

Dredge Today, Restore Tomorrow

by

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How do wetland restoration/creation projects get started? What are some of the factors that limit the success of a wetland restoration? Through the following exercise, you will learn more about what goes into the planning process of a wetland restoration as well as why people with different backgrounds and interests need to be incorporated into the planning process to restore a wetland. By the end of this case study, you should understand that ecosystem restoration and management involves *many* people with *many* different interests.

General Background

Over time, waterways can become shallow due to sediment accumulation in shipping channels and harbors, making it difficult for ships to travel. Dredging involves the removal or excavation of material from the bottom of channels and is necessary to provide safe passage for commercial ships and recreational boating. Once the sediment is removed from the bottom, it has to be placed somewhere. Historically, the sediment was not considered a resource and was simply placed back in the water at another location or pumped onto land. Dredged material has been erroneously called “spoil” for years. This gives the impression that it is bad and cannot be used for any purpose. To the contrary, dredged material is the topsoil from our yards, roadways, and vacant lots that has been washed into the waterway.

Topsoil is the top layer of soil from yards, farms, and natural areas where plant roots grow, organic matter decomposes, and nutrients are released and stored. Upon entering the waterway, it is separated into components, with the heavier sand and gravel settling out first, the medium sized particles settling next, and the fine grained materials and organic materials settling last.

Dredging our nation’s waterways while simultaneously protecting the environment is now common practice. Dredged material is often “recycled.” This recycling or “beneficial use” of dredged material can include re-nourishing beaches and coastal wetlands, restoring seagrass beds, and creating wetland habitat. Beneficial use of dredge material is made when dredge material from nearby construction or maintenance projects is deposited in coastal areas where fill is needed to counteract the effects of subsidence (i.e., downward shift of the Earth’s surface) and/or erosion. Dredge material is usually broadcasted as wet slurry across an area until the desired elevation is achieved (i.e., accurate elevation for survival of emergent plants). Once the dredge material settles, seedlings are planted to encourage re-vegetation of native plants as habitat for coastal wildlife. Using dredged material beneficially is not only good stewardship of the environment, it is also economically beneficial, and may reduce costs for industrial dredgers—commonly the government.

Unfortunately, the beneficial use technique may not always be a favored solution. The Clean Water Act requires an environmental evaluation of dredged material prior to discharge or impacting the waters of the United States. Remember



Maryland Port Administration, http://www.mpsafepassage.org/placement_n_use.html

where these sediments are coming from—the bottom of the harbors and waterways nearest to our largest urban centers. Before using dredge material for new habitat, a contaminant study must be performed. Contaminant studies include chemical analyses, bioassays, and bioaccumulation tests to determine if toxins are present in the material. In addition, analyses determining the soil texture are often done to ensure that the dredge material will provide a substrate with enough organic and mineral components to facilitate the growth of native vegetation.

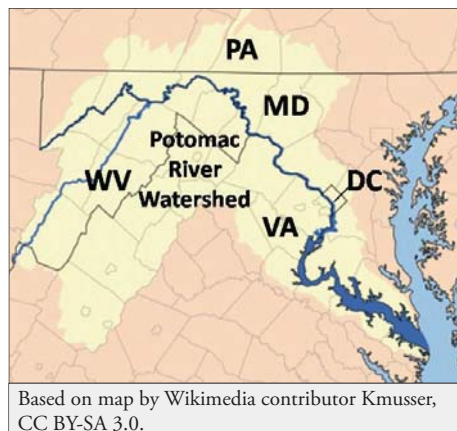


U.S. Army Corps of Engineers, Baltimore District. Poplar Island.

The Scenario

The Potomac River begins in the Appalachian Mountains of western Maryland, flows through Washington, DC, and Virginia, where it then enters the Chesapeake Bay—the nation’s largest estuary on the east coast. There is regularly scheduled dredging of the Potomac River to ensure that shipping traffic can reach the ports through DC and upriver. This reach of the Potomac River (around Washington, DC) is tidal, but freshwater. After hearing of the success others were having in Louisiana and Texas with the beneficial use technique of dredge material, the U.S. Army Corp of Engineers (USACE) initiated a partnership with the National Park Service (NPS) to create new wetland areas with the spoils from a mandatory scheduled dredging operation on the Potomac River.

