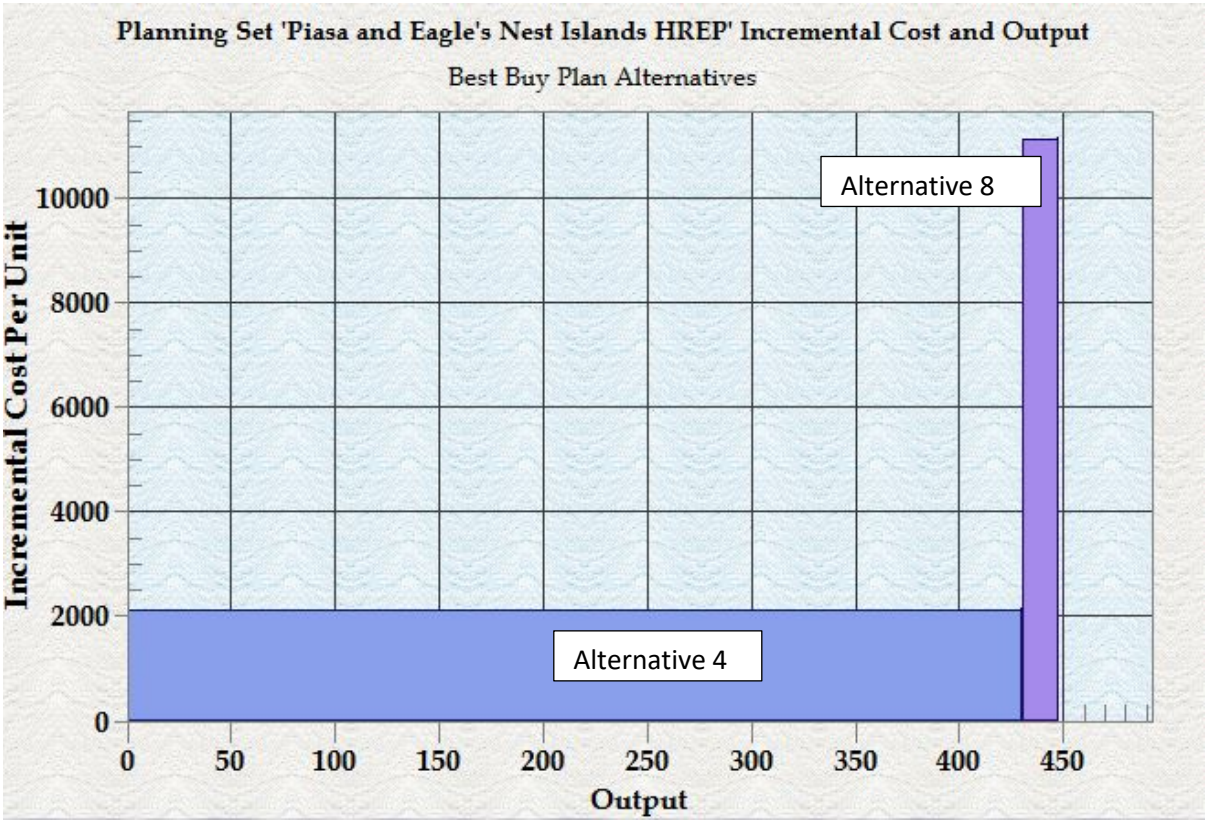

Figure 2. Best Buy Alternatives for Piasa and Eagle's Nest Islands HREP.

Step 9. Compare successive outputs and incremental costs. Table 4 and Figure 1 were used as decision making tools by progressively proceeding through available levels of output and determining if the next level is worth its additional monetary costs. This step examined the additional habitat value, as featured by increased AAHU output, for an increase in monetary costs. Federal planning for water resources development is conducted in accordance with the requirements of the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (P&G). The P&G provides a decision rule for selecting a tentatively selected plan where both outputs and costs are featured in dollars. This rule states: "The alternative plan with the greatest net economic benefit consistent with protecting the Nation's environment (National Economic Development Plan, NED Plan) is to be selected… (Paragraph 1.10.2)". There is no similar rule for plan selection where the outputs are not featured in dollars, as is the case in planning for restoration and mitigation. In the absence of such a decision-making rule, cost-effectiveness and incremental cost analyses helps to better understand the consequences of the preferred plan in relation to other choices.

3. ICA Conclusions and Selection of Recommended Plan

The best buy alternatives presented provide the information necessary information to make well-informed decisions regarding desired project scale (Table 4, Figure 1). Progressing through the increasing levels of output for the alternatives in Table 4 helps determine whether the increase in Net AAHUs is worth the additional cost. As long as decision makers consider a level of output to be "worth it", subsequent levels of outputs 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.

Typically in the evaluation of Best Buy Alternatives, 'break points' are identified in either the last column in Table 3, or in the stair-step progression from left to right in Figure 1. Break points are defined as significant increases or jumps in incremental cost per output, such that subsequent levels of output may not be considered "worth it". Identification of such break points can be subjective. For Piasa and Eagle's Nest Islands HREP, break points were identified between each of the Best Buy Plans.

The PDT reviewed the Best Buy Plans and determined that the cost to implement the first iteration of Best Buy Plans above the No Action Plan, Alternative 4, was worth the incremental investment above the No Action Plan (Alternative 1) since it provides an acceptable level of restoration for an acceptable cost. It provides 430.1 AAHUs over the No Action Plan at an incremental cost per habitat unit of $2,137.

The next Best Buy Plan, Alternative 8, differs from Alternative 4 by having a 300 foot dredge cut in Piasa Chute versus the 200 foot dredge cut. The PDT determined that although there would be some additional benefits, Alternative 8 would not be considered further since it is similar to Alternative 4 but only provides an additional 17.5 AAHUs at an incremental cost of those AAHUs of $11,124. The PDT and the IL DNR deemed this alternative to "not be worth it" and this alternative was not selected.

4. Summary

The results of the incremental cost analysis and habitat evaluation in this chapter were considered with other factors, including physical features on the site, management objectives of the resources agencies, critical needs of the region, and ecosystem needs of the UMRS. The Piasa and Eagle's Nest Islands HREP team concluded that the alternative plan that best meets the goals and objectives of each agency and the Upper Mississippi River Restoration Programs is alternative 4. This alternative is cost-effective and justified as a "Best Buy" plan. Alternative 4 has an overall output of 430.10 Net AAHUs, and was identified as the Recommended Plan. While the other "Best Buy" alternatives evaluated for this study would partially address the goals and objectives of the study, the consensus of the interagency team was that Alternative 4 would reasonably maximize ecosystem restoration benefits for the greatest diversity of fish and wildlife, and that other considered alternatives would be less effective in meeting study objectives.

Alternative 4 would restore approximately 76 acres of island habitat, enhance approximately 49 acres of backwater by increasing connectivity and depth, and improve depth and flow for approximately 485 acres of side channel habitat within the study area. This plan includes excavating Piasa Chute with a braided dredge cut 10 foot below minimum pool 200 foot wide, excavating Piasa Island Backwater to 10 feet to improve entrance conditions to restore connectivity and fisheries habitat, a notched rock structure to improve flow and bathymetric diversity within the study area, and constructing islands with the dredge material and stone protection to restore the historic island complex that once existed

For these reasons, Alternative 4 is identified as both the National Ecosystem Restoration Plan (e.g. the plan that reasonably maximizes ecosystem restoration benefits) as well as the study sponsor's preferred plan.

Appendix I

Clean Water Act - 404(b)1 Evaluation

Section 404(b)(1) Evaluation

Project Description

Location. The Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP) is located in Jersey and Madison counties, Illinois, near Grafton, in Pool 26 between Upper Mississippi River (UMR) river miles 207.5 and 211.5. The Project is comprised of 1,381 acres of side channel, main channel, forested island, and backwater habitat.

General Description. The goal of the Project is to restore and improve the quality and diversity of aquatic and island ecosystem resources within the Project Area. The objectives identified to meet this goal are to:

1) Restore depth (>8 feet) and increase velocity over existing conditions to improve sediment transport and geomorphic processes within Piasa Chute;
2) Increase the depth and connectivity between the Piasa Island Backwater and the Mississippi River, as measured by acres of deep water habitat (>5 feet) and number of days connected; and
3) Increase the aerial coverage of islands, as measured in acres.

Authority. The Upper Mississippi River Restoration – Environmental Management Program was authorized by Congress in Section 1103 of the Water Resources Development Act of 1986 (Public Law 99-662), as amended. The proposed project would be funded and constructed under this authorization.

Purpose. The purpose of the evaluation portion of this document is to comply with Section 404 of the Clean Water Act pertaining to guidelines for the placement of fill material into waters of the United States. This evaluation, in conjunction with the *Feasibility Report with Integrated Environmental Assessment, Upper Mississippi River Restoration Program, Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project, Jersey and Madison counties, Illinois* will assist in analysis of alternatives for the proposed project, resulting in a designated Recommended Plan. Additionally, this evaluation will provide information and data to the state water quality certifying agency demonstrating compliance with state water quality standards.

General Description of Excavated and Fill Material.

1. General Characteristics of Material.
    a. *Fill Material.* Fill materials will include quarry run limestone consisting of graded "A" stone and earthen materials including silt, sand, and clays.
    b. *Excavated Material.* Excavated material is defined as material that is either hydraulically dredged or mechanically excavated from waters of the United States. Earthen material excavated in Piasa Chute and Piasa Island Backwater will consist of alluvial sand, silt, and clay and will be beneficially reused within the site for construction of the islands.
2. Quantity of Material. An estimated 885,000 cubic yards (CY) of material would be hydraulically or mechanically dredged from Piasa Chute. An estimated 156,000 CY of material would be hydraulically dredged from Piasa Island Backwater. The material would be used to construct the island features. These estimates would be confirmed prior to construction.
3. Source of Material. Stone used for the project will be obtained from commercial stone quarries in the vicinity of the project area.

Description of Proposed Placement Sites

1. Location. The proposed placement sites of dredged material are located in the interior of the project area and will be used to construct the islands; shown in the Project Features Map (Figure I.1). The placement of material dredged from Piasa Chute and Piasa Island Backwater would be used to construct islands to an elevation of 421.0 NGVD, the prevailing height of Piasa Island. The island construction/dredged placement sites follow historic imagery, and hydraulic model outputs of areas with low shear stress and shallow depths. Approximately 77 acres would be converted from open water aquatic habitat to sandbar island habitat due to construction of the island features.

   In summary, the resulting dredge disposal material would be used beneficially to construct the proposed project features.

2. Size and Types of Habitat. Final placement of project features will result in loss or conversion of minor amounts of natural habitat.

   Temporary, short-term impacts to wetlands may result from construction activities. The dredging of Piasa Island Backwater, the intent of which is to restore the connectivity of the back water to the Mississippi River by removing the sediment plug at the entrance of the backwater, may result in conversion of wetland to open water habitat along the periphery of the existing backwater. No conversion or removal of existing forested wetland habitat is anticipated.

   The placement of the dredge disposal material would be beneficially reused to construct the island features. Placement of material to construct the island features would result in approximately 77 acres of open water habitat being permanently converted to sandbar island habitat.

   Overall, implementation and construction of the project features would enhance the ecosystem functionality within the Project.

3. Type of Site
   a. *Permanent Deposits of Excavated or Fill Material.* The construction of proposed islands and the notched rock structure would result in permanent placement of dredge disposal material and stone.

      Material dredged from Piasa Chute and Piasa Island Backwater would be used to construct the island features.

   b. *Temporary Deposits of Excavated or Fill Material.* Temporary placement of fill material will be done in such a manner as to avoid and minimize impacts to wetlands and other natural features. Temporary stockpiles of material may also be necessary during construction of the various project features. Construction staging areas would be created in a logical manner in order to avoid impacts to wetlands.

4. Timing and Duration of Placement. The construction of the notched rock structure would require work to be performed within higher (but non-flood) stages. Depending on local weather and river flooding conditions, the construction period may occur over several years.

Description of Placement Method. Material removed from Piasa Chute and Piasa Island Backwater would be hydraulically or mechanically dredged, or both, depending on contractor's equipment utilized

for the Project. Hydraulic dredging equipment could consist of a cutterhead dredge, pontoons, and/or pipelines to transport the excavated dredge material in the form of a slurry. Mechanical dredging equipment could consist of a crane with clamshell bucket or a barge mounted excavator along with deck barges to transport the excavated dredge material in a more solid or cohesive condition. Either construction method selected would use the removed material from Piasa Chute and Piasa Island Backwater for beneficially construct the island features. The excavated dredge material would be transported on site to the planned island locations by either pipeline system (hydraulic dredging) or by barge (mechanical dredging). The preferred method for removing material from the chute and backwater would be the hydraulic dredging method as previously described. During the plans and specifications phase, the project delivery team would identify locations for pipe crossings that would avoid and minimize the amount of temporary impact to habitat within Piasa Island. After material has been placed to the desired height for the islands (421.0 NGVD), the material may be re-graded using earth-moving equipment.

A-stone used to construct the notched rock structure and the stone protection of the islands would be transported by barge to the project site. Heavy equipment (e.g., cranes and/or excavators) operating from a barge would be used to place stone to construct these features.

Factual Determinations

Physical Substrate Determinations

1. Substrate Elevation and Slope. Piasa and Eagle's Nest Islands lie within the Upper Mississippi River and consist of typical alluvial material. The predominant elevations within the Project range from 418.0 to 424.0 ft. NGVD. Much of the project area is sloped no greater than 1-2%. Construction specifications are provided in the full report.
2. Sediment Type. The soil in the project area has been characterized by the Natural Resources Conservation Service as solely comprised of Darwin silty clay. The Darwin soils series consists of very deep, poorly and very poorly drained, and very permeable soils formed in clayey alluvium floodplains. The soils are found on 0 to 2 percent slope and frequently flooded for long durations.

   Substrate samples were taken as part of a 2014 mussel survey. Substrate was primarily composed of sand, silt, and clay in varying proportions. Silt and clay made up a larger percentage of the substrate near the banks, while loose sand became more common near the center of Piasa Chute and riverward of Piasa and Eagle's Nest Islands.
3. Excavation/Fill Material Movement. Dredge disposal material used for island construction would be subject to erosion, but the stone rock placement would limit erosion and protect the integrity of the construction island by locking the dredged material in place. The A-Stone used in the island protection and notched rock structure have been sized to withstand the force of floodwaters, and are not expected to move.
4. Actions Taken to Minimize Impacts. Numerous actions will be taken to avoid adverse effects of sediment related impacts. Project features will be designed with stable slopes. Project features will be positioned to minimize impacts to forest habitats. Faunal impacts from the construction of project features would be limited to short-term disruption of the aquatic and terrestrial communities in the areas of the disturbance. Construction would be scheduled in such a way as to avoid impacting threatened and endangered species. Additionally, best management

practices for construction will be enforced to minimize impact to Piasa Creek and the Mississippi River.

Water Circulation, Fluctuation, and Salinity Determinations

1. Water. Excavation would temporarily reduce water quality in the adjacent area. Turbidity and sedimentation would increase. This would cease after construction completion and the improved depth and velocity within Piasa Chute and increased depth and connectivity of Piasa Island Backwater would benefit fish and wildlife resources in the long-term.
2. Current Patterns and Circulation. One of the main objectives of this project is to increase flow within Piasa Chute. Dredging of Piasa Chute and construction of the notched rock structure would alter current velocity and patterns; however, based on results of the hydraulic modeling these alternations would not significantly change the hydraulics of the main channel, but would improve the hydraulics within the Project Area by increasing flow and bathymetric diversity.
3. Natural Water Level Fluctuations. Normal water level fluctuations in the Mississippi River would be unaffected. Restoration features would not detrimentally increase flood heights or adversely affect private property or infrastructure.
4. Actions That Will Be Taken to Minimize Impacts. Best management practices for construction will be enforced.

Suspended Particulate/Turbidity Determinations

1. Expected Changes in Suspended Particles and Turbidity Levels in Vicinity of Placement Site. Short-term increases in suspended particulates and turbidity due to construction activities are expected within the vicinity of the dredging areas, rock structure, and islands. This will cease after construction completion and the improved depth and increased velocity within Piasa Chute, increased depth and connectivity of Piasa Island Backwater, and restored sandbar island habitat would benefit fish and wildlife resources in the long-term.
2. Effects on Chemical and Physical Properties of the Water Column.
    a. *Light Penetration*: There will be a temporary reduction until sediments suspended as part of the project activities settle out of the water column.
    b. *Dissolved Oxygen*: No adverse effects expected.
    c. *Toxic Metals and Organics*: No adverse effects are expected.
    d. *Aesthetics*: Aesthetics of work sites are likely to be adversely affected during construction, but are expected to be temporary and improve after construction.
    e. *Water Temperature*: No adverse effects expected.
3. Effects on Biota. The project would likely result in some short-term displacement of biota in the immediate vicinity of construction activities due to temporary decreases in water quality and disturbance from construction equipment. Long-term beneficial effects would occur as aquatic species, especially riverine species, benefit from improved habitat within the side channel and backwater. Increased sandbar island habitat resulting from the project would benefit wildlife, including the endangered least tern.

Contaminant Determinations. The project is located in the Mississippi River floodplain which is primarily natural habitat with a history of agriculture. There is little evidence that the land has been used for other purposes. The Phase I Hazardous, Toxic, and Radioactive Waste survey has been completed and revealed low level recognized environmental conditions that should not impact the project.

Aquatic Ecosystem and Organism Determinations.

1. Effects on Plankton. The project could have temporary adverse effects on the plankton in the immediate vicinity of the project area. This would cease after construction completion.
2. Effects on Benthos. Negative effects to benthos would be limited to elimination of those organisms currently residing in the immediate dredging sites, island placement areas, and notched rock structure placement site. Benthic organisms in the immediate vicinity of sites designated for the placement of dredged material or rock will be lost due to burial; however the benefits grained from improved aquatic habitat, reconnecting backwater, and island habitat would far outweigh any loss in benefits during the time of construction. And rock used to construct proposed project features would quickly be colonized by benthic organisms.
3. Effects on Nekton. Temporary adverse effects may be experienced by free-swimming aquatic life during construction, as with the benthic community; the long-term impact would be beneficial.
4. Effects on Aquatic Food Web. Effects on the aquatic food web are expected to be beneficial overall by improving backwater habitat, side channel habitat, and island habitat.
5. Effects on Special Aquatic Sites. Effects on special aquatic sites should be negligible in the project area; no sanctuaries or refuges would be adversely affected by the proposed action. Project goals and features have been developed in coordination with state and federal partners.
    a. *Sanctuaries and Refuges.* The project is expected to greatly benefit fish and migratory wildlife.
    b. *Wetlands, Mudflats, and Vegetated Shallows.* No wetlands or mudflats, vegetated shallows, coral reefs, or riffle and pool complexes would be adversely affected over the long-term by the proposed action. The Piasa Island Backwater may extend beyond its existing open water footprint, affecting existing wetland areas; however, the proposed backwater dredging is geared toward removal of the sediment plug and deepening the interior of the backwater, while minimizing impacts to wetlands, mudflats, and vegetated shallows. The placement of the dredge disposal material to build the island features would avoid impacts to wetlands. Project planning considered the full extent the minimization of wetland loss.
6. Threatened and Endangered Species. Presence, or use by, federally endangered and threatened species is discussed in the Biological Assessment in the Feasibility Report. No adverse effects are expected to result from this Project.
7. Other Wildlife. The Project would likely result in some short-term displacement of wildlife in the immediate vicinity of construction activities. Minimizing disruption of migratory waterfowl during fall and early winter will be considered during the development of plans and specifications. Wildlife, especially waterfowl, would benefit from the increase in habitat diversity and food resources made possible through improved island diversity and improved foraging habitat.

Proposed Placement Site Determinations

1. Mixing Zone Determinations. A mixing zone is that volume of water at a placement site or discharge site required to dilute contaminant concentrations associated with discharge of excavated material to an acceptable level. The concentration of sediment material associated with construction of proposed project features would not be high enough to require a mixing zone.
2. Determination of Compliance with Applicable Water Quality Standards. This Section 404(b)(1) evaluation serves as the necessary compliance required by law under the Clean Water Act. A

Section 401 Water Quality certification and all other permits necessary for the completion of the project, would be obtained prior to project construction.

3. Potential Effects on Human Use Characteristics. No long-term adverse impacts to municipal and private water supplies; water-related recreation; aesthetics; or parks, national and historic monuments, national seashores, wilderness areas, research sites or similar preserves would occur. Following construction, the proposed project would enhance fish and wildlife habitat and improve the overall ecosystem functionality of Piasa and Eagle's Nest Islands.

Determination of Cumulative Effects on the Aquatic Ecosystem. Although minor short-term construction-related impacts to local and wildlife populations are likely to occur, no negative cumulative impacts to fish and wildlife are identified. From a systemic approach, the proposed project would result in positive long-term benefits to side channel, backwater, and island habitat located in and around Piasa and Eagle's Nest Islands HREP.

Determination of Secondary Effects on the Aquatic Ecosystem. No adverse secondary affects should result from the proposed action. Long-term benefits to aquatic habitat and wildlife are expected.

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

A. No significant adaptations of the 404(b)(1) guidelines were made relative to this evaluation.

B. Alternatives that were considered for the proposed action included more features than the Recommended Plan. They were analyzed for environmental benefits and costs. The Recommended Plan provided a large number of environmental benefits and best met project objectives and the four plan formulation criteria of completeness, effectiveness, efficiency, and acceptability.

C. Certification under Section 401 of the Clean Water Act would be obtained from the Illinois Department of Natural Resources.

D. The project is not anticipated to introduce toxic substances into nearby waters or result in appreciable increases in existing levels of toxic materials. The proposed activity is in compliance with Applicable Toxic Effluent Standards or Prohibitions under Section 307 of the Clean Water Act.

E. No significant impact to Federal or state listed threatened or endangered species would result from the proposed action. Prior to construction, full compliance with the Endangered Species Act would be documented.

F. No municipal or private water supplies would be affected by the proposed action, and no degradation of waters of the United States is anticipated to result from the proposed action. The proposed construction activity would not have a significant adverse effect on human health and welfare, recreation and commercial fisheries, plankton, fish, shellfish, wildlife, or special aquatic sites. No significant adverse effects on life stages of aquatic life or other wildlife dependent on the aquatic ecosystem are expected to result. The proposed construction activity would have no significant adverse effects on aquatic ecosystem diversity, productivity, and stability. No significant adverse effects on recreational, aesthetic, and economic values would occur.

G. The materials used for construction would be chemically and physically stable and non-contaminating.

H. No other practicable alternative less damaging to the aquatic environment has been identified that would address the project goal and objectives better than the Recommended Plan. The proposed action is in compliance with Section 404(b)(1) of the Clean Water Act, as amended. The proposed action would not significantly impact water quality. On the basis of the guidelines the proposed disposal site for the discharge of excavated material is specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

Bryan K Sizemore Date: 12 Sep 2019

BRYAN K. SIZEMORE
Colonel, U.S. Army
District Commander

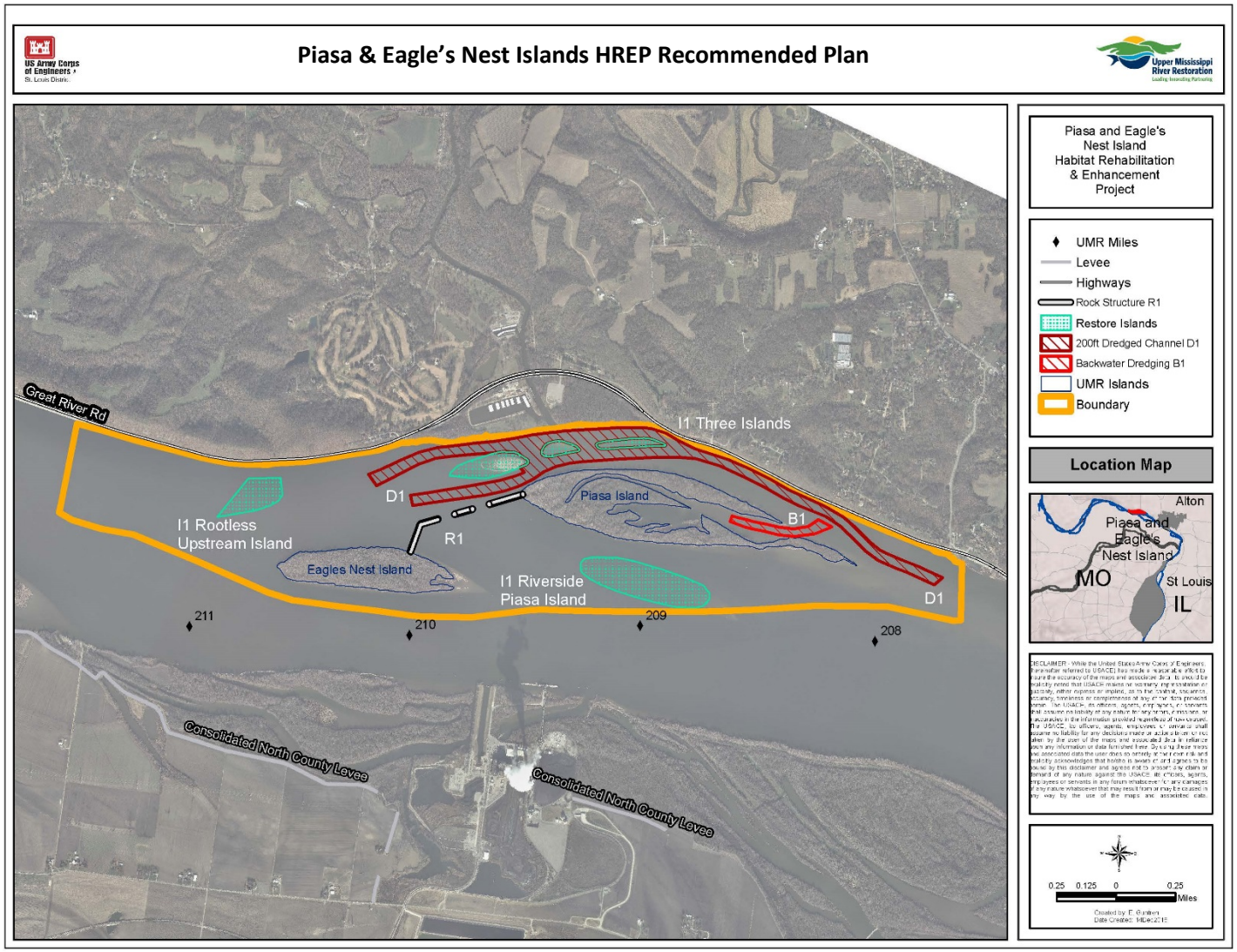

Figure I.1. Location of restoration measures of the recommended plan

Appendix J

Cost Estimate

COST ESTIMATE SUMMARY

GENERAL

The goal of this HREP is to restore and improve the quality and diversity of aquatic and island ecosystem resources within the project area. The objectives identified to meet this goal are to:

- Restore depth (> 8 feet) and increase velocity over existing conditions to improve sediment transport and geomorphic processes within Piasa Chute.
- Increase the depth and connectivity between the Piasa Backwater and the Mississippi River, as measured by acres of deep water habitat (> 5 feet) and number of days connected.
- Increase the spatial coverage of islands, as measured in acres.

The tentatively selected plan for the Piasa and Eagle's Nest Island project consists of multiple features to restore and improve the ecosystem resources by implementation of the following project features:

- Dredge Piasa Chute
- Dredge Piasa Island Backwater
- Construct islands with excavated material and stone protection
- Construct river training structures

Implementation of the TSP would increase the quality and quantity of ecosystem resources and meet the needs for a large variety of native aquatic species. Establishing connectivity between Piasa Island Backwater and main channel would contribute to overwintering fish habitat as well as feeding areas for migratory wildlife; providing bathymetric diversity and flow within Piasa Chute would provide important side channel habitat within Pool 26; and restoring historic islands would allow the Project Area to realize the highest benefit to fish and wildlife. The Project outputs are also consistent with the goals and objectives of the Upper Mississippi River Restoration Program.

All Project measures would be located on Federally-owned lands, and waters are in Federal ownership. Lands are managed by the St. Louis Corps of Engineers' Rivers Project Office (e.g., forest monitoring, bat surveys), with some management in partnership with the Illinois Department of Natural Resources (e.g., migratory wildlife and fish); responsibility for the operation, maintenance, rehabilitation, replacement, and repair of the Project would be the responsibility of ILDNR.

BASIS OF COST ESTIMATE

The cost estimate has been prepared based on current concept designs and specific site information available to date. Pricing data was developed from recent contract estimates for similar projects in the St. Louis Area. This estimate will be considered the basis for the Current Working Estimate and considers all phases of the project.

CONTINGENCIES

The Abbreviated Risk Analysis process indicated an approximate 26% contingency based on associated project risks.

PLANNING, ENGINEERING AND DESIGN (PED)

Planning, engineering and design costs are based on historical data of similar projects in the St. Louis District. Recommended percentages by the cost MCX were taken into consideration as well.

CONSTRUCTION MANAGEMENT

Construction Management costs are based on historical data of similar projects in the St. Louis District. Recommended percentages by the cost MCX were taken into consideration as well.

WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For Project No. 145444

MVS – Piasa and Eagle's Nest Islands
Habitat Rehabilitation and Enhancement Project

The Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project, as presented by St Louis District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of February 1, 2018, the Cost MCX certifies the estimated total project cost:

FY2018 Project First Cost: $26,746,000
Fully Funded Amount: $28,258,000

It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management through the period of Federal Participation.

FOR: Michael P. Jacobs, PE, CCE
Chief, Cost Engineering MCX
Walla Walla District

Appendix K
DRAFT MEMORANDUM OF AGREEMENT

MEMORANDUM OF AGREEMENT
BETWEEN
THE UNITED STATES FISH AND WILDLIFE SERVICE
AND
THE DEPARTMENT OF THE ARMY
FOR
UPPER MISSISSIPPI RIVER RESTORATION PROGRAM
PIASA & EAGLES NEST ISLANDS
HABITAT REHABILITATION AND ENHANCEMENT PROJECT
POOL 26, MISSISSIPPI RIVER MILES 207.5 THROUGH 211.5
JERSEY AND MADISON COUNTIES, ILLINOIS

1. 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, rehabilitating, and replacing the Piasa & Eagles Nest Islands Habitat Rehabilitation and Enhancement Project (HREP) separable element of the Upper Mississippi River Restoration Program (UMRR).

2. BACKGROUND

Section 1103 of the Water Resources Development Act of 1986, Public Law 99-662, 33 U.S.C. 652, authorizes construction of features for the purpose of enhancing fish and wildlife resources in the Upper Mississippi River System. The project area (outlined in red on Exhibit A) is managed as a national wildlife refuge under a cooperative agreement signed 21 January 1954 between the Department of the Interior, USFWS, and the U.S. Army Corps of Engineers. This agreement was amended in 1958, 1963, 1986, and 2001. Management of the project area has been assumed by the Illinois Department of Natural Resources under a successive cooperative agreement with the USFWS dated 03 May 1954, recently amended in 2012. Under the conditions of Section 906(e) of the Water Resources Development Act of 1986, Public Law 99-662, 33 U.S.C. 2283 (e), all construction costs of those fish and wildlife features for the Piasa & Eagles Nest Islands HREP are 100 percent Federal first costs, and pursuant to Section 107(b) of the Water Resources Development Act of 1992, Public Law 102-580, 33 U.S.C. 652(e)(7)(A), all costs of operation, maintenance, repair, rehabilitation, and replacement "OMRR&R" for the Piasa & Eagles Nest Islands HREP are the responsibility of the Illinois Department of Natural Resources through their cooperative agreement with the USFWS.

3. GENERAL SCOPE

The project to be accomplished pursuant to this MOA shall consist of rehabilitating and improving fish and wildlife habitat in the Pool 26 of the Upper Mississippi River. The project involves dredging of a side channel, construction of a river training structure, construction of islands. The project is located on the left descending bank of the Upper Mississippi River between river miles 207.5 through 211.5. The features would be constructed to improve habitat conditions for resident and migratory fish and wildlife that use the area.

4. RESPONSIBILITIES

A. DA is responsible for:

1) Construction: Construction of the project features to include necessary stabilization and vegetation measures.
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 Feasibility Study 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 1986m Public Law 99-662, 33 U.S.C. 2283(e), DA will construct the Piasa & Eagles Nest Island National Wildlife Refuge HREP as described in the Feasibility Report/Environmental Assessment, [INSERT DATE], 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 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 three years after completion of construction of the project and resolution of all relevant claims arising therefrom, and shall make available at its offices, 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 General Plans lands cooperatively managed between the USFWS and IDNR.

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 OMRR&R of the Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project, in Jersey and Madison Counties, Illinois will be borne by the IDNR. These functions will be further specified in the Project OMRR&R Manual to be developed by the DA with participation by USFWS and IDNR and provided to both agencies upon its completion.

5. 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.

6. 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
1 Federal Drive
Fort Snelling, MN 55111-4056

DA: District Engineer
U.S. Army Corps of Engineers, St. Louis
1222 Spruce Street
St. Louis, MO 63103-2833

7. EFFECTIVE DATE OF MOA

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

THE DEPARTMENT OF ARMY

BRYAN K. SIZEMORE
COL, EN
Commanding

Dated: _____

THE U.S. FISH AND WILDLIFE SERVICE

Thomas O. Melius
Regional Director
U.S. Fish and Wildlife Service

Dated: _____

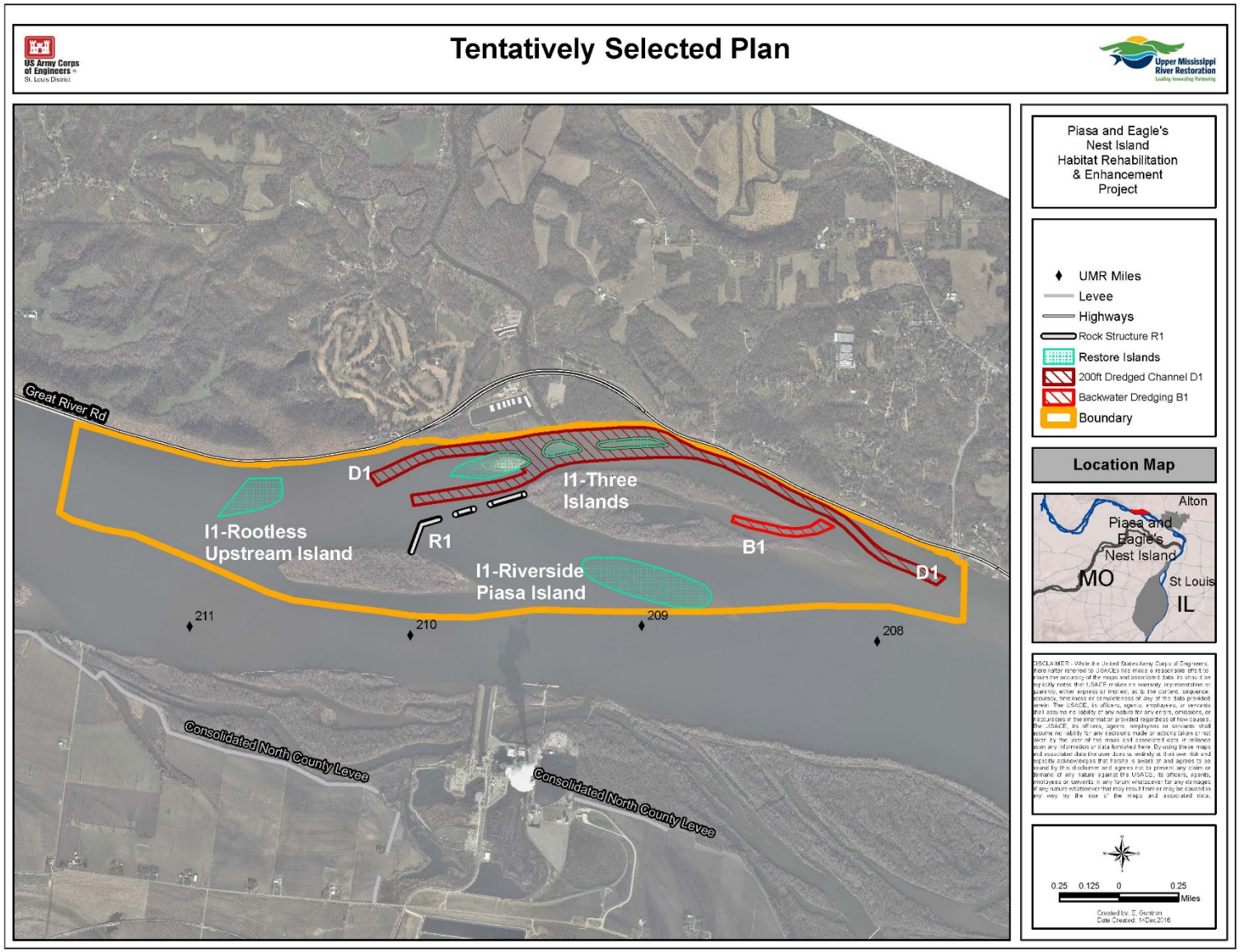
US Army Corps of Engineers
St. Louis District
Tentatively Selected Plan
Upper Mississippi River Restoration
Great River Rd
D1
I1-Three Islands
I1-Rootless Upstream Island
R1
B1
I1-Riverside Piasa Island
D1
211
210
209
208
Consolidated North County Levee
Consolidated North County Levee
Piasa and Eagle's Nest Island Habitat Rehabilitation & Enhancement Project
UMR Miles
Levee
Highways
Rock Structure R1
Restore Islands
200ft Dredged Channel D1
Backwater Dredging B1
Boundary
Location Map
Alton
Piasa and Eagle's Nest Island
MO
St Louis
IL
0.25 0.125 0 0.25
Miles

EXHIBIT A

PIASA AND EAGLE'S NEST ISLANDS
HABITAT REHABILITATION AND
ENHANCEMENT PROJECT
MEMORANDUM OF AGREEMENT

Certification of
Review

The Memorandum of Agreement for the Piasa & Eagles Nest Islands Habitat Rehabilitation and Enhancement Project, Jersey & Madison Counties, Illinois, is in compliance with all applicable laws and regulations.

