

**BAY ISLAND
INSPECTION OF COMPLETED WORKS
2017**

PROJECT: Bay Island Habitat Rehabilitation and Enhancement Project

AUTHORITY: Upper Mississippi River Restoration (UMRR) Program

LOCATION: Pool 22, Mississippi River Miles (RM) 311.0 - 312.0, Marion County, MO

PREVIOUS REPORTS:

Reports listed below are posted at this website:

<http://www.mvr.usace.army.mil/Missions/Environmental-Protection-and-Restoration/Upper-Mississippi-River-Restoration/Habitat-Restoration/Rock-Island-District/Bay-Island/>

U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River System, Environmental Management Program, Definite Project Report (R-8) with Integrated Environmental Assessment, Bay Island, Missouri Rehabilitation and Enhancement, May 1990.

U.S. Army Corps of Engineers, Rock Island District, Operation and Maintenance Manual, Bay Island Habitat Rehabilitation and Enhancement Program, November 1995.

U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River System, Environmental Management Program, Post-Construction Initial Performance Evaluation Report, Bay Island Habitat Rehabilitation and Enhancement, December 1999.

U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River System, Environmental Management Program, Post-Construction Supplemental Performance Evaluation Report, Bay Island Habitat Rehabilitation and Enhancement, April 2002.

U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River Restoration, Environmental Management Program, Post-Construction Performance Evaluation Report, Bay Island Habitat Rehabilitation and Enhancement, March 2003.

U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River Restoration, Environmental Management Program, 10-Year Performance Evaluation Report, Bay Island Habitat Rehabilitation and Enhancement, May 2004.

U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River Restoration, Environmental Management Program, Inspection of Completed Works: Trip Report, Bay Island Habitat Rehabilitation and Enhancement, August 2012.

U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River Restoration, Environmental Management Program, Post-Construction Performance Evaluation Report, Bay Island Habitat Rehabilitation and Enhancement, 2015.

DATE OF FIELD VISIT: June 20, 2017, warm, sunny, mid 80's °F

ATTENDEES:

The following table outlines the list of personnel who visited the site in 2017.

Table 1: 2017 Site Visit Attendees

Name	Office	Title	Number
Kara Mitvalsky	USACE – Rock Island	Environmental Engineer	309-794-5623
Steve Gustafson	USACE – Rock Island	Environmental Protection Specialist	(309) 794-5202
Ben Vandermyde	USACE – Rock Island	Lead Forester	(309) 794-4522
Ryan Kelly	Missouri Department of Conservation	Wildlife Biologist	(573) 754-6171
Davi Michl	USACE - Peoria	Biologist	(309) 794-5174
Cole Clements	USACE – Rock Island	Civil Engineer	
Heng-Wei Tsai	USACE – Rock Island	Civil Engineer	(309)794-5184
Logan Grothus	USACE – Rock Island	Pathways Intern	(309) 794-5693
Tara Gambon	USACE – Rock Island	Pathways Intern	(309) 794-5874

PROJECT GOAL & OBJECTIVES:

The project goals and objectives are summarized in the table below.

Table 2: Project Goals and Objectives

Project Goals and Objectives		
Goals	Objectives	Project Features
Enhance Wetland Habitat for Migratory Waterfowl	Provide controlled water levels during waterfowl migration – forested and non-forested	WMUs – perimeter levee, pump station, and water control structures
	Increase mast tree dominance in the forested wetlands	Mast Tree planting
	Increase total wetland values for migratory waterfowl	New project access road

MONITORING PLAN EVALUATION CRITERIA:

The following tables were copied from the following report: U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River Restoration, Environmental Management Program, Post-Construction Performance Evaluation Report, Bay Island Habitat Rehabilitation and Enhancement, 2015.

No changes or discussion of these tables was made during this site assessment.

