



Performance Monitoring

Rock Island District

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“Traditional” Reports

- ▶ Analysis of existing data
- ▶ Comparison of data points to objectives identified in the feasibility reports (DPR)
- ▶ Goal was to complete a report every five years while completing the proposed monitoring laid out of the DPR.

The Reality of Traditional Reports

- ▶ Reports were taking several years to complete.
- ▶ Limited data was available which leads to weak conclusions being drawn.
- ▶ Due to the length of time to complete the reports, several projects were not looked at for greater than five years.
- ▶ Reports are based on single projects, not on how projects relate to each other or the surrounding system.
- ▶ Reports do not address how to better or differently manage a site to meet original objectives or new objectives.
- ▶ Lessons learned were identified to be applied to future projects.
- ▶ The number of projects continues to increase.
- ▶ Funding for this analysis does NOT continue to increase.

Success??

- ▶ What is success?
- ▶ When can you call a project successful and walk away?
- ▶ Is it possible to call it a success before the 50 year “project life” is complete?
- ▶ If the measurable objectives (such as overwintering water depth) are not met, is the project a failure?

When do we hit 50 years?

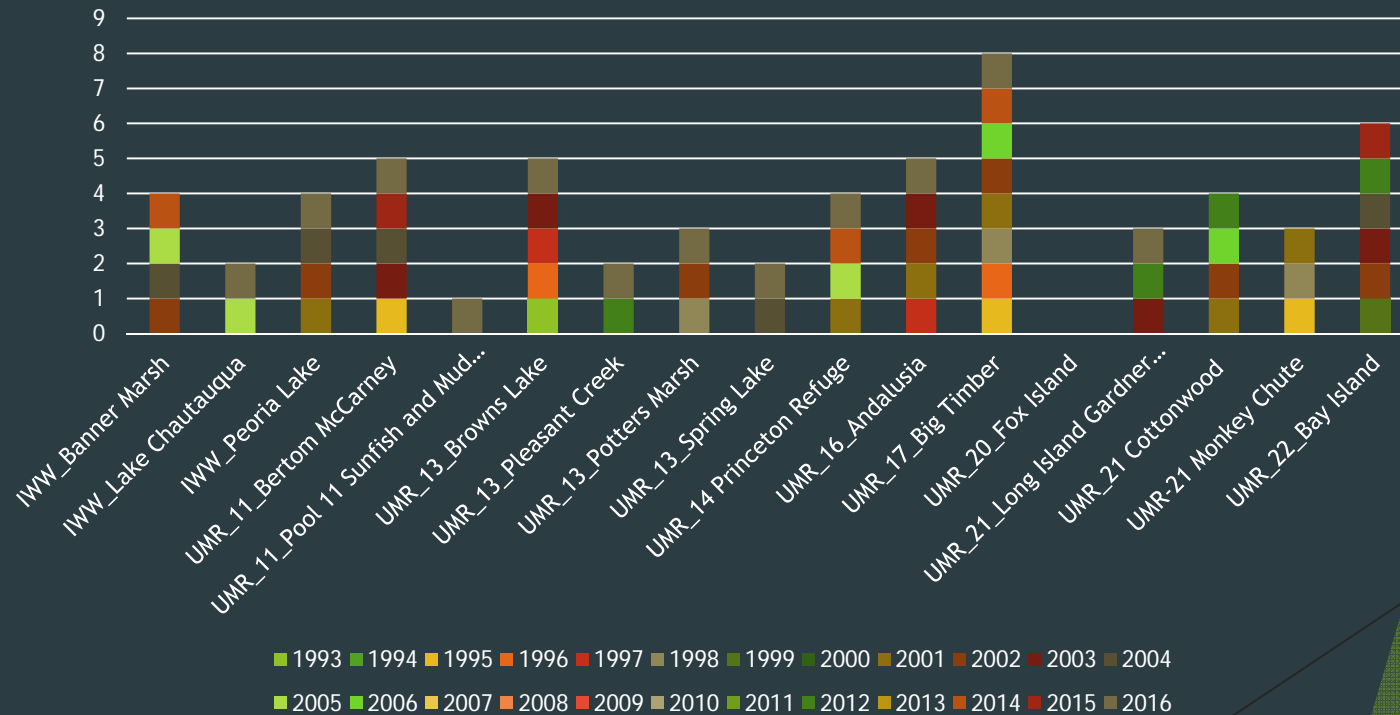
50 year Date

Estimated dates circled as projects are in planning or construction

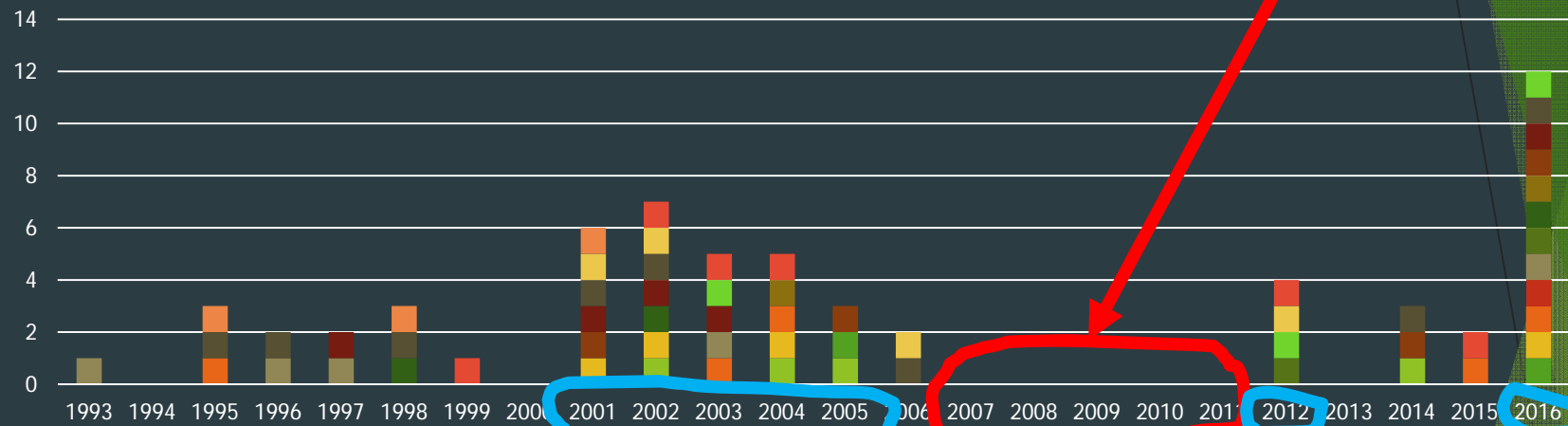


How Many Have We completed (Completed Projects Only)?

MVR Performance Assessments By Completed Project



MVR Performance ASsessmentS of Completed Projects By Year



- IWW_Banner Marsh
- UMR_11_Bertom McCarney
- UMR_13_Pleasant Creek
- UMR_14 Princeton Refuge
- UMR_20_Fox Island
- UMR-21 Monkey Chute
- IWW_Lake Chautauqua
- UMR_11_Pool 11 Sunfish and Mud Lakes
- UMR_13_Potters Marsh
- UMR_16_Andalusia
- UMR_21_Long Island Gardner Division
- UMR_22_Bay Island
- IWW_Peoria Lake
- UMR_13_Browns Lake
- UMR_15_Spring Lake
- UMR_17_Big Timber
- UMR_21_Cottonwood

Flood recovery pulled staff from PERs

Years we did more site inspection reports

Brainstorming Ideas....

- ▶ Traditional reports are not giving us much bang for our buck and are taking too long.
- ▶ So, time to figure out what is the RIGHT way for us to look at reports.
- ▶ (And everyone has an opinion on what way is the RIGHT way)...