_____

Office of Counsel

DATED: _____

Appendix L

MONITORING AND ADAPTIVE MANAGEMENT

1. Introduction

The 1985 Supplemental Appropriations Act (Public Law 99-88) and Section 1103 of the Water Resources Development Act of 1986 (Public Law 99-662) authorized implementation of ecosystem restoration projects to ensure the coordinated development and improvement of the Upper Mississippi River System. Section 2039 of WRDA 2007 requires that when conducting a feasibility study for ecosystem restoration, the proposed project includes a plan for monitoring the success of the ecosystem restoration. Additionally, paragraph (3)(d) of Section 2039 states that "an adaptive management plan will be developed for ecosystem restoration projects…appropriately scoped to the scale of the project." The implementation guidance for Section 2039, in the form of a CECW-PB Memo dated 31 August 2009, also requires that an adaptive management plan be developed for all ecosystem restoration projects. Adaptive management "prescribes a process wherein management actions can be changed in response to monitored system response, so as to maximize restoration efficacy or achieve a desired ecological state" (Fischenich et al. 2012).

At the programmatic level, knowledge gained from monitoring one project can be applied to other projects. Opportunities for this type of adaptive management are common within the UMRR. Using an adaptive management approach during project planning enabled better selection of appropriate design and operating scenarios to meet the Piasa and Eagle's Nest Islands HREP project objectives. Lessons learned in designing, constructing, and operating similar restoration projects within the UMRS have been incorporated into the planning and design of this HREP to ensure that the proposed plan represents the most effective design and operation to achieve project goal and objectives.

The adaptive management for the Piasa and Eagle's Nest Islands HREP describes and justifies whether adaptive management is needed in relation to the proposed project management alternatives identified in the project feasibility study. This appendix outlines how the results of the project-specific monitoring plan would be used to adaptively manage the project, including monitoring targets which demonstrate project success in meeting project objectives. The District's intent was to develop monitoring and adaptive management actions appropriate for the project's goal and objectives.

2. Goal and Objectives

The primary goal of the Piasa and Eagle's Nest Island HREP is to restore and improve the quality and diversity of aquatic and island ecosystem resources within the Project Area. Full realization of the potential habitat value in Piasa and Eagle's Nest Islands has been hindered by loss of depth and flow into Piasa Chute, loss of connectivity between the Piasa Island Backwater and the main channel of the Mississippi River, loss of islands due to inundation caused by impoundment, and the subsequent degradation of aquatic resources. Establishing connectivity between the backwater and main channel would contribute to overwintering fish habitat as well as feeding areas for migratory wildlife; providing bathymetric diversity and flow within Piasa Chute would provide important side channel habitat within Pool 26; and restoring historic islands would allow the Project Area to realize the highest benefit to fish and wildlife. The objectives identified to meet the project goal are to:

1. Restore depth (> 8 feet) and increase velocity over existing conditions to improve sediment transport and geomorphic processes within Piasa Chute.
2. Increase the depth and connectivity between the Piasa Backwater and the Mississippi River, as measured by acres of deep water habitat (> 5 feet) and number of days connected.
3. Increase the spatial coverage of islands, as measured in acres.

The following restoration measures were considered to achieve the Project goal and objectives:

- No Action
- Excavate Piasa Chute
- Excavate Piasa Island Backwater
- Construct river training structures
- Construct islands with excavated material and stone protection

3. Sources of Uncertainty

Adaptive management provides a process for making decisions in the face of uncertainty. The primary incentive for implementing an adaptive management plan is to increase the likelihood of achieving desired project outcomes given the identified uncertainties, which can include incomplete description and understanding of relevant ecosystem structure and function; imprecise relationships among project management actions and corresponding outcomes; engineering challenges in implementing project alternatives; and ambiguous management and decision-making processes. Following is a list of uncertainties associated with the aquatic and island habitat in the Piasa and Eagle's Nest Islands HREP.

- **Side Channel Habitat (Piasa Chute)**
    - It is expected that implementation of the notched rock structure would not significantly alter the hydraulic forces over the existing mussel beds within the Project Area. If monitoring demonstrates a significant impact to mussels in the known mussel beds, a modification of the structure would be required.
    - The District evaluated the level of uncertainty and risk in the Piasa Chute dredging measure and determined it did not require the use of Adaptive Management to address uncertainty in the potential of the measure to meet performance criteria. Dredging to increase depth and flow has been shown to be successful through the St. Louis District's Biological Opinion and Regulating Works Program. In addition, the Project Area underwent extensive physical and numerical hydraulic modeling to evaluate the persistence of the dredge cut and project measures. Furthermore, lessons learned from the St. Louis District's efforts as well as work from the Kansas City District were used in the design of the side channel dredging for this Project. Monitoring will be conducted to determine project success.
- **Backwater Fish Habitat (Piasa Island Backwater)**
    - It is expected that overwintering and summer habitat in the dredged backwater will not be limited by dissolved oxygen, flow, or depth. However, uncertainty still remains since the proposed project is only removing the sediment plug at the entrance of the backwater. If monitoring demonstrates that conditions of the interior backwater were not improved then an adaptive management measure of installing a rock structure (similarly to the constructed chevron on Bolter's Island of the Pools 25 and 26 Islands HREP) to promote scour or additional backwater interior excavation would be implemented.
- **Island Habitat**
    - It is expected the implementation of the island building will become permanent features in the Project Area; however there is some uncertainty as to whether the islands will remain as sand bar islands (which is the desired for the endangered Least Tern habitat) or become established with woody vegetation. If monitoring demonstrates a need to remove establishment of woody vegetation, an adaptive management measure to re-evaluate the team's desire to maintain sandbar habitat versus vegetated island habitat.

If the interagency team determined that sandbar habitat was still the target habitat then an adaptive management measure of removing the woody vegetation would be implemented.

4. Monitoring of Objectives to Determine Project Success and Adaptive Management Measures

The power of a monitoring program developed to support determinations of project success and inform adaptive management lies in the establishment of feedback between continued project monitoring and corresponding project management. This monitoring and adaptive management plan was developed with input from state and federal resource agencies. Performance indicators to the above objectives were developed with the best available knowledge. They were developed to be specific, measurable, attainable, realistic, and timely. Current performance indicators are summarized in Table 1. The conceptual monitoring schedule and estimated costs are provided in Table 2.

- **Side Channel Habitat (Piasa Chute).**
  - Bathymetric surveys will be conducted upon completion of the Project 2-year post construction to determine base depth conditions and construction compliance. A comparison survey (ISOPACH) survey will be conducted at year 7 to map and quantify the amount of the side channel greater than 8 feet in depth.

    Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
% of side channel $\geq$ 8 feet deep	>75%	>65%	>50%

  - ADCP surveys will be conducted upon completion of the Project to determine base flow conditions at year 2. A comparison survey will be conducted at year 7 to map and quantify the average current velocity greater than 2.0 ft/sec.

    Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
Average Current Velocity ft/sec	>2.0	>2.0	>2.0

  - Water quality data collected from the site annually under UMRR-LTRM will be used to determine dissolved oxygen concentrations throughout the year.

    Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
Minimum dissolved oxygen (mg/L)	>5.0	>5.0	>5.0

  - Comparison of fish habitat use during the year will be compared with pre-project habitat use to aid in determining Project success. The UMRR-LTRM (i.e., daytime electrofishing) will complete the fish surveys used to conduct this comparison.

    Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
Catch-per-unit-effort of native fish preferring flowing habitat (i.e., fluvial specialists and dependents)	Increase over pre-construction		

- Comparison of post-construction mussel density with post-construction mussel density will be used to aid in determining Project success.

Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
Mussel Density (individuals per m^2) of Piasa Head Bed and Piasa Toe Bed maintained/enhanced	>1.5/m^2 - (Piasa Head) >5.5/m^2 (Piasa Toe)	>1.5/m^2 - (Piasa Head) >5.5/m^2 (Piasa Toe)	>1.5/m^2 - (Piasa Head) >5.5/m^2 (Piasa Toe)

Adaptive Management Trigger and Measure. If post-construction mussel survey monitoring results indicate an inability to reach the success criteria *and* mussel density is reduced by more than 50% over pre-construction mussel surveys, then modifications to the notched rock structure would be implemented to modify flow over the beds.

- **Backwater Fish Habitat (Piasa Island Backwater)**
  - Bathymetric surveys will be conducted upon completion of the Project 2-year post construction to determine base depth conditions and construction compliance. A comparison survey (ISOPACH) survey will be conducted at year 7 to map and quantify the amount of the backwater greater than 5 feet in depth. Pre-construction backwater is approximately 49 acres. The proposed backwater dredging would result in 9 acres of deepwater habitat restored, or approximately 18% of the backwater.

Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
% if backwater $\geq$ 5 feet deep	>15%	>12%	>10%

  - Water quality data collected from the site annually under UMRR-LTRM will be used to determine dissolved oxygen concentrations throughout the year.

Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
Minimum dissolved oxygen (mg/L)	>5.0	>5.0	>5.0

  - Comparison of fish habitat use during the year will be compared with pre-project habitat use to aid in determining Project success. The UMRR-LTRM (i.e., daytime electrofishing) will complete the fish surveys used to conduct this comparison.

Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
Catch-per-unit-effort of native fish preferring slackwater habitat	Increase over pre-construction		

- Comparison of days Piasa Island Backwater is connected to the main channel will be compared with pre-project days connected to aid in determining Project success. Visual observations and gage readings will be used to conduct this comparison

  Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
% of year Piasa Island Backwater is connected to the main channel	>75%	>65%	>50%

Adaptive Management Trigger and Measure. If monitoring result indicate an inability to reach success criteria by year 6 post-construction *and* more than 50% of the restored deepwater habitat is lost (i.e., approximately 5 acres), 3 more more fish kills in the backwater have been observed, and/or restored connectivity is reduced by more than 50% from Year 1, then installation of scouring rock structure or dredging of the backwater would be re-visited by the Corps and sponsor.

- **Island Habitat**
  - Aerial imagery along with hydrographic survey and topographic surveys will be conducted upon completion of the Project to determine base acres constructed and construction compliance. A comparison survey will be conducted at years 1, 5, and 10 to map and quantify the acres of island habitat greater than 421.0 feet (NGVD29). The results of this will study will inform Project success, inform adaptive management triggers and measures, and inform future HREPs.

    Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
Acres of island habitat (>421.0 feet NGVD29)	>75	>65	>60

  - Vegetative monitoring would be conducted by visual observations during site inspections by the sponsor and the Corps. During planning, the desire was to restore sandbar islands with minimal woody vegetation establishment. If more than 50% of woody vegetation on the restored islands greater than 5 feet becomes established by year

    Success Criteria:

Monitoring Target	Years 1-5	Year 25	Year 50
% cover of woody vegetation cover taller than 5 feet	<15%	<25%	<50%

    Adaptive Management Trigger and Measure. If site inspections result indicate more than 50% of woody vegetation on the restored islands greater than 5 feet in height becomes established by year 8 then the Corps and the sponsor would determine if vegetation removal is still desired.

5. Documentation, Implementation Costs, Responsibilities, and Project Close-Out

Documentation, Reporting, and Coordination. The Project Delivery Team will document each of the performed assessments and communicate the results to the HREP program manager and partners designated for the Project. Periodic reports will be produced to measure progress towards the Project goal and objectives as characterized by the selected performance measures.

Cost. The costs associated with implementing monitoring an adaptive management measures were estimated based on currently available data and information developed during plan formulation as part of the feasibility study. Because uncertainties remain as to the exact Project measures, monitoring elements, and adaptive management opportunities, the estimated costs in Table 2 will need refinement in PED during the development of the Detailed Monitoring and Adaptive Management Plans.

Responsibilities. The Corps will be responsible for collecting hydrographic surveys, aerial imagery analysis, and mussel surveys. The UMRR-LTRM will be responsible for fish and water quality data collection and the Corps will be responsible for analyzing and evaluating these data. The sponsor and the Corps will be responsible for site inspections and visual observations to assist in overall project success evaluation.

Project Close-Out. Close-out of the Project would occur when it is determined that the Project has successfully met the Project success criteria described above. Success would be considered to have been achieved when the Project objectives have been met, or when it is clear that they will be met based upon the trends for the site conditions and processes. Project success would be based on the following:

- Success criteria met;
- Continued site inspections to determine continued Project status; and
- Continued OMRR&R into the future

Table 1. Project objectives, performance indicators, monitoring target, and adaptive management triggers and measures

Objective	Performance Indicator	Monitoring Target (Desired Outcome)	Responsible Party	Action Criteria (AM triggers)	AM Measure
Restore depth and increase flow within Piasa Chute	Bathymetric Diversity	% of side channel ≥ 8 feet deep	Corps	Not applicable. See discussion in text	Not applicable. See discussion in text
	Average current velocity (ft/s)	> 2.0 ft/sec	Corps		
	Minimum dissolved oxygen (mg/L)	> 5.0 mg/L	UMRR-LTRM		
	Native fish assemblage	Increase in abundance (Catch-per-unit-effort) over existing conditions of fish species preferring flowing habitat (i.e. fluvial specialists or dependents)	UMRR-LTRM		
	Mussel	Mussel density (individuals per m^2) of Piasa Island Head Bed and Piasa Toe Bed maintained/enhanced	Corps	Post construction mussel survey show mussel density reduced by more than 50% over existing	Modify notched rock structure
Increase depth and connectivity of Piasa island Backwater	Bathymetric Diversity	% of backwater ≥ 5 feet deep	Corps	By year 6 post construction: >50% loss of restored deepwater habitat 3+ fish kills observed Restored connectivity reduced by >50% from Year 1	Install a scouring rock structure and/or re-excavate
	Minimum dissolved oxygen (mg/L)	> 5.0 mg/L	UMRR-LTRM		
	Native fish assemblage	Increase in abundance (Catch-per-unit-effort) over existing conditions of fish species preferring slackwater habitat	UMRR-LTRM		
	Connectivity	% of year Piasa Island Backwater is connected to main channel	Sponsor/Corps		
Increase surface area of islands	Acres of islands	Acres of restored islands > 421 feet	Corps	By year 8 post-construction: >50% woody vegetation cover taller than 5 feet established	Vegetation Removal
	Vegetation	<50% woody vegetation cover taller than 5 feet	Corps		

Table 2. CCNWR HREP conceptual monitoring schedule and estimated monitoring costs. Construction completion is set at year 0.

			Post-Construction Years										
Obj.	Work Category	Activity	1	2	3	4	5	6	7	8	9	10	SUBTOTAL
Piasa Chute	Monitoring, Analysis, & Reporting	Hydrographic /ADCP Survey		20000					20000				40000
		UMRR LTRM Fisheries	X	X	X	X	X	X	X	X	X	X	0
		UMRR LTRM Water Quality	X	X	X	X	X	X	X	X	X	X	0
		Mussel Survey			40000					40000			80000
	AM Feature: Notch Rock Structure/Install Rock (if needed)					35000							35000
Piasa Island Backwater	Monitoring, Analysis, & Reporting	UMRR LTRM Fisheries	X	X	X	X	X	X	X	X	X	X	0
		UMRR LTRM Water Quality	X	X	X	X	X	X	X	X	X	X	0
		Gage Data Analysis	1000		1000		1000		1000		1000		5000
	AM Feature: Install rock/excavate backwater entrance (if needed)							70000					70000
Islands	Monitoring, Analysis, & Reporting	Public Aerial Imagery & Analysis	5000				5000					5000	15000
	AM Feature: Vegetation removal (if needed)				5000					5000			10000
Overall Project	Monitoring, Analysis, & Reporting	Site Inspections	2000			2000			2000		2000		8000
		Performance Evaluation Reporting					10000					10000	20000
												Subtotal	283,000
												Contingencies (30%)	84,900
												TOTAL	**$367,900**
												Annualized Cost (FY17 2.875% discount rate; 50 year period of analysis)	**$12,000**

* The Project falls within a Corps UMRR-LTRM study reach; therefore no additional funds would be needed to collect data. Assessment of the data is included in the cost of preparing of the Performance Evaluation Report

6. References

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UPPER MISSISSIPPI RIVER RESTORATION
FEASIBILITY REPORT
PIASA & EAGLE'S NEST ISLANDS
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

APPENDIX M

REAL ESTATE PLAN

UPPER MISSISSIPPI RIVER RESTORATION
FEASIBILITY REPORT
PIASA & EAGLE'S NEST ISLANDS
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

APPENDIX M
REAL ESTATE PLAN

UPPER MISSISSIPPI RIVER RESTORATION
FEASIBILITY REPORT
PIASA & EAGLE'S NEST ISLANDS
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

APPENDIX M
REAL ESTATE PLAN

1. PURPOSE

This report is tentative in nature, focuses on the Tentatively Selected Plan (TSP), and is to be used for planning purposes only. There may be modifications to the plans that occur during Preconstruction, Engineering and Design (PED) phase, thus changing the final acquisition area(s) and/or administrative and land cost. This Real Estate Plan (REP) is intended to support the Feasibility Report for the Upper Mississippi River Restoration (UMRR) Piasa & Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project. The Illinois Department of Natural Resources (ILDNR) is the Non-Federal Sponsor (NFS) for the project. This REP identifies Lands, Easements, and Rights-of-Way (LER) necessary to complete the project. There are no previous REP's for this project.

The Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (Project) is approximately 1,350 acres of island, side channel, and backwater habitats located on the left descending bank of the Mississippi River, upstream of the city of Alton, Illinois in Madison and Jersey counties (Figure 1-1) between river miles (RM) 207.5 and 211.5. The Project lies within Pool 26, a 40-mile reach of the Upper Mississippi River System (UMRS), beginning below Lock and Dam 25 (RM 241.4) near Cap au Gris, Missouri, and ending at Melvin Price Locks and Dam (RM 200.8) at Alton, Illinois. The Project encompasses Piasa Island and Eagle's Nest Island including Piasa Chute (the side channel between Piasa Island and the Illinois bankline), and the unnamed chute between Piasa Island and Eagle's Nest Island. See Exhibit A for project location.

All Project restoration measures and activities are located on federally managed lands and waters and as such, the project first cost will be 100% federal. Currently USACE and USFWS are in the process of adding the project area to the General Plan Lands Agreement between the USACE and the USFWS, subsequently to the Cooperative Agreement For Management of USACE General Plan Lands between the USFWS and IDNR (Appendix A, Authorization and Agreements). Per these agreements the Illinois Department of Natural Resources (IDNR) will manage the lands and waters as a national wildlife refuge to enhance fish and wildlife. Responsibility for the operation, maintenance, rehabilitation, replacement, and repair of the Project would be the responsibility of IDNR.

Lands (i.e., the islands) of the Project are managed by the St. Louis Corps of Engineers' Rivers Project Office, some in partnership with the Illinois Department of Natural Resources (ILDNR). The Corps is conducting forestry monitoring and management as well as conducting other wildlife surveys (e.g., bat surveys) as needed. ILDNR provides management associated with fish and migratory wildlife.

The Project objectives include: restoring depth (> 8 feet) and increasing velocity over existing conditions to improve sediment transport and geomorphic processes within Paisa Chute; increasing the depth and connectivity between the Piasa Backwater and the Mississippi River, as measured by acres of deep water habitat (> 5 feet) and number of days connected; and increasing the areal coverage of islands, as measured in acres.

The project is located in and around islands in the Mississippi River. All access will be by water. River access can be obtained from the Piasa Harbor boat ramp near RM 210 on the Illinois bank. It is likely that heavy material such as riprap or bedding stones will be transported by river from boat ramps closer to the quarries.

The recommended plan includes a 200-ft wide braided channel excavation of Piasa Chute, excavation of the entrance of Piasa Island Backwater, construction of notched rock structure between Piasa and Eagle's Nest Islands, and construction of islands using excavated material with stone protection.

2. LANDS, EASEMENTS, AND RIGHTS-OF-WAY (LER)

The recommended plan will take place on federally managed lands and in areas under Navigational Servitude. The plan also includes utilizing federally-owned lands for river access to reach the islands. Approximately 444.5 acres of Federally-owned fee title lands will be utilized for this project (Tracts J-1, J-2, J-3, and J-7). As the interests needed are available to the Government, no acquisition is required.

3. NON-FEDERAL SPONSOR-OWNED LER

The Non-Federal Sponsor, Illinois Department of Natural Resources, will manage the area for wildlife through the GP Lands agreement once that is put into place. The IDNR will be responsible for future Operation and Maintenance costs for this project's features.

4. NON STANDARD ESTATES

No Non Standard Estates are required for the project.

5. EXISTING FEDERAL PROJECTS

The Piasa & Eagle's Nest Project is within the area of responsibility of the USACE, St. Louis District, Rivers Project Office. The Habitat Rehabilitation and Enhancement Project will not affect Navigation and will have positive environmental effects.

6. FEDERALLY-OWNED LANDS

Approximately 444.5 acres of Federally-owned fee title lands will be utilized for this project (Tracts J-1, J-2, J-3, and J-7). The Rivers Project Office, which manages federal lands along the Mississippi River for the St. Louis District, has a favorable view towards this project. There have been no issues raised by the requirement for this land.

7. NAVIGATION SERVITUDE

The environmental conditions addressed by this project were ultimately caused by navigation; pursuant to the 1930 Rivers and Harbors Act (9' Channel Project). Navigational Servitude would therefore apply to those lands (required for this project) that fall below the ordinary high water mark. This includes submerged rock placement and dredging activities. All placement materials will be from dredged material below the ordinary high water mark. A Navigation Chart is provided as Exhibit C indicating the channel location and river training structures.

8. MAPPING

See Exhibit A.

9. INDUCED FLOODING

There will be no induced flooding as part of this project.

10. BASELINE COST ESTIMATE

The land for this project is Federally-owned and managed by USACE, there is no cost estimate required.

11. RELOCATION ASSISTANCE BENEFITS

No persons, farms, or businesses will be displaced as part of this project.

12. MINERAL ACTIVITY

There are no known present or anticipated mineral activity or timber harvesting in the project area.

13. NON-FEDERAL SPONSOR ASSESSMENT

The Illinois Department of Natural Resources is the Non-Federal Sponsor for this project. The NFS however is not required to make any acquisitions for this project. An assessment is not necessary but has been included as Exhibit D.

14. ZONING

There will be no zoning ordinances enacted to facilitate acquisition of land for this project.

15. SCHEDULE

Normally a period of one year is allowed for the sponsor to acquire Right-of-Way (ROW) after receipt of the final ROW limits from the Real Estate Division. This one year period does not include land which may have to be condemned. No acquisitions are anticipated for this project, therefore an acquisition schedule is unnecessary.

16. FACILITY OR UTILITY RELOCATIONS

No facility or utility relocations are anticipated as part of this project.

17. HTRW

A Phase 1 Environmental Site Assessment has been conducted. There are no known areas of contamination within the project boundaries.

18. LANDOWNER ATTITUDE

There is no known landowner opposition to this project.

19. NOTIFICATION TO THE NON-FEDERAL SPONSOR REGARDING THE RISKS ASSOCIATED WITH LAND ACQUISITION BEFORE EXECUTION OF THE PROJECT PARTNERSHIP AGREEMENT (PPA)

The sponsor does not intend to acquire any real estate.

20. OTHER RELEVANT REAL ESTATE ISSUES

The distance between these islands and the bank is such that access by water is required.

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DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=LOVELACE.JAMES.T.1247764824
Date: 2018.02.13 13:52:41 -06'00'

James T. Lovelace
Realty Specialist
St. Louis District - MVS

Jaclyn C. Wittenborn
Chief, Real Estate
St. Louis District - MVS

Exhibit A – PROJECT LOCATION

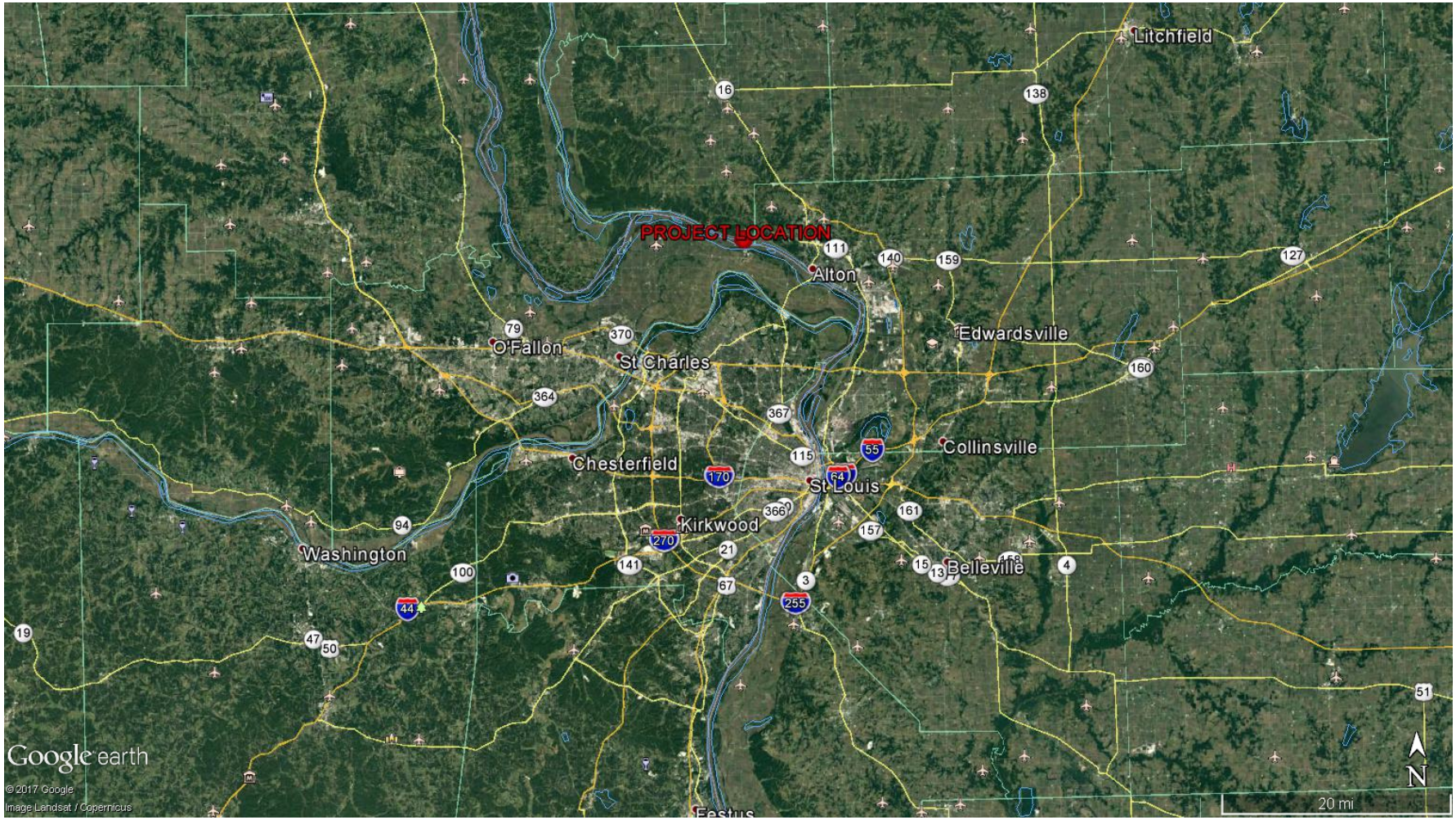

Exhibit B – TENTATIVELY SELECTED PLAN

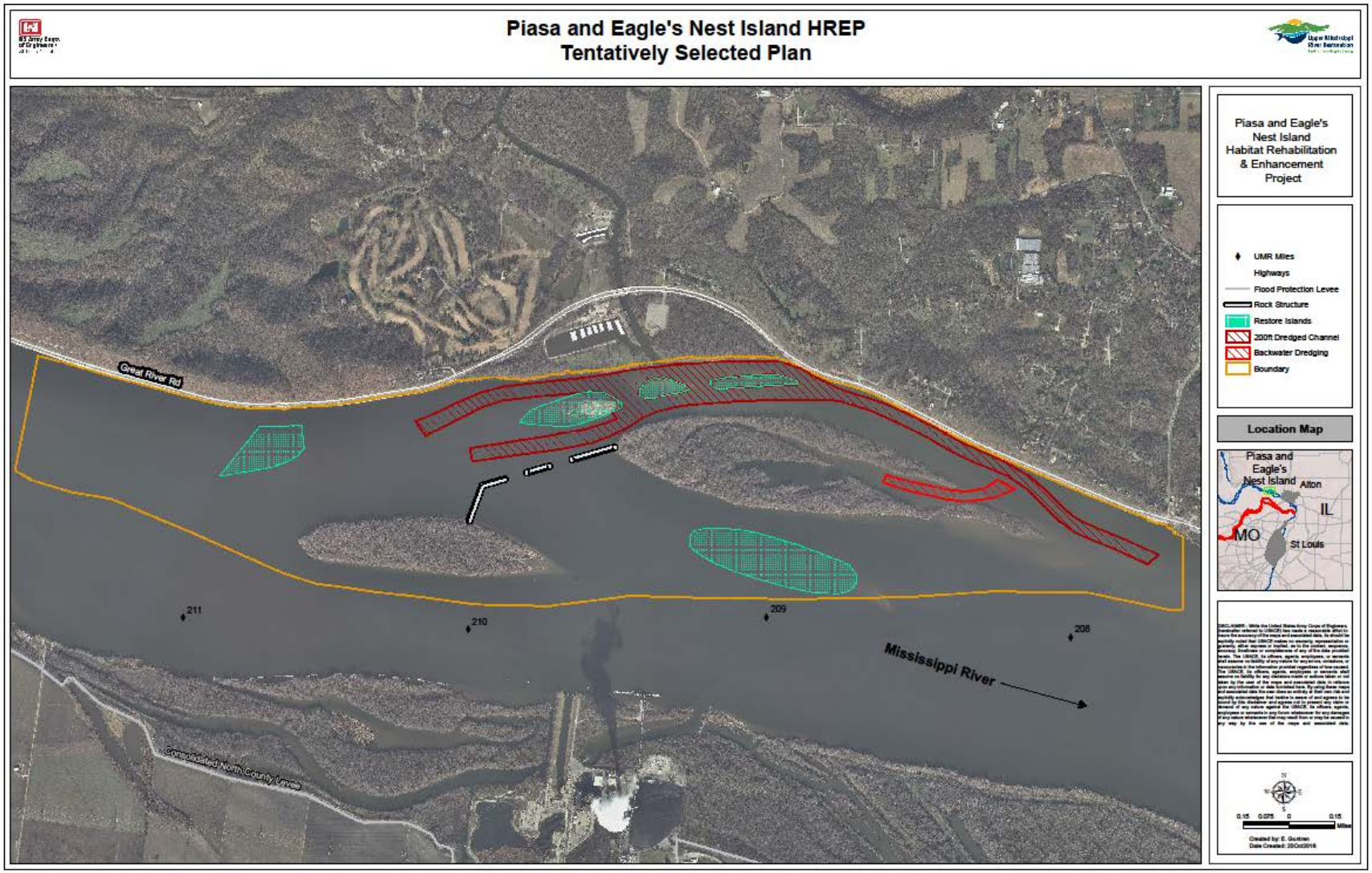

Exhibit C – NAVIGATION CHART OF THE UPPER MISSISSIPPI RIVER

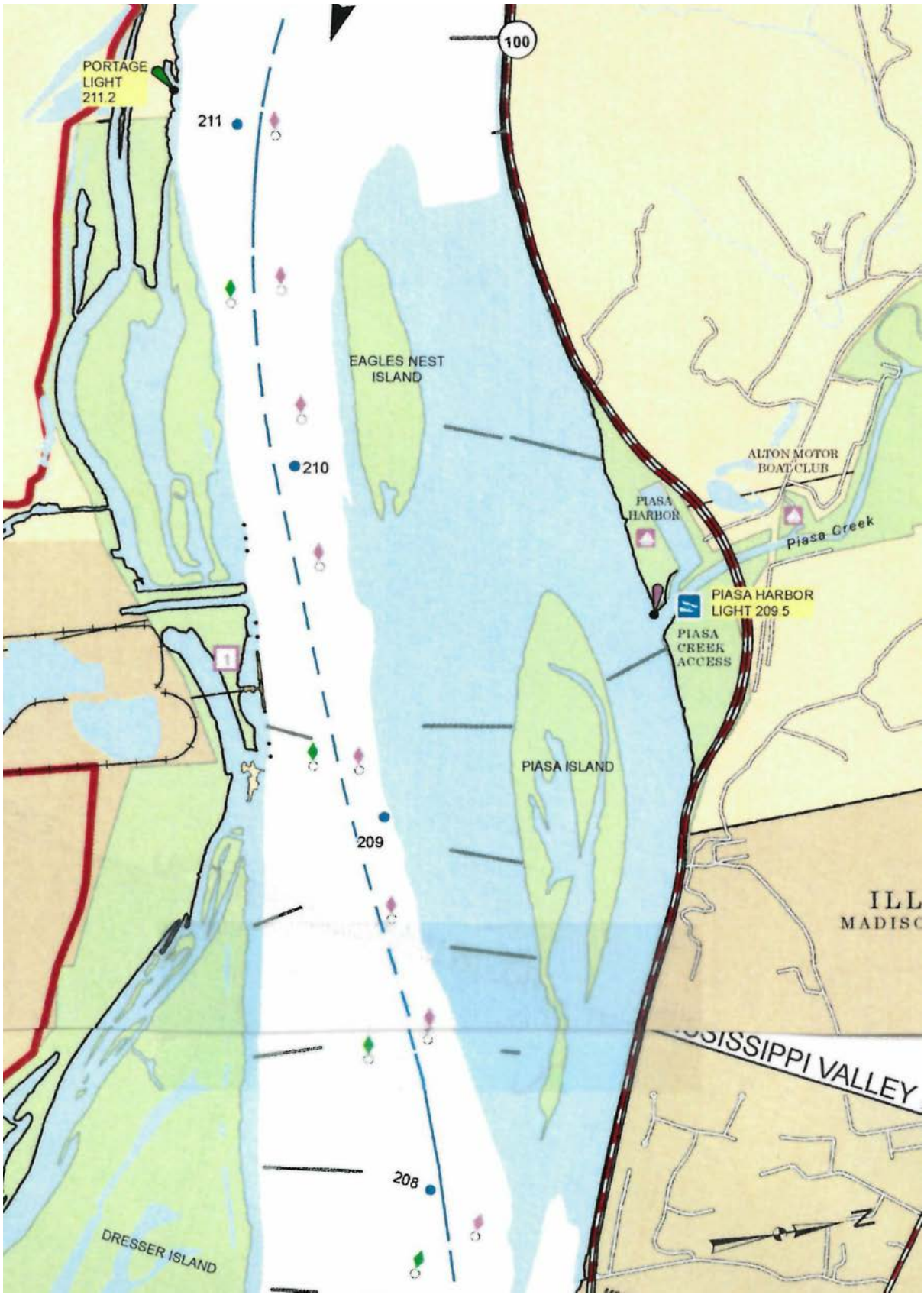

Exhibit D – NON FEDERAL SPONSOR ASSESSMENT

ASSESSMENT OF NON-FEDERAL SPONSOR'S REAL ESTATE ACQUISITION CAPABILITY

State of Illinois Department of Natural Resources

I. Legal Authority:

a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes? **Yes**

b. Does the sponsor have the power of eminent domain for this project? **Yes**

c. Does the sponsor have "quick-take" authority for this project? **Yes**

d. Are any of the lands/interests in land required for the project located outside the sponsor's political boundary? **No**

e. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn? **No**

II. Human Resource Requirements:

a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of Federal projects including P.L. 91-646, as amended? **No**

b. If the answer to II.a. is "yes," has a reasonable plan been developed to provide such training? _____

c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? **Yes**

d. Is the sponsor's projected in-house staffing level sufficient considering its other workload, if any, and the project schedule? **Yes**

e. Can the sponsor obtain contractor support, if required in a timely fashion? **Yes**

f. Will the sponsor likely request USACE assistance in acquiring real estate? **No**

g.

III. Other Project Variables:

a. Will the sponsor's staff be located within reasonable proximity to the project site? **Yes**

b. Has the sponsor approved the project/real estate schedule/milestones?

At this stage, a definitive project schedule has not been developed. Once project designs are finalized, the sponsor will be requested to provide an acquisition schedule.

IV. Overall Assessment:

a. Has the sponsor performed satisfactorily on other USACE projects? **Yes**

b. With regard to this project, the sponsor is anticipated to be: highly capable/fully capable/moderately capable/marginally capable/insufficiently capable.