In order to ensure a wetland is created that not only looks appealing to the many recreationists in the area but also functions properly, the Director of NPS has assembled a task force to identify an ideal location for creating a wetland with the dredge material from the Potomac River. Scientists have determined that the dredge material is suitable for creating wetlands, and the task force has identified five different placement locations for the dredge material to create new wetlands. Now, the members of the task force must work to investigate all possible avenues for wetland success and failure at each location, and then come together as a group to propose the recommended location to the NPS Director.



Based on map by Wikimedia contributor Kmusser, CC BY-SA 3.0.

Assignment Overview

The class will be split into task force groups that contain five members each. In every task force group, each student will be assigned a dredge placement location to investigate.

Activity 1 – Research

Using the information in the handout on your location, students assigned the same location will work together to identify all possible pros and cons of the location to be used for wetland creation. Topics you could address in your group include:

- *Hydrology*—What would the water budget of this location look like? Specifically, what are the inflow sources and how would water flow out?
- *Soil*—How would the substrate of the dredge material match up with the substrate currently found at the proposed location? Specifically, is the source (dredge) material from close proximity to the site material? (Remember from the background information you read that dredge material comes from the areas running off into the waterway.)
- *Nutrients*—Are nutrients being flushed into and out of this location to support plant life? Is there potential

for this site to become a source of nutrient pollution?

- *Biota*—What types of plants would thrive in this location and what animal species would subsequently live there? Specifically, are there marsh areas nearby to provide source seed and animals? Are there invasive species in the area that would dominate the newly created wetland?
- *Social aspects*—Would this location provide recreational opportunities? Would choosing this location destroy any existing recreational opportunities or local livelihoods? What are the current land uses in the area? How would they influence the wetland and how would they be influenced by the wetland?
- *Policy*—Consider political boundaries, both state and local. What role could political boundaries play in decision making?
- *Further information needed*—What additional information is needed on this location to make a sound recommendation?

You are allowed to use the Internet and class notes to look up information on your location, restoration techniques, or to find supporting documentation for your recommendations. *60 minutes*

Activity 2 – Presentation

One at a time, each group will present the pros and cons of their assigned location, conclude with their recommendation on whether or not that site should be considered, and then answer questions from the other group members. After all the locations have been presented to the class, each task force must choose what they think is the ideal location to recommend to the NPS Director. *60 minutes*

Activity 3 – Recommendation

Each task force will produce a concise 1- to 2-page letter providing a clear recommendation of dredge placement to the NPS Director (class instructor). The letter should summarize and critically analyze all of the location options and explain why one is recommended over the others. In addition, describe the trials and successes of wetland creation that managers of the recommended location may anticipate. Be creative in your recommendations, but also realistic. After your letter is complete, you will have the opportunity to present your recommendation to the NPS Director and answer any questions from your classmates. Class will end with the story of how this real-life situation was actually resolved. *45 minutes*



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Location 1 – Airport

Along the Potomac River adjacent to National Airport in Virginia

Wetlands along the Potomac River near Washington, DC, are sparse due to the effects of urbanization. National Airport lies along the Potomac River immediately downriver of the Washington, DC, monuments, the White House, and Congress. This created wetland would be in the tidal freshwater range of the Potomac River in a highly urbanized area. The wetland would be placed on the same river where the dredging is taking place.