A few MVR Ideas on what might be the “Right” way

- ▶ Bi-Annual Site Inspection of Completed Projects
- ▶ Monitoring and Evaluation of Feature Types
- ▶ Assessment of Specific Projects to Determine Better Outputs
- ▶ Ongoing monitoring and data collection

Money makes the world go round (or makes us choose which one to do first)

- ▶ MVR had several “traditional” reports to complete.
- ▶ Then we started the site inspections.
- ▶ Water quality monitoring continues through 2016

2016 Traditional Reports (start-stop)

- ▶ Posted:
 - ▶ Lake Chautauqua (2012-2016)
 - ▶ Pool 11 (2012-2016)
 - ▶ Bay Island (2014-2016)
 - ▶ Andalusia (2014-2016)
 - ▶ Brown's Lake (2014-2016)

Site Inspections 2016

- ▶ Peoria Lake (posted)
- ▶ Princeton (posted)
- ▶ Potters Marsh
- ▶ Long Island (Gardner Division)
- ▶ Pleasant Creek
- ▶ Spring Lake
- ▶ Big Timber
- ▶ Bertom and McCartney
- ▶ Cottonwood Island (delayed to FY17 due to water levels and heavy vegetation)
- ▶ Banner Marsh (delayed to FY17)

Princeton Refuge

- ▶ Site Visit June 7, 2016
 - ▶ U.S. Army Corps of Engineers, Rock Island District
 - ▶ Iowa Department of Natural Resources
 - ▶ U.S. Fish and Wildlife Service
- ▶ The project is operated and maintained by the IA DNR through a cooperative agreement with the USFWS.



Princeton Refuge

The project continues to provide a reliable food source for migratory birds through construction of a levee system, pump station, and water control structures, and increases overall vegetation diversity and availability of preferred wildlife foods through mast tree plantings.



View of Northern Unit which is operated as a closed area within the refuge. This photograph was taken from a water control structure located on the cross dike.

Princeton Refuge



Southern Unit: Photo was taken from the water control structure located adjacent to the pump station. The photograph is looking towards the southern unit, with the restored perimeter levee noted on the left hand side of the photo.



Numerous egrets and herons were noted along the perimeter levee.

Peoria Lake

- ▶ July 5, 2016 Site Visit
 - ▶ U.S. Army Corps of Engineers, Rock Island District
 - ▶ IL DNR
- ▶ This project was completed nearly 20 years ago and is located in Woodford County, Illinois in the Peoria Pool between River Miles 178.5 and 181.0.



Peoria Lake

- ▶ The barrier and overburden islands constructed as part of this project have grown in size and are supporting a variety of maturing trees and wetland species, including Black Willow, Cottonwood, and silver maple.
- ▶ Ample amounts of aster were also observed on the island which was being utilized by numerous waterfowl at the time of the inspection.
- ▶ The closure structure at the head end of the flowing side channel was also inspected.



Peoria Lake

- ▶ The wetland complex continues to be maintained as a moist soil management unit, with the IL DNR maximizing the efficiency of the site given current budget constraints.
- ▶ A local Friends group has provided significant support to continue the ongoing success of this site.



Peoria Lake

- Existing pump station was pulled and the unit is being maintained with temporary pumps as well as possible until a permanent pump can be reinstalled.



Peoria Lake

- ▶ Operating 4 bays with stoplogs was not necessary in most conditions, so a local friends group funded the construction of aluminum gates, which were installed in $\frac{3}{4}$ of the 3 stoplog bays.



Peoria Lake

- ▶ A variety of floodplain trees were planted within the complex and on the islands. Many of these trees continue to thrive. Upon funding availability, the IL DNR performs timber stand improvement in many of the planted areas.



Big Timber

- ▶ On July 20, 2016, the US Army Corps of Engineers, IA Department of Natural Resources, and the US Fish and Wildlife Service inspected the Big Timber Habitat Rehabilitation and Enhancement Project, part of the Upper Mississippi River Restoration program.
- ▶ This project, located in Louisa County, IA, and managed as part of the Port Louisa National Wildlife Refuge, was constructed in the early 1990s to enhance aquatic, terrestrial and migratory waterfowl habitat.



Big Timber

- ▶ Material had been excavated and side cast to provide fish habitat and elevations more suitable for mast tree survival. Shown in the photo is a view of the channel with the side cast locations noted with the light green vegetation.
- ▶ Almost no depth has been maintained.