Fully Capable

V. Coordination:

a. Has this assessment been coordinated with the sponsor? **Yes**

b. Does the sponsor concur with this assessment? **Yes**

Prepared by:

James T. Lovelace
Realty Specialist
St. Louis District - MVS

Approved by:

Jacki Wittenborn
Chief, Real Estate Division
St. Louis District - MVS

Appendix N

Distribution List

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Piasa Eagle's Nest Landowners

Madison County

Stone Ledge Estates Civic Association
Stoneledge Drive
Godfrey, Illinois 62035

Resident
4119 Stoneledge Drive
Godfrey, Illinois 62035

Resident
4021 Stoneledge Court
Godfrey, Illinois 62035

Resident
4017 Stoneledge Court
Godfrey, Illinois 62035

Resident
4009 Stoneledge Court
Godfrey, Illinois 62035

Resident
4003 Stoneledge Court
Godfrey, Illinois 62035

Resident
4001 Stoneledge Court
Godfrey, Illinois 62035

Great Rivers Land Preservation Association, Inc.
P.O. Box 821
Alton, Illinois 62002

Resident
4100 Stoneledge Drive
Godfrey, Illinois 62035

Resident
4101 Stoneledge Drive
Godfrey, Illinois 62035

Realbanc II Corp.
P.O. Box 1452
Decatur, Illinois 62525

Resident
4020 Stonledge Court
Godfrey, Illinois 62035

Resident
13226 Spring Run
Helotes, Texas 78023

Resident
4008 Stoneledge Court
Godfrey, Illinois 62035

Resident
4006 Stoneledge
Godfrey, Illinois 62035

Resident
4002 Stoneledge Court
Godfrey, Illinois 62035

Resident
4000 Stoneledge Court
Godfrey, Illinois 62035

Resident
3505 Riverview Court
Godfrey, Illinois 62035

Resident
3503 Riverview Court
Godfrey, Illinois 62035

Resident
3501 Riverview Court
Godfrey, Illinois 62035

Resident
3405 Riverview Court
Godfrey, Illinois 62035

Resident
3403 Riverview Court
Godfrey, Illinois 62035

Resident
3401 Riverview Court
Godfrey, Illinois 62035

Resident
3514 Rosenberg Lane
Godfrey, Illinois 62035

Resident
3420 Rosenberg Lane
Godfrey, Illinois 62035

Resident
401 Market Street
Alton, Illinois 62002

Resident
3318 Rosenberg Lane
Godfrey, Illinois 62035

Resident
3312 Rosenberg Lane
Godfrey, Illinois 62035

Resident
3302 Rosenberg Lane
Godfrey, Illinois 62035

Alton Water Ski Club, Inc.
4708 Clifton Terrace Road
Godfrey, Illinois 62035

Resident
P.O. Box 189
Godfrey, Illinois 62035

Illinois Department of Natural Resources
1 Natural Resources Way
Springfield, Illinois 62702

Village of Godfrey
P.O. Box 5067
Godfrey, Illinois 62035

Resident
4613 Clifton Terrace Road
Godfrey, Illinois 62035

Resident
4609 Clifton Terrace Road
Godfrey, Illinois 62035

Resident
4818 Whitford Drive
Godfrey, Illinois 62035

Resident
4814 Whitford Drive
Godfrey, Illinois 62035

Resident
4812 Whitford Drive
Godfrey, Illinois 62035

Union Electric Company (Ameren)
PO Box 66149, MC210
St. Louis, MO 63166-6149

Resident
C/O Gary Thompson, Trustee
24 Brunton Court
Bloomington, IL 61704

Resident
4813 Whitford Place
Godfrey, Illinois 62035
The Principia
State Highway 100 W
Godfrey, IL 62035

Lockhaven Golf Club
1530 Locust, LLC
10872 Lawrence Keller Dr
Godfrey, IL 62035

Resident
24 Logan Road
Alton, Illinois 62002

Resident
4801 Whtiford Place
Godfrey, Illinois 62035

Resident
4805 Whitford Drive
Godfrey, Illinois 62035

Resident
4809 Whitford Drive
Godfrey, Illinois 62035

Resident
12761 Fessler Road
Dow, Illinois 62022

Resident
4817 Whitford Place
Godfrey, Illinois 62035

Resident
4821 Clifton Terrace Road
Godfrey, Illinois 62035

Resident
12300 Bellefontaine Road
St. Louis, Missouri 63138

Resident
4800 Clifton Terrace Road
Godfrey, Illinois 62035

Resident
4806 Clifton Terrace Road
Godfrey, Illinois 62035

Resident
4810 Clifton Terrace Road
Godfrey, Illinois 62035

McTalyd LLC
459 East Broadway
Alton, Illinois 62002

Resident
3317 Rosenberg Lane
Godfrey, Illinois 62035

Jersey County Landowners

Alton, Illinois 62002

Resident
26501 Lockhaven Hill Road
Godfrey, Illinois 62035

Resident
26541 Lockhaven Hill Road
Godfrey, Illinois 62035

Resident
26581 Lockhaven Hill Road
Godfrey, Illinois 62035

Resident
26607 Lockhaven Hill Road
Godfrey, Illinois 62035

Resident
26641 Lockhaven Hill Road
Godfrey, Illinois 62035

Resident
26921 Shady Oaks Trail
Godfrey, Illinois 62035

Resident
26681 Lockhaven Hill Road
Godfrey, Illinois 62035

Lockhaven Development
Corporation
117 West Third
Alton, Illinois 62002

Resident
26582 Lockhaven Hill Road
Godfrey, Illinois 62035

Resident
9702 Big Bethel Road
Fredericksburg, Virginia
22407

Great Rivers Land
Preservation
P.O. Box 821

Resident
27747 Thompson Drive
Godfrey, Illinois 62035

Jersey County USACE Lessees

Alton Motor Boat Club
11134 Harbor Dell
Godfrey, Illinois 62035

Piasa Harbor Marina
10815 Lockhaven Road
Godfrey, Illinois 62035

Resident
4450 N. Hwy 111
Brighton, Illinois 62012

Resident
1005 Rozier
Alton, Illinois 62002

Resident
6250 Kingferry Place
St. Louis, Missouri 63129

Resident
506 Lincoln Street
East Alton, Illinois 62024

Resident
512 Hamilton
Wood River, Illinois 62095

Resident
14 Holly Hills Drive
Alton, Illinois 62002

Resident
2100 Terra Cotta Drive
Godfrey, Illinois 62035

Resident
404 West Arch Street
Jerseyville, Illinois 62052

Resident
8941 Lucerne Court
St. Louis, Missouri 63136

Resident
13 Country Maple Drive
Glen Carbon, Illinois 62034

Resident
8709 Blueridge Road
Alton, Illinois 62002

Resident
325 Francisca Drive
Florissant, Missouri 63031

Resident
409 West St. Louis Avenue
East Alton, Illinois 62024

Resident
33 Greybrook
Florissant, Missouri 63031

Resident
5104 Lake Lane
Brighton, Illinois 62012

Resident
307 Allen Street
Alton, Illinois 62002

Resident
219 Goulding Street
East Alton, Illinois 62024

Resident
704 Seiler Road
Godfrey, Illinois 62035

Resident
P.O. Box 72
265 Keating Street
Shipman, Illinois 62685

Interested Parties

Jersey County Board of Commissioners
Chairman, Donald R Little
200 N. Lafayette, Suite 3
Jerseyville, IL 62052

St. Charles County
County Council
100 N. Third St.
Suite 124
St. Charles, MO 63301

City of Godfrey
The Honorable Mayor
Michael McCormick
PO Box 5067
6810 Godfrey Road
Godfrey, IL 62035

City of Alton
The Honorable Mayor
Brant Walker
101 E. Third Street
Alton, IL 62002

City of Grafton
The Honorable Mayor
Rick Eberlin
P.O. Box 287
111 Main St.
Grafton, IL 62037

U.S. Environmental Protection Agency, Region 5,
NEPA Implementation Section
Chief Ken Westlake
77 W. Jackson Blvd.
Chicago, IL 60604

U.S. Fish & Wildlife Service
Kevin Sommerland
5600 American Blvd. West
Suite 990
Minneapolis, MN 55437

U.S. Fish & Wildlife Service
Matt Mangan
8588 Route 148
Marion, IL 62959

Illinois Department of Natural Resources
Division of Realty
One Natural Resources Way
Springfield, IL 62702

Illinois Department of Natural Resources
Office of Fisheries
Elmer (Butch) Atwood
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Greenville, Illinois 62246
butch.atwood@illinois.gov

Illinois Department of Natural Resources
Kenny Scott
Mississippi River Area State Fish & Wildlife Area
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Grafton, IL 62037

Illinois Department of Natural Resources
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Rob Maher
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Illinois Department of Transportation - District 8
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Region 5 Engineer
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Collinsville, Illinois 62234-6198

Missouri Department of Conservation
Matt Vitello
2901 W. Truman Blvd.
Jefferson City , MO 65109

Carterville Fish and Wildlife Conservation
Donovan Henry
Office RR 2 Box J
Carterville, IL 62918

Jersey County Highway Department
Thomas E. Klasner, P.E.
County Engineer
722 State Highway 16
Jerseyville, IL 62052

United States Congress
The Honorable Senator
Richard Durbin
711 Hart Senate Office Building
2nd St NE #711
Washington, DC 2002

United States Congress
The Honorable Senator
Tammy Duckworth
524 Hart Senate Office Building
Washington, DC 20510

United States Congress
The Honorable Congressman
Rodney Davis
1740 Longworth House Office Bldg.
Washington, DC 20515

Illinois Legislature
The Honorable Senator
William R Haine
311C State Capitol Building
Springfield, IL 62706

Illinois Legislature
The Honorable Representative
Monica Bristow
200-7S Stratton Office Building
Springfield, IL 62706

Southern Illinois University
Carbondale
1220 Douglas Drive
Carbondale, IL 62901

Alton Motor Boat Club
Butch Rister
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Godfrey, Illinois 62035
boaterdar@att.net

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news@suntimesnews.com

The Alton Telegraph
news@thetelegraph.com

Jerseyville County Journal
832 S. State St
Jerseyville IL 62052

St. Louis Post-Dispatch
900 N. Tucker Blvd.
St. Louis, MO 63101

The Nature Conservancy
Illinois Field Office
8 South Michigan Avenue
Suite 900
Chicago, IL 60603

The Nature Conservancy
Missouri Chapter Office:
The Nature Conservancy
2816 Sutton Blvd, Ste 2
St. Louis, MO 63143

Sierra Club-Piasa Palisades
200 W 3rd St #251
Alton, IL 62002

Illinois Federation for Outdoor Resources
President Scott Bryant
P.O. Box 5
Godfrey, IL 62035
skycarp@aol.com

Alley Ringhausen
Great Rivers Land Trust
pcwpgrlt@gmail.com

Izaak Walton League of America
President Illinois Division
55 Ridgecrest Drive
Decatur, IL 62521

Heartlands Conservancy
406 E. Main Street
Mascoutah, IL 62258

Southern Illinois Audubon Society
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Springfield, IL 62703

Audubon Center at Riverlands
Ken Buchholz
Center Director
301 Riverlands Way
West Alton, MO 63386

Ducks Unlimited
Regional Director, S IL
Trevor Hickman
290 Douglas Avenue, Unit 12
Mascoutah, IL 62258

Great Rivers Habitat Alliance
PO Box 50014
Saint Louis, MO 63105

Missouri Coalition for the Environment
3115 S. Grand Blvd., Ste. 650
St. Louis, MO 63118

Marshall Plumley
UMRR MVR
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Rock Island, IL 61201
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Tom Novak
UMRR MVP
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St Paul, MN 55101
tom.novak@usace.army.mil

Piasa and Eagle's Nest Islands HREP

Additional Project Material

List of Enclosures

1) Approved Fact Sheet – 8 Sep 2010
2) Feasibility Scoping Meeting Documentation – Dec 2014
3) District Quality Control Documentation – Mar 2017
4) Project Management Plan – 11 Mar 2014
5) Project Review Plan – 28 Mar 2014
6) Cost Documentation – 1 Feb 2018
    a. Full Cost Appendix
    b. Walla Walla Cost Certification
7) Agency Technical Review of Draft Report Documentation – Mar 2018
8) Alternative Formulation Briefing Documentation
    a. DE Transmittal Memo – 21 Feb 2018
    b. AFB PowerPoint Presentation – 3 Apr 2018
    c. Comment/Response Resolution Mar 2018
    d. MVD release for public review memo – 6 Apr 2018
    e. MVS public review letter – 2 May 2018
9) Final Project Study Issue Checklist – 5 Jun 2006
10) Agency Technical Review of Final Draft Report Documentation – 21 Jun 2018
11) Post Authorization Decision Document Checklist – 7 Sep 2018
12) Final Report Submittal Documentation
    a. DE Transmittal Memo – 25 Jun 2018
    b. MVD approval memo – 7 Sep 2018

Enclosure 1

Fact Sheet

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

8 September 2010

MEMORANDUM FOR Commander, St. Louis District, ATTN: CEMVS-PM-N

SUBJECT: Upper Mississippi River System - Environmental Management Program (UMRS-EMP), Piasa and Eagles Nest Island, Madison and Jersey Counties, Illinois, Habitat Rehabilitation and Enhancement Project (HREP), Fact Sheet Approval

1. Reference memorandum, CEMVS-PM-N, 2 June 2010, subject as above.

2. Subject fact sheet was resubmitted on 26 July 2010 incorporating MVD comments. The subject revised fact sheet is approved for continued HREP planning (encl).

3. The MVD point of contact is Elizabeth Ivy, CEMVD-PD-SP, (601) 634-5310.

Encl

for CHARLES B. BARTON
Chief, District Support Team for
St. Louis, Rock Island, and
St. Paul

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

2 June 2010

CEMVS-PM-N

MEMORANDUM FOR: Commander, Mississippi Valley Division, ATTN: CEMVD-PD-SP (Ms. Elizabeth Ivy), 1400 Walnut Street, P.O. Box 80, Vicksburg, MS 39180

SUBJECT: Upper Mississippi River System-Environmental Management Program (UMRS-EMP), Piasa and Eagles Nest Island, Madison and Jersey Counties, Illinois, Habitat Rehabilitation and Enhancement Project (HREP), Fact Sheet Approval

1. We have attached one copy of the fact sheet with project site map and Illinois Department of Natural Resources (IDNR) Letter of Intent for the Piasa and Eagles Nest Island, Madison and Jersey Counties, Illinois, HREP an element of the UMRS-EMP.

2. All project features are on federally owned General Plan lands. Accordingly, this project is being pursued as 100% Federal. Operation, Maintenance, Repair, and Rehabilitation costs are the responsibility of the project's sponsor, IDNR.

3. This transmittal is consistent with standing program implementation guidance (see HQUSACE memoranda dated 1 August 1986 and 12 May 2000, regarding UMRS-EMP implementation).

4. A Definite Project Report will be generated for this project.

5. If you have any questions, or need additional information, please contact Mr. Brian Markert, MVS Environmental Management Program Manager, at (314) 331-8455.

FOR THE COMMANDER:

Attached (1 copy)

BRUCE MUNHOLAND
Chief, Project Management Branch

EAGLES NEST AND PIASA ISLANDS
HABITAT REHABILITATION AND ENHANCEMENT PROJECT
MADISON AND JERSEY COUNTIES, ILLINOIS
ENVIRONMENTAL MANAGEMENT PROGRAM
ST. LOUIS DISTRICT

FACT SHEET

I. LOCATION

The proposed project includes Eagles Nest and Piasa Islands and the surrounding channel in Madison and Jersey counties, Illinois (Fig. 1). The project area is in Upper Mississippi River Pool 26 near Alton, IL. These islands are owned by the Corps of Engineers and managed by the Illinois Department of Conservation (IDNR) through a cooperative agreement. They are part of the Mississippi River Fish and Wildlife Area.

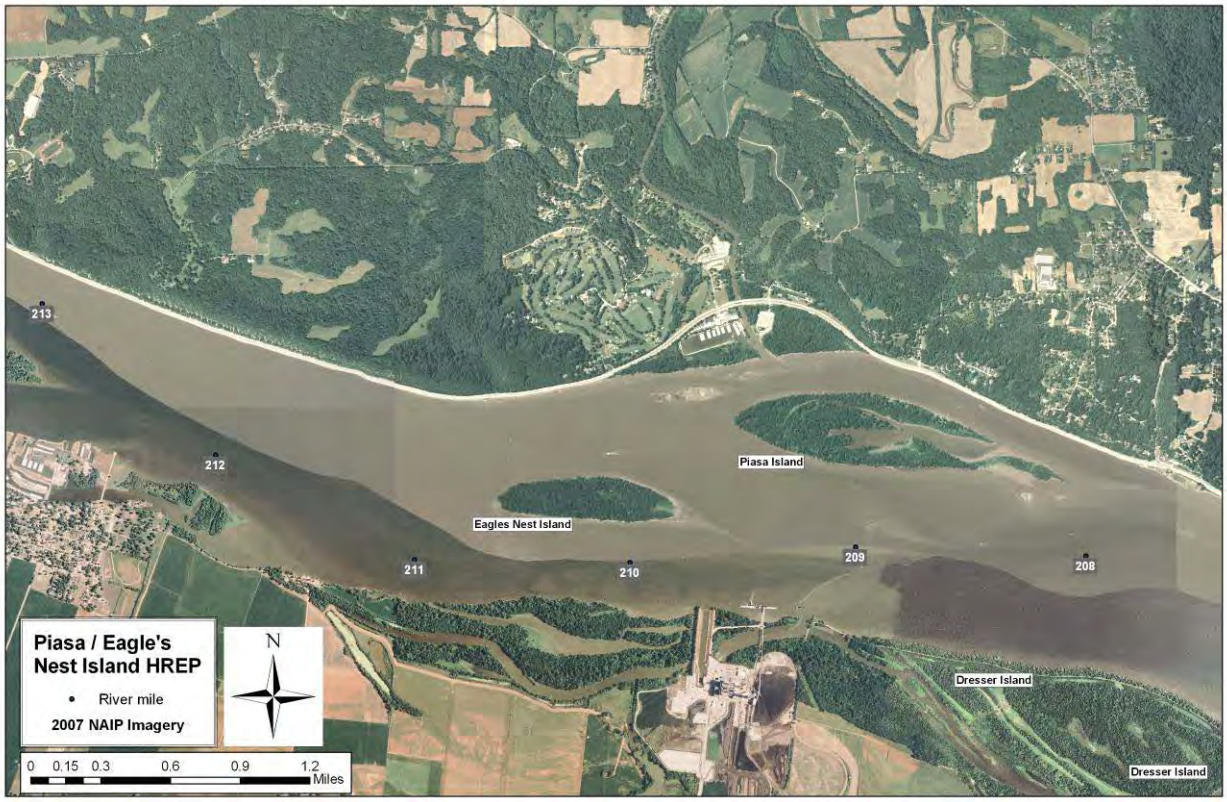


Figure 1. The proposed project area including Eagles Nest and Piasa Islands.

II. EXISTING RESOURCES

A 2006 bathymetric survey of Eagles Nest and Piasa Islands' side channel indicates that the majority of the depth exists between the two islands (Fig. 2). The remaining side channel from the head of Piasa Island to where it rejoins the Mississippi River is relatively shallow with two small areas of deep water. Local partners indicate that the two deep areas were once a continuous channel. Near the head of Piasa Island, there is a very shallow area covered in woody debris that reaches from the center of the channel to the mouth of Piasa Creek. At minimum pool, this area becomes a sand bar (Fig. 1). Area land managers indicate that the depth in this area varies. During most years, sediment deposits in this area. In years when the Mississippi River is low and Piasa Creek floods, the sediment is washed out. Recent Piasa Creek watershed restoration efforts may have increased the upstream storage capacity preventing the necessary flood flows to remove this sediment. The interior backwater on Piasa Island is shallow throughout.

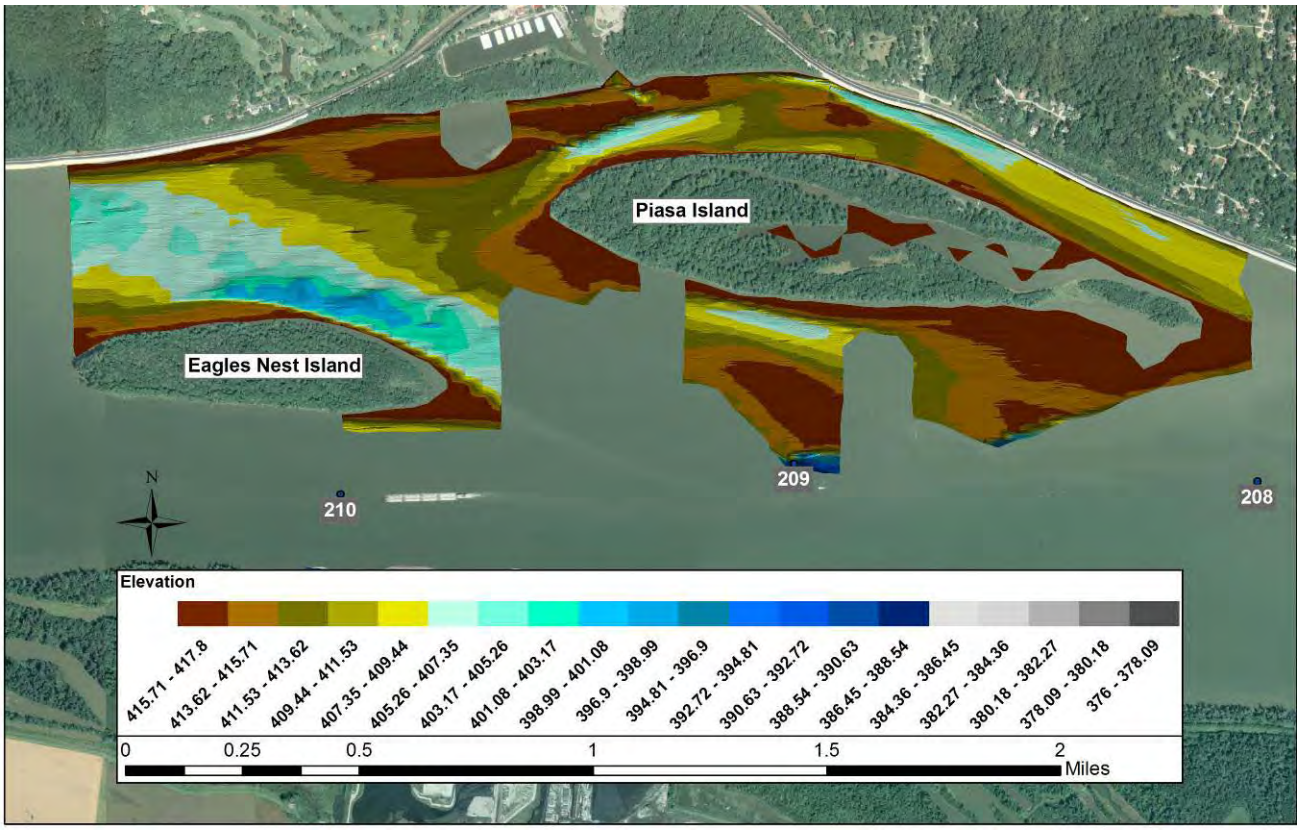


Figure 2. A bathymetric survey of the Eagles Nest and Piasa Island side channel was taken in 2006. Mean Pool 26 elevation for this location is: mean 419 - 420 and minimum 415 - 416.

Land cover on Eagles Nest Island is a mixture of cottonwood forest and mixed floodplain forest. Piasa Island is almost exclusively floodplain forest with small pockets of shallow annual marsh and wet meadow wetland. Cottonwoods and maples are the dominant tree species with occasional sycamores. On the side channel side of Piasa, there are four cabin leases which have maintained lawn around them.

III. PROBLEM IDENTIFICATION

The 1890 Mississippi River Commission Map of the Eagles Nest and Piasa Island area has two isolated sand bars at the head of Piasa Island. There were also small vegetated islands on the riverside and at the tail end of Piasa Island. In imagery from 1941 after Lock and Dam 26 was complete, only the two islands remained.

Area land managers indicate that the head of Eagles Nest Island is eroding. Additionally, the side

channel from the head of Piasa Island to the Mississippi River is losing depth resulting in declining habitat for native fishes. The backwater area in the interior of Piasa Island is very shallow with only 3 - 5 feet of depth at mean pool; at minimum pool, it does not hold water.

The existing habitat conditions, future habitat needs and proposed general actions recommended for habitat restoration on the Upper Mississippi River (UMR) are addressed in the Upper Mississippi River System (UMRS) Habitat Needs Assessment (HNA) Report (COE, 2000). This report calls for creation and restoration of 10,000 acres of secondary channel habitat, 3,000 acres of island habitat and 12,000 acres of contiguous backwater in Pools 14 - 26. An opportunity exists to restore depth, reduce erosion, enhance aquatic habitat diversity, and recreate some of the historic islands and sand bars.

IV. PROJECT GOALS

Enhance and conserve terrestrial and aquatic habitats to benefit fisheries, migratory birds, and other organisms

- Enhance secondary channel depth and create flow diversity
- Reduce island erosion
- Create island/sand bar habitat
- Enhance backwater depth diversity

These goals are consistent with identified needs in the Habitat Needs Assessment (HNA) for side channel, island and backwater habitat. The project is also consistent with the goals developed for the region under the NESP program.

V. PROPOSED PROJECT

The following are potential measures that could up one implementable alternative that may be in the federal interest, addresses the area's problems, and achieves projects goals (Fig. 3). If approved, a feasibility study resulting in a definite project report would be prepared. As part of this study, a full range of measures and alternatives would be developed and analyzed. To determine these, the project delivery team would utilize existing literature, historic information, area studies, models (hydraulic sediment response model), partner input and best scientific judgment.

Dredging – Dredge channels in the interior backwater of Piasa Island to a depth of 10'. Dredging these areas would create depth diversity and deep slack water habitat that would serve as a fish refuge

Island/Sand bar creation – The dredge material would be placed behind constructed chevrons on the riverside of Piasa Island and between Eagles Nest and Piasa Islands. Deposition areas naturally form behind chevron structures. Dredge disposal in this area would increase the likelihood of island/sand bar formation.

Dike Notching - A 300' notch is proposed for each dike on the riverside and in the side channel. In the side channel, these notches would improve flow and help maintain the side channel. On the riverside, the notches would create a new side channel and maintain the created islands.

Structures – Three chevrons and two trail dikes are proposed. Two rock dikes are proposed to be built on either side of the tail end of Eagles Nest Island. These structures would redirect flow along the islands rather than between the islands. This would improve the depth in the existing side channel below the head of Piasa Island. One chevron would be located at the end of the trail dike between Eagles Nest and Piasa Islands. This chevron would aide in redirecting flow, create flow diversity and potentially form island/sand bar habitat downstream. Two additional chevrons are

proposed in the dike field on the riverside of Piasa Island. These chevrons would create flow diversity and protect the dredge disposal islands.

Erosion protection structures – Off-bank rock structures are proposed at the head of Eagles Nest and Piasa Islands to prevent erosion and create habitat. Flood flows would overtop the off-bank rock creating a deep hole followed by a deposition zone at the head of the island. This would provide additional deep and shallow slack water habitat at the island heads.

VI. IMPLEMENTATION CONSIDERATIONS

The placement, number, and type of structures, islands, and sand bars is contingent on the results of a hydraulic sediment response model indicating that the structures address project problems and achieve project goals. Construction may be phased to determine feature effects and if additional features are necessary to achieve project goals. It is assumed that dredged material can be used for island/sand bar construction. Soil borings may be necessary to determine the characteristics of the dredge material. Creation of deeper water within the side channel is contingent upon scour created by the structures and Pool 26 flows. The project will be planned to ensure that post-construction maintenance dredging is not necessary. A Value Engineering Analysis will be conducted early in the feasibility study phase. This analysis will suggest a variety of measures and methods to meet project objectives while minimizing total project cost.

Historically, there have been eagles' nests on the two islands. Eagles also utilize the side channel and its woody debris for fishing and resting. The Fish and Wildlife Service Bald and Golden Eagle Protection Act guidelines require that activities in view of an active nest maintain a 660' distance from the nest. Five mussel beds have been identified within the project area. These beds may or may not still be present. A thorough mussel survey of the project area will be needed to inform the placement of structures and dredge material. There is a heron rookery on the head of Eagles Nest Island. Surveys of the area for natural resources will be conducted and coordinated with local, state, and federal agencies. Project planning and construction will ensure impacts to these and other natural resources are avoided and minimized.

VII. FINANCIAL DATA

The total estimated base year cost for this project is $4,650,254.00. All of the project features are on Corps-owned lands managed by the Illinois Department of Natural Resources. Accordingly, under the provisions of Section 906 (e) of WRDA 1986, as amended, the project's first costs are 100 percent Federal. Operation, Maintenance, Repair, and Rehabilitation costs are the responsibility of the project's sponsor, IDNR. The estimated annual operations and maintenance cost is $9,000.00. There are numerous publicly owned lands near the project area, if project features are proposed on these lands the project may gain additional project sponsors.

VIII. STATUS OF THE PROJECT

The project has been endorsed by the River Resource Action Team. A transition plan has been developed for EMP and the Navigation and Ecosystem Sustainability Program (NESP). Ecosystem Restoration projects are being formulated for compatibility between the two programs. It is anticipated that this project could easily transition between the two programs if directed by Congress to do so.

IX. POINTS OF CONTACT

Brian Markert, Program Manager, U.S. Army Corps of Engineers, St. Louis District,
(314) 331-8455, brian.j.markert@usace.army.mil
Richard J. Mollahan, Acting Manager Corps of Engineers Projects Section, IDNR, 217-785-8264,
rick.mollahan@illinois.gov
Kim Postlewait, Site Manager, IDNR, 618-376-3303, kim.postlewait@illinois .gov

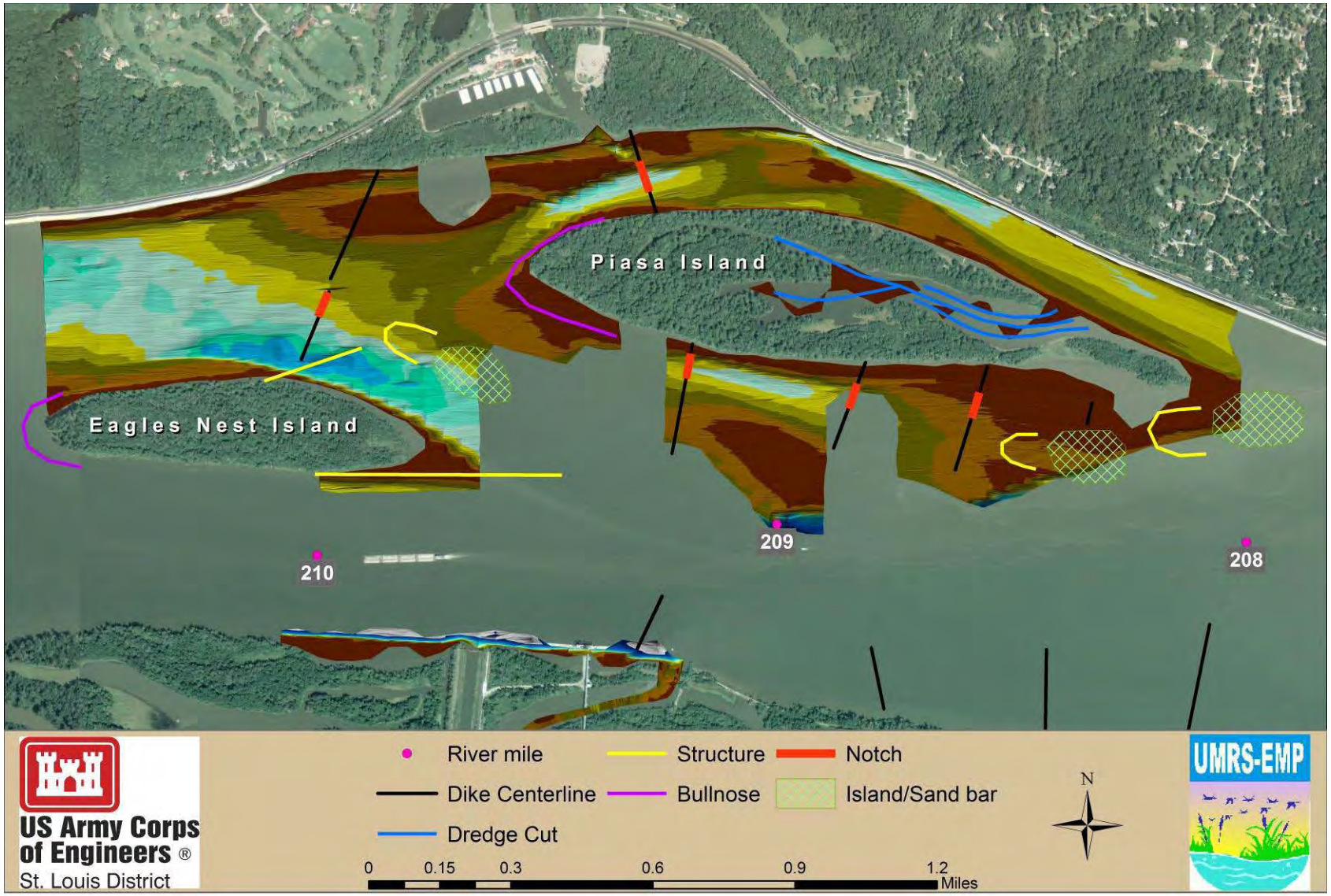
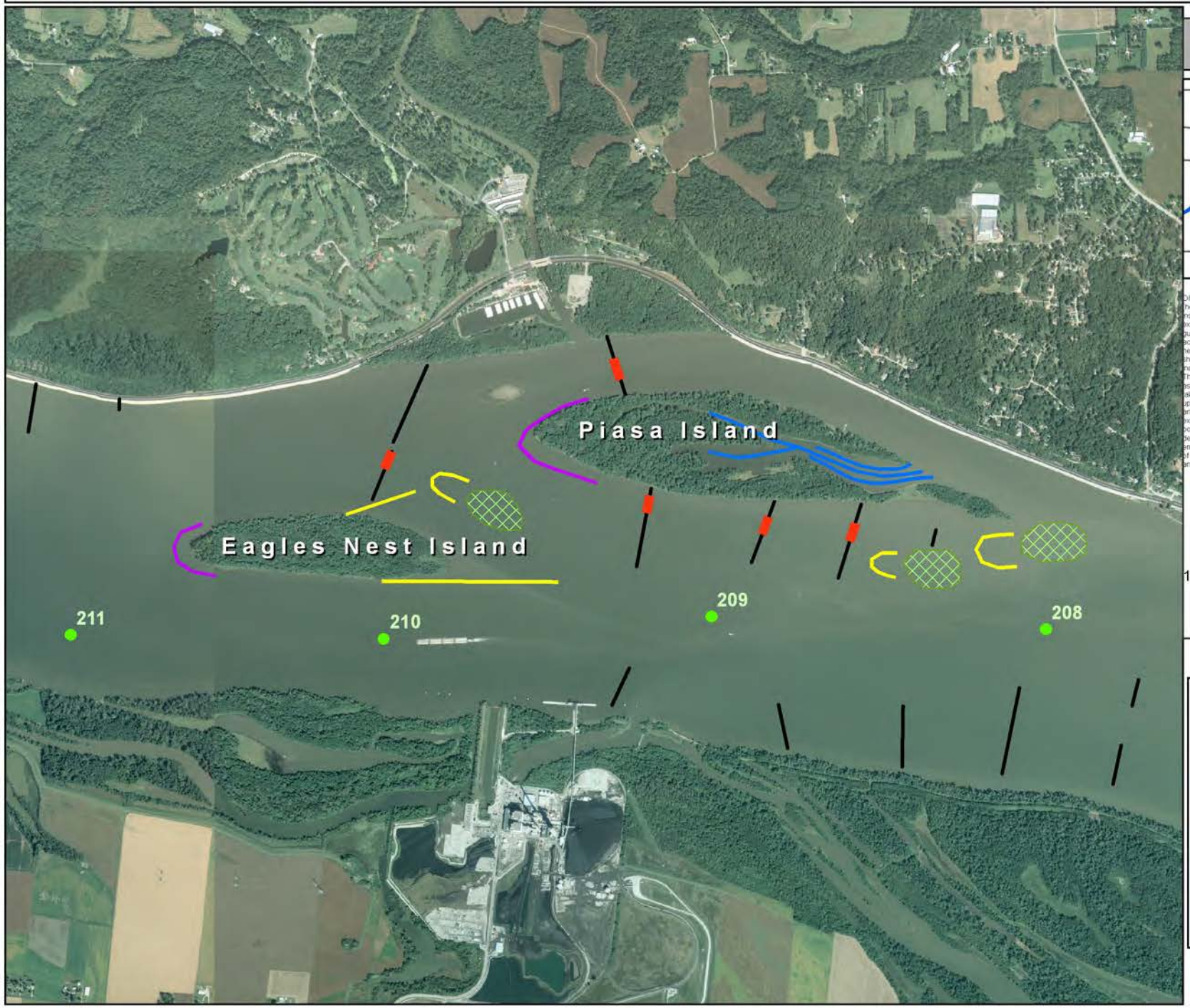


Figure 3. Proposed features to address the problems and goals for the Eagles Nest and Piasa Islands Habitat Rehabilitation and Enhancement Project.

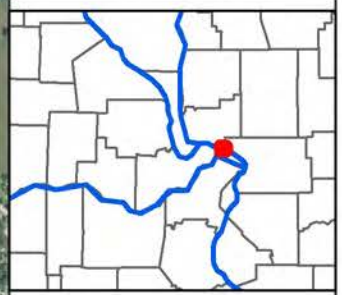
US Army Corps of Engineers ®
St. Louis District

EAGLES NEST AND PIASA ISLANDS
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

UMRS-EMP



Location Map



N
W E
S

1,250 625 0 1,250 2,500 Feet

- River Miles
- Dredge Cut
- Structure
- Bullnose
- Notch
- Dike Centerline
- Island/Sand bar

Enclosure 2

Feasibility Scoping Meeting Documentation

DISTRICT QUALITY CONTROL REVIEW REPORT

Subject: Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP) Draft Feasibility Report (first 4 chapters), December 2014

1. **Scope and Purpose of Review.** The purpose of this review report was to document District Quality Control on the first four chapters of the feasibility report with integrated environmental assessment for the Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project. The St. Louis District has completed Steps 1 and 2 of the planning process (i.e., Step 1 – Identification of Problems and Opportunities; Step 2 – Inventory and Forecast Resource Conditions) and preliminary project feature discussion. This included review of a detailed description of identified problems and opportunities, assessment of existing conditions, statements of specific planning objectives and constraints, a detailed description of the future without project condition, a description of feasible project features, and the results of any preliminary coordination or public involvement. The review was conducted by a multi-disciplinary expert-level team composed of St. Paul and St. Louis District employees. The primary point of contact for this review was Dr. Kat McCain.
2. **References.** This review report was prepared in response to EC 1165-2-214, 15 December 2012, Water Resources Policies and Authorities, CIVIL WORKS REVIEW.
3. **Project Description.** The Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP) is located on the left descending bank of the Mississippi River within navigation pool 26 between river miles 207.5 and 211.5, upstream of Alton, Illinois in Madison and Jersey counties. The resource problems identified for the Project include:
    - Loss of depth and flow in Piasa Chute
    - Loss of year-round connectivity and depth within Piasa Island backwater
    - Loss of diverse island complex
    - Loss of wetlands

    The goal of this HREP is to restore and improve the quality and diversity of aquatic, island, and wetland ecosystem resources within the Piasa and Eagle's Nest Island project area.

