

Wetland Rehabilitation and Restoration

An overview and project review

WEDA 2016 Chapter Meeting

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Wetlands – What are they?

- According to Merriam-Webster:

noun wet·land \ 'wet-, land, -lənd\

wetland: land or areas (as marshes or swamps) that are covered often intermittently with shallow water or have soil saturated with moisture.

- EPA (US Environmental Protection Agency) states:

“**Wetlands** are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Water saturation (hydrology) largely determines how the soil develops and the types of plant and animal communities living in and on the soil. Wetlands may support both aquatic and terrestrial species. The prolonged presence of water creates conditions that favor the growth of specially adapted plants (hydrophytes) and promote the development of characteristic wetland (hydric) soils.”

Wetlands – why are they important?

According to the EPA: “Wetlands....provide numerous beneficial services for people fish and wildlife. “

PEOPLE

- Water Quality
- Recreation
- Flood Water storage
- Erosion Control
- Control / reduce carbon-based climate damage
- Food sources

FISH & WILDLIFE

- Habitats
- Water Quality
- Food sources
- Erosion Control

Wetlands can help with excess carbon -
According to the EPA - “ Wetlands store carbon within their plant communities and soil instead of releasing it to the atmosphere as carbon dioxide. Thus wetlands help to moderate global climate conditions.

Examples of Wetland Benefits

Nesting, Breeding and Food Sources for numerous breeding birds and migratory waterfowl – including: Ducks, Geese, Woodpeckers, Hawks as well as numerous song and wading birds.

Food sources for humans like fish, shell fish, blueberries, cranberries and wild rice.

The EPA estimates a 80% reduction in flood water storage in the Bottomland hardwood wetlands along the Mississippi alone. Much of this because the wetlands were viewed as marginal or unproductive land and were drained or filled in.

Scientific American estimates that “If all of the worlds wetlands were put together, they take up an area over 1/3 larger than the United States.” That is over 5 million square miles – almost 10% of the worlds land area!

According to Scientific American “over 1/3 of the species on the U.S. Endangered Species List live only in the wetlands and almost 1/2 use them at some time during their lifecycles.”

Types of wetland works.

The Federal Geographic Data Committee, Wetlands Subcommittee defines wetlands based activities under the following categories:

Restoration and Rehabilitation - the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to former or degraded wetland.

Wetland Creation – the manipulation of the physical, chemical, or biological characteristics present to develop a wetland that did not previously exist on an upland or deepwater site.

Enhancement – the manipulation of the physical, chemical, or biological characteristics of a wetland (undisturbed or degraded) site heighten, intensify, or improve specific function(s) or for a purpose such as water quality improvement, flood water retention or wildlife habitat.

Protection / Maintenance -- the removal of a threat to, or preventing decline of, wetland conditions by an action in or near a wetland.

What are the opportunities for dredging work?

- Remove material to restore original water flow / movement.
- Use dredged material to restore shallows
- Create new wetland areas
- Creating new habitats for fish and or wildlife
- Removing invasive and/or encroaching vegetation
- Create channels for recreation / education / efficient in-flow and out-flow.

Wetland Rehabilitation and Restoration

How is it typically funded?

Federal

- Deep Horizon Administrative and Civil Penalties(through the RESTORE Act)
- US Army Corps of Engineers
- National Fish and Wildlife Service
- US Department of Agriculture
- US Environmental Protection Agency (EPA)

State

- State Fish and Wildlife Services
- State Department of Natural Resources

Private

- National Audubon Society
- Ducks Unlimited
- National Wildlife Federation
- Large Corporate Clients for “Wetland Credits” – Mitigation Banking

Wetland Credits / Mitigation Banking

According to NMBA (National Mitigation Banking Association), mitigation banking is defined as “the restoration, creation, enhancement, or preservation of a wetland, stream, or other habitat area undertaken expressly for the purpose of compensating for unavoidable resource losses in advance of development actions, when such compensation cannot be achieved at the development site or would not be as environmentally beneficial.”

For more information:

- <https://www.epa.gov/cwa-404/mitigation-banking-factsheet>
- <http://mitigationbanking.org/>