Big Timber

- ▶ Numerous hard mast trees had been planted at higher elevations in the project area. Some of these species (Kentucky Coffeetree shown) were observed during the field visit.



Big Timber

- ▶ Year round surface water habitat continues to be utilized by numerous wildlife species.



Big Timber

Select potholes were observed, but were not holding water and did not have any vegetation present.



Potters Marsh

- ▶ Site Visit was conducted on July 21, 2016.
 - ▶ US Army Corps of Engineers
 - ▶ US Fish and Wildlife Service
 - ▶ Iowa DNR



Potters Marsh



View from Thomson Causeway Recreation Area access road - Sediment Trap and Hydraulic Dredging
According to the FWS, the excavation into the project (near the bridge/causeway) has filled in.

Potters Marsh



The well pump is maintained well and continues to operate for the service.



Potters Marsh

- ▶ The grassland is full of various vegetation. At the time of inspection, much of the vegetation was in bloom, including lotus, purple coneflower, purple poppy mallow, rose marsh mallow, and black eyed susan. The containment dike roadway was mowed for a clear path around the project site.



Potters Marsh

- Some of the dredge cut locations could be observed by changed or lack of aquatic vegetation.
- Most of these cuts have filled in more than expected, especially at the downstream end of the site.



Potters Marsh



This structure is a favorite location for beavers, who enjoy filling the structure. This is removed as needed; however, the beavers also have constructed an access hole through their debris which allows for some water movement. The gage on the structure has numbers that no one was sure what were tied to, so the FWS constructed their own gage off shore (not far from the large beaver lodge) to gage interior water levels. While a beaver was not observed on this site visit, stories of beavers the size of hogs have been reported in this area.



Spring Lake

- ▶ Site Visit was conducted on July 21, 2016.
 - ▶ US Army Corps of Engineers
 - ▶ US Fish and Wildlife Service
 - ▶ Iowa DNR



Spring Lake

Gatewell Structure



Perimeter Levee
Vegetation



Spring Lake

Interior Cell B,
looking north from
cross dike



Cross dike spillway



Spring Lake

Hemi marsh well



Hemi Marsh



Bertom and McCartney Lakes

► Site Team:

- U.S. Army Corps of Engineers,
 - Wisconsin Department of Natural Resources
 - Iowa Department of Natural Resources
 - U.S. Fish and Wildlife Service (including members from the Upper Mississippi River Refuge, the MacGregor District, and the Rock Island Field Office)
- This project, located in the Upper Mississippi River National Wildlife and Fish Refuge, was funded by the Upper Mississippi River Restoration program and constructed in the early 1990s.



Bertom and McCartney Lakes

- ▶ A rock substrate aquatic habitat was constructed, and has been successful in providing habitat for mussels.
- ▶ The top photo, taken as part of the 2014 mussel survey, provides an indication of success at this site.
- ▶ Erosion beyond the rock channel was observed on a curve in the channel.



Bertom and McCartney Lakes

- ▶ The rock substrate channel is protected by a rock closure structure which is still present on site.



Bertom and McCartney Lakes

- The aquatic fish habitat continues to thrive. The Wisconsin DNR has been monitoring fish in the area which continues to experience success, particularly in the upstream dredge cuts.



Bertom and McCartney Lakes

- ▶ The dredged material placement site has created a secondary benefit of an isolated wetland. This somewhat unique habitat to this portion of the river is thriving with both plant species and herp species such as frogs and turtles.



Pleasant Creek

- ▶ A site inspection of the Pleasant Creek Habitat Rehabilitation and Enhancement Project occurred on August 16, 2016.
- ▶ The U.S. Army Corps of Engineers, along with partners from the Iowa Department of Natural Resources, and the U.S. Fish and Wildlife Service (including members from the Upper Mississippi River Refuge, and the Savanna District) were present.
- ▶ This project, located in Jackson County, Iowa enhances wetland and aquatic habitat through mostly passive systems, and was constructed in the early 2000s.
- ▶ The project was funded by the Upper Mississippi River Restoration program and is operated and maintained by the Refuge



Pleasant Creek

- ▶ Spillways protect the berm surrounding the wetland allowing a protected surface for overtopping water. The articulated concrete mat spillway remains in good condition.