4. **Review Team.** The review was conducted by a multi-disciplinary expert-level team composed of St. Paul and St. Louis District employees.
    a. Environmental – Tim George (RPEDN- MVP-PD-C)
    b. Plan Formulation – Monique Savage (RPEDN – MVP –PD-F)
    c. Hydrology and Hydraulics – Peter Russell (MVS – EC-H)
5. **DQC Summary.** A summary of non-editorial comments is provided below.
    a. **Environmental -** The reviewer advised that in future drafts ensure certified habitat evaluation model(s) are selected. No other technical comments received from environmental reviewer.
    b. **Plan Formulation -** The reviewer advised that in future drafts that discussion on the following are included: 1) climate change be added per ECB 2014-10; 2) USACE

Environmental Operating Principles; 3) additional information on UMRR authorization; 4) additional quantification of habitat; and 5) address risk and uncertainty associated with the project. Other comments received recommended re-writing sentences for clarity and consistencies with cross-referencing between sections.

c. **Hydrology and Hydraulics –** The reviewer provided several in-text edits and comments provided, with the biggest concern related to need for more data within the report as related to the identified problems (i.e., shallow conditions within side channel). These data have been added.

6. **Assessment of District Quality Control.** All comments from this DQC review are closed in DrChecks. The DQC activities for this product were sufficient and adequately documented.
7. **DrChecks Report.** The DrChecks Report for all the comments is attached as Enclosure 1.

_____

Thomas L. Crump, P.E.

Chief, Regional Planning and Environment Division North

Enclosure 3

District Quality Control Documentation

US Army Corps
of Engineers®

St. Louis District

Project Management Plan

PIASA AND EAGLE'S NEST ISLANDS
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

Prepared by
St. Louis District
US Army Corps of Engineers
Original Date: Feb 2014 Revision Number: Revision Date:

St. Louis District, U.S. Army Corps of Engineers
Clarence Cannon National Wildlife Refuge
EMP

REVIEWED BY:

Brian Markert — 11 Mar 14
Brian Markert — Date
Program/Project Manager, Mississippi River Restoration

for Shula Burnett — 11 MAR 14
Nichelle Gafford — Date
Chief, Resource Management Office

11 MAR 14
Tim Nelson — Date
Chief, Real Estate Division

Brenda Wynne-George — 11 Mar 14
Brenda Wynne-George — Date
Chief, Contracting Division

pr Danny D. McClendon — 3/11/14
Lou Dell Orco — Date
Chief, Operations Readiness Division

David Busse — 3/11/14
David R. Busse — Date
Chief, Engineering Construction Division

William P. Levins — 3/11/14
William P. Levins — Date
Chief, Office of Council

3/11/14
Michael Feldmann — Date
Deputy District Engineer for Planning,
Programs, and Project Management

11 MAR 14
Aaron W. Wolf — Date
Deputy District Commander,

APPROVED BY:

3-11-14
Christopher G. Hall — Date
COL, EN
COMMANDING

TABLE OF CONTENTS

APPENDICES

Piasa and Eagle's Nest Islands
Habitat Rehabilitation And Enhancement Project

The purpose of this project management plan is to establish scope, schedule, budgets, and technical performance requirements for the management and control of the project from Planning, Engineering, and Design through construction. This plan has been developed in accordance with St. Louis District Project Management Business Process Policy and Procedure Manual and Engineering Regulation 5-1-11. It documents the plan to address the Definite Project Report (DPR) phase of the project.

1.0 PROJECT AUTHORIZATION

Congress authorized the Upper Mississippi River Restoration – Environmental Management Program (UMRR-EMP) in Section 1103 of the 1986 Water Resources Development Act (WRDA). Over the course of its first 13 years, UMRR-EMP proved to be one of this country's premier ecosystem restoration programs, combining close collaboration between Federal and State partners, an effective planning process, and a built-in monitoring process. This success led Congress to reauthorize UMRR-EMP in WRDA 1999 (Public Law 106-53). Section 509 of the 1999 Act made several adjustments to the program and established the following two elements as continuing authorities:

- Planning, construction, and evaluation of fish and wildlife habitat restoration and enhancement projects (known as Habitat Rehabilitation and Enhancement Projects (HREPs)).
- Long-term resource monitoring, computerized data inventory and analysis, and applied research (known collectively as Long Term Resource Monitoring Program (LTRMP)).

The proposed project would be funded and constructed under this authorization.

2.0 PROJECT BACKGROUND AND HISTORY

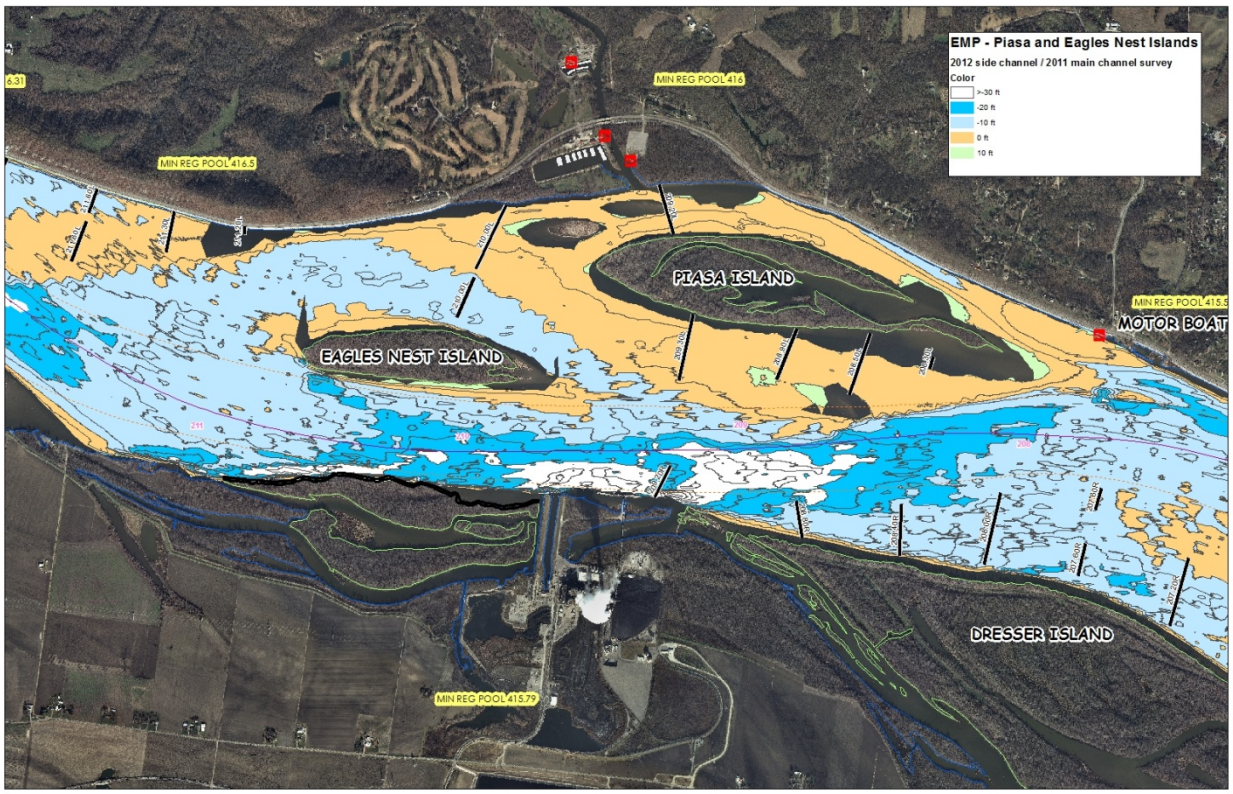
The Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP) is located outside of shipping channel in the vicinity of Upper Mississippi River Mile 209, and approximately 20 miles north west of Saint Louis, MO. The project lies in pool 26, between UMR miles 211 and 208. It is approximately 11 miles upstream from Melvin Price Lock and Dam, near the pool hinge point.

The project covers approximately 1,350 acres of backwaters, side channels, and island habitats. The project area is located on USACE-owned lands, but are managed by the Illinois Department of Natural Resources.

The primary resource problems include: sedimentation resulting in loss of depth in the side channels, altered river hydrology, loss of emergent wetlands, and loss of islands and island area within Pool 26 of the Upper Mississippi River. These problems have led to degraded aquatic and wetland ecosystem structures and functions. Potential project features to address these problems

include: river training structures including, but not limited to, chevron dikes, closure structures, alternating hard points, bullnose dikes, trail dikes, stub dikes, in-stream habitat structure, dredging, beneficial dredge material placement, and revetment.

A 2012 bathometric survey (Fig.1) of Eagles Nest and Piasa Islands' side channel indicates that the majority of the depth exits between the two islands. The remaining side channel from the head of Piasa Island to where it rejoins the Mississippi River is relatively shallow with two small areas of deep water. Local partners indicate that the two deep areas were once a continuous channel. Near the head of Piasa Island, there is a very shallow area covered in woody debris that reaches from the center of the channel to the mouth of Piasa Creek. At minimum pool, this area becomes a sand bar (Fig. 1). Area land managers indicate that the depth in this area varies. During most years, sediment deposits in this area. In years when the Mississippi River is low and Piasa Creek floods, the sediment is washed out. Recent Piasa Creek watershed restoration efforts may have increased the upstream storage capacity preventing the necessary flood flows to remove this sediment. The interior backwater on Piasa Island is shallow throughout.



The 1890 Mississippi River Commission Map of the Eagles Nest and Piasa Island area has two isolated sand bars at the head of Piasa Island. There were also small vegetated islands on the riverside and at the tail end of Piasa Island. In imagery from 1941 after Lock and Dam 26 was complete, only the two islands remained.

Area land managers indicate that the head of Eagles Nest Island is eroding. Additionally, the side channel from the head of Piasa Island to the Mississippi River is losing depth resulting in declining habitat for native fishes. The backwater area in the interior of Piasa Island is very

shallow with only 3 - 5 feet of depth at mean pool; at minimum pool, it does not hold water.

3.0 PROJECT PURPOSE

The purpose of Draft Definite Project Report with Integrated Environmental Assessment, including the draft Finding of No Significant Impact (FONSI) is to evaluate the proposal for the Upper Mississippi River Restoration – Environmental Management Program Habitat Rehabilitation and Enhancement Project (HREP) at Piasa Eagles Nest Island. This report provides planning, engineering, and sufficient construction details of the proposed plan to allow final design and construction to proceed subsequent to document approval.

4.0 PROJECT SCOPE

4.1 General

As the project progresses through the plan formulation process, the scope of work will be further defined and a Definite Project Report (DPR) will be prepared. This PMP will be revised and updated to address design and construction once the DPR is approved. All work that the Corps is responsible for will be accomplished using either in-house staff or Architect-Engineer (AE) firms through open-ended indefinite delivery type contracts. Each discipline will be responsible for preparing a scope of work for the AE firms for their particular area of expertise and for periodic review of AE progress.

Team responsibilities include:

- Identifying problems and opportunities
- Inventorying and forecasting conditions
- Formulating alternative plans
- Evaluating alternative plans
- Comparing alternative plans
- Selecting a recommended plan
- Report writing

4.2 Critical Assumptions and Constraints

- It is assumed that construction of the project can be completed within project existing boundaries and that no real estate interest for ingress and egress over private property will be necessary. Should they become necessary, rights-of-entry would be obtained from private landowners for this purpose prior to any construction.

- All project features would be constructed on land owned by the Federal Government with management responsibility provided by the Illinois Department of Natural Resources. Accordingly, under the provisions of Section 906(e) of WRDA 1986, as amended, the projects first costs are 100 percent Federal. OMRR&R costs are the responsibility of IDNR as the project's sponsor.

- All features of the selected plan must be compatible with all IDNR goals, objectives, activities, fiscal capabilities, etc. IDNR will be a key member of the project delivery team.

4.3 Summary of Technical Analysis

4.3.1 Project Management

The Project Management Branch will have the lead for the plan formulation process and development of the Definite Project Report (DPR) with Integrated Environmental Assessment (EA) document. Project management activities entail the oversight of all project activities relating to scope, schedule, and budget and preparing and updating the Project Management Plan, for the integrity of the project schedule, ensuring all PDT members have input to the schedule. The Project Manager will ensure that the scope remains within the project authorized scope as the study progresses, and continually communicate the scope to all project stakeholders. The Project Manager is also responsible for updating the project schedule as the project progresses and for the project's budget. Budget functions include coordinating a full team budget , preparation of budgetary data and documents, management of District-level input to the budgetary process, notification of work allowances, allocation of funds, monitoring all obligations and expenditures, and reviews of work progress in relation to costs. The Project Manager is responsible for defining issues for consideration by the Project Review Board, and reporting project status via Project Executive Summary reports. Project Management for this project also entails coordination with the local sponsor and other local interests.

4.3.2 Environmental Quality

The purpose of a Phase I Hazardous, Toxic, and Radiological Waste (HTRW) site assessment is to identify recognized environmental conditions. A recognized environmental condition means "the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions compliant with the laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies."

The Phase I site assessment report will follow the standard described in ASTM Practice E-1527. The findings and conclusions will not be scientific certainties, but rather professional opinions concerning the significance of the limited data gathered during the course of the environmental site assessment.

A Phase II assessment will be conducted if indicated as being required in the Phase I site assessment. However, it is anticipated that a Phase II assessment will not be required.

4.3.3 Hydrologic & Hydraulic Engineering and Applied River Engineering

In close coordination with the environmental team member, hydrologic and hydraulic engineering (EC-HE and EC-HR) will be responsible for the following:

Specific responsibilities include:

- Model water conveyance within the project area
- Assist in the design of river training structures

4.3.4 Environmental Planning

In coordination with the project manager, the environmental planning section (RPEDN-PD-P) will assist in coordinating with the sponsor Illinois Department of Natural Resources (IDNR), and with all interested federal, state, and local agencies throughout the process, including preparation of the Environmental Assessment. Environmental will work with the PDT in the development of alternatives based on the project problems and opportunities. An Environmental Assessment (EA) will be prepared and integrated in the report. Coordination and correspondence regarding the EA and Finding of No Significant Impact (FONSI) will be included in the final DPR/EA provided to MVD. PD-P will coordinate the proposed work with state and federal environmental agencies.

Environmental coordination for this project has been and will continue to be maintained with all interested federal, state, and local agencies through the project development process.

The St. Louis District will comply with applicable environmental laws, executive orders, and regulations for the current stage of project development.

Specific responsibilities include:

- identification of project problems and opportunities, and follow the USACE 6-step Planning Process
- development of potential project features to address problems and opportunities
- determination of environmental benefits
- assure compliance with NEPA requirements
- coordination of surveys and monitoring efforts
- coordinate the development of USFWS Coordination Act Report

4.3.5 Civil Engineering

Specific responsibilities include:

- Perform preliminary design of civil elements such as access roads, borrow site, haul roads, reforestation, etc.
- coordination with geotechnical engineers on proposed borrow and placement.
- coordination with other elements as needed to develop project features.
- prepare text describing civil elements of the project.
- prepare quantities for cost estimate for civil elements of the project .

4.3.6 Geotechnical

Specific responsibilities include:

- provide geotechnical considerations to the team on possible design options.
- coordinate drilling and soil sampling and testing activities.

4.3.7 Cultural

The Curation and Archives Analysis branch of the St. Louis District will perform historic properties investigations (archival records searches and on-site investigations) within all areas of potential ground surface disturbances associated with this study. Such areas will include any potential construction sites/equipment staging areas as well as any other areas where ground disturbances are anticipated. Should these investigations identify any potentially significant archeological remains, the District will immediately notify the Missouri State Historic Preservation Office (SHPO) and apprise them of the discovery. After consultation with the SHPO, should avoidance of the potentially significant remains not be feasible, additional archaeological fieldwork will be required to determine the significance of the archaeological remains. The conduct and extent of such investigations will also be formally coordinated, in advance, with the SHPO and other interested parties, including potentially affiliated Native American tribal officials.

Specific responsibilities include:

- perform historic properties investigations and inventory
- provide a letter from SHPO for report
- develop the Cultural Resource Plan
- Tribal coordination

4.3.10 Economics

Specific responsibilities include:

- perform Institute for Water Resources (IWR) incremental cost analysis
- write economic analysis portion of DPR

4.3.11 Geospatial

Specific responsibilities include:

- provide maps and drawings as needed
- provide analysis of gathered data needed for mapping and drawings

4.3.12 Cost Engineering

The cost estimating section, EC-DCS, will develop cost estimates using the Micro-Computer Aided Cost Estimating System (MCASES) cost estimating system. Cost estimates will be presented in the Civil Works Breakdown Structure (CWBS) format.

Specific responsibilities include:

- provide unit cost estimate for draft report
- provide MCASES estimate for final report

4.3.13 Real Estate

Real Estate Division (RE) along with Engineering and PM participation, through exchange of information and ongoing consultation, will develop an acceptable process by which Land, Easement, Relocation, Rights-of-Way, and Disposal Area (LERRD) requirements can be

developed. LERRD descriptions will include the specific estate, acreage, location and schedule requirements.

Specific responsibilities include:

- development of RE plan

4.3.14 Operations

Specific responsibilities include:

- provide information on potential dredging methods and problems
- provide information on natural management and comments on alternatives

4.3.15 Regulatory

Specific responsibilities include:

- provide assistance in developing solutions to potential problems
- identify future required permit actions associated with all alternatives

4.3.16 Construction

During project formulation Construction Branch, EC-C, will provide technical assistance if special costs associated with mobilization, access, and specialized construction are anticipated.

Specific responsibilities include:

- Perform Quality Assurance during construction of all phases

5.0 PROJECT DELIVERY TEAM

The Project Delivery Team includes the sponsor, the Program Manager, Project Manager, District planning and technical staff, necessary to effectively develop and deliver the project. The project manager is responsible for overall project execution and is the team leader of the project delivery team. In addition, the project manager is the District point of contact and operates as the District Commander's representative for this project. Planning and technical leads are responsible for the day-to-day management of their assigned products; compiling the DPR, product budgets; development and updating of detailed product schedules; quality control of assigned products, assisting in the preparation of the PMP; and delivery of assigned products on schedule and within budget. Project Delivery Team (PDT) members contribute their particular expertise necessary for project execution. Team members for each Work Breakdown Structure (WBS) product, service, or deliverable are listed in Appendix A.

6.0 WORK BREAKDOWN STRUCTURE

The Work Breakdown Structure (WBS) is a deliverable-oriented grouping of project elements that organizes and defines the total scope of the project. The WBS identifies the products and sub-products that will be required to implement the total project. It presents these products and sub-products in a hierarchical arrangement.

An overall summary schedule is shown below which assumes funding is available as needed. Appendix A provides a detailed project schedule.

TASK/MILESTONE	BASELINE START DATE	BASELINE END DATE	ACTUAL START DATE	ACTUAL END DATE
Project Review Plan	Feb 2014	April 2014		
Program Management Plan	Feb 2014	Mar 2014		
Feasibility Phase				
Complete Draft Report	Feb 2014	Jan 2015		
DQC Draft Review Complete	Jan 2015	Jan 2015		
ATR Draft Review Complete	Feb 2015	Mar 2015		
Alternative Formulation Briefing	Mar 2015	Jun 2015		
ATR of Final DPR	Aug 2015	Sept 2015		
Final Draft Report	Sep 2015	Sep 2015		
Submit Final Feasibility Report for Approval	Sep 2015	Oct 2015		
Submit Project Partnership Agreement for Design & Implementation Phase	Sep 2015	Nov 2015		
Prepare Plans & Specs	Nov 2015	May 2016		
Solicitation for Contracts	May 2016	Nov 2016		
Award Construction Contract (NTP)	Dec 2016	Apr 2018		

7.0 ACQUISITION STRATEGY

Contract specific acquisition strategies will be developed for each individual contract to be advertised and awarded. Factors to be considered in determining the specific acquisition strategies include but are not limited to technical complexity of the work, whether a construction or a supply/install format will be used, environmental considerations/constraints, construction schedules and magnitude of construction. In addition, maximum consideration will be given to placing contracts with qualified small, small disadvantaged, and women-owned business concerns in support of the District's Small and Disadvantaged Business Utilization program. Acquisition strategies will be fully staffed by the Project Delivery Team through the District's Small Business Coordinator, Contracting Division and Office of Counsel.

At this time the following contract procurements are anticipated:

WBS Products, Deliverables, or Services to be Provided by Contract	**Estimated Cost**	**FY to be Awarded**	**Acquisition Strategy**
Construction Contract	$500,000	FY 2017	Small and Disadvantaged Business

8.0 COMMUNICATIONS PLAN

8.1 Project Delivery Team

Project delivery team members will generally meet weekly as appropriate to discuss technical issues, program strategy, critical milestones, budget, and team progress. Meeting minutes will be provided to the entire team and meeting minutes will be kept in the ProjectWise directory.

8.2 Internal Briefings

The Project Manager will brief the District Project Review Board as required. Similarly, the Project Manager will present the current status and issues to the monthly Coordination Meeting and as required will meet and brief the District Management Team.

8.3 Regulatory and Resource Agencies

Meetings with the resource agencies will be done as necessary and will consist of brainstorming, criteria development and clarification, product review, and alternative evaluations and development. Agency input is critical during these meetings in regards to selecting and developing the most appropriate alternatives for design and eventual construction.

8.4 Public Involvement

The Project Delivery Team (PDT) is responsible for assisting the PM in determining all stakeholder project communications requirements, to include both external and internal communications.

8.5 Project Directory

Electronic copies of all documents related to this project are stored in ProjectWise Explorer

9.0 CHANGE CONTROL

The Project Management Plan is a living document that will be updated or revised, as necessary, throughout the life of the project. Updates are defined as changes to the Project Management Plan that do not substantially modify the scope, schedule, or cost of the project. Updates to the PMP do not require formal review. Revisions to the PMP reflect changes in scope, schedule, or cost of the project and require formal review. Presently, Section 14 funds are very restricted and work will be scheduled around availability of funds.

The Project Delivery Team (PDT) members are responsible for notifying the PM as soon as they become aware of any potential changes, including changes identified by Resource Providers. This process is performed whenever changes occur to the project. Changes that exceed the thresholds, as established by the PDT, will require a re-approval of the PMP.

10.0 QUALITY MANAGEMENT

Quality control is the process employed to ensure the performance of a task meets the agreed upon requirements of the customer and appropriate laws, policies, and technical criteria, on schedule and within budget.

10.1 Project Management Plan

Quality control procedures, as applied to the Project Management Plan, will follow the St. Louis District PMP Quality Management Plan.

10.2 WBS Products and Deliverables

The customers for this project are the United States Fish and Wildlife Service and the federal taxpayer. The PDT is responsible for delivering quality products that meet the customer's requirements.

10.2.1 Quality Control

Product quality is the responsibility of everyone on the PDT. Technical quality of WBS products and deliverables shall be achieved through a process that includes development of realistic comprehensive work plans, well defined functional and technical criteria, close coordination among PDT members, and conformance to accepted USACE and industry standards. In addition, WBS products and deliverables shall be reviewed by highly qualified staff from their respective section prior to submittal of the final product. For Engineering products and deliverables, computations will be checked and initialed prior to submittal of the final product.

10.2.2 District Quality Control (DQC)

The DQC is an internal review of basic science and engineering work products focused on technical quality and conducted according to the Home District's Quality Management Plan.

10.2.3 Agency Technical Review (ATR)

The purpose of an agency technical review is to assure the integrity and accuracy of the technical products produced. In particular, the ATR team will ensure that WBS products and deliverables are safe, functional, constructible, economical, and reasonable; engineering assumptions, concepts and analyses are valid and comply with accepted USACE and industry standards; economic analyses and cost estimates are reasonable and accurate; that the customer's needs will be met; and that WBS products and deliverables comply with U.S. laws, regulations, and existing public policy. ATR certification is required for the following WBS products and deliverables:

10.2.4 BCOE Certification

The purpose of the Biddability, Constructibility, Operability, and Environmental Review (BCOE) is to ensure efficient construction that is environmentally sound, to minimize cost and time growth, to avoid unnecessary changes and claims, as well as to ensure safe efficient operations by the user.

10.2.5 Reviews

WBS products and deliverables shall be reviewed as they are developed to ensure they meet project and customer objectives, comply with regulatory and engineering guidance, and meet customer expectations of quality. Informal reviews, consisting of project delivery team (PDT) presentations and discussions, shall be documented with meeting minutes. Formal reviews, consisting of review comments, review conferences, and back checking, shall be documented. Feasibility Report review will be conducted using Dr. Checks.

10.3 Construction Products

Obtaining quality construction is a combined responsibility of the construction contractor and the government. Construction products include those that are acquired using either Construction Contracts or Supply and Install Contracts. Quality control specifications will be incorporated

into the contract specifications for each construction product. In general, the Contractor will implement a quality control system that ensures the final product is constructed in accordance with the contract plans and specifications and the project objectives. In addition, the Resident Office will develop a Quality Assurance plan for each construction product. Government Quality Assurance Representatives (GQAR) will monitor the construction progress and perform periodic on-site inspections as necessary.

10.4 Lessons Learned

As the project progresses, design lessons learned will be documented. Lessons learned should focus on the positive aspects of a project as well as the negative ones.

11.0 SAFETY AND OCCUPATIONAL HEALTH PLAN

All aspects of this project shall comply with the St. Louis District Safety Plan. For construction or service contracts, contractors will submit an Accident Prevention and Site-Specific Safety Plan as identified in the contract specifications; in accordance with EM 385-1-1 (USACE Safety and Health Requirements Manual); and meeting Federal, state and local codes, regulations, and standards.

12.0 RISK MANAGEMENT PLAN

Risk management is the systematic process of identifying, assessing, making risk decisions, implementing controls, and analyzing risk decisions during the entire project life cycle. Monthly reviews by the project delivery team of progress and deliverables will assess potential problems and develop appropriate actions.

Risk will be minimized through the use of schedules, metrics, and assignment of specific responsibilities. Contingencies to manage financial risk have been incorporated in the cost estimates for each WBS product, deliverable, or service.

13.0 VALUE MANAGEMENT PLAN

Value Management (VM) is a process to facilitate and encourage the understanding, consideration, and integration of the needs of all customers, PDT members, partners, and stakeholders. Value Management seeks the highest value for a project by balancing resources and quality. The VM process emphasizes the use of multi-disciplinary teams and their resulting synergy, using a functional analysis approach for decision making.

Engineer Regulation 1110-2-1150 requires a value engineering study for all projects with an estimated construction cost of $2.0 million or more. The VM process will be informally applied continuously throughout the life cycle of the project.

14.0 FISCAL MANAGEMENT

The project manager will allocate funds to the technical leads for completion of products as outlined in the PMP. The PM is responsible for management of all contingency. Technical leads are responsible for sub-allocations and detailed budgeting for their assigned products. The technical lead can change the distribution between team members without the approval of the

project manager as long as the scope or overall cost of the product is not changed. It is anticipated that this will be done with concurrence from the affected offices. The budget will be tracked and monitored at all times. Technical leads will assist the Project Manager in the preparation of 2101's (i.e. monthly schedules of obligations and expenditures) and milestones.

15.0 PROJECT CLOSEOUT PROCEDURES

Project closeout procedures will include the following:

Final inspection
Final payment
As-builts, warranties, and O&M manual
Fiscal closeout

Appendix A – List Of Project Delivery Team Members

Team members for each WBS product, service, or deliverable are listed below. For advanced phases of work, only disciplines and organizations required to accomplish the work may be listed.

NAME	DISCIPLINE	OFFICE
Brian Markert	Program Manager	PM-F
TBD	Civil/Drawings	EC-DCC
Greg Dyn	Cost Estimator	EC-DCS
Dawn Lamm	Hydrology/modeling	EC-HW
Kat McCain	Environmental/Planner	PD-P
Matt Afflerbaugh	Fisheries Biologist	PD-C
TBD	HTRW	EC-EQ
Ashley Cox	Applied River Engineering	EC-HR
CPT Matt Collins	Project Manager	PM-N
Dan Linkowski	Economics	PD-E
Terry Acree	Program Analyst	PM-F
TBD	Real Estate	RE-A
Charlie Deutsch	Operations	OD-NR
TBD	Regulatory	OD-F

1. Plans and Specifications

TBD.

2. Agency Technical Review

NAME	DISCIPLINE	ORGANIZATION
TBD	ATR Team Lead	TBD
TBD	Civil Engineer	TBD
TBD	Environmental	TBD
TBD	Plan Formulation	TBD
TBD	Model Reviewer	TBD
TBD	Cultural	TBD
TBD	Cost	TBD
TBD	Economist	TBD
TBD	Geotechnical Engineer	TBD
TBD	H&H Engineer	TBD
TBD	Real Estate	TBD

3. Plans/Specifications and Construction

Appropriate team members for the plans/specifications and construction phases will be determined based upon individual workloads after approval of the Definite Project Report.

Appendix B – Project Schedule

The project schedule was developed using input from PDT members. Activities listed are those necessary to provide products, deliverables, and services listed in the Work Breakdown Structure (WBS). Scheduled critical milestones and links among the tasks will be tracked and monitored. If any HQ or P1 reportable milestones are anticipated to be missed, this will be reported to management and corrective actions will be discussed by the team as soon as discovered. The baseline schedule will be fixed after approval of the PMP.
Major project milestones are listed below.

MAJOR PROJECT MILESTONES

Task	**Baseline**	**Actual**
Initiate Feasibility Phase		
Complete Draft Report (60%)	Jan 2015	
DQC Draft Review Complete	Jan 2015	
Final Draft Report (95%)	Jun 2015	
Division Approval Complete	Oct 2015	
Complete Plans and Specs	May 2016	
Initiate Construction	FY2017	
Complete Construction/Acceptance	FY2020	

The following schedule is from the Corps Project Management Business Process (PMBP) system which includes the project schedule with financial and resource assets identified

Appendix C – Budgets and Cost Estimates

Project budgeting involves allocating the overall cost estimate to individual activities over time so that project cost performance can be measured. The table below shows the total project cost and includes each WBS product, deliverable or service cost. The funding source for this project is Section 1103 WRDA 1986. This a multi-year project. Costs below are presented in $1,000s.

WBS Product, Deliverable, or Service	**FY14**	**FY15**	**FY16**	**FY17**
Feasibility Report with Environmental Compliance	$300	$200	$100	
Plans and Specs			$245	$275
Construction				$500

Plans and Specs and Construction costs are estimated.

The feasibility study WBS product, deliverable, and service costs are supported by budget summary sheets. The budget summary sheets summarize District in-house labor, government orders and contracts, travel, administrative costs, and contingency. The budget summary sheets can be accessed from the Cadd5\cap project directory for Silverton.

Each office has prepared a budget estimate for the work they are responsible for. These estimates are based on a realistic schedule for accomplishing the necessary work and show direct labor, other direct costs, private sector contracting costs, and all indirect project costs. Quality control and ITR costs are also included in each budget estimate. Budget estimates that support the budget summary sheets can be found in the project directory. Below is a summary.

DISTRICT QUALITY CONTROL ESTIMATED COST

Reviewer	**Feasibility**	**P&S**	**Total Cost**
Real Estate	$1,000	$1,000	$2,000
Plan Formulation	$1,000		$1,000
Geotechnical Engineer	$1,500	$3,000	$4,500
Regulatory	$1,200		$1,200
Environmental	$1,000		$1,000
Civil Engineer	$1,000	$2,000	$3,000
H&H Engineer	$2,000	$2,000	$4,000
Cultural Resources	$1,000		$1,000
TOTAL	$9,700	$8,000	$17,700

AGENCY TECHNICAL REVIEW ESTIMATED COSTS

Reviewer	**ATR Pre AFB**	**ATR Pre Final**	**ATR P&S**	**COST**
ATR Team Lead	$3,000	$2,500	$2,500	$8,000
Civil Engineer	$3,000	$1,000	$3,000	$7,000
Environmental	$2,500	$1,000	$1,000	$4,500
Plan Formulation	$2,500	$1,000		$3,500
Model Reviewer	$2,500	$500		$3,000
Cultural	$2,000	$500		$2,500
Cost	$4,000	$1,000	$3,000	$8,000
Economist	$2,000	$500		$2,500
Geotechnical Engineer	$2,500	$500	$2,500	$5,500
H&H Engineer	$5,000	$1,000	$3,000	$9,000
Real Estate	$1,000	$500		$1,500
TOTAL	$30,000	$10,000	$15,000	$55,000

Enclosure 5

Project Review Plan

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

REPLY TO
ATTENTION OF:

28 MAR 14

CEMVD-PD-SP

MEMORANDUM FOR Commander, St. Louis District

SUBJECT: Upper Mississippi River Restoration (formerly known as the Environmental Management Program) Piasa-Eagle's Nest Islands, Habitat Rehabilitation and Enhancement Project Review Plan

1. References:

a. Memorandum, CEMVS-PD-F, 11 March 2014, subject as above (encl 1).

b. Email, CEMVD-RB-T, 19 March 2014, subject: Piasa Eagles Nest PRP (encl 2).

c. Memorandum, CECW-MVD, 16 May 2012, subject: Request for Approval of a Model Peer Review Plan for the Upper Mississippi River System Environmental Management Program (encl 3).

d. EC 1165-2-214, 15 December 2012, subject: Civil Works Review Policy.

2. The enclosed Review Plan (RP)(encl 4) is a combined decision document and implementation document review plan. It includes the MVD EMP Checklist and has been prepared in accordance with EC 1165-2-214. The RP has been coordinated between the Business Technical Division and the Upper District Support Team.

3. MVD hereby approves the Piasa Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project RP, which is subject to change as circumstances require. Any subsequent revisions to this RP or its execution will require new written approval from this office. Non-substantive changes to this RP do not require further approval. The district should post the approved RP to its website.

CEMVD-PD-SP
SUBJECT: Upper Mississippi River Restoration (formerly known as the Environmental Management Program) Piasa-Eagle's Nest Islands, Habitat Rehabilitation and Enhancement Project Review Plan

4. The MVD point of contact for this action is Mr. Philip Hollis, CEMVD- PD-SP, (601) 634-5293.

4 Encls

EDWARD E. BELK, JR., P.E., SES
Director of Programs

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103

REPLY TO
ATTENTION OF:

CEMVS-PM-F

11 March 2014

MEMORANDUM FOR Commander, U.S. Army Engineer Division, Mississippi Valley (CEMVD-PD-SP/Philip Hollis), P.O. Box 80, 1400 Walnut Street, Vicksburg, MS 39181-0080

SUBJECT: Upper Mississippi River Restoration (formerly known as the Environmental Management Program) Piasa-Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project Review Plan

1. The subject Model Review Plan (Encl 1) and MVD Environmental Management Program Review Plan Checklist (Encl 2) for Piasa-Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project Feasibility Study are submitted for your review and approval. The Model Review Plan includes both the feasibility report (decision document) and P&S (implementation product). An electronic copy of the subject Model Review Plan and MVD EMP Review Plan Checklist has been sent to Mr. Phil Hollis, CEMVD.

2. The points of contacts are CPT. Matt Collins, Project Manager, 314-331-8626, matthew.p.collins@usace.army.mil or Mr. Brian Markert, District Program Manager, 314-331-8455, brian.j.markert@usace.army.mil.

CHRISTOPHER G. HALL
COL, EN
Commanding

2 Encls
1. Project Review Plan
2. Review Plan Checklist

ENCL 1

Brown, Becky MVD

From: Bradley, William N MVD
Sent: Wednesday, March 19, 2014 4:12 PM
To: Hollis, Philip B MVD
Cc: Turner, Renee N MVD; Simmons, Cindy B MVD
Subject: RE: Piasa Eagles Nest PRP (UNCLASSIFIED)

Follow Up Flag: Follow up
Flag Status: Flagged

Phil, I think this RP is ok to move forward. No comments.

-----Original Message-----
From: Hollis, Philip B MVD
Sent: Monday, March 17, 2014 10:15 AM
To: Bradley, William N MVD
Cc: Turner, Renee N MVD
Subject: FW: Piasa Eagles Nest PRP (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Fyi, RP attached.

-----Original Message-----
From: Hollis, Philip B MVD
Sent: Monday, March 17, 2014 9:23 AM
To: Turner, Mike A MVD; Simmons, Cindy B MVD
Cc: Turner, Renee N MVD
Subject: FW: Piasa Eagles Nest PRP (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Mike, the review plan is programmatic and follows the model. Since it includes implementation, RB-T will need to review and provide comments or concurrence as appropriate. Please advise as to who will be assigned to review. Request suspense: cob 21 Mar 14.

Thanks,

Phil Hollis
St. Louis Program Manager
Phone: 601-634-5293

-----Original Message-----
From: Collins, Matthew P CPT MVS
Sent: Friday, March 14, 2014 2:54 PM
To: Hollis, Philip B MVD
Subject: Piasa Eagles Nest PRP (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Good afternoon Phil,

ENCL 2

May I please request approval of our Project Review Plan for the Piasa Eagles Nest Islands EMP project? Kat asked if we could get it back by 28 March to maintain our schedule. Please let me know if there are any issues. Thanks for your time.
Matt

Matthew Collins, PMP
CPT, EN
U.S. Army Corps of Engineers
St. Louis District
314-331-8626
matthew.p.collins@usace.army.mil

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF

CECW-MVD

MAY 16 2012

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, Mississippi Valley Division (ATTN: CEMVD-PD-SP)

SUBJECT: Request for Approval of a Model Peer Review Plan for the Upper Mississippi River System Environmental Management Program

1. HQUSACE has reviewed the draft model peer review plan for the Upper Mississippi River System Environmental Management Program. The model peer review plan is consistent with programmatic review plans developed and in use for the Continuing Authorities Program. The model Peer Review Plan is to be used for all projects within the program except those that include an Environmental Impact Statement or that meet the mandatory triggers for Type I IEPR as stated in EC 1165-2-209.

2. Questions or concerns should be directed to Mr. Joseph Redican, Deputy Chief, Mississippi Valley Division Regional Integration Team, at 202-761-4523.