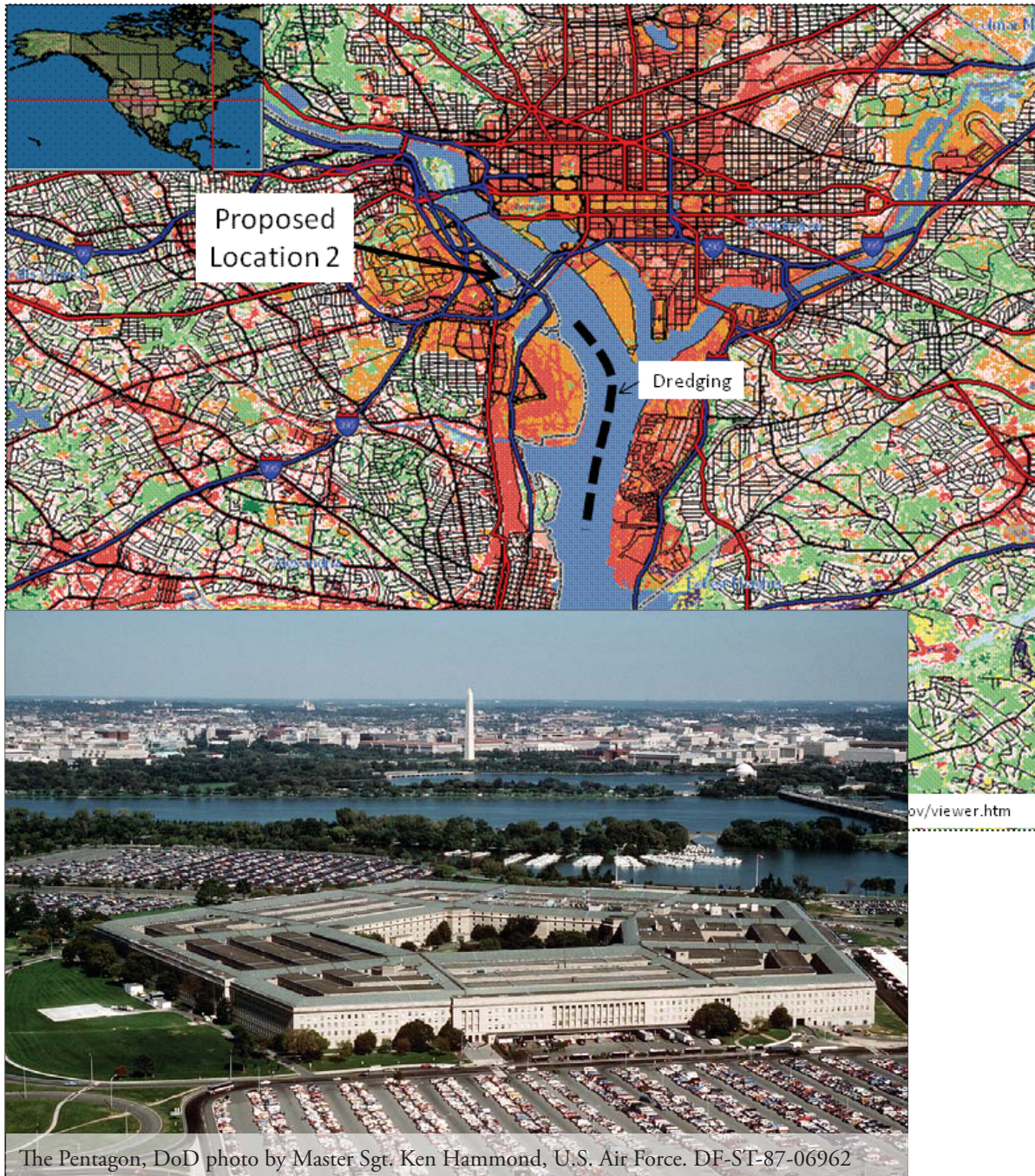


USGS satellite image of Ronald Reagan Washington National Airport.

