



April 11th, 2014

USING MULTIPLE DREDGE METHODS FOR HABITAT RESTORATION



The Upper (Mississippi River)

America's Best Kept Secret

- Home to outdoor enthusiasts
 - 326 Bird Species (60% of North America)
 - 150 Freshwater fish and mussel species (25% of North America)
 - 145 Amphibian and Reptile Species
 - 50 Mammal species

***Upper Mississippi River Conservation Committee**





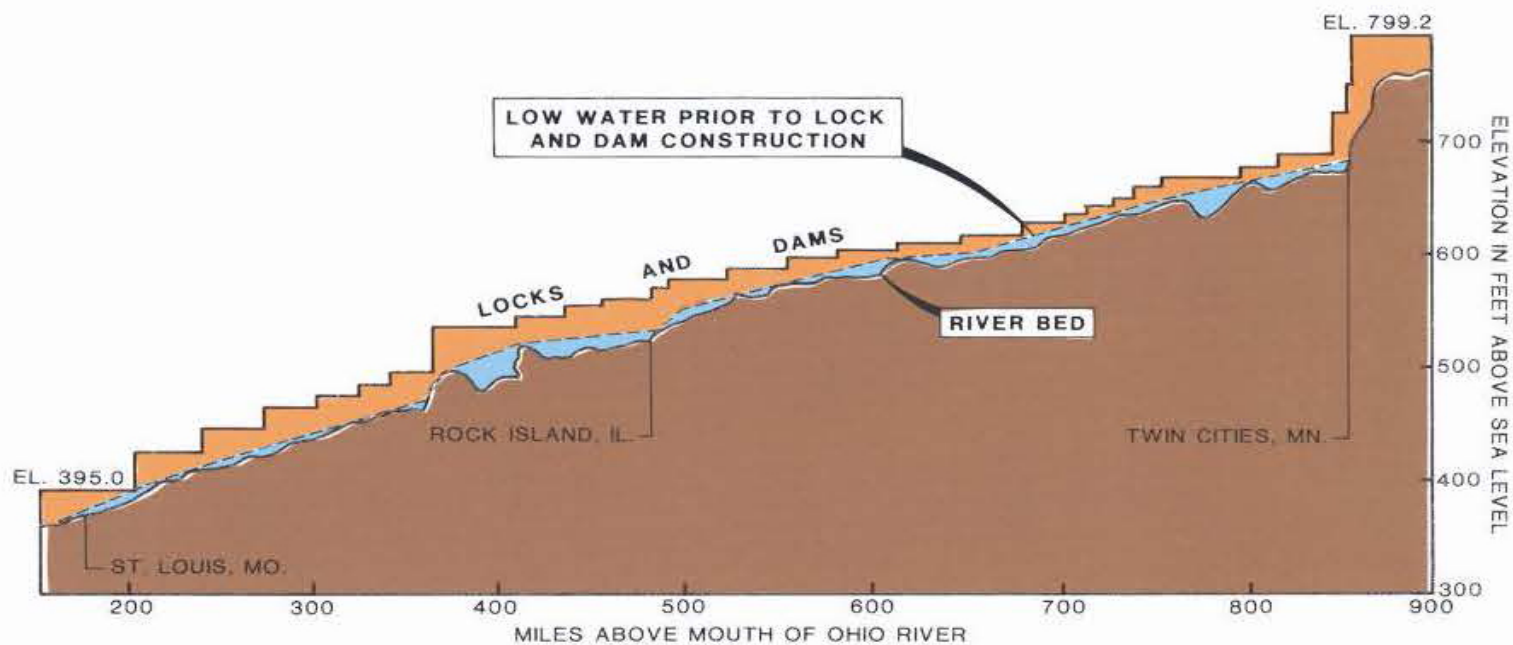
Navigation

- The Rivers and Harbors Act of 1930
 - Established a 9-foot navigational channel
 - 29 Locks and Dams
 - 400-foot drop between Minneapolis and St. Louis (600 miles)
- Grain is king
- One 15-barge tow
 - = 200 Train cars
 - = 870 Large semi trucks