Table 3: Monitoring and Performance Evaluation

Activity	Purpose	Responsible Agency	Implementing Agency	Funding Source	Remarks
Pre-Project Monitoring	Establish need of proposed project features	MDC	MDC	MDC	Attempts to begin defining baseline.
Baseline Monitoring and Data Collection for Design	Establish baseline conditions; meet specific design and data requirements	USACE	USACE	USACE (HREP)	See DPR for location and sites for data collection and baseline information.
Construction Monitoring	Assess construction impacts; meet permit requirements	USACE	USACE	USACE (HREP)	Environmental protection specifications included in construction contract documents. Inter-agency field inspections accomplished during project construction phase
Performance Evaluation Monitoring	Continue monitoring and assess physical, chemical, and vegetation performance of project relative to design goals and objectives	USACE (quantitative) MDC (field observations)	USACE MDC	USACE (HREP) MDC	Comes after construction phase of project
Analysis of Biological Response to Project Features	Evaluate biological response predictions and assumptions	USACE	USACE	USFWS	Intensive biological response monitoring of this Project, as part of the HREP element of the UMRS-EMP, is not scheduled.

Table 4: Monitoring and Performance Evaluation Schedule

Goal	Objective	Enhancement Measures	Units	Year 0 w/out Project (1992)	Year 50 Target w/ Project (2042)	Monitoring Schedule
Enhance Wetland Habitat for Migratory Waterfowl	Provide controlled water levels during waterfowl migration - forested and non-forested. Increase reliable food production area (moist-soil species)	Earthen Levee, pump station, stoplog structures	Acres	40 (uncontrolled)	400	USFWS and MDC will observe the presence of waterfowl annually. The Corps will perform aerial surveys every 5 years.
	Increase mast tree dominance	Mast tree plantings including seedlings and acorns	Acres	6.9	36.9	MDC will observe the survival of plantings annually. The Corps will take a Timber Inventory every 10 years.
	Increase total wetland values for migratory waterfowl	All project features are intended to enhance wetland values	Habitat Units Acres	0.14 99.1	0.62-0.64 420.5-434.0	USFWS and MDC will observe the presence of waterfowl annually. The Corps will perform WHAG Analysis at 1, 15, and 50-year intervals.

SIGNIFICANT EVENTS SINCE LAST INSPECTION:

In the fall of 2016 there was a high water event where water levels remained above flood stage for several weeks. The most recent event was in the spring of 2017 where peak height reached 3.52 ft above flood stage.

OBSERVATIONS:

Perimeter Levee:

This levee is mowed twice a year. Settlement, sloughs, wavewash, and scouring do not appear to be a problem. Rip-rap is in good condition and well maintained. No issues with encroachment or unfavorable vegetation growth was observed. There were minor areas of rutting due to vehicle traffic and wet conditions.

Intermediated Levee:

The Intermediate levee is in the same condition as the Perimeter levee.

Water Control Structure North Perimeter Levee:

The water control structures along the North Perimeter levee is in good condition. The rip rap for the most part was still in place. There was no erosion adjacent to the structure, and only minimal concrete structural degradation adjacent to the grate decks above the stoplogs.

The main issue indicated by the sponsor with the water control structures is the stoplogs. The structures require two people to operate which is difficult given current staffing levels. The low guardrails and the awkward angle for insertion and removal of the lifting hooks also leads to safety concerns. Missouri Department of Conservation (MDC) plans to change to gates that can be operated by one person pending funding. Images of the stoplogs can be viewed in Attachment A. These give a clearer indication of the difficult angle necessary to manipulate the structure and the safety concerns that may arise.

Water Control Structure South Perimeter Levee:

Condition of the water control structure South Perimeter Levee is similar to the North Perimeter Levee.

Additionally, beavers have in the past filled the water control structures requiring them to be cleared out by MDC staff.

Water Control Structure Intermediate Levee:

The screw gate on the intermediate levee separating the North and South WMUs needs repaired. In addition, protective cages are set up on either side of this water control structure to protect from beaver damage. The structure resembles a cage and surrounds the area at risk. According to the As-builts this was part of the original design.

Pump Station:

No concerns were noted in regards to the pump station structure. Regular maintenance is occurring. The only issue brought to USACE representatives' attention by the project sponsor was that leaf litter during the fall clogs the pump, causing it to shut down. The sponsor also noted the pump is working efficiently to bring water into the project area. However, getting water out of the project area during extended high water events has been a concern. Routinely long duration high stages of the Mississippi River prevent adequate drawdown of the HREP, which is leading to tree stress and death. Besides the water control structures, there is no other way to remove water from the HREP. The pump station only brings water in.

Spillways:

The North Spillway is well maintained. There is no erosion, and unwanted vegetation is managed well in the riprap. Following flood events sediment needs to be scraped off. The South Spillway is in the same condition as the North Spillway. The condition of both spillways and riprap can be viewed in Attachment A.