Location 2 – Pentagon

Along an oxbow of the Potomac River next to the Pentagon

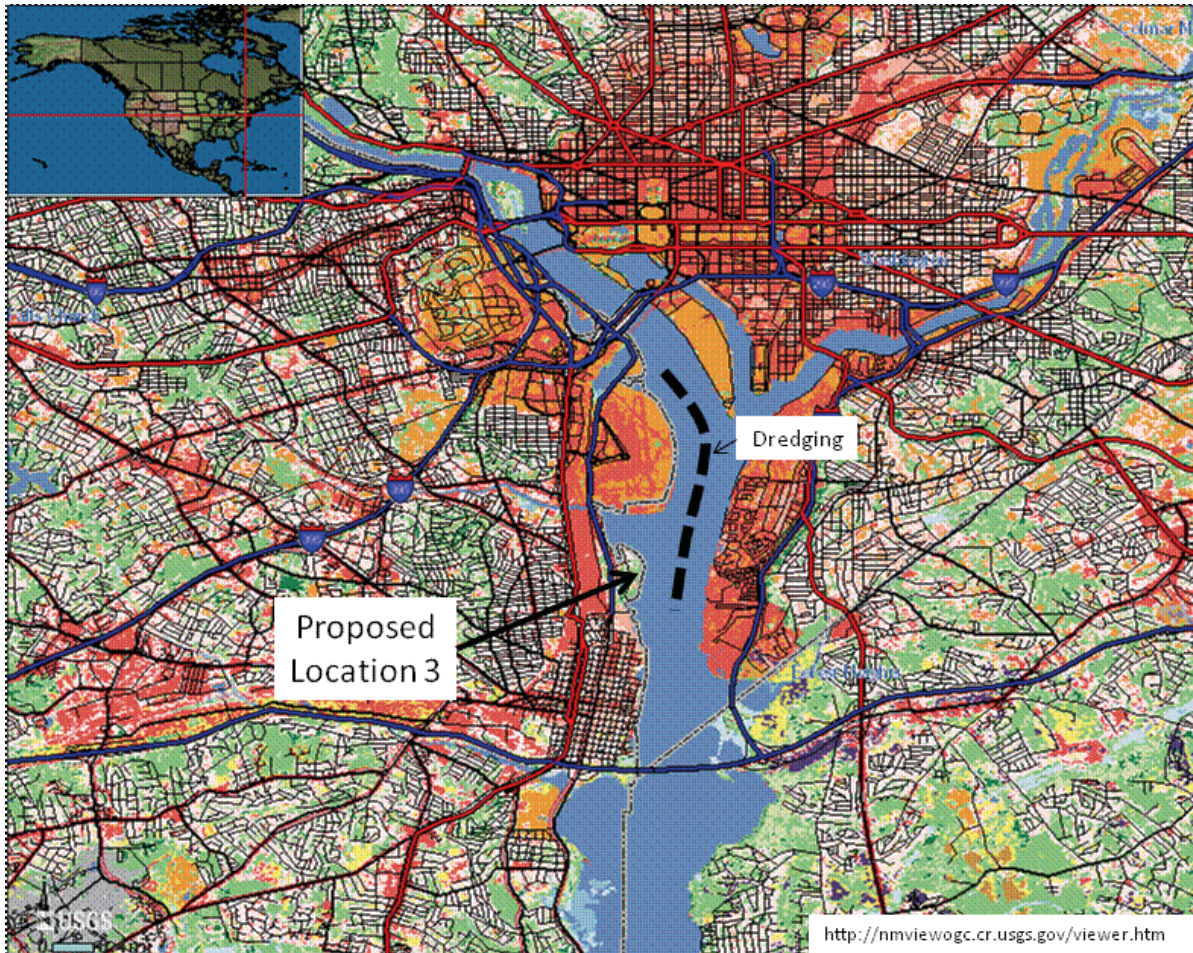
The proposed location near the Pentagon would be on an oxbow (i.e., U-shape bend) of the Potomac River in the tidal freshwater range of the river. This proposed location is in a highly urbanized area. Along with the Pentagon being a high security area, the wetland would also be located near the water-cooling system intake valve for the water supply to the Pentagon. This location is near the original dredging site.