Changes for Navigation



*Diagram courtesy of the U.S. Army Corps of Engineers

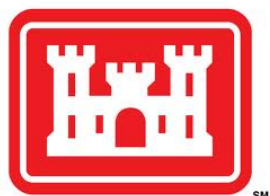




USACE EMP Program

- UMRR-EMP

- Upper Mississippi River Restoration – Environmental Management Program
- Authorized by WRDA 1986
- 54 projects to date, restoring over 100,000 acres
- Team Approach
 - Oversight by the USACE
 - Involvement from USFWS, USGS, USEPA, State DNRs, Local Governments







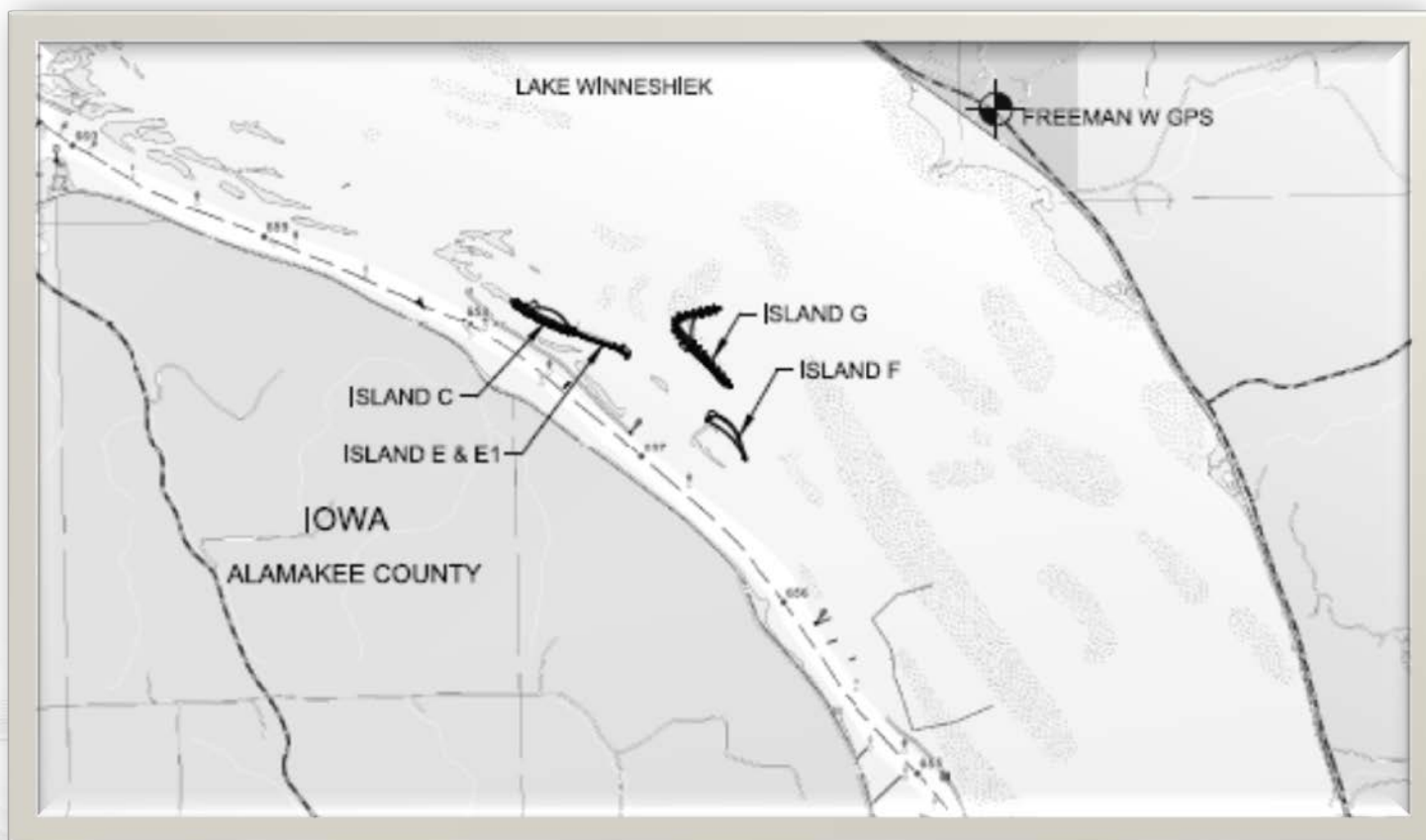


Capoli Slough Islands

- Upper Mississippi River Pool 9 EMP, Phase II
 - 5 Islands
 - 1 Emergent wetland
 - 27 acres of new land created
 - 12 acres of access channels dredged
 - 229,000 Cubic Yards of sand and topsoil used
 - 15,000 tons of rock placed
 - 6 miles from nearest access point



Capoli Slough Islands





Building the Islands

- Multiple dredge methods
 - Hydraulic
 - Mechanical
 - Amphibious
- Multiple methods of transport
 - Hydraulic
 - Material barge
- Scour and erosion control
- Native seeding and planting





Creating the Base



- 12" Swinging ladder cutter head dredge
 - Dredged 183,000 CY of sand
 - Pumped through 4,050 feet of pipeline
 - Borrowed material from main channel
 - Compaction using dozers, excavators, and amphibious equipment





Base Layer Challenges

- Challenging placement