Pleasant Creek

The moist soil management unit is generally drained in the summer months, allowing vegetation to be grown as a food source during the fall migration.



Pleasant Creek

A portable electric pump is installed in this location to add water to the moist soil management unit during the fall waterfowl migration. As the area is filled, different waterfowl and shorebirds visit to area to consume plants, seeds and invertebrates which provides an energy source while they travel to their winter grounds.



Pleasant Creek

Various wetland plants were observed in the areas, including swamp milkweed, an important pollinator used by the monarch butterfly as well as other pollinator species. Also shown are buttonbush and Cardinal flower.



Pleasant Creek

- ▶ Tree planting in this area continues to be managed by Rock Island District Foresters. Survivability of planted trees was observed.



Pleasant Creek

This project is adjacent to the Mississippi River. The berm separating the wetland from the river is protected by riprap which ensures that fluctuating river levels do not adversely impact the wetland.



Long Island (Gardner) Division

A site inspection was completed on July 18, 2016 and included members from the US FWS and the US Army Corps of Engineers



Long Island Division

- ▶ Chevron
 - ▶ Summerged
 - ▶ Shallower depths on the interior
 - ▶ Asian carp jumped into boat



Long Island Division

- ▶ Small islands protected throughout the complex appeared to be well protected by the riprap, although downstream of riprap protection, active erosion was noted.



Long Island Division



Invasive species



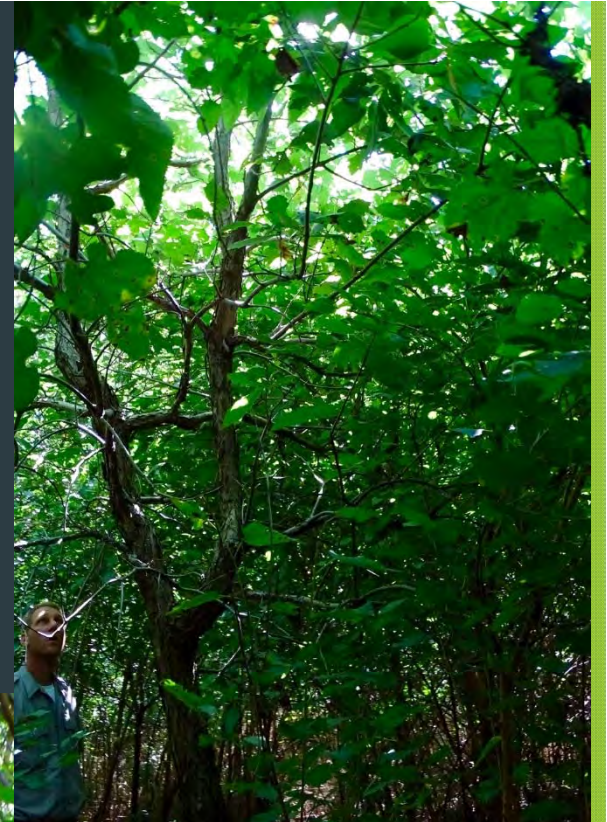
Long Island Division

Due to elevated water levels, the closure structure was submerged. Riprap on bankline was observed. The river is being diverted away from the structure.



