

MISSISSIPPI RIVER

**POOL 11 ISLANDS
SUNFISH LAKE AND MUD LAKE**

GRANT COUNTY, WISCONSIN AND DUBUQUE COUNTY, IOWA

U.S. ARMY CORPS OF ENGINEERS
ENVIRONMENTAL MANAGEMENT PROGRAM
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

**OPERATION AND MAINTENANCE
MANUAL**

AUGUST 2012
Amended APRIL 2016



**US Army Corps
of Engineers** ®
Rock Island District

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POOL 11 ISLANDS
SUNFISH LAKE AND MUD LAKE
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**MISSISSIPPI RIVER MILES 583.3 TO 593.0
GRANT COUNTY, WISCONSIN AND DUBUQUE COUNTY, IOWA**

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Pool 11 Islands Mud Lake & SunFish Lake

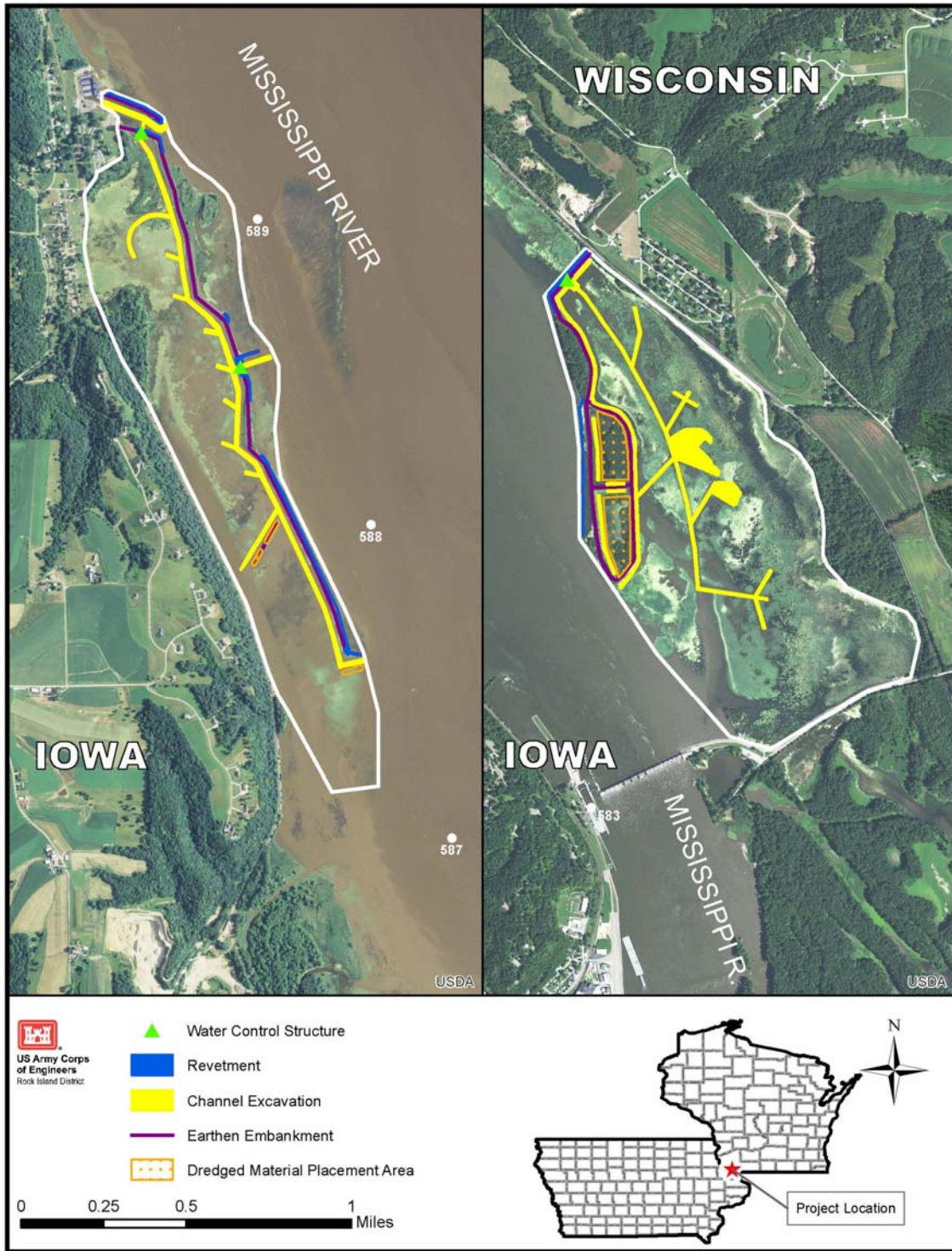


Figure 1.1. Pool 11 Islands Project Overview Map

1.3. Project Function. The Project is classified as a Habitat Rehabilitation and Enhancement Project that was Federally constructed and is Federally maintained. It was designed to restore and protect backwater and aquatic habitat by reducing resuspension of sediments, creating areas with flow and depth diversity, increasing the abundance and diversity of aquatic plants, enhancing nesting and brooding habitat for migratory birds, providing reliable food sources for migratory birds and resident wildlife and creating off-channel deep-water areas to provide year-round habitat for centrarchids and associated species.

2. AUTHORIZATION

This O&M manual serves to meet the Department of the Army's requirements under the 1985 Supplemental Appropriations Act (Public Law 99-88), Section 1103 of the Water Resources Development Act (WRDA) of 1986 (Public Law 99-662), Section 405 of WRDA 1990 (Public Law 101-640), Section 107 of WRDA 1992 (Public Law 102-580), and Section 509 of WRDA 1999 (Public Law 106-53). The U.S. Army Corps of Engineers, Rock Island District (Corps) funded and constructed the Project under these authorizations.