 - Displaced unsuitable foundation material before sand placement
 - 2013 flood season
 - Lasted well into July
 - Required base of islands to be built underwater
 - Shallow water access only before channels were dug





Installing Topsoil

- Excavator with 4 CY bucket
 - Material moved using barges
 - Black dirt dredged from designated areas forming access channels
- Material was then placed in drying beds
- Spread using dozers





Topsoil Challenges



- 56,000 yards of material placed*
- Borrow sites were located in environmentally sensitive areas
- During extended flood season, topsoil could not be placed



Amphibious Dredging

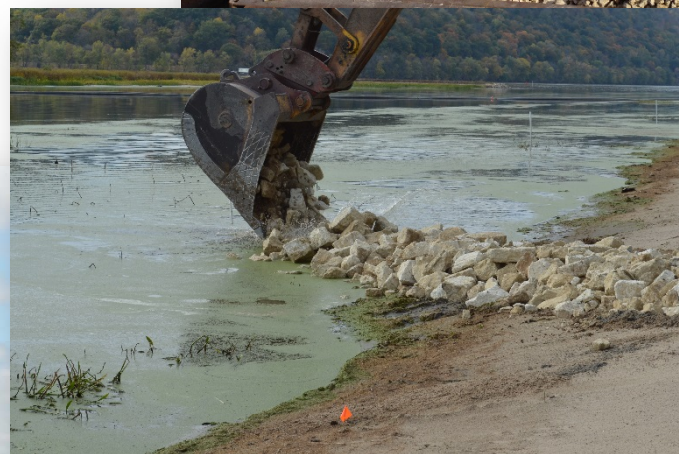
- Specialty equipment used in areas with very limited access
 - Initial material placement
 - Shallow marsh areas
 - Used to construct the emergent wetlands





Scour and Erosion Control

- To keep the islands in place
 - 15,000 tons of rock were placed
 - Dikes
 - Vanes
 - Groins
 - Embankment protection





Scour and Erosion Challenges



- Rock was brought in from an access point located 6 miles upstream
- Placement was completed throughout the duration of the project





Survey



- Tight tolerances
- Island layout
- Elevation verification
- RTK-GPS system used





Finishing





Thank You

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