

Detroit River



International Wildlife Refuge Grassy Island Update- 2017

Grassy Island is a 72-acre island in the Detroit River that was used from 1961 to 1982 to contain contaminated sediments dredged 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 (photo credit: 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 to 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

Conceptual Designs

The Bureau of Reclamation developed conceptual alternatives for addressing contamination on Grassy Island based on previous geotechnical investigations and regulatory requirements. The alternatives that appeared the most feasible involved modifying the topography of the island so that would slope from the center to the shorelines to improve drainage and then constructing a clean impermeable cap. Conceptual designs included combinations of two cap types (7' of clean soil; layered soil and geomembrane) and two sources of material for achieving slopes (on-site reuse; offsite acquisition). Preliminary cost estimates ranged from \$81.5 million to \$120 million.

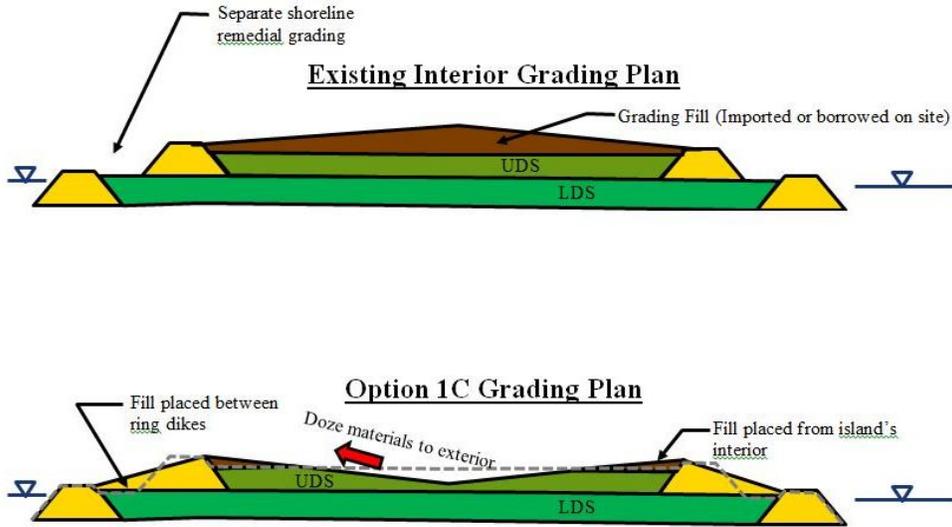
Value Planning Study

The Department of Interior requires a Value Planning Study (VPS) be conducted for all projects with an expected cost exceeding \$10 million. The VPS was held to identify potential improvements to the previously developed conceptual designs and to identify new alternatives or alternative concepts that will add project value and/or provide cost savings. The VPS was held in March of 2016 at the Service’s East Lansing office and included team members from the Service, Bureau of Reclamation, Army Corps of Engineers, and the Michigan Department of Environmental Quality. The VPS team listed dozens of potential concepts. Through a screening process, eight key concepts were developed further and recommended for consideration during future design phases. The key concepts are summarized in the table below.

Text box: Brief overview of 8 concepts evaluated through the remedial investigation.

Changes to Original Conceptual Designs	Description	Potential Cost Savings and Value Added
Concept 1: Grading Plan Optimization	Grading is required in advance of cap construction (regardless of type) to provide positive drainage and a stable base. This concept describes additional grading options that should be considered during future design phases that have the potential to minimize required earthwork prior to cap construction.	\$\$
Concept 2: Evapotranspirative Cap Design	This concept describes an alternative cap design to minimize material volumes, reduce construction costs, reduce long-term vegetation control and management, and enhance habitat value.	\$
Concept 3: Potential Inexpensive Material Borrow Sources	This concept identifies potential sources of inexpensive off-site borrow from which materials can be obtained to amend grading earthfill requirements and to construct an acceptable cap.	\$\$
Concept 4: Alternative Shoreline Stabilization and Enhancements	This concept describes alternative shoreline stabilization and enhancements that would provide more ecological value than riprap while still providing cost-effective shoreline stabilization.	#
Concept 5: Removal and Treatment of Contaminated Pore Water in Advance of Cap Construction	This concept includes measures that could be used to dewater the upper dredged sediments so they can be used as part of the interior grading plans (Concept 1). Environmental requirements will dictate the treatment of the water prior to discharge to the Detroit River.	#
Concept 6: Perimeter Containment Wall	This concept describes alternative containment wall designs to limit lateral releases of contaminants and allow for a less robust cap.	\$\$
Concept 7: Interim Actions	This concept explores whether certain actions might be taken prior to full remedial design and funding to reduce receptor exposure, reduce seepage, and stabilize the island's shorelines.	#
Concept 8: Alternative Island Removal Methods and Sequencing	This concept includes alternative methods for removal of the Grassy Island dredged sediment materials for containment at an off-site containment facility.	\$

Notes: \$\$ indicates potential cost savings in the millions, \$ indicated potential cost savings in the thousands, # indicates no cost savings but improved project value/function.



Schematic of grading plan that would provide positive drainage and a stable base.

Note: Dashed line indicates existing ground surface

Groundwater Monitoring Well Data Recovery

Forty groundwater monitoring wells were installed at Grassy Island during the 2010 geotechnical investigation. Electronic data loggers were installed in each monitoring well. The expected battery life for the data loggers is about five years. The data loggers were recovered by the Service and the Bureau of Reclamation in June 2016. Data were collected from October 2010 through June 2016. These monitoring well data have been used to better understand the groundwater level response to seasonal precipitation and changes in the Detroit River level, aid in geotechnical analysis, and to develop dewatering and earthwork grading plans. The monitoring wells will continue to be used in support of future design phases and preparation for remedial work.



Josh Eash (USFWS) and Richard Kelsic (Bureau of Reclamation) retrieving data-loggers from monitoring wells on Grassy Island on June 22, 2016 (photo credit: Lisa Williams, USFWS).

Next Steps in the Process

The Service, with support from the Bureau of Reclamation, will consult with Michigan Department of Environmental Quality, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and others on next steps in the process. The Service will work with regulatory partners to further evaluate conceptual design alternatives to meet regulatory requirements for the presumed remedy of a cap. We will be examining every opportunity for cost savings, including the possible beneficial use of dredged material where dredged sediments could be placed on Grassy Island as part of the re-grading or even part of a clean cap.

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