Screw Gate:

The gate is not operable. The screw turns but the gate will not raise or lower. It is likely stripped and needs repaired. As-built shows the gate on the edge of the levee. However, it is actually in the center.

Mast Tree Plantings:

The tree plantings are all showing general signs of stress. The pin oak planting has had a high rate of survival of over 80%. However, 50% of these trees are stressed and have a reduction in crown development.

Many of the RPM trees planted at the Northeast end of the project are 7-10 inches in diameter with good canopy cover. Several appeared to have grown from stump sprouting. Others showed stress most likely due to crowding. These conditions can be viewed in Attachment A. Scattered pecans are present and in good condition. USACE foresters anticipate thinning the stand in fall 2017 with the MDC staff to ensure success of the best trees. Invasive plants include giant ragweed, reed canary grass, honeysuckle bush, and bur cucumber.

Access Road:

The access road was navigable and in good condition.

Ameren Mitigation Plot:

This plot was planted in 2015 and has since flooded approximately 3 times. Most plantings have endured to the 2-year critical threshold, after which continued survival of tree species increases. However, aggressive mowing and windthrow on the site has negatively impacted some of the trees; many had to be righted and re-set into the soil during the site inspection. Tree species included northern pecan, swamp white oak, overcup oak, bur oak, persimmon, river birch and sycamore. A handful of trees exhibited stump sprouting. Ameren is required to monitor for a period of 10 years to ensure containerized trees and shrubs do not fall below the 60% survival rate; otherwise, supplemental planting will be required to achieve at least 80% stocking. The site is under heavy vegetation control by mowing and spraying. This has provided excellent growing conditions for the planted trees. However, minor residual damage and tree loss has occurred.

Additional Comments:

Near the south water control structure, break through commonly occurs between the borrow pit and the ditch by the levee.

Several species of waterfowl were seen to be using the site during the inspection, including 6 blue heron individuals. No waterfowl counts have been completed. However, based on sponsor observations, the project successfully provides enough emergent wetland and forested wetland habitat to continue to support such migratory waterfowl species.

SUMMARY

Overall the Bay Island HREP appears to be generally meeting its goals and objectives.

LESSONS LEARNED

Sponsor recommends not using stoplogs in future designs as they are extremely difficult to manage. A structure that can be manipulated with one person is more practical for local staff to manage.

RECOMMENDATIONS

Recommendations for this site include:

1. Thin pin oak stand.
2. Determine actions to be taken to reduce leaf litter debris at pump station.
3. Replace stop log structures with gates.
4. Fix screw gate.
5. Repair erosion between borrow pit and levee (break through).

Attachment A

2017 Photos

Bay Island Site Visit

6/20/17 Photos



On June 20, 2017 Missouri Department of Conservation and U.S. Army Corps of Engineers employees inspected the Bay Island Habitat Rehabilitation and Enhancement Project, constructed under part of the Upper Mississippi River Program in the 1990s. The project continues to enhance wetland habitat for migratory waterfowl.

Site Visit Attendees from the USACE and MDC

Pump Station



Pump station structure



Pump station outlet

Pump Station

The site provides controlled water levels during waterfowl migration in both forested and non-forested areas. The water is managed through water control structures and a pump station.



Pump Station

Pump station electrical



Maintenance to the site has required some repairs to the pump station electrical control box, but in general, water levels are able to be raised to mimic natural riverine wetland processes.

Spillways



North Spillway



South Spillway

Spillways



North Spillway riprap in good condition

Riprap



Water Control Structures

The stoplogs require two individuals to operate which is difficult to staff. The low guardrails and the awkward angle for insertion and removal of the lifting hooks may lead to safety concerns. The MODOC is hoping to modify the structures to ease the operation for water level management to one individual. This would occur pending the availability of funding.



Water Control Structures



Water Control Structures



Gate, not operable



Beaver Deterrent

Inlet Structure Channel



Break through

Mast Tree Planting

Mast trees which were planted for the project have grown significantly over the past 20 years, with large stands of pin oak trees observed.



Pin Oaks in need of thinning



Vegetation

Numerous pecan trees, some approaching 100 years in age, were observed. Protection from frequent water level changes is provided by the embankment surrounding the wetlands. This protection increases the chances for hard mast tree survivability.



Vegetation



Vegetation



Trees showing stress most likely due to flooding.