FOR THE COMMANDER:

Theodore A. Brown

THEODORE A. BROWN, P.E.
Chief, Planning and Policy Division
Directorate of Civil Works

ENC 13

MODEL REVIEW PLAN

Using the MVD Model Review Plan
for the
Upper Mississippi River Restoration (UMRR)
[formerly known as the Environmental Management Program (EMP)]
and
Referencing the EMP Programmatic Review Plan

Piasa and Eagle's Nest Islands
Madison and Jersey Counties, Illinois– Mississippi River Pool 26
River Mile 207.5-211.5

St. Louis District

MSC Approval Date: *Pending*
Last Revision Date: *None*

US Army Corps
of Engineers ®

Encl 4

Review Plan
Using the MVD Model Review Plan

Piasa and Eagle's Nest Islands, Madison and Jersey Counties, Ilinois – Mississippi River Pool 26 River Miles 207.5-211.5

TABLE OF CONTENTS

REVIEW PLAN
Piasa and Eagle's Nest Islands, Madison and Jersey Counties, Ilinois, Mississippi River Pool 26, River Mile 207.5-211.5

1. Purpose and Requirements

a. Purpose

This Review Plan defines the scope and level of peer review for the *UMRR-EMP HREP Piasa and Eagle's Nest Islands, Madison and Jersey Counties, Illinios, Mississippi River Pool 26, River Miles 207.5-211.5. Public Law 99-662 of the 1986 WRDA, as amended, authorizes the US Army Corps of Engineers (USACE) to study, design, and construct habitat rehabilitation and enhancement projects (HREP) on the Upper Mississippi River system without specific Congressional authorization. This Review Plan is for the Piasa and Eagle's Nest Definite Project Report (DPR) with integrated environmental assessment as well as the Piasa and Eagle's Nest Plans and Specifications (P&S) implementation document. Products included for review of the DPR are an environmental and cultural assessment; plan formulation; cost estimate; incremental cost analysis; hydraulic and hydrologic analysis; geotechnical analysis; real estate plan; and drawings and specifications. Products included for review of the P&S is the P&S document.*

The Environmental Management Program (EMP) study and construction authority is contained in the EMP Programmatic Review Plan (EMP PRP), Section IV.

b. Applicability

This review plan is based on the MVD Model Review Plan, which is applicable to projects that do not require Independent External Peer Review (IEPR), as defined by the mandatory Type I IEPR triggers contained in EC 1165-2-214, Civil Works Review Policy.

Tha applicability regarding the EMP is contained in the EMP PRP, Section II.

c. References

Reference materials are shown in the EMP PRP.
Piasa and Eagle's Nest Project Management Plan, approved 11 March 2014

2. Review Management Organization (RMO) Coordination

RMO coordination will be in accordance with the MP PRP, Sections I, III, VI, and VIII. *The RMO for the ATR will be MVD in lieu of ECO-PCX. The PCX will continue to serve in its advisory role.*

3. Project Information

a. Decision and/or Implementation document

The *Piasa and Eagle's Nest HREP* decision document will be prepared in accordance with ER 1105-2-100, Appendix F, Amendment #2. The approval level of the decision document (if policy compliant) is MVD. An Environmental Assessment (EA) will be prepared along with the decision document. *An implementation document (Plans and Specifications, or P&S) will also be prepared for implementation and will undergo DQC and ATR Reviews.*

b. Study/Project Description

Piasa and Eagle's Nest Island project area covers approximately 1,350 acres of backwaters, side channels, and island habitats. The project is solely on USACE owned lands but are managed by the Illinois Department of Natural Resources. It consists of 115 acres of island area, and 1,235 acres of side channel, sandbar, wetland and other aquatic areas.

The primary resource problems include: sedimentation resulting in loss of depth in the side channels, altered river hydrology,loss of emergent wetlands, and loss of islands and island area within Pool 26 of the Upper Mississippi River. These problems have led to degraded aquatic and wetland ecosystem structures and functions. Potential project features to address these problems include: river training structures including, but not limited to, chevron dikes, closure structures, alternating hard points, bullnose dikes, trail dikes and stub dikes, in-stream habitat structure, dredging, beneficial dredge material placement, revetment, and reforestation of islands for stabilization. Based upon the project features currently used in the UMRR-EMP Design Handbook (2012), the associated costs are estimated around $10 million.

HQ approval for a programmatic IEPR exclusion for the Upper Mississippi River Restoration Environmental Management Program was granted on 22 February 2012. No other existing policy waiver request are anticipated.

c. Factors Affecting the Scope and level of Review

The factors affecting the scope and level of review are discussed in the EMP PRP, Section V.

d. In-Kind Contributions

Products and analyses provided by non-Federal sponsors as in-kind services are subject to District Quality Control (DQC) and ATR, similar to any products developed by USACE. *No in-kind products are anticipated.*

4. District Quality Control (DQC)

District Quality Control (DQC) will be conducted in accordance with the EMP PRP, Section III.A.

5. Agency Technical Review (ATR)

The Agency Technical Review (ATR) will be conducted in accordance with the EMP PRP, Section III.B and VI.C. *To assure independence, the leader of the ATR team shall be from outside the home MSC.*

6. Policy And Legal Compliance Review

The Policy and Legal Compliance Reviews will be conducted in accordance with the EMP PRP, Section III.D.

7. Cost Engineering Directory of Expertise (DX) Review And Certification

Cost Engineering Directory of Expertise (DX) Review and Certification will be conducted in accordance with the EMP PRP, Section VIII.D.

8. Model Certification And Approval

Approval of planning and engineering models used in EMP projects will be in accordance with the EMP PRP, Section III.E, and Section VII. *See Table 1.*

Table 1. Planning and Engineering Models That May Be Used in the Development of Piasa and Eagle's Nest Island HREP

Model Name and Version	***Brief Description of the Model and How it Will be Applied in the Study***	***Certification/ Approval Status***
IWR-Plan	*The IWR-Plan was developed by the Institute of Water Resources as accounting softward to compare habitat benefits among alternatives.* *This model will be used to determine best buy alternatives and incremental cost analysis of alternatives*	*Certified*
Habitat Suitability Index Models	*The Habitat Suitability Index (HSI) Models are designed to measure the quality of habitat for select, representative aquatic, avian, and terrestrial wildlife species. The Habitat Suitability Index Models are the approved Habitat Evaluation Procedure (HEP) models developed by the U.S. Fish and Wildlife Service. The indicator species chosen by the PDT would represent the needs of a wider variety of species and habitat requirements. Results of the HSI models are used to evaluate among potential species-specific or aggregate habitat improvements or detriments associated with proposed project alternatives as part of the overall USACE ecosystem restoration planning process.* *These models may be used to determine wetland and aquatic habitat benefits of the Piasa and Eagle's Nest Islands HREP for existing conditions, future without project conditions and alternaive plans.*	*Approved for Use*
Micro-Computer Aided Cost Engineering System (MCACES) MII Version 3.0	*MCACES is a cost estimation model.* *This model will be used to estimate costs for the Piasa and Eagle's Nest HREP.*	*Certified*

9. Review Schedules And Costs

A. District Quality Control (DQC) Schedule and Cost

1) *DQC Estimated Schedule*

Event	Kick-off	Reviewer Comments End	PDT Evaluation	Back Check	Complete
Feasibility	5 Jan 2015	10 Jan 2015	10 Jan 2015	15 Jan2015	16 Jan 2015

2) *DQC Estimated Cost*

Reviewer	Feasibility	P&S	Total Cost
Real Estate	$1,000	$1,000	$2,000
Plan Formulation	$1,000		$1,000
Geotechnical Engineer	$1,500	$3,000	$4,500
Regulatory	$1,200		$1,200
Environmental	$1,000		$1,000
Civil Engineer	$1,000	$2,000	$3,000
H&H Engineer	$2,000	$2,000	$4,000
Cultural Resources	$1,000		$1,000
TOTAL	$9,700	$8,000	$17,700

B. Agency Technical Review (ATR) Schedule and Cost

1) *ATR Estimated Schedule*

Event	Kick-off	Reviewer Comments End	PDT Evaluation	Back Check	Complete
Pre-AFB ATR	2 Feb 2015	13 Feb 2015	14 Feb 2015	27 Feb 2015	13 Mar 2015
Pre-AFB Cost ATR	19 Jan 2015	13 Feb 2015	14 Feb 2015	24 Feb 2015	27 Feb 2015
AFB Review with MVD	23 March 2015	17 Apr 2015	18 Apr 2015	27 Apr 2015	8 Jun 15
Public Review	15 June 2015	15 Jul 2015	20 Jul 2015	n.a	31 July 2015
Pre Final DPR ATR	11 Aug 2015	29 Aug 2015	30 Aug 2015	5 Sept 2015	12 Sept 2015
Submit Final Report to MVD	19 Sept 2015	10 Oct 2015	11 Oct 2015	24 Oct 2015	31 Oct 2015
P&S ATR	TBD	TBD	TBD	TBD	TBD

2) *ATR Estimated Cost*

Reviewer	ATR Pre AFB	ATR Pre Final	ATR P&S	COST
ATR Team Lead	$3,000	$2,500	$2,500	$8,000
Civil Engineer	$3,000	$1,000	$3,000	$7,000
Environmental	$2,500	$1,000	$1,000	$4,500
Plan Formulation	$2,500	$1,000		$3,500
Model Reviewer	$2,500	$500		$3,000
Cultural	$2,000	$500		$2,500
Cost	$4,000	$1,000	$3,000	$8,000
Economist	$2,000	$500		$2,500
Geotechnical Engineer	$2,500	$500	$2,500	$5,500
H&H Engineer	$5,000	$1,000	$3,000	$9,000
Real Estate	$1,000	$500		$1,500
TOTAL	$30,000	$10,000	$15,000	$55,000

10. Public Participation

Public review will be in accordance with the EMP PRP, Section VI.F

11. Review Plan Approval And Updates

The Review Plan approval process will be in accordance with the EMP PRP, Section VIII.B.

12. Review Plan Points Of Contact

Public questions and/or comments on this review plan can be directed to the following points of contact:

- *Brian Markert, St. Louis District UMRR-EMP Program Manager , 314-331-8455- MVS*
- *CPT Matthew Collins, St. District Project Manager, 314-331-8626 - MVS*
- *Philip Hollis, St. Louis Program Manager, 601-634-5293- MVD*

Attachment 1: Team Rosters

Major Subordinate Command Roster – 2014

Name	Title	Contact
Philip Hollis, MVD	St. Louis Program Manager	Philip.B.Hollis@usace.army.mil
Renee Turner, MVD	Deputy Chief DST	Renee.N.Turner@usace.army.mil

Project Delivery Team Roster – 2014

Name	Discipline/Title	Contact Information
Kim Postlewait	Sponsor-IDNR Site Manager	618-376-3303
Marv Hubbell	UMRR-EMP Regional Program Manager	Marvin.E.Hubbell@usace.army.mil
Brian Markert	UMRR-EMP District Program Manager	Brian.J.Markert@usace.army.mil
CPT Matthew Collins	Project Manager	Matthew.P.Collins@usace.army.mil
TBD	Civil Engineer	TBD
Kat McCain, Ph.D.	Planning, Environmental Compliance, GIS Mapping	Kathryn.mccain@usace.army.mil
Dawn Lamm	Hydrology & Hydraulics Engineer	Dawn.Lamm@usace.army.mil
Ashley Cox	Applied River Engineer	Ashley.Cox@usace.army.mil
TBD	Cultural Resources	TBD
TBD	Tribal Coordination	TBD
TBD	Economics	TBD
TBD	Geotechnical Engineer	TBD
TBD	Cost Estimate	TBD
TBD	Real Estate	TBD
TBD	HTRW	TBD

District Quality Control Roster – 2015

Name	Discipline/Title	Contact Information
TBD	Senior Real Estate	TBD
TBD	Senior Plan Formulation	TBD
TBD	Senior Geotechnical Engineer	TBD
TBD	Senior Regulatory	TBD
TBD	Senior Environmental	TBD
TBD	Senior Civil Engineer	TBD
TBD	Senior H&H Engineer	TBD
TBD	Senior Cultural Resources	TBD

Agency Technical Review Roster – 2015

Name	Discipline/Title	Contact Information	District	Education/Qualifications	Years of Experience
TBD	ATR Team Lead	TBD	TBD	TBD	TBD
TBD	Civil Engineer	TBD	TBD	TBD	TBD
TBD	Environmental	TBD	TBD	TBD	TBD
TBD	Plan Formulation	TBD	TBD	TBD	TBD
TBD	Model Reviewer	TBD	TBD	TBD	TBD
TBD	Cultural	TBD	TBD	TBD	TBD
TBD	Cost	TBD	TBD	TBD	TBD
TBD	Economist	TBD	TBD	TBD	TBD
TBD	Geotechnical Engineer	TBD	TBD	TBD	TBD
TBD	H&H Engineer	TBD	TBD	TBD	TBD
TBD	Real Estate	TBD	TBD	TBD	TBD

For further details on ATR members please see the ATR report which contains each reviewer's biographical sketch

Attachment 2: Review Plan Revisions

Revision Date	Description of Change	Page/Paragraph Number

Attachment 3

MVD UMRR-EMP Review Plan Checklist

Date:	March 11 2014
Originating District:	MVS
Project/Study Title:	Piasa and Eagle's Nest HREP
P2# and AMSCO#:	
District POC:	CPT Matthew Collins
PCX Reviewer:	None needed since using the Approved EMP Model Review plan and checklist

Please fill out this checklist and submit with the draft Review Plan when coordinating with the MSC. Any evaluation boxes checked "No" may indicate the project may not be able to use the MVD Model Review Plan. Further explanation may be needed or a project specific review plan may be required. Additional coordination and issue resolution may be required prior to MSC approval of the Review Plan. Checklist may be limited to Section I or Section II or Both, depending on content of review plan (or subsequent amendments).

Section I - Decision Documents

REQUIREMENT	EVALUATION
1. Is the Review Plan (RP) for an EMP Project?	Yes ☒ No ☐
a. Does it include a cover page identifying it as following the Model RP and listing the project/study title, originating district or office, and date of the plan?	a. Yes ☒ No ☐
b. Does it include a table of contents?	b. Yes ☒ No ☐
c. Is the purpose of the RP clearly stated?	c. Yes ☒ No ☐
d. Does it reference the Project Management Plan (PMP) of which the RP is a component?	d. Yes ☒ No ☐
e. Does it succinctly describe the levels of review: District Quality Control (DQC), and Agency Technical Review (ATR)?	e. Yes ☒ No ☐
f. Does it include a paragraph stating the title, subject, and purpose of the decision document to be reviewed?	f. Yes ☒ No ☐
g. Does it list the names and disciplines of the Project Delivery Team (PDT)?* **Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.*	g. Yes ☒ No ☐

Comments: Additional names will be added as the PDT team develops	
2. Is the RP detailed enough to assess the necessary level and focus of the reviews?	Yes ☒ No ☐
3. Does the RP define the appropriate level of review for the project/study?	Yes ☒ No ☐
a. Does it state that DQC will be managed by the home district in accordance with the MVD and district Quality Management Plans? b. Does it state that ATR will be managed by MVD? **Comments:**	a. Yes ☒ No ☐ b. Yes ☒ No ☐
4. Does the RP explain how ATR will be accomplished?	Yes ☒ No ☐
a. Does it identify the anticipated number of reviewers? b. Does it provide a succinct description of the primary disciplines or expertise needed for the review (not simply a list of disciplines)? c. Does it indicate that ATR team members will be from outside the home district? d. Does it indicate where the ATR team leader will be from? e. If the reviewers are listed by name, does the RP describe the qualifications and years of relevant experience of the ATR team members?* **Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.* **Comments:** ATR team members, once identified, will be from outside the home district and the ATR lead, once identified, will be from outside MVD. Names and qualifications will be added once ATR team members have been identified.	a. Yes ☒ No ☐ b. Yes ☒ No ☐ c. Yes ☒ No ☐ d. Yes ☒ No ☐ e. Yes ☐ No ☐ n.a
5. Does the RP address review of sponsor in-kind contributions?	Yes ☒ No ☐

6. Does the RP address how the review will be documented?	Yes ☒ No ☐
a. Does the RP address the requirement to document ATR comments using Dr Checks? **Comments:**	a. Yes ☒ No ☐
7. Does the RP address Policy Compliance and Legal Review?	Yes ☒ No ☐
8. Does the RP present the tasks, timing and sequence (including deferrals), and costs of reviews?	Yes ☒ No ☐
a. Does it provide a schedule for ATR including review of the Alternative Formulation Briefing (AFB) materials and final report? b. Does it include cost estimates for the reviews?	a. Yes ☒ No ☐ b. Yes ☒ No ☐
9. Does the RP indicate the study will address Safety Assurance factors? Factors to be considered include: • Where failure leads to significant threat to human life • Novel methods\complexity\ precedent-setting models\policy changing conclusions • Innovative materials or techniques • Design lacks redundancy, resiliency of robustness • Unique construction sequence or acquisition plans • Reduced\overlapping design construction schedule	Yes ☐ No ☐ n/a ☒ **Comments:**
10. Does the RP address opportunities for public participation?	Yes ☒ No ☐
11. Does the RP indicate ATR of cost estimates will be conducted by pre-certified district cost personnel who will coordinate with the Walla Walla Cost DX?	Yes ☒ No ☐
12. Has the approval memorandum been prepared and does it accompany the RP?	Yes ☒ No ☐

Section II - Implementation Documents

Please fill out this checklist and submit with the draft Review Plan or subsequent Review Plan amendments when coordinating with the MSC. For DQC, the District is the RMO; for ATR and Type II IEPR, MVD is the RMO. Any evaluation boxes checked "No" indicate the RP possibly may not comply with MVD Model Review Plan and should be explained. Additional coordination and issue resolution may be required prior to MVD approval of the Review Plan.

REQUIREMENT	EVALUATION
1. Are the implementation documents/products described in the review or subsequent amendments?	Yes ☒ No ☐
2. Does the RP contain documentation of risk-informed decisions on which levels of review are appropriate?	Yes ☒ No ☐
3. Does the RP present the tasks, timing, and sequence of the reviews (including deferrals)?	Yes ☒ No ☐
a. Does it provide an overall review schedule that shows timing and sequence of all reviews?	a. Yes ☒ No ☐
b. Does the review plan establish a milestone schedule aligned with the critical features of the project design and construction?	b. Yes ☒ No ☐
4. Does the RP address engineering model review requirements?	Yes ☒ No ☐
a. Does it list the models and data anticipated to be used in developing recommendations?	a. Yes ☒ No ☐
b. Does the RP identify any areas of risk and uncertainty associated with the use of the proposed models?	b. Yes ☒ No ☐
c. Does it indicate the certification/approval status of those models and if review of any model(s) will be needed?	c. Yes ☒ No ☐
d. If needed, does the RP propose the appropriate level of review for the model(s) and how it will be accomplished?	d. Yes ☒ No ☐
5. Does the RP explain how and when there will be opportunities for the public to comment on the study or project to be reviewed?	Yes ☒ No ☐
6. Does the RP address expected in-kind contributions to be provided by the sponsor?	Yes ☒ No ☐
If expected in-kind contributions are to be provided by the sponsor, does the RP list the expected in-kind contributions to be provided by the sponsor?	Yes ☐ No ☐ n/a ☒

7. Does the RP explain how the reviews will be documented?	Yes ☒ No ☐
a. Does the RP address the requirement to document ATR comments using Dr Checks published comments and responses pertaining to the design and construction activities summarized in a report reviewed and approved by the MSC and posted on the home district website?	a. Yes ☒ No ☐
8. Has the approval memorandum been prepared and does it accompany the RP?	Yes ☒ No ☐

Attachment 4

STATEMENT of TECHNICAL REVIEW
COMPLETION OF AGENCY TECHNICAL REVIEW

CERTIFICATION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Draft Final version of the Definite Project Report with Integrated Environmental Assessment for the Piasa and Eagle's Nest Islands HREP. ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. During the ATR, compliance with established policy principles and procedures, utilizing 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 level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control documentation and made the determination that the DQC activities employed appear to be appropriate and effective.. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

_____ _____

TBD
ATR Team Leader
TBD

Date

_____ _____

CPT. Matt Collins
Project Manager
CEMVS

Date

_____ _____

Dave Busse
Chief, Engineering & Construction Division
CEMVS

Date

_____ _____

Brian Johnson
Chief, Environmental Compliance
CEMVP-RPEDN

Date

_____ _____

Philip Hollis
Review Management Office
Representative, CEMVD-PD-SP

Date

Enclosure 6

Cost Documentation

Intentionally Left Blank

WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For Project No. 145444

MVS – Piasa and Eagle's Nest Islands
Habitat Rehabilitation and Enhancement Project

The Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project, as presented by St Louis District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of February 1, 2018, the Cost MCX certifies the estimated total project cost:

FY2018 Project First Cost: $26,746,000
Fully Funded Amount: $28,258,000

It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management through the period of Federal Participation.

FOR: Michael P. Jacobs, PE, CCE
Chief, Cost Engineering MCX
Walla Walla District

****** TOTAL PROJECT COST SUMMARY ******

PROJECT: **Piasa & Eagle's Nest Islands HREP**
PROJECT NO: P2 145444
LOCATION: Madison & Jersey Counties, Illinois

DISTRICT: **St. Louis District** **PREPARED:** **12/19/2017**
POC: **CHIEF, COST ENGINEERING, Brandon Lewis**

This Estimate reflects the scope and schedule in report; Piasa & Eagle's Nest Islands HREP Feasibility Report

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2018									
						Effective Price Level Date: 1 OCT 17									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	**TOTAL ($K)**	Spent Thru: **1-Oct-17** ($K)	**TOTAL FIRST COST** ($K)	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*		*K*	*L*	*M*	*N*	*O*
06	FISH & WILDLIFE FACILITIES	$14,984	$5,668	37.8%	$20,652	0.0%	$14,984	$5,668	$20,652	$0	$20,652	4.9%	$15,712	$5,944	$21,656
	CONSTRUCTION ESTIMATE TOTALS:	$14,984	$5,668		$20,652	0.0%	$14,984	$5,668	$20,652	$0	$20,652	4.9%	$15,712	$5,944	$21,656
01	LANDS AND DAMAGES	$0	$0	-	$0	-	$0	$0	$0	$0	$0	-	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN	$2,849	$1,078	37.8%	$3,927	0.0%	$2,849	$1,078	$3,927	$0	$3,927	7.5%	$3,063	$1,159	$4,222
31	CONSTRUCTION MANAGEMENT	$1,572	$595	37.8%	$2,167	0.0%	$1,572	$595	$2,167	$0	$2,167	9.8%	$1,726	$653	$2,380
	PROJECT COST TOTALS:	$19,405	$7,341	37.8%	$26,746		$19,405	$7,341	**$26,746**	$0	**$26,746**	5.7%	$20,502	$7,756	$28,258

ESTIMATED TOTAL PROJECT COST: **$28,258**

_____ **CHIEF, COST ENGINEERING, Brandon Lewis**

_____ **PROJECT MANAGER, Timothy Eagan**

_____ **CHIEF, REAL ESTATE, xxx**

_____ **CHIEF, PLANNING,xxx**

_____ **CHIEF, ENGINEERING, xxx**

_____ **CHIEF, OPERATIONS, xxx**

_____ **CHIEF, CONSTRUCTION, xxx**

_____ **CHIEF, CONTRACTING,xxx**

_____ **CHIEF, PM-PB, xxxx**

_____ **CHIEF, DPM, xxx**

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Piasa & Eagle's Nest Islands HREP
LOCATION: Madison & Jersey Counties, Illinois
This Estimate reflects the scope and schedule in report; Piasa & Eagle's Nest Islands HREP Feasibility Report

DISTRICT: St. Louis District
POC: CHIEF, COST ENGINEERING, Brandon Lewis

PREPARED: 12/19/2017

Estimate Prepared: **19-Dec-17**
Effective Price Level: 1-Oct-17

Program Year (Budget EC): 2018
Effective Price Level Date: 1 OCT 17

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
				RISK BASED										
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	PHASE 1 - Dredging & Island Building													
06	FISH & WILDLIFE FACILITIES	$7,080	$2,678	37.8%	$9,759	0.0%	$7,080	$2,678	$9,759	2020Q1	4.1%	$7,370	$2,788	$10,158
	CONSTRUCTION ESTIMATE TOTALS:	$7,080	$2,678	37.8%	**$9,759**		$7,080	$2,678	$9,759			$7,370	$2,788	$10,158
01	LANDS AND DAMAGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	$177	$67	37.8%	$244	0.0%	$177	$67	$244	2019Q2	4.9%	$186	$70	$256
1.0%	Planning & Environmental Compliance	$71	$27	37.8%	$98	0.0%	$71	$27	$98	2019Q2	4.9%	$74	$28	$103
10.0%	Engineering & Design	$708	$268	37.8%	$976	0.0%	$708	$268	$976	2019Q2	4.9%	$743	$281	$1,024
1.0%	Reviews, ATRs, IEPRs, VE	$71	$27	37.8%	$98	0.0%	$71	$27	$98	2019Q2	4.9%	$74	$28	$103
0.5%	Life Cycle Updates (cost, schedule, risks)	$35	$13	37.8%	$48	0.0%	$35	$13	$48	2019Q2	4.9%	$37	$14	$51
1.0%	Contracting & Reprographics	$71	$27	37.8%	$98	0.0%	$71	$27	$98	2019Q2	4.9%	$74	$28	$103
2.0%	Engineering During Construction	$142	$54	37.8%	$196	0.0%	$142	$54	$196	2020Q1	8.2%	$154	$58	$212
1.0%	Planning During Construction	$71	$27	37.8%	$98	0.0%	$71	$27	$98	2020Q1	8.2%	$77	$29	$106
0.0%	Project Operations	$0	$0	37.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	$566	$214	37.8%	$780	0.0%	$566	$214	$780	2020Q1	8.2%	$612	$232	$844
0.0%	Project Operation:	$0	$0	37.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
2.5%	Project Management	$177	$67	37.8%	$244	0.0%	$177	$67	$244	2020Q1	8.2%	$192	$72	$264
	CONTRACT COST TOTALS:	$9,169	$3,469		$12,638		$9,169	$3,469	$12,638			$9,593	$3,629	$13,222

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Piasa & Eagle's Nest Islands HREP
LOCATION: Madison & Jersey Counties, Illinois
This Estimate reflects the scope and schedule in report; Piasa & Eagle's Nest Islands HREP Feasibility Report

DISTRICT: St. Louis District
POC: CHIEF, COST ENGINEERING, Brandon Lewis

PREPARED: 12/19/2017

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: / Effective Price Level:			19-Dec-17 / 1-Oct-17	Program Year (Budget EC): / Effective Price Level Date:			2018 / 1 OCT 17					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	PHASE 2 - Dredging & Island Building													
06	FISH & WILDLIFE FACILITIES	$6,378	$2,413	37.8%	$8,791	0.0%	$6,378	$2,413	$8,791	2020Q3	5.1%	$6,706	$2,537	$9,243
	CONSTRUCTION ESTIMATE TOTALS:	$6,378	$2,413	37.8%	**$8,791**		$6,378	$2,413	$8,791			$6,706	$2,537	$9,243
01	LANDS AND DAMAGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	$159	$60	37.8%	$219	0.0%	$159	$60	$219	2020Q1	8.2%	$172	$65	$237
1.0%	Planning & Environmental Compliance	$64	$24	37.8%	$88	0.0%	$64	$24	$88	2020Q1	8.2%	$69	$26	$95
10.0%	Engineering & Design	$638	$241	37.8%	$879	0.0%	$638	$241	$879	2020Q1	8.2%	$690	$261	$951
1.0%	Reviews, ATRs, IEPRs, VE	$64	$24	37.8%	$88	0.0%	$64	$24	$88	2020Q1	8.2%	$69	$26	$95
0.5%	Life Cycle Updates (cost, schedule, risks)	$32	$12	37.8%	$44	0.0%	$32	$12	$44	2020Q1	8.2%	$35	$13	$48
1.0%	Contracting & Reprographics	$64	$24	37.8%	$88	0.0%	$64	$24	$88	2020Q1	8.2%	$69	$26	$95
2.0%	Engineering During Construction	$128	$48	37.8%	$176	0.0%	$128	$48	$176	2020Q3	10.4%	$141	$53	$195
1.0%	Planning During Construction	$64	$24	37.8%	$88	0.0%	$64	$24	$88	2020Q3	10.4%	$71	$27	$97
0.0%	Project Operations	$0	$0	37.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	$510	$193	37.8%	$703	0.0%	$510	$193	$703	2020Q3	10.4%	$563	$213	$776
0.0%	Project Operation:	$0	$0	37.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
2.5%	Project Management	$159	$60	37.8%	$219	0.0%	$159	$60	$219	2020Q3	10.4%	$176	$66	$242
	CONTRACT COST TOTALS:	$8,260	$3,125		$11,385		$8,260	$3,125	$11,385			$8,761	$3,314	$12,076

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Piasa & Eagle's Nest Islands HREP
LOCATION: Madison & Jersey Counties, Illinois
This Estimate reflects the scope and schedule in report; Piasa & Eagle's Nest Islands HREP Feasibility Report

DISTRICT: St. Louis District
POC: CHIEF, COST ENGINEERING, Brandon Lewis

PREPARED: 12/19/2017

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: / Effective Price Level:			19-Dec-17 / 1-Oct-17	Program Year (Budget EC): / Effective Price Level Date:			2018 / 1 OCT 17					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	PHASE 3 - Stone Structure													
06	FISH & WILDLIFE FACILITIES	$1,526	$577	37.8%	$2,103	0.0%	$1,526	$577	$2,103	2021Q3	7.2%	$1,636	$619	$2,255
	CONSTRUCTION ESTIMATE TOTALS:	$1,526	$577	37.8%	**$2,103**		$1,526	$577	$2,103			$1,636	$619	$2,255
01	LANDS AND DAMAGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	$38	$14	37.8%	$52	0.0%	$38	$14	$52	2021Q1	12.7%	$43	$16	$59
1.0%	Planning & Environmental Compliance	$15	$6	37.8%	$21	0.0%	$15	$6	$21	2021Q1	12.7%	$17	$6	$23
10.0%	Engineering & Design	$153	$58	37.8%	$211	0.0%	$153	$58	$211	2021Q1	12.7%	$172	$65	$238
1.0%	Reviews, ATRs, IEPRs, VE	$15	$6	37.8%	$21	0.0%	$15	$6	$21	2021Q1	12.7%	$17	$6	$23
0.5%	Life Cycle Updates (cost, schedule, risks)	$8	$3	37.8%	$11	0.0%	$8	$3	$11	2021Q1	12.7%	$9	$3	$12
1.0%	Contracting & Reprographics	$15	$6	37.8%	$21	0.0%	$15	$6	$21	2021Q1	12.7%	$17	$6	$23
2.0%	Engineering During Construction	$31	$12	37.8%	$43	0.0%	$31	$12	$43	2021Q3	14.9%	$36	$13	$49
1.0%	Planning During Construction	$15	$6	37.8%	$21	0.0%	$15	$6	$21	2021Q3	14.9%	$17	$7	$24
0.0%	Project Operations	$0	$0	37.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	$122	$46	37.8%	$168	0.0%	$122	$46	$168	2021Q3	14.9%	$140	$53	$193
0.0%	Project Operation:	$0	$0	37.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
2.5%	Project Management	$38	$14	37.8%	$52	0.0%	$38	$14	$52	2021Q3	14.9%	$44	$17	$60
	CONTRACT COST TOTALS:	$1,976	$747		**$2,723**		$1,976	$747	$2,723			$2,148	$813	**$2,961**

****** TOTAL PROJECT COST SUMMARY ******

PROJECT: **Piasa & Eagle's Nest Islands HREP**
PROJECT NO: P2 145444
LOCATION: Madison & Jersey Counties, Illinois

DISTRICT: St. Louis District **PREPARED: 1/13/2017**
POC: CHIEF, COST ENGINEERING, Brandon Lewis

This Estimate reflects the scope and schedule in report; Piasa & Eagle's Nest Islands HREP Feasibility Report

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2018									
						Effective Price Level Date: 1 OCT 17									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	**TOTAL ($K)**	Spent Thru: **1-Oct-16** ($K)	**TOTAL FIRST COST** ($K)	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*		*K*	*L*	*M*	*N*	*O*
06	FISH & WILDLIFE FACILITIES	$14,788	$3,808	25.8%	$18,595	1.8%	$15,061	$3,878	$18,939	$0	$18,939	4.7%	$15,773	$4,061	$19,834
	CONSTRUCTION ESTIMATE TOTALS:	$14,788	$3,808		$18,595	1.8%	$15,061	$3,878	$18,939	$0	$18,939	4.7%	$15,773	$4,061	$19,834
01	LANDS AND DAMAGES	$0	$0	-	$0	-	$0	$0	$0	$0	$0	-	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN	$2,811	$724	25.8%	$3,535	3.6%	$2,912	$750	$3,662	$0	$3,662	7.3%	$3,126	$805	$3,931
31	CONSTRUCTION MANAGEMENT	$1,554	$400	25.8%	$1,954	3.6%	$1,610	$415	$2,025	$0	$2,025	9.5%	$1,763	$454	$2,217
	PROJECT COST TOTALS:	$19,153	$4,932	25.8%	$24,084		$19,583	$5,043	**$24,626**	$0	**$24,626**	5.5%	$20,661	$5,320	$25,982

ESTIMATED TOTAL PROJECT COST: **$25,982**

CHIEF, COST ENGINEERING, Brandon Lewis

PROJECT MANAGER, Timothy Eagan

CHIEF, REAL ESTATE, xxx

CHIEF, PLANNING,xxx

CHIEF, ENGINEERING, xxx

CHIEF, OPERATIONS, xxx

CHIEF, CONSTRUCTION, xxx

CHIEF, CONTRACTING,xxx

CHIEF, PM-PB, xxxx

CHIEF, DPM, xxx

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Piasa & Eagle's Nest Islands HREP
LOCATION: Madison & Jersey Counties, Illinois
This Estimate reflects the scope and schedule in report; Piasa & Eagle's Nest Islands HREP Feasibility Report

DISTRICT: St. Louis District
POC: CHIEF, COST ENGINEERING, Brandon Lewis

PREPARED: 1/13/2017

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 13-Jan-17 Effective Price Level: 1-Oct-16				Program Year (Budget EC): 2018 Effective Price Level Date: 1 OCT 17								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	PHASE 1 - Dredging & Island Building													
06	FISH & WILDLIFE FACILITIES	$6,957	$1,791	25.8%	$8,749	1.8%	$7,086	$1,825	$8,910	2020Q1	4.0%	$7,366	$1,897	$9,263
	CONSTRUCTION ESTIMATE TOTALS:	$6,957	$1,791	25.8%	**$8,749**		$7,086	$1,825	$8,910			$7,366	$1,897	$9,263
01	LANDS AND DAMAGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	$174	$45	25.8%	$219	3.6%	$180	$46	$227	2019Q2	4.9%	$189	$49	$238
1.0%	Planning & Environmental Compliance	$70	$18	25.8%	$88	3.6%	$73	$19	$91	2019Q2	4.9%	$76	$20	$96
10.0%	Engineering & Design	$696	$179	25.8%	$875	3.6%	$721	$186	$907	2019Q2	4.9%	$756	$195	$951
1.0%	Reviews, ATRs, IEPRs, VE	$70	$18	25.8%	$88	3.6%	$73	$19	$91	2019Q2	4.9%	$76	$20	$96
0.5%	Life Cycle Updates (cost, schedule, risks)	$35	$9	25.8%	$44	3.6%	$36	$9	$46	2019Q2	4.9%	$38	$10	$48
1.0%	Contracting & Reprographics	$70	$18	25.8%	$88	3.6%	$73	$19	$91	2019Q2	4.9%	$76	$20	$96
2.0%	Engineering During Construction	$139	$36	25.8%	$175	3.6%	$144	$37	$181	2020Q1	8.0%	$155	$40	$195
1.0%	Planning During Construction	$70	$18	25.8%	$88	3.6%	$73	$19	$91	2020Q1	8.0%	$78	$20	$98
0.0%	Project Operations	$0	$0	25.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	$557	$143	25.8%	$700	3.6%	$577	$149	$726	2020Q1	8.0%	$623	$160	$783
0.0%	Project Operation:	$0	$0	25.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
2.5%	Project Management	$174	$45	25.8%	$219	3.6%	$180	$46	$227	2020Q1	8.0%	$195	$50	$245
	CONTRACT COST TOTALS:	$9,012	$2,321		$11,333		$9,215	$2,373	$11,588			$9,629	$2,480	$12,109

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Piasa & Eagle's Nest Islands HREP
LOCATION: Madison & Jersey Counties, Illinois
This Estimate reflects the scope and schedule in report; Piasa & Eagle's Nest Islands HREP Feasibility Report

DISTRICT: St. Louis District
POC: CHIEF, COST ENGINEERING, Brandon Lewis

PREPARED: 1/13/2017

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared:			13-Jan-17	Program Year (Budget EC):			2018					
		Effective Price Level:			1-Oct-16	Effective Price Level Date:			1 OCT 17					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	PHASE 2 - Dredging & Island Building													
06	FISH & WILDLIFE FACILITIES	$6,348	$1,635	25.8%	$7,982	1.8%	$6,465	$1,665	$8,130	2020Q3	5.0%	$6,789	$1,748	$8,537
	CONSTRUCTION ESTIMATE TOTALS:	$6,348	$1,635	25.8%	**$7,982**		$6,465	$1,665	$8,130			$6,789	$1,748	$8,537
01	LANDS AND DAMAGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	$159	$41	25.8%	$200	3.6%	$165	$42	$207	2020Q1	8.0%	$178	$46	$224
1.0%	Planning & Environmental Compliance	$63	$16	25.8%	$79	3.6%	$65	$17	$82	2020Q1	8.0%	$70	$18	$89
10.0%	Engineering & Design	$635	$164	25.8%	$799	3.6%	$658	$169	$827	2020Q1	8.0%	$710	$183	$893
1.0%	Reviews, ATRs, IEPRs, VE	$63	$16	25.8%	$79	3.6%	$65	$17	$82	2020Q1	8.0%	$70	$18	$89
0.5%	Life Cycle Updates (cost, schedule, risks)	$32	$8	25.8%	$40	3.6%	$33	$9	$42	2020Q1	8.0%	$36	$9	$45
1.0%	Contracting & Reprographics	$63	$16	25.8%	$79	3.6%	$65	$17	$82	2020Q1	8.0%	$70	$18	$89
2.0%	Engineering During Construction	$127	$33	25.8%	$160	3.6%	$132	$34	$165	2020Q3	10.0%	$145	$37	$182
1.0%	Planning During Construction	$63	$16	25.8%	$79	3.6%	$65	$17	$82	2020Q3	10.0%	$72	$18	$90
0.0%	Project Operations	$0	$0	25.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	$508	$131	25.8%	$639	3.6%	$526	$136	$662	2020Q3	10.0%	$579	$149	$728
0.0%	Project Operation:	$0	$0	25.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
2.5%	Project Management	$159	$41	25.8%	$200	3.6%	$165	$42	$207	2020Q3	10.0%	$181	$47	$228
	CONTRACT COST TOTALS:	$8,220	$2,117		$10,336		$8,405	$2,164	$10,569			$8,901	$2,292	$11,193

