

U.S. Fish & Wildlife Service

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# Detroit River

## *International Wildlife Refuge Grassy Island Update*



*Grassy Island in 1962 showing the first perimeter dike constructed to contain contaminated sediments. USFWS*

*Grassy Island is a 72-acre island in the Detroit River that was used from 1961 to 1982 to contain contaminated sediments dredge primarily from the Rouge River. Approximately three million cubic yards of contaminated sediment were disposed on Grassy Island. In 1961, Grassy Island became part of the National Wildlife Refuge System and is now part of the Detroit River International Wildlife Refuge. The U.S. Fish and Wildlife Service (Service), as owner of the island, has been working with federal and state agencies, and interested nongovernmental organizations, to investigate the nature and extent of contamination on Grassy Island and identify a remedy that would meet federal and state regulatory requirements, and meet the Service's responsibilities for protection of trust resources.*

*Since 2004, federal and state agencies, and other organizations, have collaborated to share information, cooperatively complete necessary investigations, and begin conceptual design to address contamination at Grassy Island. The purpose of this Grassy Island Update is to help keep interested individuals and organizations informed of progress.*



*Grassy Island in 2013 showing its current state following disposal of three million cubic yards of contaminated sediment, installation of monitoring wells, and a geotechnical investigation. USFWS*

## Status

Grassy Island is considered a “federal facility” under the Federal Facilities Act, requiring cleanup and containment. Regulatory oversight rests with the Michigan Department of Environmental Quality. The presumed remedy for Grassy Island is containment of contaminants, including a cap. Currently, Grassy Island has a concave shape, like a bathtub, that retains water and promotes infiltration. Agency partners have collaborated on investigations to better understand the severity and geographic extent of contamination, the potential for contaminant movement into the Detroit River, and potential ways and means of controlling these contaminants and minimizing risk to human and ecological health. Conceptual designs being considered include changing the shape of the island from concave to convex and capping it to promote runoff and better control infiltration and ponding.

Since 2004, the Service has received approximately \$3.5 million to: coordinate remedial activities with state and federal regulatory agencies; perform sediment characterization; undertake a preliminary assessment and site inspection; perform a baseline ecological risk assessment; conduct groundwater monitoring; complete geotechnical work related dike integrity and stability and contaminant pathways and movement; and develop conceptual design alternatives for possible remedies. It should be noted that this is the minimum, necessary, sufficient, and feasible approach to completing the investigative phase. The work plan for this phase was developed by experts from the Bureau of Reclamation, with input from the Service, Michigan Department of Environmental Quality, U.S. Geological Survey and the U.S. Army Corps of Engineers. Additional information is available at: [http://www.fws.gov/refuge/detroit\\_river/refuge\\_units/grassy\\_island.html](http://www.fws.gov/refuge/detroit_river/refuge_units/grassy_island.html)

## Geotechnical Investigations

The Bureau of Reclamation and Bayshore Contractors completed a geotechnical investigation at Grassy Island for the Service in the fall of 2010. Findings from the 2010 field investigation greatly improved understanding of the seepage and strength characteristics of the materials contained within Grassy Island, as well as the perimeter dikes. The Bureau of Reclamation’s subsequent geotechnical assessment of the island’s stability identified the need for additional in-situ and laboratory strength data to better characterize

the foundations strength, especially on the east side of the island where the slopes extending below the river level are the tallest and steepest. The Bureau of Reclamation, Bayshore Contractors and O’Brien and Gere completed a supplemental geotechnical investigation in April of 2014. The 2014 supplemental investigation included drill holes along the eastern side of the island to better understand strength of the foundation soils and test pits within the islands interior to assess the composition of the dredge sediments and to evaluate their suitability for use as a grading material to improve surface drainage.

A system of groundwater monitoring wells was installed during the work in 2010 to determine how groundwater moves within and to the edges of the island. We have now been monitoring groundwater levels for five years and have a good understanding of groundwater elevations across the island and relative to the Detroit River under a wide range of conditions.

The Bureau of Reclamation has utilized the two geotechnical investigation findings to develop conceptual alternatives for addressing contamination on Grassy Island. The alternatives that appear the most feasible involve modifying the topography of the island so that it slopes

from the center to the shorelines to improve drainage and then construction of a clean impermeable cap. The proposed slopes are designed so that water flows off the clean cap to minimize infiltration and thereby seepage from the island. Alternatives for flattening of the perimeter dike slopes and placement of erosion control measures have been developed to improve stability. Several configurations of the island grading and cap systems are being considered.

## Next Steps in the Process

The Service, the Bureau of Reclamation and other partners will be conducting an engineering workshop in March of 2016 to further develop and evaluate the conceptual design alternatives for the presumed remedy of a cap. We will be examining every opportunity for cost savings, including the possible beneficial use of the existing dredged materials as part of the re-grading efforts. The Service plans to complete this work and describe conceptual design alternatives to the public in the fall of 2016.

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### What is a Geotechnical Investigation?

- Studies performed by geotechnical engineers or engineering geologists
- Gather data on the physical properties of soil and rock at a site
- Necessary to design and repair earthworks
- Includes a surface and subsurface exploration of a site
- Involves soil sampling and laboratory tests of the soil samples retrieved

### Conclusions of the Grassy Island Geotechnical Investigations

- The dredge material has low permeability, especially in lower layers, so any seepage occurring downwards and then laterally to the Detroit River is considered to be relatively slow.
- Regrading of the island with additional fill and construction of a cap is possible and would result in a stable island with a further reduction in seepage by preventing infiltration of water.
- Regrading of the eastern shoreline, which is steeper and taller than the other shorelines, will be necessary to ensure stability during construction of a cap.
- Differential settlement is expected as the existing dredge sediments and foundation soils compress under the load of the grading fill and cap construction. An over-build will be designed to account for the expected differential settlement to maintain the desired slopes for surface drainage.