View from water control structure

Ameren Mitigation Site



Ameren Mitigation Site



Trees falling or growing at an angle due to flooding



Wildlife



Water snake



Dead turtle



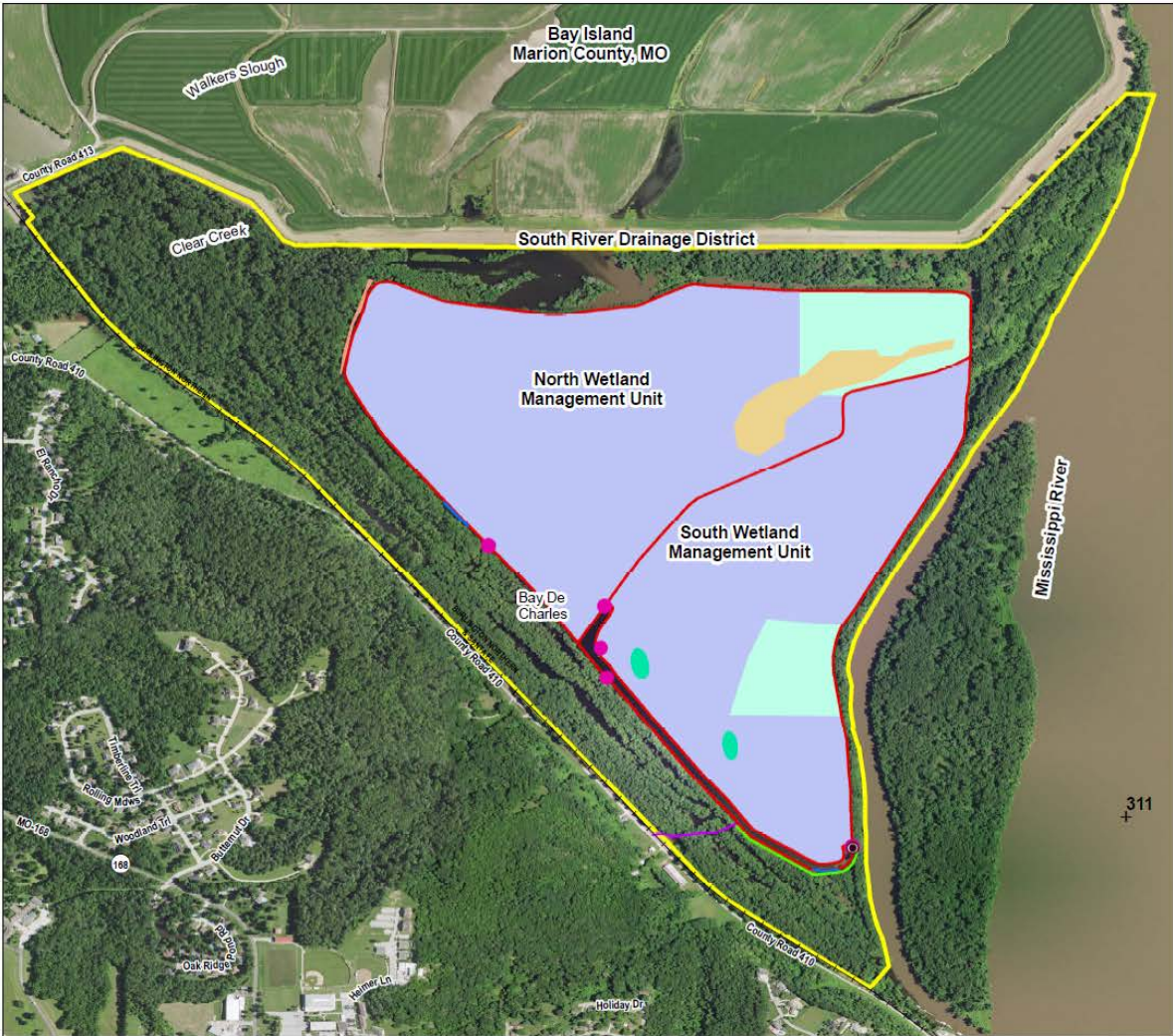
Dead carp

Attachment B

Site Plan and GIS map

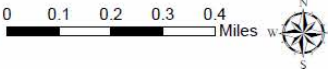
Bay Island HREP
Inspection of Completed Works