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Piasa & Eagle's Nest Islands HREP
LOCATION: Madison & Jersey Counties, Illinois
This Estimate reflects the scope and schedule in report; Piasa & Eagle's Nest Islands HREP Feasibility Report

DISTRICT: St. Louis District
POC: CHIEF, COST ENGINEERING, Brandon Lewis
PREPARED: 1/13/2017

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: / Effective Price Level:			13-Jan-17 / 1-Oct-16	Program Year (Budget EC): / Effective Price Level Date:			2018 / 1 OCT 17					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	PHASE 3 - Stone Structure													
06	FISH & WILDLIFE FACILITIES	$1,483	$382	25.8%	$1,864	1.8%	$1,510	$389	$1,899	2021Q3	7.1%	$1,617	$416	$2,034
	CONSTRUCTION ESTIMATE TOTALS:	$1,483	$382	25.8%	**$1,864**		$1,510	$389	$1,899			$1,617	$416	$2,034
01	LANDS AND DAMAGES	$0	$0	0.0%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	$37	$10	25.8%	$47	3.6%	$38	$10	$48	2021Q1	12.2%	$43	$11	$54
1.0%	Planning & Environmental Compliance	$15	$4	25.8%	$19	3.6%	$16	$4	$20	2021Q1	12.2%	$17	$4	$22
10.0%	Engineering & Design	$148	$38	25.8%	$186	3.6%	$153	$39	$193	2021Q1	12.2%	$172	$44	$216
1.0%	Reviews, ATRs, IEPRs, VE	$15	$4	25.8%	$19	3.6%	$16	$4	$20	2021Q1	12.2%	$17	$4	$22
0.5%	Life Cycle Updates (cost, schedule, risks)	$7	$2	25.8%	$9	3.6%	$7	$2	$9	2021Q1	12.2%	$8	$2	$10
1.0%	Contracting & Reprographics	$15	$4	25.8%	$19	3.6%	$16	$4	$20	2021Q1	12.2%	$17	$4	$22
2.0%	Engineering During Construction	$30	$8	25.8%	$38	3.6%	$31	$8	$39	2021Q3	14.4%	$36	$9	$45
1.0%	Planning During Construction	$15	$4	25.8%	$19	3.6%	$16	$4	$20	2021Q3	14.4%	$18	$5	$22
0.0%	Project Operations	$0	$0	25.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	$119	$31	25.8%	$150	3.6%	$123	$32	$155	2021Q3	14.4%	$141	$36	$177
0.0%	Project Operation:	$0	$0	25.8%	$0	0.0%	$0	$0	$0	0	0.0%	$0	$0	$0
2.5%	Project Management	$37	$10	25.8%	$47	3.6%	$38	$10	$48	2021Q3	14.4%	$44	$11	$55
	CONTRACT COST TOTALS:	$1,921	$495		**$2,415**		$1,964	$506	$2,469			$2,131	$549	**$2,680**

Piasa and Eagle's Nest HREP Jan 2017

UPPER MISSISSIPPI RIVER RESTORATION
FEASIBILITY REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

PIASA AND EAGLE'S NEST ISLANDS
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

Estimated by Michelle Puzach
Designed by St. Louis District
Prepared by Michelle Puzach

Preparation Date 11/9/2016
Effective Date of Pricing 11/9/2016
Estimated Construction Time Days

Description	UOM	Quantity	DirectCost	ProjectCost
Owner Cost Level 1			**15,582,407.65**	**19,152,641.00**
06 FISH AND WILDLIFE FACILITIES	**LS**	**1.0000**	**11,217,407.65**	**14,787,641.00**
30 PLANNING, ENGINEERING AND DESIGN	**LS**	**1.0000**	**2,811,000.00**	**2,811,000.00**
31 CONSTRUCTION MANAGEMENT	**LS**	**1.0000**	**1,554,000.00**	**1,554,000.00**

Description	UOM	Quantity	DirectCost	ProjectCost
Owner Cost Level 2			**15,582,407.65**	**19,152,641.00**
06 FISH AND WILDLIFE FACILITIES	**LS**	**1.0000**	**11,217,407.65**	**14,787,641.00**
			5,244,740.4915	*6,957,219.8527*
Phase 1 - Dredging & Island Building	**EA**	**1.0000**	**5,244,740.49**	**6,957,219.85**
			4,785,360.6819	*6,347,846.2647*
Phase 2 - Dredging & Island Building & Backwater Dredging	**EA**	**1.0000**	**4,785,360.68**	**6,347,846.26**
			1,187,306.4737	*1,482,574.8812*
Phase 3 - Stone Structure	**EA**	**1.0000**	**1,187,306.47**	**1,482,574.88**
30 PLANNING, ENGINEERING AND DESIGN	**LS**	**1.0000**	**2,811,000.00**	**2,811,000.00**
PED Through Completion of Project	**LS**	**1.0000**	**2,811,000.00**	**2,811,000.00**
31 CONSTRUCTION MANAGEMENT	**LS**	**1.0000**	**1,554,000.00**	**1,554,000.00**
CM Through Completion of Project	**LS**	**1.0000**	**1,554,000.00**	**1,554,000.00**

Description	UOM	Quantity	DirectCost	ProjectCost
Owner Cost Level 3			**15,582,407.65**	**19,152,641.00**
06 FISH AND WILDLIFE FACILITIES	**LS**	**1.0000**	**11,217,407.65**	**14,787,641.00**
Phase 1 - Dredging & Island Building	**EA**	**1.0000**	*5,244,740.4915* **5,244,740.49**	*6,957,219.8527* **6,957,219.85**
Braided Chute - 200 Ft with Upstream Island	**EA**	**1.0000**	*5,244,740.4915* **5,244,740.49**	*6,957,219.8527* **6,957,219.85**
Phase 2 - Dredging & Island Building & Backwater Dredging	**EA**	**1.0000**	*4,785,360.6819* **4,785,360.68**	*6,347,846.2647* **6,347,846.26**
Braided Chute - 200 Ft with Upstream Island	**EA**	**1.0000**	*3,992,880.6819* **3,992,880.68**	*5,296,610.7274* **5,296,610.73**
Backwater Dredging	**EA**	**1.0000**	*792,480.0000* **792,480.00**	*1,051,235.5374* **1,051,235.54**
Phase 3 - Stone Structure	**EA**	**1.0000**	*1,187,306.4737* **1,187,306.47**	*1,482,574.8812* **1,482,574.88**
Stone Structures with Notches	**TON**	**42,400.0000**	*21.3280* **904,306.47**	*28.2919* **1,199,574.88**
Post Construction Monitoring & Adaptive Management	**EA**	**1.0000**	*283,000.0000* **283,000.00**	*283,000.0000* **283,000.00**
30 PLANNING, ENGINEERING AND DESIGN	**LS**	**1.0000**	**2,811,000.00**	**2,811,000.00**
PED Through Completion of Project	**LS**	**1.0000**	**2,811,000.00**	**2,811,000.00**
31 CONSTRUCTION MANAGEMENT	**LS**	**1.0000**	**1,554,000.00**	**1,554,000.00**
CM Through Completion of Project	**LS**	**1.0000**	**1,554,000.00**	**1,554,000.00**

Abbreviated Risk Analysis

Project (less than $40M): **Piasa & Eagle's Nest Islands HREP** **Alternative: D1R1B1**

Project Development Stage/Alternative: **Feasibility (Recommended Plan)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/7/2016**

Total Estimated Construction Contract Cost = **$ 14,787,641**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	06 FISH AND WILDLIFE FACILITIES	**Braided Chute - 200 ft with Upstream Island**	$ 12,253,831		26.88%	$ 3,294,029	$ 15,547,860
2	06 FISH AND WILDLIFE FACILITIES	**Stone Structure with Notches**	$ 1,199,575		21.01%	$ 252,082	$ 1,451,657
3	06 FISH AND WILDLIFE FACILITIES	**Backwater Dredging**	$ 1,051,235		22.07%	$ 232,042	$ 1,283,277
4					0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	**$ 283,000**	*2.0%*	10.63%	$ 30,085	$ 313,085
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 2,809,652		9.37%	$ 263,361	$ 3,073,013
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 1,552,702		16.23%	$ 251,937	$ 1,804,639
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

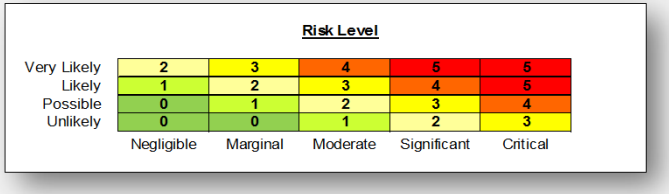
Totals				
Real Estate	$ -	0.00%	$ -	$ -
Total Construction Estimate	$ 14,787,641	25.75%	$ 3,808,238	$ 18,595,879
Total Planning, Engineering & Design	$ 2,809,652	9.37%	$ 263,361	$ 3,073,013
Total Construction Management	$ 1,552,702	16.23%	$ 251,937	$ 1,804,639
Total Excluding Real Estate	**$ 19,149,995**	**23%**	**$ 4,323,536**	**$ 23,473,531**

Piasa & Eagle's Nest Islands HREP D1R1B1

Feasibility (Recommended Plan)

Abbreviated Risk Analysis

Meeting Date: 7-Nov-16



Risk Register

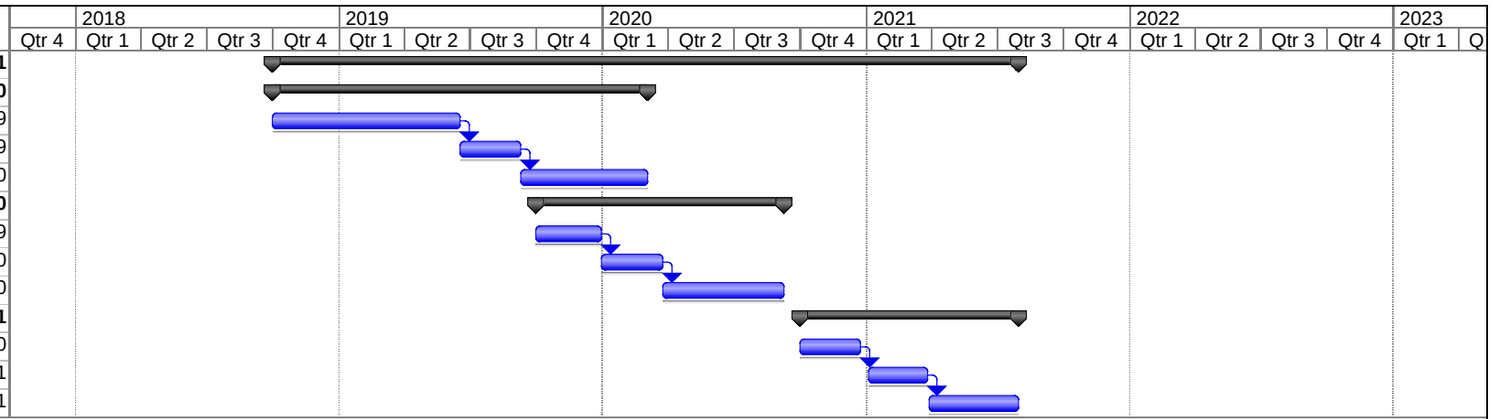
23%

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level	Line Item Magnitude ($000)
Project Management & Scope Growth				**Maximum Project Growth**		**40%**	
PS-1	Braided Chute - 200 ft with Upstream Island	Potential for scope growth, added features? Funding Difficulties?	No concern for added features. Modeling has brought down the risk of the project not accomplishing the intent. Siltation risk for dredging has been mitigated through adaptive management. Funding may be difficult because of the magnitude of this portion of the project and the typical amount of construction funds received each year. Additional mob & demobs may be needed.	Marginal	Likely	2	$12,254k
PS-2	Stone Structure with Notches	Potential for scope growth, added features?	No concern for added features. Modeling has brought down the risk of the solution not accomplishing the intent.	Negligible	Unlikely	0	$1,200k
PS-3	Backwater Dredging	Potential for scope growth, added features?	No concern for added features. Modeling has brought down the risk of the solution not accomplishing the intent. Siltation risk for dredging has been mitigated through adaptive management. Additional mob & demobs may be needed.	Marginal	Likely	2	$1,051k
PS-12	Remaining Construction Items	Potential for scope growth, added features?	No concern for added features. Post Construction Monitoring & Adaptive Management scope may grow depending on the requirements after construction.	Negligible	Likely	1	$283k
PS-13	Planning, Engineering, & Design	Funding Difficulties?	Funding may be difficult because of the magnitude of the portion of the project and the typical amount of construction funds received each year. Several mob and demobs will be needed.	Marginal	Likely	2	$2,810k
PS-14	Construction Management	Funding Difficulties?	Funding may be difficult because of the magnitude of the portion of the project and the typical amount of construction funds received each year. Several mob and demobs will be needed. Increasing the construction management time.	Marginal	Likely	2	$1,553k
Acquisition Strategy				**Maximum Project Growth**		**30%**	
AS-1	Braided Chute - 200 ft with Upstream Island	Contracting plan firmly established? 8a or small business likely?	In the feasibility phase the contracting plan has not been established, but it is most likely that the contract will be awarded to an 8A or small business. Limited contractors will be able to do the work. Project will be broken into several contracts.	Marginal	Likely	2	$12,254k
AS-2	Stone Structure with Notches	Contracting plan firmly established? 8a or small business likely?	In the feasibility phase the contracting plan has not been established, but it is most likely that the contract will be awarded to an 8A or small business. Limited contractors will be able to do the work. Project will be broken into several contracts.	Marginal	Likely	2	$1,200k
AS-3	Backwater Dredging	Contracting plan firmly established? 8a or small business likely?	In the feasibility phase the contracting plan has not been established, but it is most likely that the contract will be awarded to an 8A or small business. Limited contractors will be able to do the work. Project will be broken into several contracts.	Marginal	Likely	2	$1,051k
AS-12	Remaining Construction Items		Post Construction Monitoring and Adaptive Management will be done in house.	Negligible	Unlikely	0	$283k
AS-13	Planning, Engineering, & Design		No concern that the acquisition strategy will affect the planning, engineering, and design.	Negligible	Unlikely	0	$2,810k

AS-14	Construction Management	Contracting plan firmly established? 8a or small business likely?	In the feasibility phase the contracting plan has not been established, but it is most likely that the contract will be awarded to an 8A or small business. Limited contractors will be able to do the work. Project will be broken into several contracts.	Marginal	Likely	2	$1,553k
Construction Elements				**Maximum Project Growth**		**15%**	
CON-1	Braided Chute - 200 ft with Upstream Island	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Flood/water level will impact construction. Dredge efficiency will be affected by woody debris. Threatened & endangered species may also impact the construction schedule.	Moderate	Likely	3	$12,254k
CE-2	Stone Structure with Notches	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Flood/water level will impact construction. Dredge efficiency will be affected by woody debris. Threatened & endangered species may also impact the construction schedule.	Moderate	Likely	3	$1,200k
CE-3	Backwater Dredging	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Flood/water level will impact construction. Dredge efficiency will be affected by woody debris. Threatened & endangered species may also impact the construction schedule.	Moderate	Likely	3	$1,051k
CE-12	Remaining Construction Items	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Flood/water level may impact the available times to do the monitoring and adaptive management, but these will not be on a strict schedule.	Negligible	Likely	1	$283k
CE-13	Planning, Engineering, & Design		No concern that the construction elements will affect the planning, engineering, and design.	Negligible	Unlikely	0	$2,810k
CE-14	Construction Management	• Accelerated schedule or harsh weather schedule? • High risk or complex construction elements, site access, in-water?	Flood/water level will impact construction. Dredge efficiency will be affected by woody debris. Threatened & endangered species may also impact the construction schedule.	Marginal	Likely	2	$1,553k
Specialty Construction or Fabrication				**Maximum Project Growth**		**50%**	
SC-1	Braided Chute - 200 ft with Upstream Island		Not applicable for this project.	Negligible	Unlikely	0	$12,254k
SC-2	Stone Structure with Notches		Not applicable for this project.	Negligible	Unlikely	0	$1,200k
SC-3	Backwater Dredging		Not applicable for this project.	Negligible	Unlikely	0	$1,051k
SC-12	Remaining Construction Items		Not applicable for this project.	Negligible	Unlikely	0	$283k
SC-13	Planning, Engineering, & Design		Not applicable for this project.	Negligible	Unlikely	0	$2,810k
SC-14	Construction Management		Not applicable for this project.	Negligible	Unlikely	0	$1,553k
Technical Design & Quantities				**Maximum Project Growth**		**20%**	
T-1	Braided Chute - 200 ft with Upstream Island	• Possibility for increased quantities due to loss, waste, or subsidence? • Sufficient investigations to develop quantities?	Several methods of modeling have been applied to develop quantities, but there is still a potential for increase on the braided chute dredging if the upstream sediment plug migrates into the channel.	Moderate	Possible	2	$12,254k
T-2	Stone Structure with Notches	• Possibility for increased quantities due to loss, waste, or subsidence? • Sufficient investigations to develop quantities?	Several methods of modeling have been applied to develop quantities.	Marginal	Possible	1	$1,200k
T-3	Backwater Dredging	• Possibility for increased quantities due to loss, waste, or subsidence? • Sufficient investigations to develop quantities?	Several methods of modeling have been applied to develop quantities.	Marginal	Possible	1	$1,051k
T-12	Remaining Construction Items		Since it is already a guess as to the amount of adaptive management that may be needed post construction, it is very possible this could increase or decrease.	Negligible	Likely	1	$283k
T-13	Planning, Engineering, & Design		The PED of this project will not change based on the quantities developed for this project.	Negligible	Unlikely	0	$2,810k
T-14	Construction Management		The CM of this project will not change based on the quantities developed for this project.	Negligible	Unlikely	0	$1,553k

Cost Estimate Assumptions				Maximum Project Growth		25%	
EST-1	Braided Chute - 200 ft with Upstream Island	• Assumptions regarding crew, productivity, overtime? • Site accessibility, transport delays, congestion?	TSP estimate was a detailed estimate, created using MII and CEDEP software. Possibility of assumptions about crews, productivity, and site complications affecting the cost.	Marginal	Possible	1	$12,254k
EST-2	Stone Structure with Notches	• Assumptions regarding crew, productivity, overtime? • Site accessibility, transport delays, congestion?	TSP estimate was a detailed estimate, created using MII and CEDEP software. Possibility of assumptions about crews, productivity, and site complications affecting the cost.	Marginal	Possible	1	$1,200k
EST-3	Backwater Dredging	• Assumptions regarding crew, productivity, overtime? • Site accessibility, transport delays, congestion?	TSP estimate was a detailed estimate, created using MII and CEDEP software. Possibility of assumptions about crews, productivity, and site complications affecting the cost.	Marginal	Possible	1	$1,051k
EST-12	Remaining Construction Items		Costs developed from previous projects.	Negligible	Possible	0	$283k
EST-13	Planning, Engineering, & Design	• Reliability and number of key quotes?	The engineering and design of this project has been taken into account in the work items above.	Negligible	Unlikely	0	$2,810k
EST-14	Construction Management	• Reliability and number of key quotes?	The construction management of this project will not change based on the cost estimating method developed for this project.	Negligible	Unlikely	0	$1,553k
External Project Risks				**Maximum Project Growth**		**20%**	
EX-1	Braided Chute - 200 ft with Upstream Island	• Potential for severe adverse weather? • Unanticipated inflations in fuel, key materials?	Weather impact was covered in construction elements, but there is a possibility that a key material, such as rock, could experience a significant cost increase affecting the braided chute and stone structure.	Moderate	Possible	2	$12,254k
EX-2	Stone Structure with Notches	• Potential for severe adverse weather? • Unanticipated inflations in fuel, key materials?	Weather impact was covered in construction elements, but there is a possibility that a key material, such as rock, could experience a significant cost increase affecting the braided chute and stone structure.	Moderate	Possible	2	$1,200k
EX-3	Backwater Dredging	• Potential for severe adverse weather? • Unanticipated inflations in fuel, key materials?	Weather impact was covered in construction elements, but there is a possibility that a key material, such as rock, could experience a significant cost increase affecting the braided chute and stone structure.	Negligible	Unlikely	0	$1,051k
EX-12	Remaining Construction Items	• Potential for severe adverse weather? • Unanticipated inflations in fuel, key materials?	Weather impact was covered in construction elements.	Negligible	Unlikely	0	$283k
EX-13	Planning, Engineering, & Design	• Potential for severe adverse weather? • Unanticipated inflations in fuel, key materials?	The PED of this project will not change because of weather or inflation of key materials.	Negligible	Unlikely	0	$2,810k
EX-14	Construction Management	• Potential for severe adverse weather? • Unanticipated inflations in fuel, key materials?	The CM may increase if weather prolongs construction schedule, but this was covered in construction elements.	Negligible	Unlikely	0	$1,553k

ID	Task Name	Duration	Start	Finish
1	**Piasa & Eagle's Nest HREP**	**721 days**	**Mon 10/1/18**	**Fri 7/30/21**
2	**Phase 1 - Dredging & Isla**	**360 days**	**Mon 10/1/18**	**Tue 3/3/20**
3	Plans & Specs	180 days	Mon 10/1/18	Mon 6/17/19
4	Acquisition	60 days	Tue 6/18/19	Mon 9/9/19
5	Construction	120 days	Tue 9/10/19	Tue 3/3/20
6	**Phase 2 - Dredging & Isla**	**240 days**	**Tue 10/1/19**	**Tue 9/8/20**
7	Plans & Specs	60 days	Tue 10/1/19	Mon 12/30/19
8	Acquisition	60 days	Tue 12/31/19	Tue 3/24/20
9	Construction	120 days	Wed 3/25/20	Tue 9/8/20
10	**Phase 3 - Stone Structur**	**210 days**	**Thu 10/1/20**	**Fri 7/30/21**
11	Plans & Specs	60 days	Thu 10/1/20	Wed 12/23/20
12	Acquisition	60 days	Mon 1/4/21	Fri 3/26/21
13	Construction	90 days	Mon 3/29/21	Fri 7/30/21



Project: Piasa HREP Construction Sch
Date: Thu 12/1/16

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

Assumptions -

Stone - Stone prices are based on historical pricing of river contracts and considers some areas that will require stone placement in shallow water. This will result in slower production and will require light loading of stone barges. Overall average prices are considered for all locations

Dredging - The various disposal areas have been considered and avgerage dredging prices will be used for all project locations. Reference 2009 Kaskaskia Dredging IDIQ Solicitation 09-R-0734, Contract 09-C-0415 Escalate Price Level to 2016

GOVERNMENT ESTIMATE WORK SHEET

EC-DM

PROJECT: Piasa Island

DATE: 27-Jul-2016

SUBJECT: Alternative D1R0B1

FILE:

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	JB		1,007,500
Braided Chute - 200ft with Rootless Blob -				
Stone for Islands	60,700	TN	22.00	1,335,400
Stone for Rootless Blob	56,000	TN	22.00	1,232,000
Stone for Disposal Riverside of Piasa Island	29,900	TN	22.00	657,800
Dredging - Disposal Riverside of Piasa Island	475,000	CY	9.00	4,275,000
Dredging - Disposal on Braided Islands	177,000	CY	9.00	1,593,000
Dredging - Disposal on Rootless Blob	233,000	CY	9.00	2,097,000
Backwater Dredging -				
Minimum (sediment plug removal)	156,000	CY	9.00	1,404,000

SUBTOTAL:		$13,601,700
CONTINGENCIES: (in %)	30	$4,098,300
SUBTOTAL:----------		$17,700,000
E & D (in %)----------	15	$2,660,000
S & A. (in %)----------	10	$1,770,000
TOTAL COST		**$22,130,000**

GOVERNMENT ESTIMATE WORK SHEET

EC-DM

PROJECT: Piasa Island DATE: 27-Jul-2016

SUBJECT: Alternative D1R0B2 FILE:

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	JB		1,119,100
Braided Chute - 200ft with Rootless Blob -				
Stone for Islands	60,700	TN	22.00	1,335,400
Stone for Rootless Blob	56,000	TN	22.00	1,232,000
Stone for Disposal Riverside of Piasa Island	29,900	TN	22.00	657,800
Dredging - Disposal Riverside of Piasa Island	475,000	CY	9.00	4,275,000
Dredging - Disposal on Braided Islands	177,000	CY	9.00	1,593,000
Dredging - Disposal on Rootless Blob	233,000	CY	9.00	2,097,000
Backwater Dredging -				
Maximum (sediment plug removal plus interior)	311,000	CY	9.00	2,799,000

SUBTOTAL:		$15,108,300
CONTINGENCIES: (in %)	30	$4,491,700
SUBTOTAL:-------------------		$19,600,000
E & D (in %)-----------------	15	$2,940,000
S & A. (in %)-----------------	10	$1,960,000
TOTAL COST		**$24,500,000**

GOVERNMENT ESTIMATE WORK SHEET

EC-DM

PROJECT: Piasa Island DATE: 27-Jul-2016

SUBJECT: Alternative D1R1B1 FILE:

\

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	JB		1,082,200
Braided Chute - 200ft with Rootless Blob -				
Stone for Islands	60,700	TN	22.00	1,335,400
Stone for Rootless Blob	56,000	TN	22.00	1,232,000
Stone for Disposal Riverside of Piasa Island	29,900	TN	22.00	657,800
Dredging - Disposal Riverside of Piasa Island	475,000	CY	9.00	4,275,000
Dredging - Disposal on Braided Islands	177,000	CY	9.00	1,593,000
Dredging - Disposal on Rootless Blob	233,000	CY	9.00	2,097,000
Stone Structures With Notches -				
Island Connection between Piasa & Eagles Nest				
Graded Stone A	42,400	TN	22.00	932,800
Backwater Dredging -				
Minimum (sediment plug removal)	156,000	CY	9.00	1,404,000

SUBTOTAL:		$14,609,200
CONTINGENCIES: (in %)	30	$4,390,800
SUBTOTAL:-------------------		$19,000,000
E & D (in %)-----------------	15	$2,850,000
S & A. (in %)-----------------	10	$1,900,000
TOTAL COST		**$23,750,000**

GOVERNMENT ESTIMATE WORK SHEET

EC-DM

PROJECT: Piasa Island — DATE: 27-Jul-2016

SUBJECT: Alternative D1R1B2 — FILE:

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	JB		1,193,800
Braided Chute - 200ft with Rootless Blob -				
Stone for Islands	60,700	TN	22.00	1,335,400
Stone for Rootless Blob	56,000	TN	22.00	1,232,000
Stone for Disposal Riverside of Piasa Island	29,900	TN	22.00	657,800
Dredging - Disposal Riverside of Piasa Island	475,000	CY	9.00	4,275,000
Dredging - Disposal on Braided Islands	177,000	CY	9.00	1,593,000
Dredging - Disposal on Rootless Blob	233,000	CY	9.00	2,097,000
Stone Structures With Notches -				
Island Connection between Piasa & Eagles Nest				
Graded Stone A	42,400	TN	22.00	932,800
Backwater Dredging -				
Maximum (sediment plug removal plus interior)	311,000	CY	9.00	2,799,000

SUBTOTAL:		$16,115,800
CONTINGENCIES: (in %)	30	$4,884,200
SUBTOTAL:-------------------		$21,000,000
E & D (in %)-----------------	15	$3,150,000
S & A. (in %)-----------------	10	$2,100,000
TOTAL COST		**$26,250,000**

GOVERNMENT ESTIMATE WORK SHEET

EC-DM

PROJECT: Piasa Island

DATE: 27-Jul-2016

SUBJECT: Alternative D2R0B1

FILE:

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	JB		1,239,000
Braided Chute - 300ft with Rootless Blob -				
Stone for Islands	60,700	TN	22.00	1,335,400
Stone for Rootless Blob	88,500	TN	22.00	1,947,000
Stone for Disposal Riverside of Piasa Island	29,900	TN	22.00	657,800
Dredging - Disposal Riverside of Piasa Island	475,000	CY	9.00	4,275,000
Dredging - Disposal on Braided Islands	177,000	CY	9.00	1,593,000
Dredging - Disposal on Rootless Blob	475,000	CY	9.00	4,275,000
Backwater Dredging -				
Minimum (sediment plug removal)	156,000	CY	9.00	1,404,000

SUBTOTAL:		$16,726,200
CONTINGENCIES: (in %)	30	$4,973,800
SUBTOTAL:----------		$21,700,000
E & D (in %)----------	15	$3,260,000
S & A. (in %)----------	10	$2,170,000
TOTAL COST		**$27,130,000**

GOVERNMENT ESTIMATE WORK SHEET

EC-DM

PROJECT: Piasa Island DATE: 27-Jul-2016

SUBJECT: Alternative D2R0B2 FILE:

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	JB		1,350,600
Braided Chute - 300ft with Rootless Blob -				
Stone for Islands	60,700	TN	22.00	1,335,400
Stone for Rootless Blob	88,500	TN	22.00	1,947,000
Stone for Disposal Riverside of Piasa Island	29,900	TN	22.00	657,800
Dredging - Disposal Riverside of Piasa Island	475,000	CY	9.00	4,275,000
Dredging - Disposal on Braided Islands	177,000	CY	9.00	1,593,000
Dredging - Disposal on Rootless Blob	475,000	CY	9.00	4,275,000
Backwater Dredging -				
Maximum (sediment plug removal plus interior)	311,000	CY	9.00	2,799,000

SUBTOTAL:		$18,232,800
CONTINGENCIES: (in %)	30	$5,467,200
SUBTOTAL:-------------------		$23,700,000
E & D (in %)-----------------	15	$3,560,000
S & A. (in %)-----------------	10	$2,370,000
TOTAL COST		**$29,630,000**

GOVERNMENT ESTIMATE WORK SHEET

EC-DM

PROJECT: Piasa Island DATE: 27-Jul-2016

SUBJECT: Alternative D2R1B1 FILE:

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	JB		1,313,600
Braided Chute - 300ft with Rootless Blob -				
Stone for Islands	60,700	TN	22.00	1,335,400
Stone for Rootless Blob	88,500	TN	22.00	1,947,000
Stone for Disposal Riverside of Piasa Island	29,900	TN	22.00	657,800
Dredging - Disposal Riverside of Piasa Island	475,000	CY	9.00	4,275,000
Dredging - Disposal on Braided Islands	177,000	CY	9.00	1,593,000
Dredging - Disposal on Rootless Blob	475,000	CY	9.00	4,275,000
Stone Structures With Notches -				
Island Connection between Piasa & Eagles Nest				
Graded Stone A	42,400	TN	22.00	932,800
Backwater Dredging -				
Minimum (sediment plug removal)	156,000	CY	9.00	1,404,000

SUBTOTAL:		$17,733,600
CONTINGENCIES: (in %)	30	$5,366,400
SUBTOTAL:-------------------		$23,100,000
E & D (in %)-----------------	15	$3,470,000
S & A. (in %)-----------------	10	$2,310,000
TOTAL COST		**$28,880,000**

GOVERNMENT ESTIMATE WORK SHEET

EC-DM

PROJECT: Piasa Island DATE: 27-Jul-2016

SUBJECT: Alternative D2R1B2 FILE:

ITEM	QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
Mobilization and Demobilization	1	JB		1,425,200
Braided Chute - 300ft with Rootless Blob -				
Stone for Islands	60,700	TN	22.00	1,335,400
Stone for Rootless Blob	88,500	TN	22.00	1,947,000
Stone for Disposal Riverside of Piasa Island	29,900	TN	22.00	657,800
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Dredging - Disposal on Rootless Blob	475,000	CY	9.00	4,275,000
Stone Structures With Notches -				
Island Connection between Piasa & Eagles Nest				
Graded Stone A	42,400	TN	22.00	932,800
Backwater Dredging -				
Maximum (sediment plug removal plus interior)	311,000	CY	9.00	2,799,000

SUBTOTAL:		$19,240,200
CONTINGENCIES: (in %)	30	$5,759,800
SUBTOTAL:-------------------		$25,000,000
E & D (in %)-----------------	15	$3,750,000
S & A. (in %)-----------------	10	$2,500,000
TOTAL COST		**$31,250,000**

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS MO 63103-2833

REPLY TO
ATTENTION OF

CEMVS-DE

FEB 21 2018

MEMORANDUM FOR Commander, Mississippi Valley Division (CEMVD-PD-SP/ Mr. Ben Robinson), 1400 Walnut Street, P.O. Box 80, Vicksburg, Mississippi 39181-0080

SUBJECT: Major Subordinate Command (MSC) Review of the Draft Feasibility Study Report with Integrated Environmental Assessment for the Upper Mississippi River Restoration Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP), Mississippi River Miles 207.5-211.5, Madison and Jersey Counties, Illinois (Project # 145444).

1. The St. Louis District requests the Mississippi Valley Division (MVD) to review the Draft Feasibility Study Report for the Piasa and Eagle's Nest Islands HREP. The report contains all information that is pertinent to the formulation, evaluation, comparison, and selection of the Tentatively Selected Plan. Three hard copies of the Draft Feasibility Study Report have been furnished with this memorandum as Enclosure 1 in addition to the document being loaded to the MVD ProjectWise.

2. District Quality Control (DQC) of the Draft Feasibility Study Report was completed on 4 April 2017. The signed DQC certification and documentation of comments and responses has been furnished with this memorandum as Enclosure 2.

3. Office of Counsel Legal Sufficiency Certification was completed on 12 February 2018. The signed certification has been furnished with this memorandum as Enclosure 3.

4. Agency Technical Review of the Draft Feasibility Report was completed on 12 February 2018. ATR documentation of comments and responses has been furnished with this memorandum as Enclosure 4.

5. The Piasa and Eagle's Nest Islands HREP Fact Sheet has been furnished with this memorandum as Enclosure 5.

6. The St. Louis District will schedule the MDM meeting with MVD to seek concurrence to release the draft document for public review.

7. The points of contact are Mr. Brian Markert, District Program Manager, (314) 331-8455, brian.j.markert@usace.army.mil or Mr. Kip Runyon, Project Manager, (314) 331-8396, kip.r.runyon@usace.army.mil.