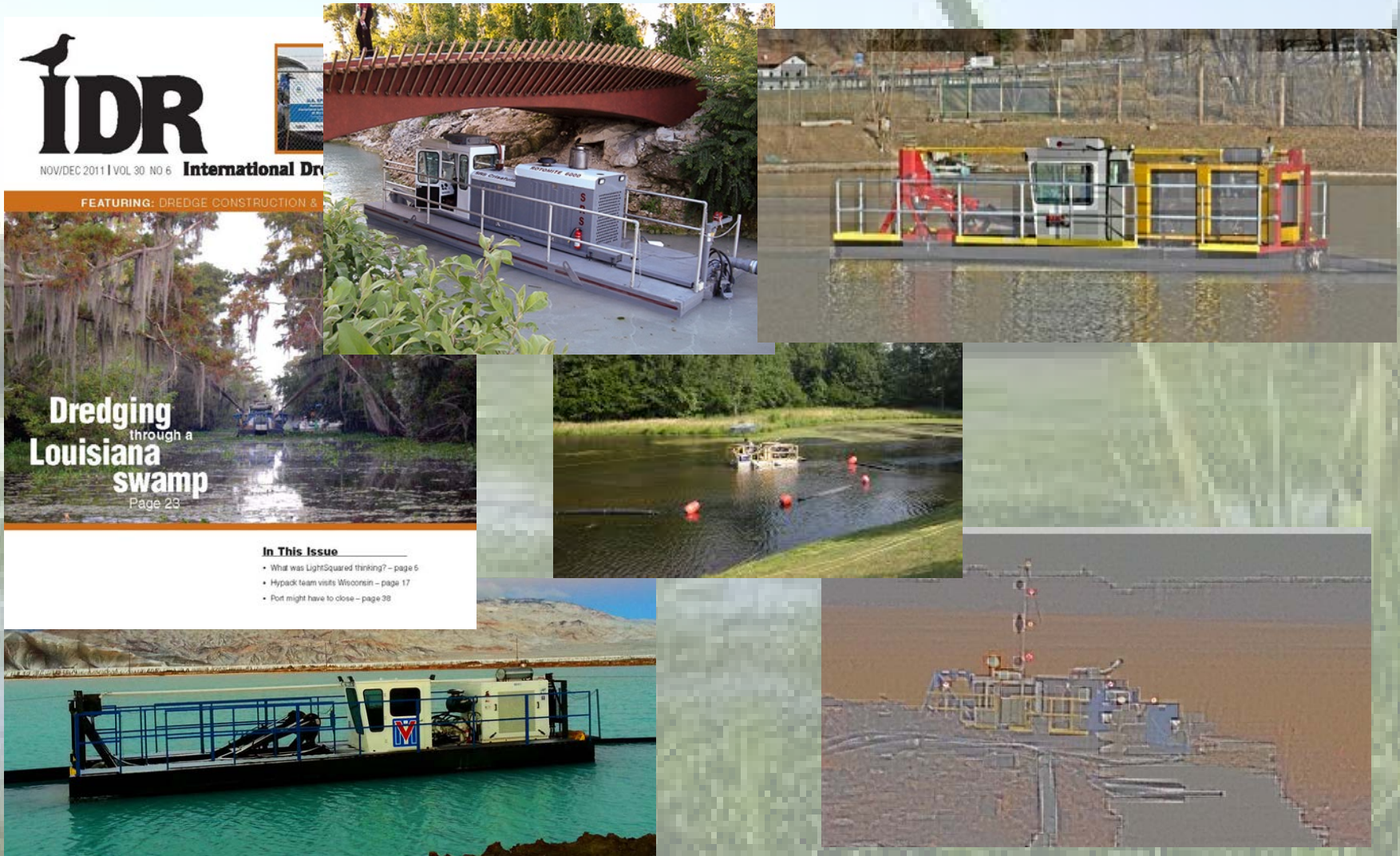
Wetland Rehabilitation and Restoration Dredging Equipment Options

- Traditional Cutter-Suction Dredges
- Horizontal Cutter Dredges
- Mechanical Dredges
- Multi-Function Dredges

Traditional Cutter-Suction Dredges In Wetland works



Horizontal Auger Dredges in Wetland works



Mechanical & Multi-function Dredges In Wetland works

Mechanical



Multi-function



Other options and equipment used in Wetland works.



WETLAND DREDGING PROJECTS



Delaware Department of Natural Resources and Environmental Control (DNREC) Wetlands of Pepper Creek



DNREC in conjunction with the Center for Inland Bays were able to successfully demonstrate a wholistic approach to dredging by using the material dredged from the adjacent channel to help restore the Pepper Creek Wetland

The dredge pumped 3,000 GPM at 10-15% solids-volume through a specially designed high pressure nozzle that was mounted on a small barge. Slurry was pumped onto the wetland to a maximum of a 6 inch layer. This project improved boater safety, preserved wildlife habitat, restored critical wetlands and improved water quality.



Mitchell Marine Jean Lafitte National Park



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FEATURING: DREDGE CONSTRUCTION & REPAIR Page 6



In This Issue

- What was LightSquared thinking? – page 6
- Hypack team visits Wisconsin – page 17
- Port might have to close – page 38

Mitchell Marine under OTAK Group, Inc. dredged almost 3 miles of the Kenta and Bayou Coquille Canals. They were clearing years of accumulated silt and detritus to restore the proper hydrology and for improved public use.

Equipment: IMS 5012 LP, marsh buggy and a small barge with high pressure pumps to flatten any build-ups of mud on the banks.

The project removed 16,500 cubic yards of material, reopened the canals for public use and provided additional flood plain to help protect new Orleans.

Dredge America

Prime Hook National Wildlife Refuge



Dredge America through AMEC working on the Prime Hook Wetland Restoration project – currently in progress. This project is designed to restore the badly damaged 4,000 acre tidal wetland. It will restore the migratory bird habitat and improve flood water capacity.

The total project consists of over 30 miles of canal dredging and shoreline restoration. This will greatly improve tidal flows for the marsh areas which will also help eradicate the invasive phragmites that have begun inundating the wetland.



Seabed Services

Slevdalsvann Nature Reserve



Slevdalsvann is a natural part of the internationally important wetland system Lista, and is a central location for migratory bird species. Slevdalsvann has been lowered and drained several times in order to acquire agricultural land. Overgrowth of phragmites has resulted in its reduction to just 2 hectares of exposed water. The restoration comprises 14 hectares of new water surface in the form of dams and canals.

Work was completed with excavators, tractor and trailers and a horizontal cutter dredge.



JND Thomas Goose Island Marsh



Photo above from Gulf of Mexico Foundation - <http://www.gulfmex.org>

JND Thomas dredged over 45,000 cubic yards to create “marsh mounds”. The project created 22 acres of new marsh lands. 17 acres planted and 5 acres open water . It resulted in improved water quality and new fish and wildlife habitat as well improved boat safety and recreational use.



Photo to right from <http://www.jndthomas.com>

Thank you for your time and attention!

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