Bay Island



Legend

- + River Miles
- Pump Station
- Water Control Structure
- Water Control Structure
- Spillway
- Electrical Utility Segment
- Embankment Centerline
- Access Road
- Borrow Site
- Forest Enhancement
- Mitigation Planting Ameren
- Revetment
- Wetland
- Project Boundary



-- Location Map --



Bay Island HREP
Inspection of Completed Works

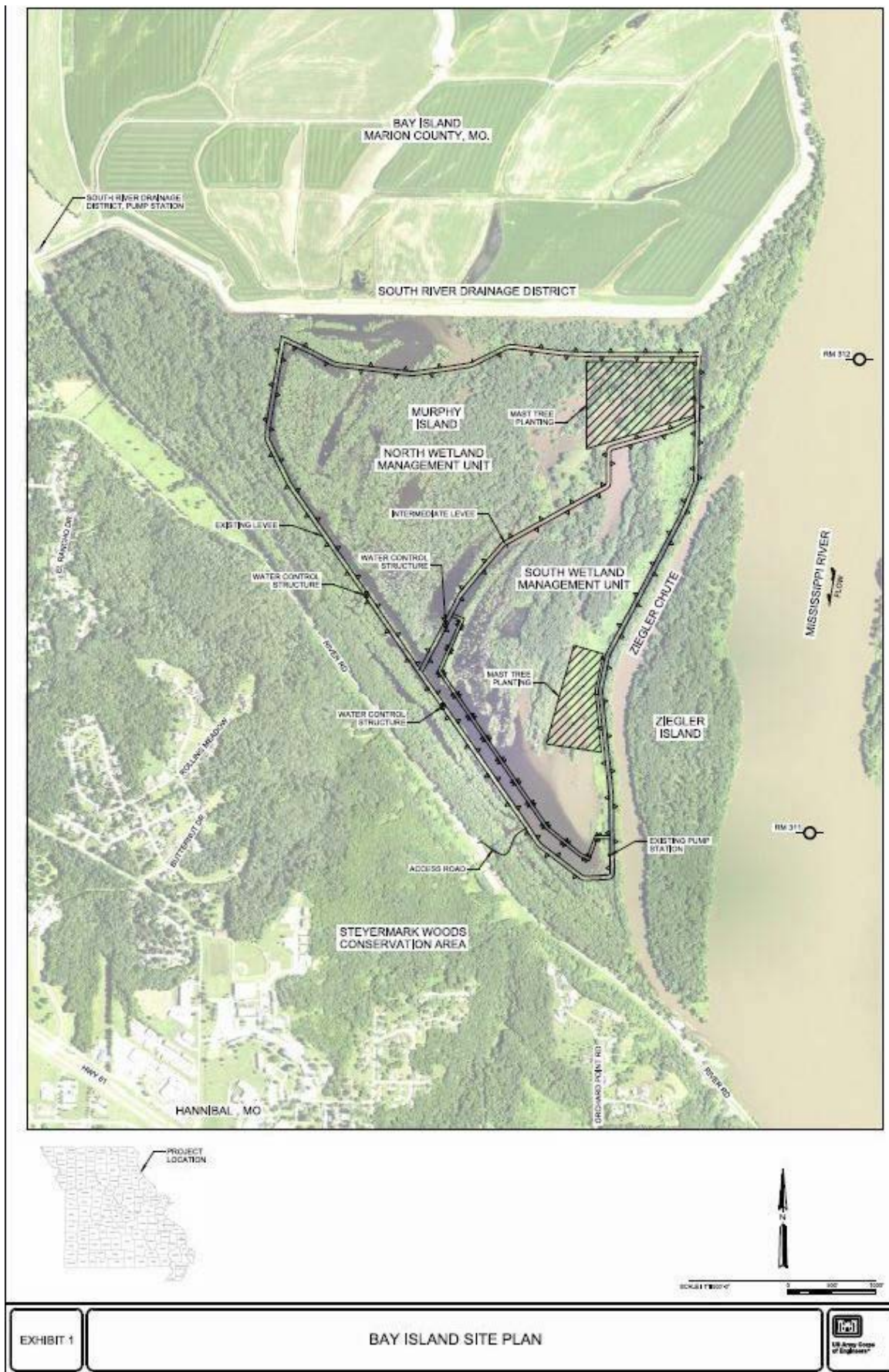


EXHIBIT 1

BAY ISLAND SITE PLAN