Bryan K. Sizemore

BRYAN K. SIZEMORE
COL, EN
Commanding

UPPER MISSISSIPPI RIVER RESTORATION PROGRAM

PIASA & EAGLE'S NEST ISLANDS

MSC DECISION MILESTONE

Corps of Engineers, St. Louis District

Non-federal sponsor: Illinois Department of Natural Resources

Federal project partner: U.S. Fish and Wildlife Service

April 3, 2017

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St. Paul District

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AGENDA

- Introductions
- Meeting Purpose
- Study Overview
- Existing & Future Without Project Conditions
- Formulation of Alternatives
- Tentatively Selected Plan
- Reviews & Comments
- Schedule
- MVD Decision

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MEETING PURPOSE

The intent of this milestone meeting is to brief the work conducted to date, and seek MSC concurrence on the following:

- Tentatively Selected Plan
- Release for public review

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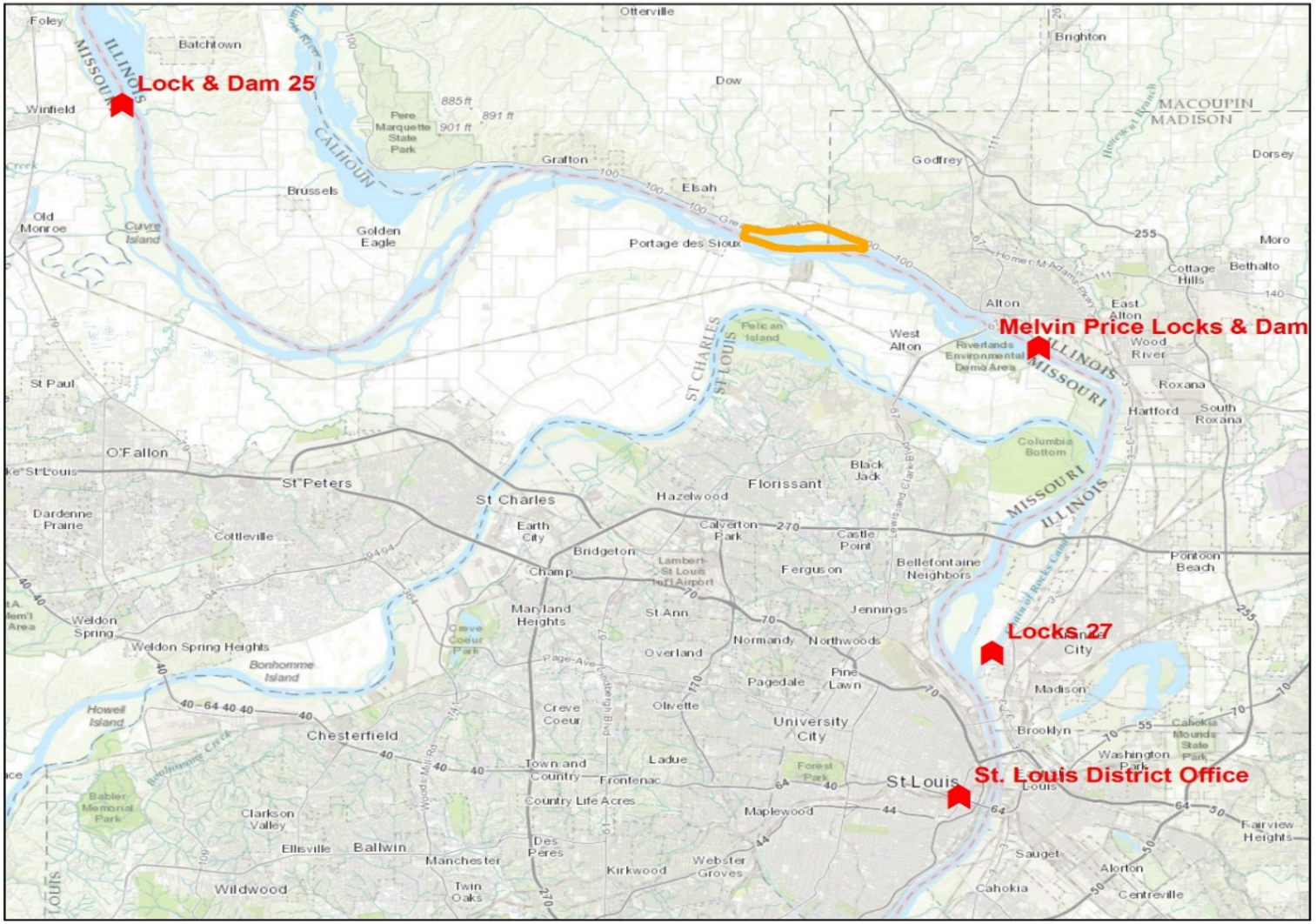
Project Vicinity



Piasa and Eagle's Nest Island Habitat Rehabilitation & Enhancement Project

USACE

Boundary

Location Map

2.5 1.25 0 2.5 Miles

Created by: E. Guntren
Date Created: 14Dec2016

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STUDY AREA

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COLLABORATIVE PARTNERS

- Illinois Department of Natural Resources
- U.S. Fish and Wildlife Service (USFWS)
- Missouri Department of Conservation
- Illinois Natural History Survey
- Other stakeholders groups:
  - Great Rivers Land Trust
  - Migratory Waterfowl Hunters, Inc.
  - Illinois Federation of Outdoor Resources
  - Alton Motorboat Club
  - Alton Ski Club
  - Alton Regional Convention and Visitors Bureau
  - City of Alton

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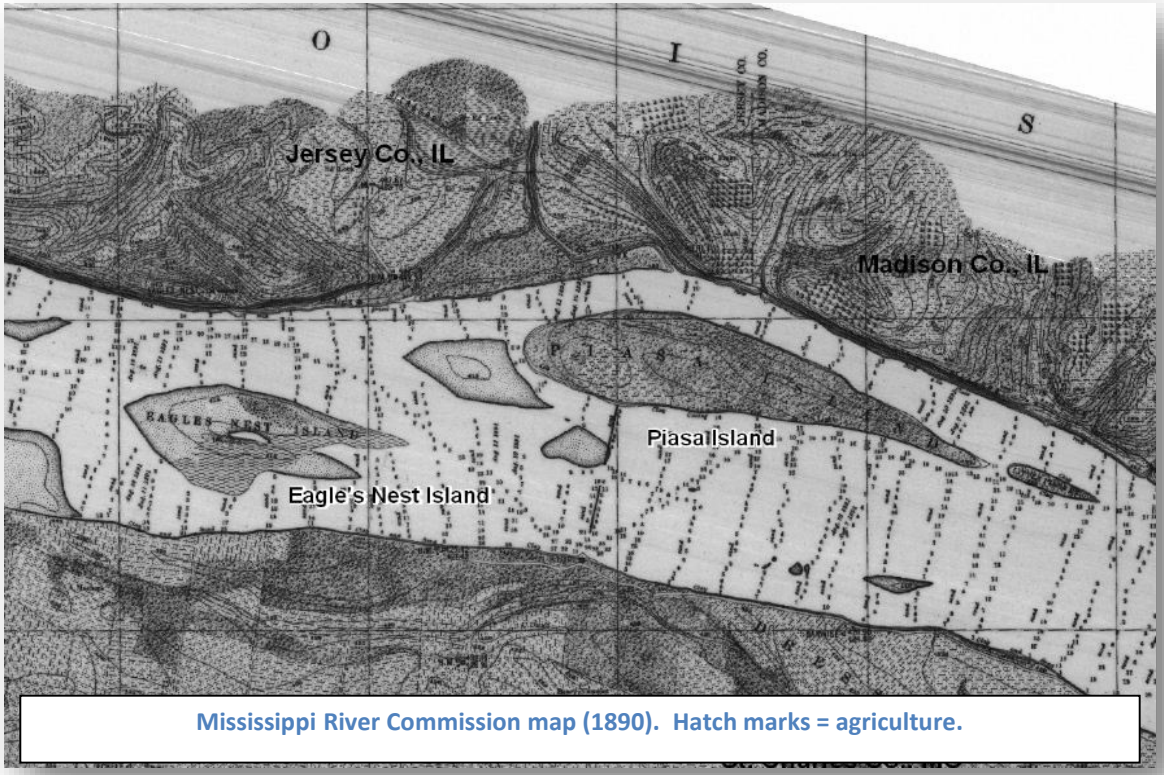
REGIONAL PROBLEMS

UMRR Habitat Needs Assessment (2000) identified the following habitat issues in Pool 26:

- Loss of side channel habitat
- Loss of contiguous backwater habitat
- Loss of island habitat



Mississippi River Commission map (1890). Hatch marks = agriculture.

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Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

PROBLEMS

1. Loss of depth and flow in Piasa Chute
2. Loss of backwater habitat
3. Loss of diverse island mosaic

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Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

OPPORTUNITIES

Increase public use:

- Eco-tourism
- Recreational boating
- Recreational fishing and hunting
- Nature photography
- Environmental interpretation and education

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Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

STUDY PURPOSE:

To restore and improve the quality and diversity of aquatic and island ecosystem resources within the study area.

OBJECTIVES

1. Increase aquatic side channel habitat with depth and flow diversity
2. Increase connected backwater habitat with depth diversity for enhanced backwater fisheries habitat benefits
3. Restore diverse island mosaic

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Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

CONSTRAINTS

Common Study Constraints:

- Be consistent with Federal, state, and local laws
- Not detrimentally affect cultural resources
- Not detrimentally increase flood heights or adversely affect private property
- Minimize negative impacts to aesthetics
- Minimize spread of invasives

Study Specific Constraints:

- *Navigation* - Ensure measures do not negatively impact 9-foot navigation channel.
- Avoid or minimize impacts to recreation.
- Avoid impacts to adjacent landowners.

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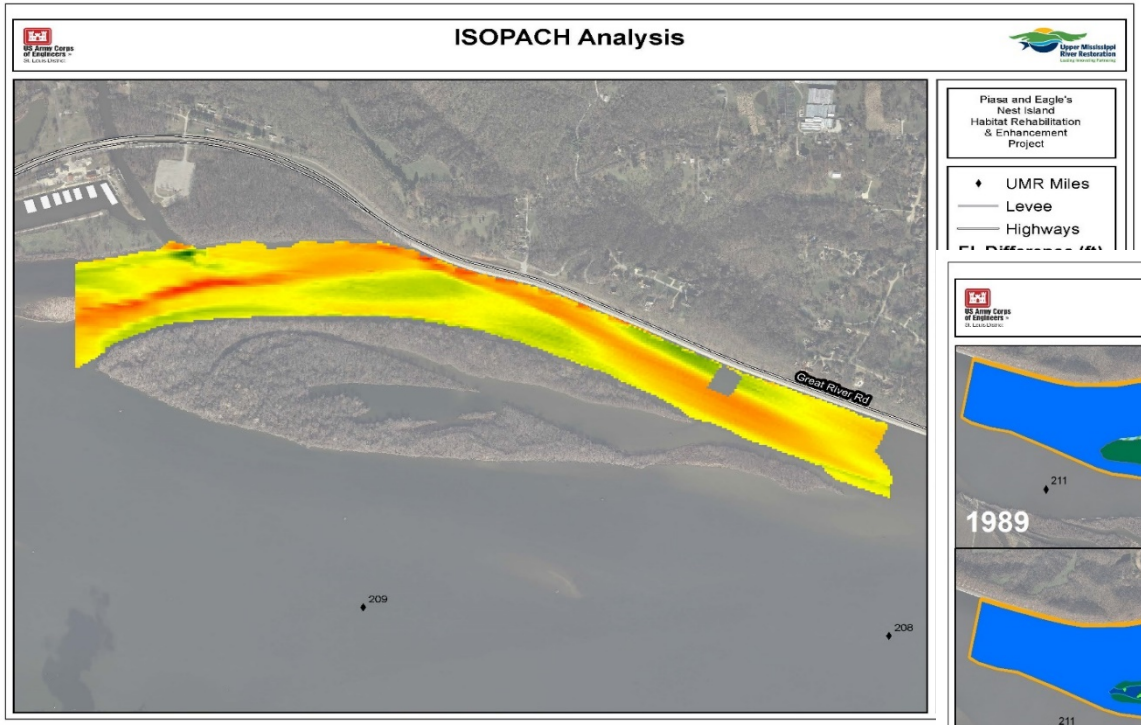
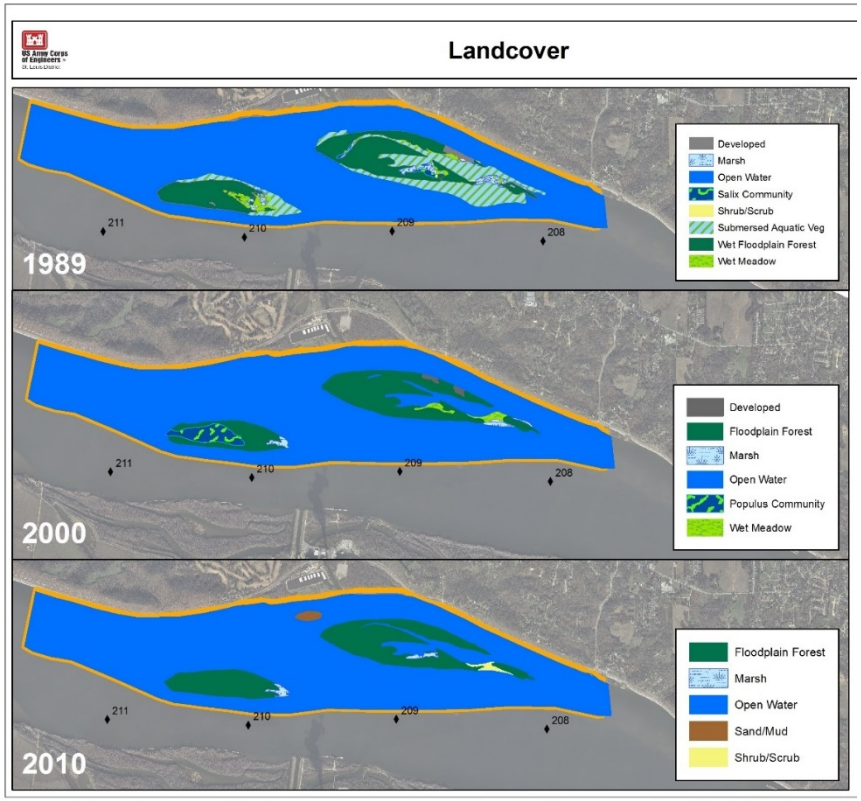
Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

EXISTING CONDITIONS





Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

FUTURE WITHOUT PROJECT CONDITIONS

Estimated from ISOPACH analysis; adjacent project calculations; imagery analysis

Side Channel habitat

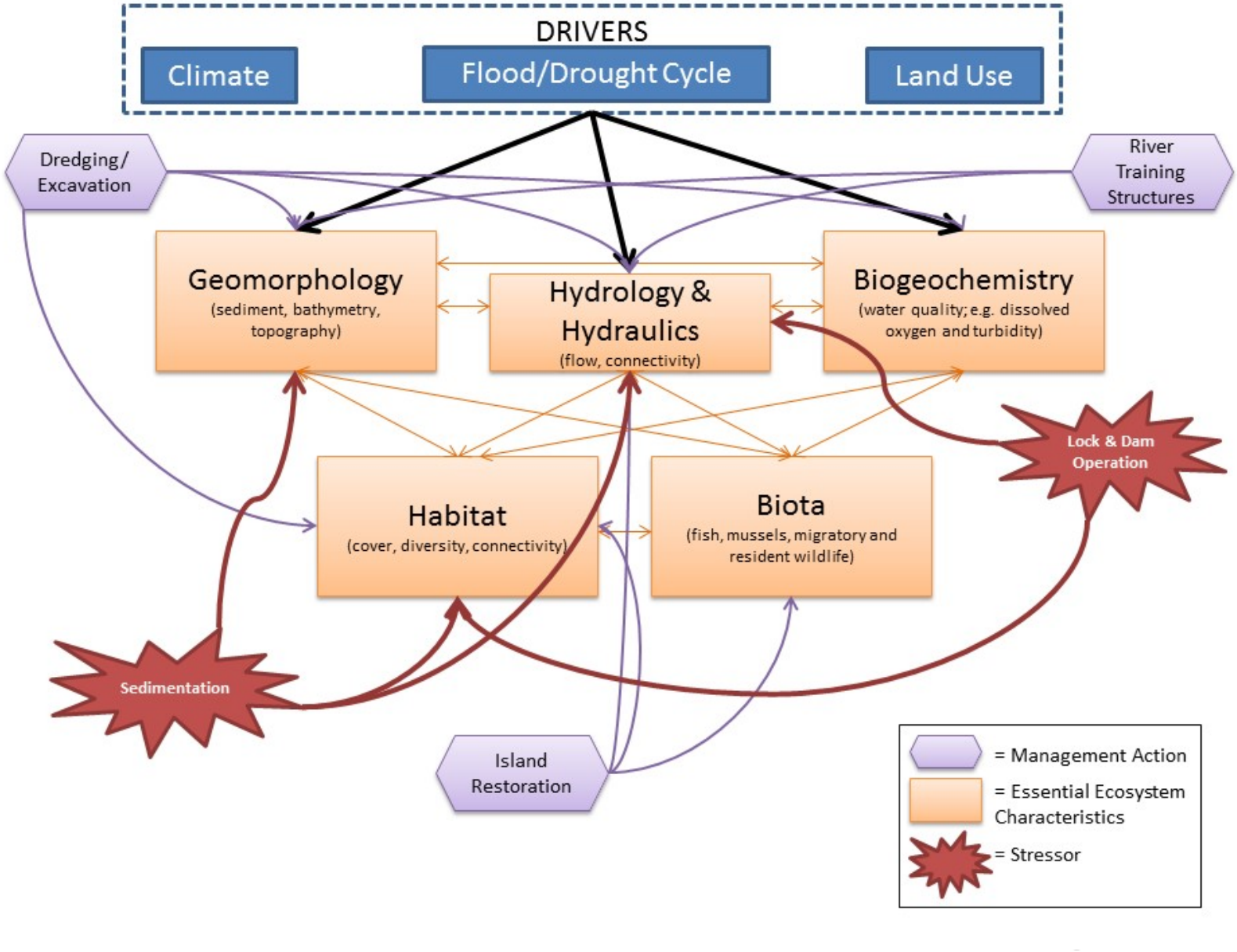
- Piasa Chute was estimated to accumulate as much as 7 feet over the 50-year period of analysis
- Estimated to lose 562 acres of suitable flowing side channel habitat

Piasa Island backwater expected to lose depth and surface area (49 acres)

- Loss of rearing and foraging habitat for backwater fisheries
- Loss of connectivity with the river
- Loss of overwintering fish habitat

Island Habitat – historic islands would continue to be submerged

CONCEPTUAL MODEL



Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

Measure Screening

24 measures were identified as possible solutions
Evaluated with 45 different hydraulic model alternatives
Evaluated using the 4 P&G criteria
16 were eliminated

Alternative_Formulation

All possible combinations

Initial Array

8 action alternatives + no action

Evaluated using 4 P&G Criteria, CE/ICA, 4 Accounts

Final Array

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Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

FINAL ARRAY OF ALTERNATIVES

	Restoration Measure					
Alternative	D1	D2	B1	B2	R1	I1
No Action						
1	X		X			X
2	X			X		X
3	X		X		X	X
4	X			X	X	X
5	X			X	X	X
6		X	X			X
7		X		X		X
8		X	X		X	X
9		X		X	X	X

D1 – 200 ft braided dredge cut	B1- Minimum backwater dredging	R1- notched rock structure
D2 – 300 ft braided dredge cut	B2 – Max backwater dredging	I1 – Island diversity

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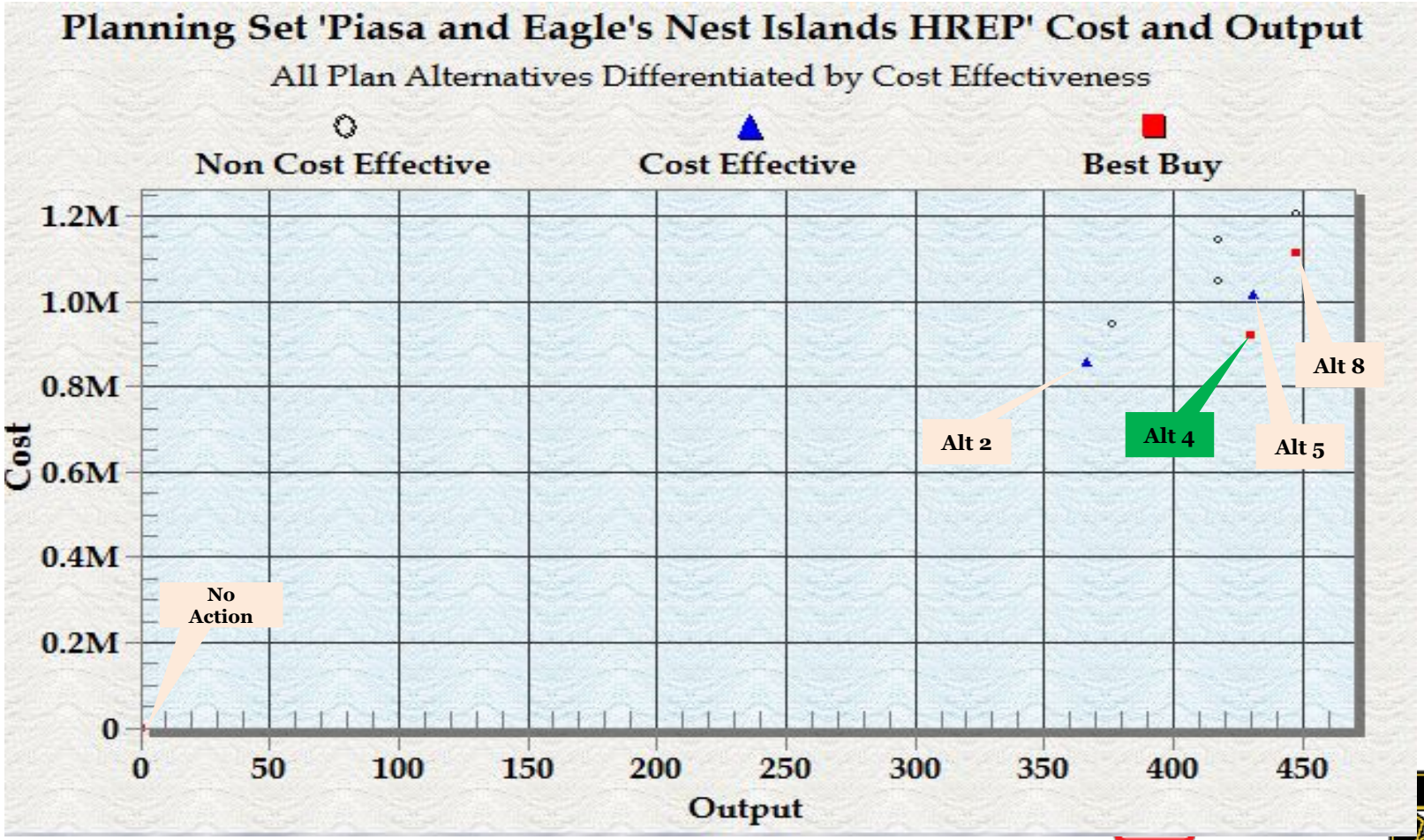
HABITAT EVALUATION

- Habitat Suitability index models for striped bass (side channel); smallmouth buffalo (backwater); least tern (islands)
- Habitat analysis included reps from USFWS, IDNR, INHS
- Net benefits of all cover types are additive

Alt.	Output (Net AAHU)	Construction Costs*	Annualized Construction Cost	Annualized OMRR&R Costs**	Annualized AM & Monitoring Costs**	Total Annualized Cost	Average Cost Per Output ($/AAHU)
1	0.00	$0	$0	$0	$0	$0	-
2	366.5	$22,130,000	$839,791	$5,850	$11,800	$857,641	$2,340
3	376.3	$24,500,000	$929,728	$5,850	$11,800	$947,578	$2,518
4	430.1	$23,750,000	$901,267	$5,850	$11,800	$919,117	$2,137
5	430.2	$26,250,000	$996,137	$5,850	$11,800	$1,013,987	$2,352
6	417.4	$27,130,000	$1,029,532	$5,850	$11,800	$1,047,381	$2,509
7	417.8	$29,630,000	$1,124,402	$5,850	$11,800	$1,142,252	$2,734
8	447.6	$28,880,000	$1,095,941	$5,850	$11,800	$1,113,791	$2,488
9	447.4	$31,250,000	$1,185,878	$5,850	$11,800	$1,203,728	$2,690

Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

COST EFFECTIVENESS



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COST EFFECTIVE PLANS

Alt #	Alternative Code	Output (AAHU)	Cost ($) (Total Annualized Cost)	Average Cost Per Unit ($/AAHU)
1	D0B0R (No Action)	0	0	
2	D1B1R0I1	366.5	857,641	2,340
4	D1B1R1I1	430.1	919,117	2,137
5	D1B2R1I1	431.2	1,013,987	2,352
8	D2B1R1I1	447.6	1,113,791	2,488

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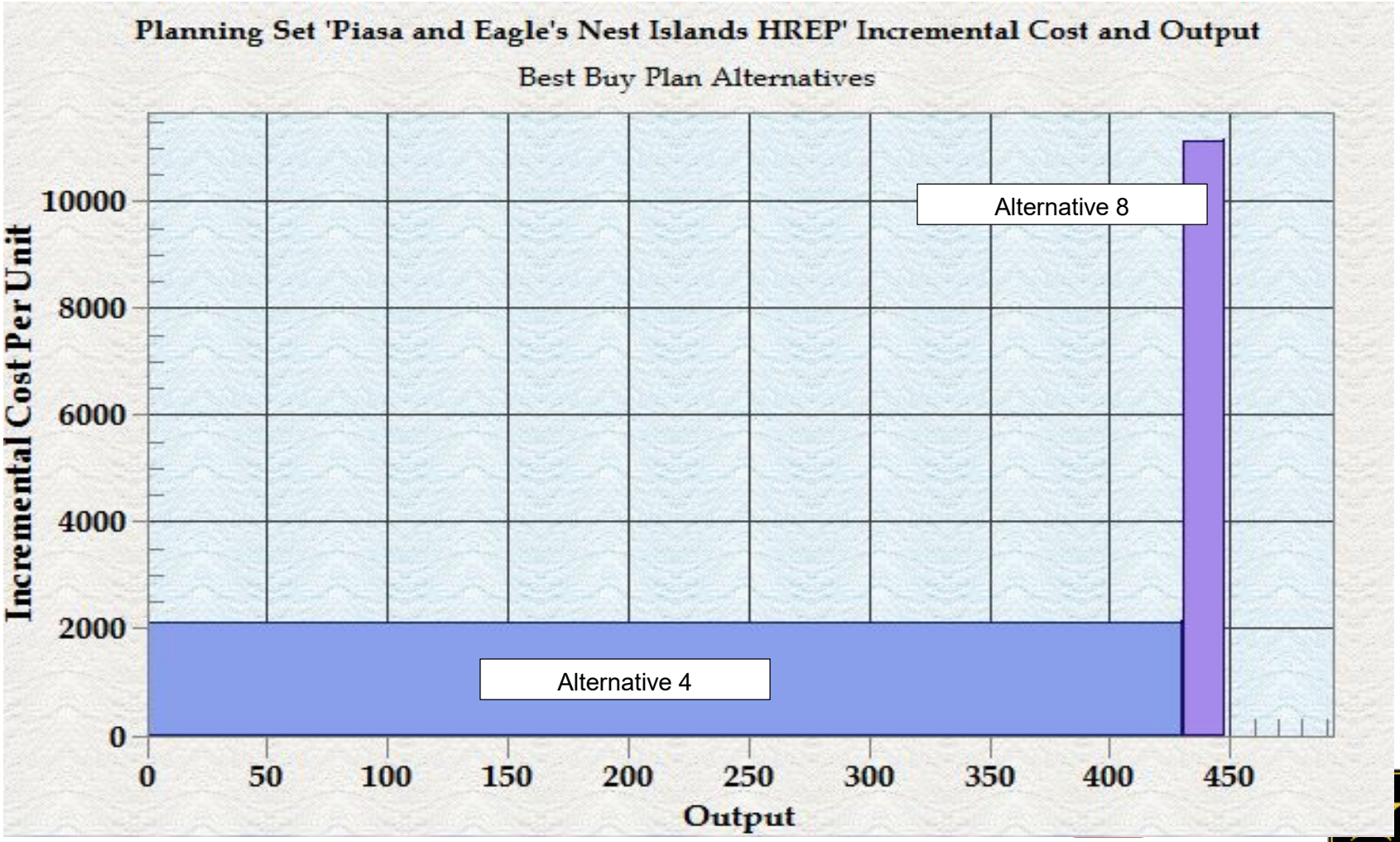
Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

BEST BUY ALTERNATIVES



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INCREMENTAL COST OF BEST BUYS

Alternative	Output (Net AAHU)	Total Annualized Cost	Incremental Output	Incremental Cost	Incremental Cost/Output ($/AAHU)
1 – No Action	0	0	0	0	0
4	430.1	$919,117	430.1	$919,117	$2,137
8	447.6	$1,113,791	17.5	$194,674	$11,124

Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

BEST BUY PLAN COMPARISON

Best Buy Alt.	P&G Evaluation Criteria				P&G Accounts			Objectives		
	Acceptability	Completeness	Effectiveness	Efficiency	NER	EQ	OSE	Increase aquatic side channel habitat with depth and flow diversity	Increase connected backwater habitat with depth diversity for enhanced backwater fisheries habitat benefits	Restore diverse island mosaic
1	Low	Low	Low	Low	Yes	Yes	Yes	No	No	No
4	High	High	High	High	Yes	Yes	Yes	Yes	Yes	Yes
8	High	High	High	Low	Yes	Yes	Yes	Yes	Yes	Yes

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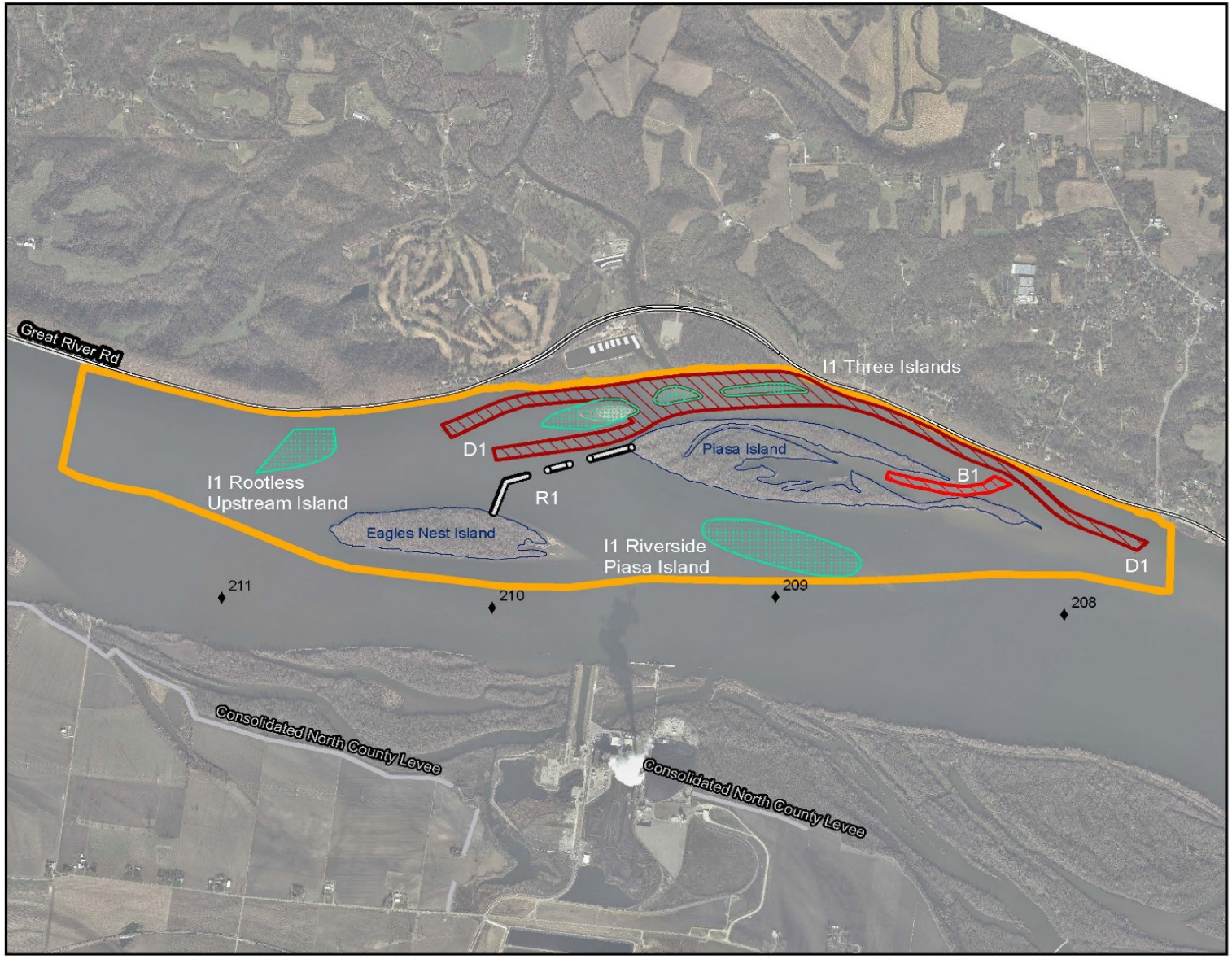
St. Louis District

Piasa and Eagle's Nest Island HREP
Tentatively Selected Plan

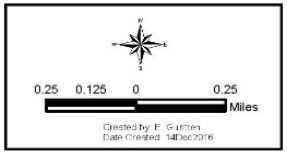
Upper Mississippi River Restoration
Leading. Innovating. Partnering.



Piasa and Eagle's
Nest Island
Habitat Rehabilitation
& Enhancement
Project

- UMR Miles
- Levee
- Highways
- Rock Structure R1
- Restore Islands
- 200ft Dredged Channel D1
- Backwater Dredging B1
- UMR Islands
- Boundary

Location Map



Problems and Opportunities	Objectives and Constraints	Inventory and Forecasting	Plan Formulation	TSP

ALT 4 =TENTATIVELY SELECTED PLAN

- 430.1 net AAHUs
- Average annual cost of $930,020 (FY18, 2.75%)
- $2,162 per AAHU
- 485 acres of side channel habitat
- 49 acres of backwater habitat
- 76 acres of island habitat

US Army Corps of Engineers

U.S.ARMY

REVIEWS

- DQC – 81 comments generated, closed out.
- ATR – 103 comments generated (0 critical), Jerry Fuentes ATR Lead (SPK), closed out.
- IEPR – not applicable.
- MVD – 10 comments generated, closed out.

	Concur	Non-Concur	Editorial
Plan Formulation	7	0	0
Real Estate	0	0	0
Environmental	0	0	0
Economics	2	0	0
No Comment	1	0	0

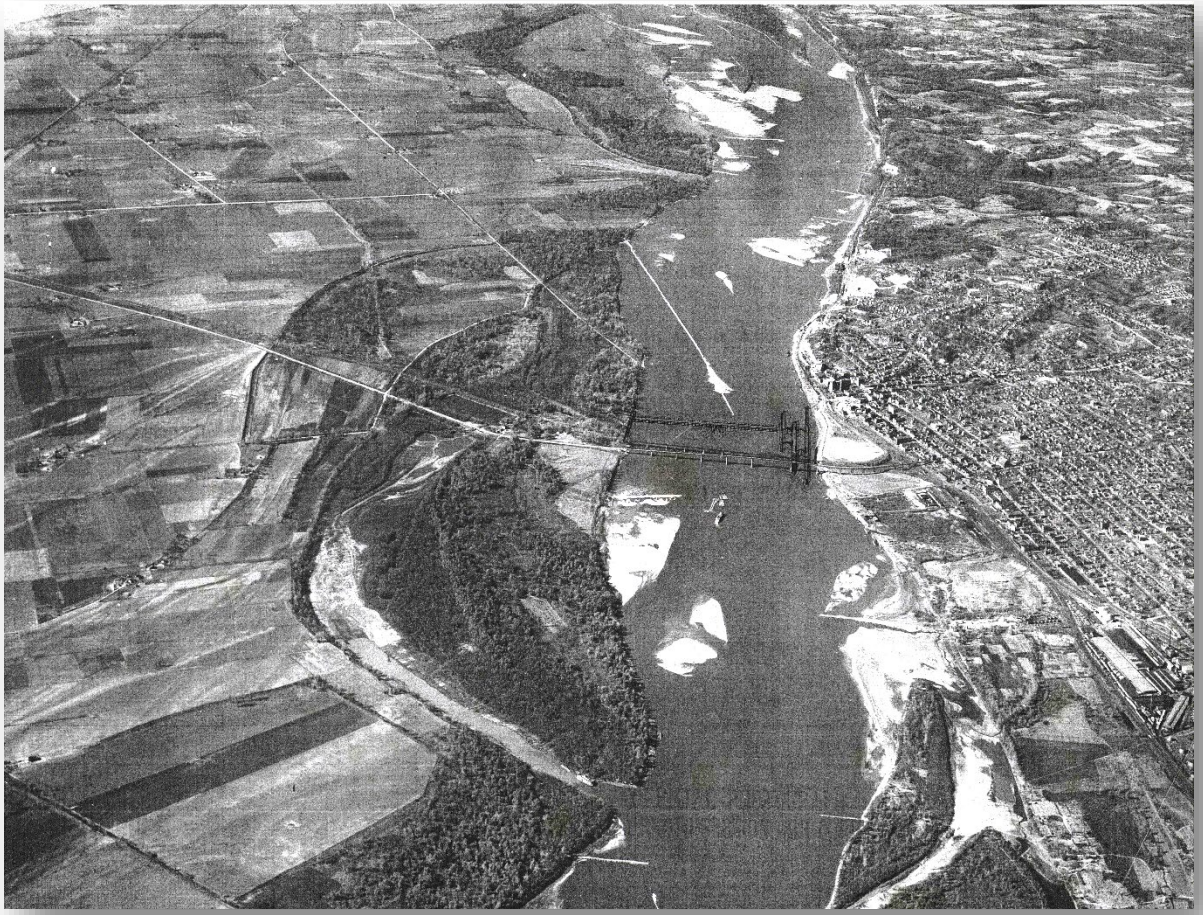
- No critical comments

US Army Corps of Engineers

U.S.ARMY

KEY DATES/ITEMS OF NOTE

4/3/18	May 2018	Sep 2018	Oct 2019	Oct 2021	10 years
MDM	PUBLIC REVIEW	REPORT APPROVAL	PED	CONSTRUCT	AM & Monitor

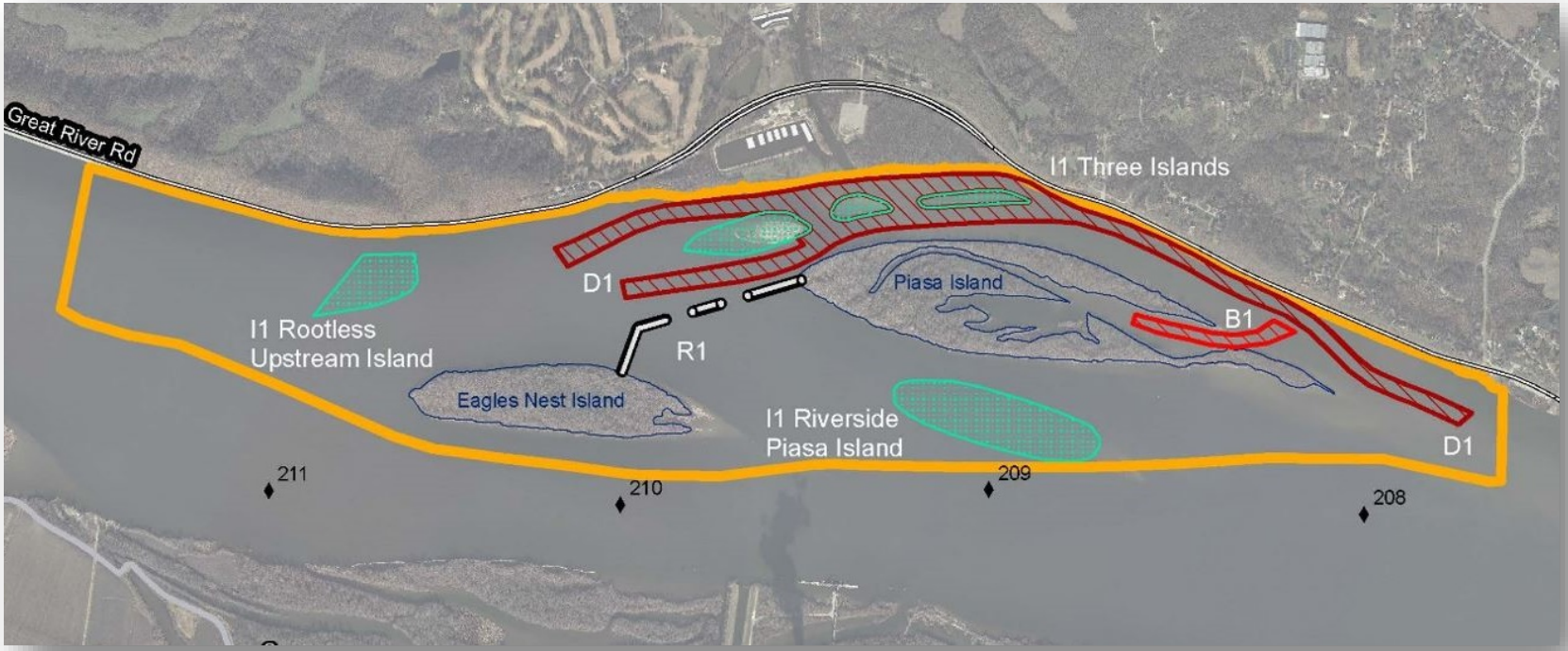


US Army Corps of Engineers

U.S.ARMY

CONCLUSION / DISCUSSION/ RECOMMENDATIONS

- Concurrence on:
  - Tentatively Selected Plan
  - Release for Public Review



US Army Corps of Engineers

U.S.ARMY

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS MO 63103-2833

REPLY TO
ATTENTION OF

CEMVS-PM-F 6 April 2018

MEMORANDUM FOR RECORD

SUBJECT: Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project, Upper Mississippi River Restoration Program, MSC Decision Milestone (MDM) Briefing

1. The subject briefing was held by way of teleconference on 3 April 2018. The following representatives were in attendance from St. Louis District (MVS), Regional Planning and Environmental Division North (RPEDN), and Mississippi Valley Division (MVD) staff:

MVS representatives:

Brian Markert	Jasen Brown	Kip Runyon
Brad Krischel	Jim Lovelace	Keli Broadstock

RPEDN representatives:

Camie Knollenberg	Jodi Creswell	Kat McCain
Monique Savage	Evan Stewart	

MVD representatives:

James Bodron	Jim Cole	James Briggs
Gary Young	Katie Opsahl	Thatch Shepard
Matt Mallard	Renee Turner	

2. Brian Markert, Kat McCain, and Kip Runyon briefed the MVD team on project-related activities to date leading to the team's recommendation of the Tentatively Selected Plan (TSP).