As set forth in the Memorandum of Agreement (MOA), included in Appendix B - Exhibit A, the USFWS has agreed to maintain and operate, at no cost to the USACE, the Project including all the repaired or restored Project features in accordance with Section 107(b) of the WRDA of 1992, Public Law 102-580.

3. LOCATION

The Project is located on the Upper Mississippi River National Wildlife and Fish Refuge in Dubuque County, Iowa and Grant County, Wisconsin on the right and left descending banks of the Mississippi River, respectively, in Pool 11, approximately 17 miles downstream of Cassville, Wisconsin and 2.3 miles upstream of Dubuque, Iowa. The Project extends from Mississippi River Miles (RM) 583.3 to 593.0. The Project is in a rural setting. The constructed features of the Project lie within Sections 10, 11, 14, 15 and 23 of Township 90 North, Range 2 East, Dubuque County, Iowa and Sections 17, 18, 19 and 20 of Township 1 North, Range 2 West, Grant County, Wisconsin. Sunfish Lake consists of 426 acres of aquatic habitat. Mud Lake consists of 493 acres of aquatic habitat. Detailed maps of the Project are shown in Section 1.2. The Project stretches from Lock and Dam 11 upstream to Potosi Creek in Dubuque County, Iowa, and Grant County, Wisconsin. The Project area roughly encompasses the aquatic and floodplain lands between the rail lines that parallel either side of the Mississippi River. All Project lands are in Federal ownership and are managed by the USFWS as part of the Upper Mississippi River National Wildlife and Fish Refuge.

4. PERTINENT AREA INFORMATION

4.1. Hydrologic Data. Table 4.1 shows how river elevation (stage) for the Pool 11 Islands and the surrounding areas relates to flooding potential. The Mississippi River at Lock and Dam 10 (Guttenberg, IA) gage is 25.6 miles upstream of the Project and the Mississippi River at Lock and Dam 11 (Dubuque, IA) gage is 0.3 miles downstream of the Project. The closer gage should be used to aid in flood forecasting and preparation. It should be noted that the Mississippi River gages are referenced to Mean Sea Level (MSL) 1912 datum and the tributary gages are referenced to National Geodetic Vertical Datum (NGVD) 1929 datum. The most accurate datum is North American Vertical Datum (NAVD) 1988. Each of these datums is slightly different from the other, varying by a few tenths of a foot in elevation. The

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10. MAINTENANCE AND INSPECTION

10.1. Maintenance. An active preventative maintenance program reduces damage to existing Project features by taking early corrective action. Additional costs associated with repair and rehabilitation are also avoided. An effective preventative maintenance program requires regular, thorough inspections. Routine inspections can aid USFWS officials in discovering deficiencies within the Project. They can also provide USFWS officials with baseline condition data. This data is necessary for considering repair options for major damage within the Project. Steps will be taken by the refuge manager to correct conditions disclosed by Project inspections or joint inspections. Regular maintenance repair measures will be accomplished during the appropriate season as scheduled by the refuge manager to ensure structure serviceability. Table 10.1 is the estimated operation and maintenance cost for the Project developed during feasibility phase and agreed to by the USFWS. Quantities assume that approximately five percent of the project would be in need of maintenance every ten years. There is no expectation for maintenance dredging during the life of the project. HREP will evaluate as part of the Performance Evaluation reports.

Table 10.1. Estimated Annual O&M Costs per Definite Project Report

Item	Quantity	Unit	Unit Price	Total Cost
Operation	0			\$0
Maintenance				
Embankment Inspection	40	Hr	\$25.00	\$1,000
Riprap	115	MG	\$30.00	\$3,450
Erosion Control	20	Hr	\$100.00	\$2,000
Debris Removal, Weirs	20	Hr	\$50.00	\$1,000
Planting Maintenance	16	Ha	\$50.00	\$800
Rehabilitation ¹				\$0
			Subtotal	\$8,250
Contingencies (20%)				\$1,710
Total				\$9,960
¹ Rehabilitation cannot be accurately measured. Rehabilitation is the reconstructive work that significantly exceeds the annual O&M requirements identified above and that is needed as a result of major storms or flood events.				

10.1.1. Barriers and Gates. The refuge manager shall make Project inspections of the wooden post barrier and gate at least once per year. Any degradation of quality or displacement of posts and erosion shall be noted. Replacement of posts may be necessary to maintain the general state of the barrier feature for the life of the Project. The gate will need to be sanded and painted as necessary to prevent damage and rusting. Steps should be taken to remedy adverse conditions disclosed by the inspections.

10.1.2. Channel Maintenance. The refuge manager shall make annual observations of the dredged portions of Sunfish and Mud Lakes to determine the approximate depth. The refuge manager shall make periodic inspections to observe any significant sedimentation. Fish activity and fish kills shall be reported. Steps should be taken to remedy adverse conditions disclosed by the inspections. USFWS is not required to dredge these channels.

10.1.3. Erosion Control. The refuge manager shall make annual observations of the embankments and other vegetated surfaces. The refuge manager shall make periodic inspections to observe any significant erosion. Rills and washouts shall be reported. Also, any adverse conditions such as undesirable debris, waste materials, and unauthorized structures shall be reported. Steps should be taken to remedy adverse conditions disclosed by the inspections.

10.1.4. Removal of Debris and Unwanted Structures. The refuge manager shall make annual observations of the sites to look for debris, wastes and unwanted structures. The refuge manager shall make periodic inspections to observe any significant problems. These problems shall be reported. Steps should be taken to remedy adverse conditions disclosed by the inspections.

10.1.5. Vegetation Management. While growth of trees may be beneficial throughout much of the project, the deflection embankment should be managed to ensure the project will function as designed. Damage from the root wads of large trees felled by a flood or wind event could compromise

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