Long Island Division

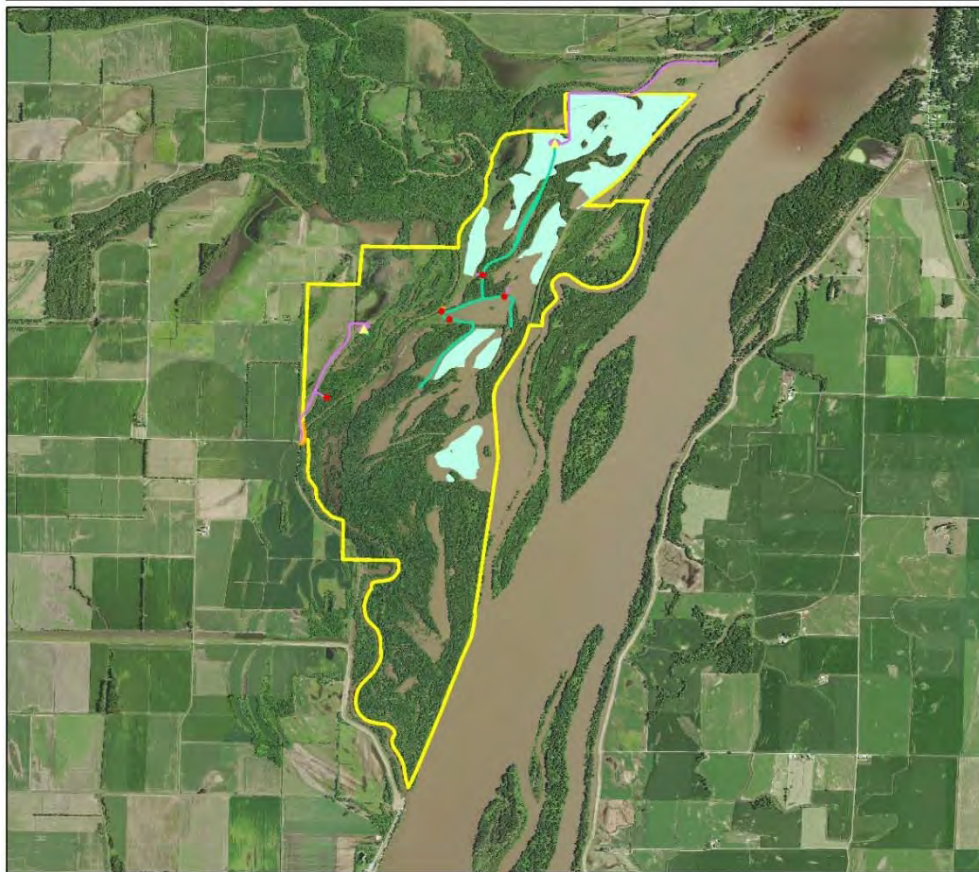
- ▶ Following tree mat removals, an experience referred to as a special bonding time, the trees have started to thrive.
- ▶ 3 years of aerial spraying helped control the vine species (2010, 2011, and 2012), and willow and silver maple are growing in between the planted trees, providing shade cover so that the weeds do not overtake the trees, and forcing the planted trees to grow straight and up.
- ▶ Several pecan and oak trees were located and they look very healthy. Several stump sprouts were also observed.
- ▶ The berms have filled in the interior with sediment, but based on different soil colors, the berm locations can still be identified.



Fox Island

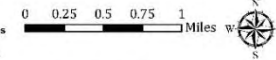
- ▶ Project Turned over to sponsor January 2016
- ▶ First Post Construction Inspection June 2017

Fox Island

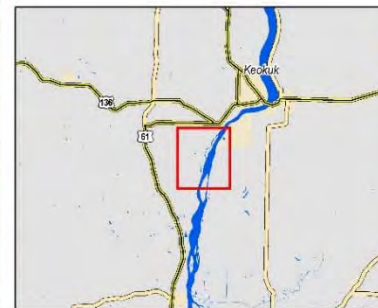


Legend

- Water Control Structure
- Well
- Access Road
- Excavation
- Flora Planting or Seeding
- Revetment
- Project Boundary



-- Location Map --



What's Next?

- ▶ Another year of site inspections (FY17)
 - ▶ Banner Marsh
 - ▶ Lake Chautauqua
 - ▶ Pool 11
 - ▶ Brown's Lake
 - ▶ Andalusia
 - ▶ Cottonwood
 - ▶ Fox Island
 - ▶ Bay Island
- ▶ Determine trends/issues to be further evaluated.
- ▶ Ensure that monitoring leads to learning and helping us to make better future projects.

More projects coming...

- ▶ More projects coming down the line...
 - ▶ Lake Odessa
 - ▶ Rice Lake
 - ▶ Pool 12
 - ▶ Huron Island
 - ▶ Beaver Island
 - ▶ Keithsburg
- ▶ Adaptive Management occurring at some sites
 - ▶ Pool 12
 - ▶ Huron Island
 - ▶ (Beaver Island)
 - ▶ (Keithsburg)