3. Questions regarding the future without project condition of Eagle's Nest Island, historic and existing least tern habitat, island ownership, OMRR&R assumptions and responsibilities, potential boating club issues with the project, schedule duration between public review and final report approval, and a potential project name change were brought up during the briefing and were addressed by the team.

4. MVD staff concurred with the TSP and provided verbal approval for release of the draft report for public review.

5. The MVS point of contact is Brian Markert, brian.j.markert@usace.army.mil, 314-331-8455.

Greg Kohler
Chief, Project Development Branch
St. Louis District

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

2 May 2018

Dear Sir or Madam:

The U.S. Army Corps of Engineers St. Louis District has prepared a draft report entitled "Upper Mississippi River Restoration Piasa and Eagle's Nest Islands Feasibility Study with Integrated Environmental Assessment Habitat Rehabilitation and Enhancement Project." You are receiving this letter because you may be interested in this project. However, no action is required on your part. The project is located in Jersey and Madison counties, Illinois, near Grafton, in Pool 26 between river miles 207.5 and 211.5. The draft report addresses the goal to restore and improve the quality and diversity of aquatic and island ecosystem resources within the study area. The report describes alternative solutions and presents a tentatively selected restoration plan. The report also serves to notify the public of the environmental effects of the project as required by law. These environmental effects are summarized in the report's Draft Finding of No Significant Impact(s) (FONSI), which is unsigned. A signed FONSI is required before project construction can occur. The FONSI will not be signed into effect until all comments received as a result of this public review have been carefully considered.

An electronic version of the draft report, titled "UMRR Piasa and Eagle's Nest Islands HREP Feasibility Study with Integrated EA" is available online at:

http://www.mvs.usace.army.mil/Portals/54/docs/pm/Reports/EA/PiasaEaglesNestIslandsHREP.pdf

You are welcome to comment on the content of the draft report. To submit a public comment please contact Dr. Kat McCain of our Environmental Planning Section, telephone 314-331-8047, or email at Kathryn.McCain@usace.army.mil. For general project inquiries, please contact Mr. Brian Markert of our Project Development Branch, telephone 314-331-8455, or email at Brian.J.Markert@usace.army.mil. Written comments may be sent to our address below:

US Army Corps of Engineers, St. Louis District
ATTN: Environmental Planning PD-P (McCain)
1222 Spruce St.
St. Louis, MO 63103-2833

The comment period runs from May 2, 2018 through June 1, 2018. A public open house will be held on May 23, 2018 from 5:00 to 7:00 pm at the Alton Motor Boat Club located at 11134 Harbor Dell, Godfrey, IL, 62035.

Sincerely,

Brian Johnson
Chief, Environmental Compliance Branch

Enclosure 9

Project Study Issue Checklist

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

ENCLOSURE 8

Appendix A

PROJECT STUDY ISSUE CHECKLIST

Sensitive Policy Areas Which Require Vertical Team Coordination with MSC/HQUSACE to Washington: (Issues not previously accounted for in an Administration approved Feasibility/Chiefs Report)

GENERAL PROJECT INFORMATION

Project Name: (State, County, River Basin/Waterbody under Study)
Upper Mississippi River Restoration (formerly Upper Mississippi River System-Environmental Management Program-UMRS-EMP), Habitat Rehabilitation and Enhancement Projects (HREPs), States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin (including those river reaches having commercial navigation channels on the Mississippi River north of Cairo, Illinois; the Minnesota River, Minnesota; Black River, Wisconsin; St. Croix River, Minnesota and Wisconsin; Illinois Waterway, Illinois; and Kaskaskia River, Illinois). The HREP's restoration features address a longstanding trend of declining fish and wildlife habitat by producing immediate and long-term benefits to the UMRS at the system, reach, pool, and local scales.

Project Description: (Need project description with general details, such as a fact sheet attached--if project is the same as authorization attach a summary, if different provide a description of what differs from original authorization, the authorizing language, and dimensions to give perspective of the change in scope and scale. If there was an authorizing report, what level approved it—i.e., OMB, ASA(CW), HQUSACE (include date of approval). If no prior reports, give a more detailed description.) The Upper Mississippi River System-Environmental Management Program (UMRS-EMP) was authorized by Section 1103 of the Water Resources Development Act (WRDA) of 1986, Public Law 99-662, as amended (see attachment 1). Section 509 of WRDA 1999 reauthorized EMP as a continuing authority.

Cost Sharing: (Describe the cost sharing for the project to be constructed. Describe whether the cost sharing follows general law or if there is other special cost sharing for the project.) EMP HREPs are either 100% Federally funded or require a non-Federal sponsor to pay 35% of the construction cost. Which of these options applies is governed by Section 906(e) of WRDA 1986. Section 906(e) authorizes 100% Federal funding for projects that (1) are "located on lands managed as a national wildlife refuge," (2) benefit Federally threatened or endangered species, or (3) "provide benefits that are determined to be national"

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

ENCLOSURE 1

(e.g., benefit andromous fish or species subject to treaty). EMP has only used criteria 1 above; criteria 2 and 3 have not been used as a matter of administration policy. EMP HREPs that do not meet criteria 1 require a 35% percent non-Federal cost share.

1. Has a NEPA document been completed?
Response: YES __ NO X *
Remarks: **Each final HREP Definite Project Report (DPR) will contain an integrated environmental assessment and signed Finding of No Significant Impact (FONSI) and Findings of Compliance (FOC) statements.**

2. Will the NEPA Documentation be more than 5 years old at the time of PCA signing or construction initiation?

Response: YES * ____ NO X
Remarks:

3. Will the ESA Findings be more than 3 years old at the time of PCA signing or construction initiation? [Note: Findings refers to Corps documentation and/or US Fish and Wildlife Service's opinions and recommendations]

Response: YES * NO X
Remarks:

4. Is ESA coordination complete?

Response: YES ____ NO X *
Remarks: **ESA coordination will be completed separately for each HREP.**

5. If an EIS/EA was completed for the project, has the Record of Decision/Finding of No Significant Impact been signed?

Response: YES ____ NO X *
Remarks: **Each finalized HREP will include a signed FONSI and FOC, as they are completed.**

6. Is the proposed project consistent with the ROD/FONSI?

Response: YES ____ NO X *
Remarks: **Each finalized HREP will include a signed FONSI and FOC, as they are completed.**

7. Has there been any changes in Federal environmental laws or Administration or Corps policy since original project authorization that makes updating necessary?

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

[e.g., change to the Clean Air Act status for the project area...going from attainment to non-attainment]

Response: YES * NO **X**
Remarks: **Should there be any changes to law or policy, these will be considered and accounted for in the NEPA documentation prepared for each HREP.**

8. Is there a mitigation plan?

Response: a. Fish and Wildlife: YES * NO **X**
b. Flood Damage: YES * NO **X**
c. Cultural and Historic Preservation: YES * NO **X**
d. Recreation: YES * NO **X**
Remarks: [If yes, identify and describe what is being mitigated and cost shared. Describe the authority for the cost sharing.]

9. Are the mitigation plan(s) that are now being proposed the same as the authorized plan?

Response: a. Fish and Wildlife YES NO *
d. Flood Damage YES NO *
e. Cultural and Historic Preservation YES NO *
f. Recreation YES NO *
Remarks: **Not applicable. EMP requires no mitigation (see question #8).**

10. Is there an incremental analysis/cost effectiveness analysis of the fish and wildlife mitigation features based on an approved method and using an accepted model?

Response: YES NO *
Remarks: **Not applicable. EMP requires no mitigation (see question #8).**

11. Is it expected that the project's fully funded cost would exceed the cost limit of Section 902 of WRDA 1986? [Note: for hurricane and storm damage reduction projects there are two separate 902 limits, one for initial project construction and one for periodic renourishment]

Response: YES * NO
Remarks: [In this section provide the authorized project cost, price level, and current and fully funded project cost estimates and price levels] **Not applicable. EMP has no Section 902 cost limit; it is a continuing authority per WRDA 1999, Section 509. Cost estimates using appropriate price levels will be included in each HREP.**

12. Does the project involve HTRW clean-up?

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

Response: YES *____NO__X___
Remarks:

13. Does the work involve CERCLA covered materials?

Response: YES *____NO__X___
Remarks:

14. Are the project purposes now being proposed different than the authorized project? [Note: different than specifically noted in authorization or noted in Chief's report and is it measured by project outputs]

Response: YES *____ NO__X___
Remarks:

15. Are there any proposed scope changes to the authorized project? [Reference: ER 1105-2-100]

Response: YES *____ NO__X___
Remarks: [Describe the authority that would enable the project to proceed without additional Congressional modification]

16. Is Non-Federal work-in-kind included in the project? [Note: Credit to a non-Federal sponsor for work-in-kind must be based upon having an existing authority. Need to identify the authority and if not a general authority such as Sec 215, provide a copy of the authority.]

Response: YES *_____ NO____
Remarks: **Some, but not all, HREPs that require cost sharing may include work-in-kind services by the non-Federal sponsor. EMP was given work-in-kind authority by Section 221 of WRDA 1999. Section 221 of WRDA 1999 amended Section 906(e) of WRDA 1986 to include credit for in-kind services. Section 1103(e)(7)(A) of WRDA 1986 governs cost sharing for EMP by reference to Section 906(e) of WRDA 1986. Section 906(e), as amended by Section 221, provides that not more than 80% of the non-Federal share of first costs for projects may be satisfied through work-in-kind.**

17. Does project have work-in-kind authority? [Note: If there is no existing authority, as determined in conjunction with District Counsel, the only other vehicle is to propose work-in-kind and rationale in the decision document and submit to HQUSACE for specific Congressional authorization.]

Response: YES__X___ NO___*_
*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

Remarks: **See the remarks for question #16.**

18. Are there multiple credit authorities (e.g., Sec. 104 & 215) including LERRDS, Work-In-Kind and Ability to Pay? [Note: See App. B of ER 1165-2-131. Describe the authority for work-in-kind and if authority exists, the PM should submit a completed App. B through the vertical team.]

Response: YES * X NO_____
Remarks: **EMP has work-in-kind and LERRDS credit authorities. See the remarks for question #16 and attachment 2 for work-in-kind authorizing language.**

19. Is an Ability to Pay cost sharing reduction included in the proposed project? [If yes, fully describe the proposal, citing how this authority is applicable. Include a table showing the cost sharing by project purpose and expected Ability to Pay reductions.]

Response: YES *_____ NO X
Remarks:

20. Is the recommended plan different from the NED plan? [Note: if this answer is yes, then a series of questions arise that will need to be addressed in the Remarks section...is plan less costly than NED plan, is the plan more costly with the same cost sharing the same as NED plan (exception), is plan more costly with all costs exceeding the cost of the NED plan at 100% non-Federal cost, or has ASA(CW) already granted an exception]

Response: YES*_____ NO X
Remarks: **Cost effectiveness/incremental cost analysis and IWR Plan will be used to evaluate the alternative using habitat benefits and costs to identify the NER plan for each HREP.**

21. Was a standard accepted Corps methodology/model used to calculate NED benefits?

Response: YES X NO *
Remarks: **Cost effectiveness/incremental cost analysis and IWR Plan will be used to evaluate the alternative using habitat benefits and costs to identify the NER plan for each HREP.**

22. Are there non-standard benefit categories? [Reference ER 1105-2-100].

Response: YES___* NO X
Remarks: **Only standard habitat categories will be used in accordance with Corps ecosystem authorities.**

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

NAVIGATION COMPONENT (INLAND OR HARBOR)

23. Is there a navigation component in the project?

Response: YES_____ NO__X____
(If yes, answer each of the following questions)

24. Is there land creation?

Response: YES *____ NO_____
Remarks:

25. Is there a single owner and/or beneficiary which is not a public body? [Public body as defined by Section 221 of WRDA 1970]

Response: YES *____ NO_____
Remarks:

26. Are there proposals for Federal cost sharing of Local Service Facilities [e.g., dredging of non-Federal berthing areas] work?

Response: YES *____ NO_____
Remarks:

27. Is there sediment remediation proposed under Sec. 312 authority? [i.e., Section 312 of WRDA 1990 as amended by Section 205 of WRDA 1996]

Response: YES *____ NO_____
Remarks:

28. Is there dredged material placement on beaches where the use is not the least costly environmentally acceptable plan?

Response: YES *____ NO_____
Remarks:

29. Will the dredged material be used for ecosystem restoration where the recommended plan is not the least costly environmentally acceptable plan?

Response: YES *____ NO_____
Remarks:

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

30. Does the project have recreation navigation benefits?

Response: YES *_____ NO_____
Remarks:

31. Does the project involve inland navigation harbor development?

Response: YES *____ NO_____
Remarks:

32. Can the resale or lease of lands used for disposal of excavated material recover the cost of the improvements?

Response: YES *____ NO_____
Remarks:

33. Will acquisition of land outside the navigation servitude be necessary for construction of the improvements (either the project or non-Federal facilities that will use or benefit from the project) and will this permit local entities to control access to the project. [The latter case is assumed to exist where the proposed improvement consists of a new channel cut into lands.]

Response: YES *____ NO_____
Remarks:

FLOOD DAMAGE REDUCTION COMPONENT

34. Is there a flood damage reduction component in the project?

Response: YES_____ NO__**X**____
(If yes, answer each of the following questions)

35. Is the project for protection of a single property or beneficiary?

Response: YES *_____ NO_____
Remarks:

36. Is the project producing land development opportunities/benefits? [If land creation benefits are expected to occur, describe whether special cost sharing should apply.]

Response: YES *_____ NO_____
Remarks:

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

37. Is there any recommendation to cost share any interior drainage facilities?

Response: YES *_____ NO_____
Remarks:

38. Are there any windfall benefits that would accrue to the project sponsor or other parties? [If windfall benefits are expected to occur, describe whether special cost sharing should apply.]

Response: YES *_____ NO_____
Remarks:

39. Are there non-structural buyout or relocation recommendations?

Response: YES *_____ NO_____
Remarks: [If yes list the authority and describe what is proposed]

40. Are the reallocation studies likely to change the existing allocated storage in lake projects?

Response: YES *_____ NO_____
Remarks:

HURRICANE AND STORM DAMAGE REDUCTION COMPONENT

41. Is there a Hurricane and Storm Damage Reduction component in the project?

Response: YES_____ NO__**X**__
[If yes, answer each of the following questions]

42. Does the project provide for protection of privately owned shores?

Response: YES *_____ NO_____
Remarks:

43. Does the project provide for protection of undeveloped lands?

Response: YES *_____ NO_____
Remarks:

44. Does the project provide for protection of Federally owned shoreline at Federal cost? [If yes, describe what is to be protected and who bears the federal cost.]

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

Response: YES *_____ NO_____
Remarks:

45. Does the project involve tidal or fluvial flooding, i.e. is it clear what the project purpose is and has the project been formulated as a hurricane and storm damage reduction project or flood damage reduction project?

Response: YES *_____ NO_____
Remarks:

46. Is there any recommendation to cost share any interior drainage facilities?

Response: YES *_____ NO_____
Remarks:

47. Is recreation > 50% of total project benefits needed to justify the project?

Response: YES *_____ NO_____
Remarks:

48. Are there any parking or public access issues [no public access or none provided within 1/2 mile increments]?

Response: YES *_____ NO_____
Remarks:

49. Are easements being provided to ensure public use and access?

Response: YES____ NO *_____ NA_____
Remarks:

50. Is there a Sec. 934 of WRDA 1986 extension of the period of authorized Federal participation?

Response: YES_*__ NO____
Remarks:

51. Are there any Sec. 111 of Rivers and Harbors Act of 1958, as amended proposals?

Response: YES *____ NO_____
Remarks:

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

ECOSYSTEM RESTORATION COMPONENT

52. Is there an ecosystem restoration component of the project?

Response: YES__X__ NO_____
(If yes, answer each of the following questions)

53. Has the project been formulated using cost effectiveness and incremental analysis techniques?

Response: YES__X__ NO__*__
Remarks:

54. Was "IWR Plan" used to do cost effectiveness/incremental analysis?

Response: YES__X__ NO__*__
Remarks:

55. Are all the benefits aquatic?

Response: YES__X__ NO__*__
Remarks: Primary benefits and features will be aquatic and wetland, but we anticipate benefits to accrue to adjacent riparian areas as a result of the HREPs

56. Is the project purpose for restoration of cultural or historic resources as opposed to ecosystem restoration?

Response: YES *____ NO__X__
Remarks:

57. Is there mitigation authorized or recommended?

Response: YES *____ NO__X__
Remarks:

58. Are there recommendations for other than restoring a degraded ecosystem [e.g., creating new habitat where it has never been]?

Response: YES__* NO__X__
Remarks:

59. Has the significance of the habitat been clearly identified? [Note: Under Remarks, describe the basis for determining the significance.]

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

Response: YES__X__ NO__*
Remarks: **Habitat within the project area (Upper Mississippi River System) was determined to be significant because it is a part of the Mississippi River Flyway and is a large contiguous floodplain habitat complex. The Flyway is internationally significant as it is utilized by 40% of all North American waterfowl and 326 total bird species representing 60% of all species in North America. The U.S. Department of the Interior lists large stream and rivers as an endangered ecosystem, with a documented 85-98% decline since European settlement. The National Research Council considers large streams and rivers to be the highest priority for aquatic restoration. The UMRS was also recognized by Congress in WRDA 1986 as a "nationally significant ecosystem".**

60. Has the restoration project been formulated for biological/habitat values? As opposed to, for example, water quality.

Response: YES__X__ NO ____*
Remarks: **All EMP projects are formulated for biological/habitat values and not for one item such as water quality.**

61. Is the project on non-public lands?

Response: YES *____ NO__X__
Remarks: **Both public and non-public lands will be used for this program. When private lands are required to implement a HREP, fee title or permanent easements would be acquired by the non-Federal sponsor.**

62. Does the project involve land acquisition where value > 25% of total project cost?

Response: YES *____ NO__X__
Remarks:

63. Are all the proposed recreation features in accord with ER 1105-2-100, Appendix E, Exhibit E-3?

Response: YES ____ NO __*
Remarks: **Not applicable. EMP HREPs do not include recreation features.**

64. Are there recommendations to include water quality improvement?

Response: YES *____ NO__X__
Remarks: **While the recommendations were not specifically formulated to address water quality, we do anticipate some water quality improvements as indirect benefits of habitat restoration activities.**
*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

65. Is the monitoring & adaptive management period proposal beyond 5 years after completion of construction?

Response: YES ***X** NO_____
Remarks: Long term monitoring and evaluation for EMP HREPs are authorized per WRDA 1986, Section 1103, subpart (e)(1)(A).

66. Does the proposal involve land acquisition in other than fee title?

Response: YES *X NO_____
Remarks: As each HREP is prepared, we may investigate the potential for acquisition of some permanent easements, in situations where an easement is the appropriate estate. This will be fully coordinated with counsel, real estate, and the vertical team.

67. Are there recommendations for non-native species?

Response: YES *___ NO__X___
Remarks:

68. Does the project propose the use of navigation servitude?

Response: YES *___ NO__X___
Remarks:

RECREATION COMPONENT

69. Is there a recreation component as part of the project?

Response: YES_____ NO__X__
(If yes, answer each of the following questions)

70. Is the cost of proposed recreation development > 10 % of the Federal project cost without recreation, [except for nonstructural flood damage reduction and hurricane and storm damage projects]?

Response: YES *____ NO_____
Remarks: [Describe the proposal and whether ASA(CW) approval has been granted.]

71. Are there recreation features located on other than project lands?

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

Response: YES *____ NO_____
Remarks:

72. Does the project involve/provide for waterfront development?

Response: YES *____ NO____
Remarks:

73. Does the project involve the need to reallocate authorized storage [Sec III, App E, ER 1105-2-100]?

Response: YES *____ NO_____
Remarks:

74. Does the project include non-standard recreation facilities? [refer to ER 1105-2-100, Appendix E, Exhibit E-2]

Response: YES *_____ NO_____
Remarks:

WATER SUPPLY COMPONENT

75. Is there a water supply component as part of the project?

Response: YES____ NO__**X**___
(If yes, answer each of the following questions)

76. Does the project use non-standard pricing for reallocated storage?

Response: YES *____ NO____
Remarks:

77. Are there exceptions to model contract/agreement language?

Response: YES *_____ NO_____
Remarks:

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

CONCURRENCE

Marvin Hubbell
Project Manager
Date: March 30, 2006

Teresa Kincaid
Chief, Planning & Policy Branch
Date: 3/20/06

Rian Hancks
District Counsel
Date: 3/21/06

Gary Loss
DDE (PM)
Date: 3/23/06

Rayford Wilbanks
Planning and Policy CoP (MSC)
Date: 4/11/06

Larry Barnett
MSC Counsel
Date: 4/26/06

*** Response where a "*" requires coordination through vertical team and complete description of issues under "Remarks", before decision to approve project/report can be delegated.**

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.

Attachment 1

(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.

(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

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.

(b) REEVALUATION OF FLOOD CONTROL PROJECTS.—At the request of a non-Federal interest for a flood control project, the Secretary shall conduct a reevaluation of a project authorized before the date of enactment of this Act to consider nonstructural alternatives in light of the amendments made by subsection (a). 33 USC 2318 note.

(c) COST SHARING.—Section 103(b) of the Water Resources Development Act of 1986 (33 U.S.C. 2213(b)) is amended—

(1) by striking "The non-Federal" and inserting the following:

"(1) IN GENERAL.—The non-Federal"; and

(2) by adding at the end the following:

"(2) NON-FEDERAL CONTRIBUTION IN EXCESS OF 35 PERCENT.—At any time during construction of a project, if the Secretary determines that the costs of land, easements, rights-of-way, dredged material disposal areas, and relocations for the project, in combination with other costs contributed by the non-Federal interests, will exceed 35 percent, any additional costs for the project (not to exceed 65 percent of the total costs of the project) shall be a Federal responsibility and shall be contributed during construction as part of the Federal share.".

SEC. 220. LAKES PROGRAM.

Section 602(a) of the Water Resources Development Act of 1986 (100 Stat. 4148; 110 Stat. 3758) is amended—

(1) in paragraph (14), by inserting "and nutrient monitoring" after "growth";

(2) in paragraph (15), by striking "and" at the end;

(3) in paragraph (16), by striking the period at the end and inserting a semicolon; and

(4) by adding at the end the following:

"(17) Clear Lake, Lake County, California, removal of silt and aquatic growth and measures to address excessive sedimentation and high nutrient concentration;

"(18) Flints Pond, Hollis, Hillsborough County, New Hampshire, removal of silt and aquatic growth and measures to address excessive sedimentation; and

"(19) Osgood Pond, Milford, Hillsborough County, New Hampshire, removal of silt and aquatic growth and measures to address excessive sedimentation.".

SEC. 221. ENHANCEMENT OF FISH AND WILDLIFE RESOURCES.

Section 906(e) of the Water Resources Development Act of 1986 (33 U.S.C. 2283(e)) is amended by inserting after the second sentence the following: "Not more than 80 percent of the non-Federal share of such first costs may be satisfied through in-kind contributions, including facilities, supplies, and services that are necessary to carry out the enhancement project.".

SEC. 222. PURCHASE OF AMERICAN-MADE EQUIPMENT AND PRODUCTS. 33 USC 2201 note.

(a) IN GENERAL.—It is the sense of Congress that, to the extent practicable, all equipment and products purchased with funds made available under this Act should be American made.

(b) NOTICE TO RECIPIENTS OF ASSISTANCE.—In providing financial assistance under this Act, the Secretary, to the greatest extent practicable, shall provide to each recipient of the assistance a notice

Attachment 2

Enclosure 10

Agency Technical Review of Final Draft Report Documentation

From: Fuentes, Jerry W CIV CESPK CESPD (US)
To: Runyon, Kip R CIV USARMY CEMVP (US)
Subject: RE: Piasa and Eagle"s Nest Targeted ATR (UNCLASSIFIED)
Date: Thursday, June 21, 2018 11:08:05 AM
Attachments: Piasa Eagles Nest Feasibility Report Draft 14 Feb to 15 June 2018 JFComments.docx

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Kip,
Just a couple minor things I caught...I placed comments as margin notes. Still quiet from RMO but it's vacation season so....I just went ahead and did the review.

Jerry

Enclosure 11

Post-Authorization Decision Document Checklist

UPPER MISSISSIPPI RIVER RESTORATION
DRAFT FEASIBILITY REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

PIASA AND EAGLE'S NEST ISLANDS
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

MISSISSIPPI RIVER POOL 26, MILES 207.5 THROUGH 211.5
MADISON AND JERSEY COUNTIES, ILLINOIS

POST-AUTHORIZATION DECISION DOCUMENT CHECKLIST

I. BASIC INFORMATION

a. Name of Authorized Project: **Upper Mississippi River Restoration**

b. Name of Separable Element: **Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project**

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 (attach copy to checklist): **Section 1103 of the Water Resources Development Act of 1986, (Public Law 99-662), as amended.**

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): **Illinois Department of Natural Resources (USFWS is the Federal project sponsor)**

h. Project/Separable Element Purpose(s): **Ecosystem Restoration (Habitat Rehabilitation and Enhancement)**

i. Congressional Interests (Senator(s), Representative(s) and district(s)): **Sen. Tammy Duckworth, Sen. Dick Durbin, and Rep. Rodney Davis District #13 from Illinois**

II. PROJECT DOCUMENTS

a. Type of Decision Document: **Feasibility Report/Environmental Assessment**

b. Approval Authority of Decision Document: **CEMVD**

c. Project Management Plan Approval Date: **11 March 2014**

d. Independent Technical Review (ITR)[1] Approval Date: **12 February 2018**

[1]Independent Technical Review is considered to be the Agency Technical Review rather than Independent External Peer Review. UMRR-EMP has a programmatic IEPR exclusion dated 22 February 2012.

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.
Ensure that mitigation is authorized as part of the project cost)

f. Current M-CACES Estimate: **$26,746,000** Date Prepared and Price Level: **December 2017, FY2018 price level**

g. Section 902 Cost Limit: **N/A (Continuing Authorization in WRDA '99)**
Fully Funded as of 1 Oct FY

h. Date of Latest Economic Analysis: **March 2017 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.)

Purpose (s)	Non-Fed Cash	Non-Fed LERRD	Non-Fed Const. Credit	Total Non-Fed Share	Federal Share (%)	Total Project Cost
Ecosystem Restoration					**100%**	**$26,746,000**
Total						

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 (FY 18 Price Levels): **$5,850**

IV. FUNDING HISTORY

Appropriations History for Project/Separable Element:

Upper Mississippi River Restoration - Environmental Management Program (UMRR-EMP)

Fiscal Year	UMRR Budget	Appropriated Amount 1/	
1985		$30,000	
1986		$814,000	
1987	$2,000,000	$1,683,000	
1988	$5,168,000	$5,911,000	
1989	$7,500,000	$7,364,000	
1990	$14,860,000	$8,778,000	
1991	$17,000,000	$10,391,000	
1992	$19,455,000	$8,604,000	
1993	$19,455,000	$7,746,000	
1994	$19,455,000	$14,426,000	
1995	$19,455,000	$9,366,500	
1996	$19,455,000	$11,855,000	
1997	$16,694,000	$12,057,000	
1998	$16,000,000	$19,411,000	
1999	$18,900,000	$17,320,000	
2000	$18,955,000	$17,713,000	
2001	$21,000,000	$21,208,000	
2002	$20,000,000	$16,235,000	
2003	$12,200,000	$10,266,000	
2004	$19,000,000	$14,782,000	
2005	$17,500,000	$15,547,000	
2006	$33,500,000	$19,799,000	
2007	$26,800,000	$21,894,000	
2008	$23,464,000	$21,851,000	2/
2009	$20,000,000	$34,560,000	2/
2010	$20,000,000	$15,252,000	3/
2011	$21,500,000	$19,407,000	3/
2012	$18,150,000	$17,472,000	3/
2013	$17,880,000	$24,025,000	3/
2014	$31,968,000	$31,974,000	
2015	$33,170,000	$33,170,000	
2016	$33,170,000	$21,174,000	
2017	$20,000,000	$33,170,000	
Total	$603,654,000	$525,429,000	

POST-AUTHORIZATION DECISION DOCUMENT CHECKLIST

1/ Appropriated Amounts for Upper Mississippi River Restoration, under which the Piasa and Eagle's Nest Islands HREP is implemented. The amounts are prior to savings and slippage or rescission reductions. Allocated funds identified for the Piasa and Eagle's Nest Islands HREP by year were $15,536 (2008), $14,726 (2010), $28,859 (2011), $106,211 (2012), $81,699 (2013), $216,614 (2014), $290,015 (2015), $274,114 (2016), and $228,741 (2017) totaling $1,256,515.

2/ The Appropriated Amount for 2008 includes $5,000,000 and 2009 includes $2,000,000 in supplemental flooding funding. 2009 also includes $14,847,000 in American Recovery and Reinvestment Act (ARRA) funding.

3/ The Appropriated Amount for 2010 reflects the return of $300,000 in supplemental funding and $918,000 in ARRA funding. The 2011 total reflects the return of $1,707,000 in supplemental funding and $8,000 in ARRA funding. The 2012 total reflects the return of $5,600 in supplemental funding and $315,000 in ARRA funding. The 2013 total reflects the return of $107,000 in ARRA funding.

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 (ER 1105-2-100, Appendix H, Exhibit H-2) been completed and 11 issues resolved?
YES __**X**__ 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 c ange by regulation ... district, MSC, Chief, Congress)
A programmatic Project Study Issue Checklist for the UMRR-EMP was approved by HQUSACE in a memorandum dated 5 June 2006.

Does the non-Federal sponsor concur in the project plan as submitted?
YES__**X**___NO_____

Has project plan as submitted been reviewed and concurred in by the non-Federal sponsor's counsel? YES____ NO __**X**___**(To be completed during public review)**

b. AUTHORITY

Has authority been delegated to the MSC for approval of the project report?
YES __**X**__NO_____.

Is authority adequate to complete the project as proposed? YES __**X**___ NO _____ .

c. POLICY /LEGAL/TECHNICAL COMPLIANCE

Has the district counsel reviewed and approved the decision document for legal sufficiency?
Yes (Certification included in decision document package submittal) __**X**___NO_____.

Have all aspects of ITR been completed with no unresolved issues remaining?
YES__**X**___ NO_____

Has the district commander documented policy/legal/technical compliance of the

decision document? YES __**X**___ NO _____ .

Has the MSC certified the policy/legal/technical compliance of the decision document? YES __ ___ NO _____ **Note: CEMVD has delegated authority to approve UMRR-EMP reports, so certification was not obtained prior to submission of the report**

POST-AUTHORIZATION DECISION DOCUMENT CHECKLIST

VI. AUTHENTICATION

Brian Markert — Date: 6-20-2018
Brian Markert
Program Manager

Greg Kohler — Date: 6/20/2018
Greg Kohler
Chief, Project Development

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Camie Knollenberg
Acting Chief, RPEDN

William Levins — Date: 6/20/2018
William Levins
District Counsel

Susan Wilson — Date: 6/21/2018
Susan Wilson
DDE (PM)

Bryan K. Sizemore — Date: 06/25/2018
Colonel Sizemore
District Engineer

Gary L. Young — Date: 08/23/18
Gary Young
MVD Planning and Policy CoP Leader

G. Rogers Sloan — Date: 9/4/18
G. Rogers Sloan
MVD Counsel

Kirk M. Kaiser — Date: September 7, 2018
General Kaiser
MVD Commander

Enclosure 12

Final Report Submittal Documentation

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

JUN 25 2018

CEMVS-PM-F

MEMORANDUM FOR Commander, Mississippi Valley Division (CEMVD-PD-SP/ Mr. Jim Cole), 1400 Walnut Street, P.O. Box 80, Vicksburg, Mississippi 39181-0080

SUBJECT: Upper Mississippi River Restoration (UMRR), Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP), Mississippi River Pool 26, Madison and Jersey Counties, IL – Approval of Final Feasibility Report with Integrated Environmental Assessment (EA)

1. Enclosed is a submittal of final documents for the subject project.

2. I have reviewed the proposed project for policy compliance and consistency, technical adequacy and appropriate National Environmental Policy Act documentation, and I have determined that the project would be in accordance with U.S. Army Corps of Engineers policies and regulations. The public comment period expired 1 June 2018. The public and federal and state agencies support the recommended project, and there are no unresolved issues.

3. Because all project measures would be located on federally managed lands and waters, project costs would be 100 percent federal in accordance with Section 906 (e) of Public Law 99-662, 33 U.S.C. § 2283(e). Upon completion of construction, the U.S. Fish and Wildlife Service (USFWS) would accept the project as part of the General Plan lands cooperatively managed between the USFWS and Illinois Department of Natural Resources (IDNR). Per these agreements IDNR would manage the lands and waters as a national wildlife refuge. Operation, maintenance, repair, rehabilitation and replacement (OMRR&R) costs would be the responsibility of IDNR.

4. I recommend proceeding with design and implementation of the Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement project. I am requesting your approval of the subject final Feasibility Report with Integrated EA.

5. The point of contact is Mr. Brian Markert, District UMRR Program Manager, 314-331-8455.

BRYAN K. SIZEMORE
COL, EN
Commanding

12 Encls
1. Final Feasibility Report with EA
2. MDM Review Comments
3. ATR Certification
4. Cost Certification
5. UMRR Project Study Issue Checklist
6. Post-Authorization Decision Document Checklist
7. DQC Certification
8. Certification of District Legal Review
9. Sponsor Letter of Support
10. Real Estate Plan
11. Approved Fact Sheet
12. Approved Review Plan

From:	Cole, James L (Jim) JR CIV USARMY CEMVD (US)
To:	Markert, Brian J CIV USARMY CEMVS (US); Runyon, Kip R CIV USARMY CEMVP (US)
Cc:	Shepard, George T Jr CIV USARMY CEMVD (US); Chewning, Daniel B (Brian) CIV USARMY CEMVD (US)
Subject:	Piasa and Eagles Nest Final Report Submittal
Date:	Thursday, June 7, 2018 11:54:04 AM
Attachments:	Signed_Approval Memo_Crains Island HREP_31May18.pdf Crains Island MDM approval Memo.docx Piasa and Eagles Nest.pdf

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As we are approaching the submittal date 25 Jun 18 for Piasa and Eagles Nest HREP report I would like to provide guidance to ensure we have everything needed to process the final report at MVD in a timely manner.

I have attached the Crains Island Approval and MDM memo to reference all the Items needed to make it through MVD staffing. I have also attached an email from R. Turner listing items we will need. I would like to make sure we have all items on the front end before the final review and staffing for approval.

Items Needed:

Enclosure 1) Transmittal and report (please make sure the transmittal letter is dated)
Enclosure 2) MSC MDM review comments
Enclosure 3) ATR SIGNED
Enclosure 4) Cost Certification SIGNED
Enclosure 5) Project Study Issue Checklist SIGNED
Enclosure 6) Post-Authorization Decision Document SIGNED

Others items needed:
a. DQC SIGNED
b. Certification of District Legal Review SIGNED
c. Sponsors LOI SIGNED
d. Real Estate Plan (REP) SIGNED
e. Approved factsheet SIGNED
d. Approved Review Plan SIGNED
e. VE Certification SIGNED

Thanks,

Jim Cole
Program Manager-Upper District Support Team
St. Louis District
Mississippi Valley Division
1400 Walnut Street
Vicksburg, MS 39180
Ph: 601.634.5293
Cell: 601.529.4753

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

CEMVD-DE

- 7 SEP 2018

MEMORANDUM FOR Commander, St. Louis District

SUBJECT: Upper Mississippi River Restoration Program (UMRR), Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project (HREP), Mississippi River Pool 26, Madison and Jersey Counties, IL– Approval of Final Feasibility Report with Integrated Environmental Assessment (EA)

1. Reference memorandum, CEMVS-PM-F, 25 June 2018, subject: subject as above (encl 1).

2. The Mississippi Valley Division has reviewed the report. In accordance with ER 1165-2-502, 31 March 2007, subject: Delegation of Review and Approval Authority for Post-Authorization Decision Documents, I hereby approve the Feasibility Report with Integrated Environmental Assessment, for the Piasa and Eagle's Nest Islands Habitat Rehabilitation and Enhancement Project.

3. The Major Subordinate Command Decision Milestone review comments and responses (encl 2), the Agency Technical Review Report (encl 3), the Cost Certification (encl 4), the Project Study Issue Checklist (encl 5), and the Post-Authorization Decision Document Checklist (encl 6) are enclosed in support of this approval.

4. The MVD point of contact for this action is Mr. Jim Cole, CEMVD-PDM, (601) 634-5296.

6 Encls

RICHARD G. KAISER
Major General, USA
Commanding