Location 3 – Daingerfield

Daingerfield Island

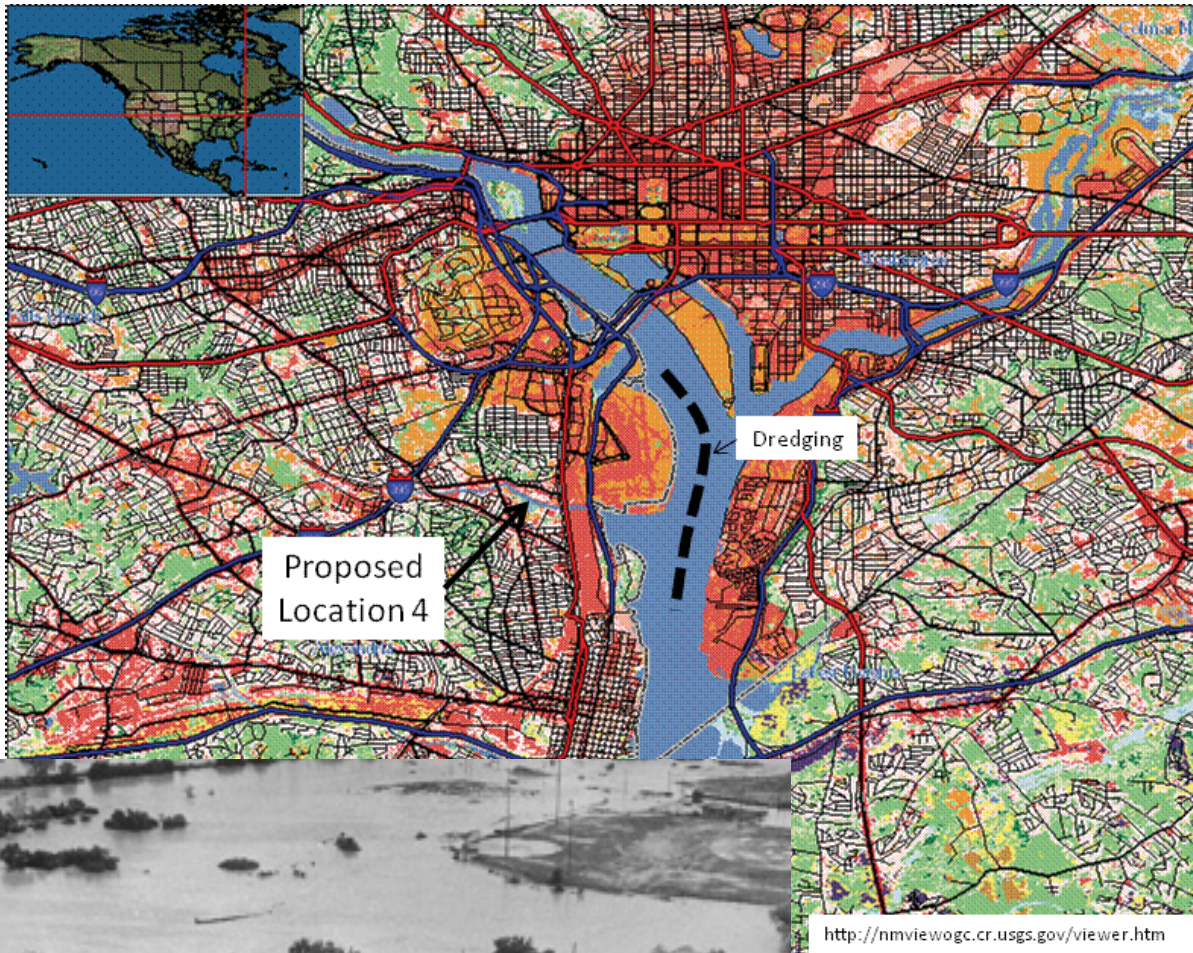
Daingerfield Island lies along the Potomac River directly downriver of National Airport and immediately north of Old-Towne Alexandria, VA. This location is in the tidal freshwater range of the river. The island is heavily used for recreation by trail bikers and runners and fishermen. Much of the small island is covered in forest and also contains a marina. The island is located in a highly urbanized area and near the dredging operations.



Location 4 – Four-Mile Run

Four-Mile Run, Virginia

Four-Mile Run, Virginia, is a waterway highly managed by the U.S. Army Corps of Engineers as a flood control channel to transport water from the urban areas of Arlington and Alexandria, VA, to the Potomac River. Frequent flooding has been and continues to be a common problem in this floodplain urban area along the Potomac River. Four-Mile Run is a freshwater tributary to the Potomac River.

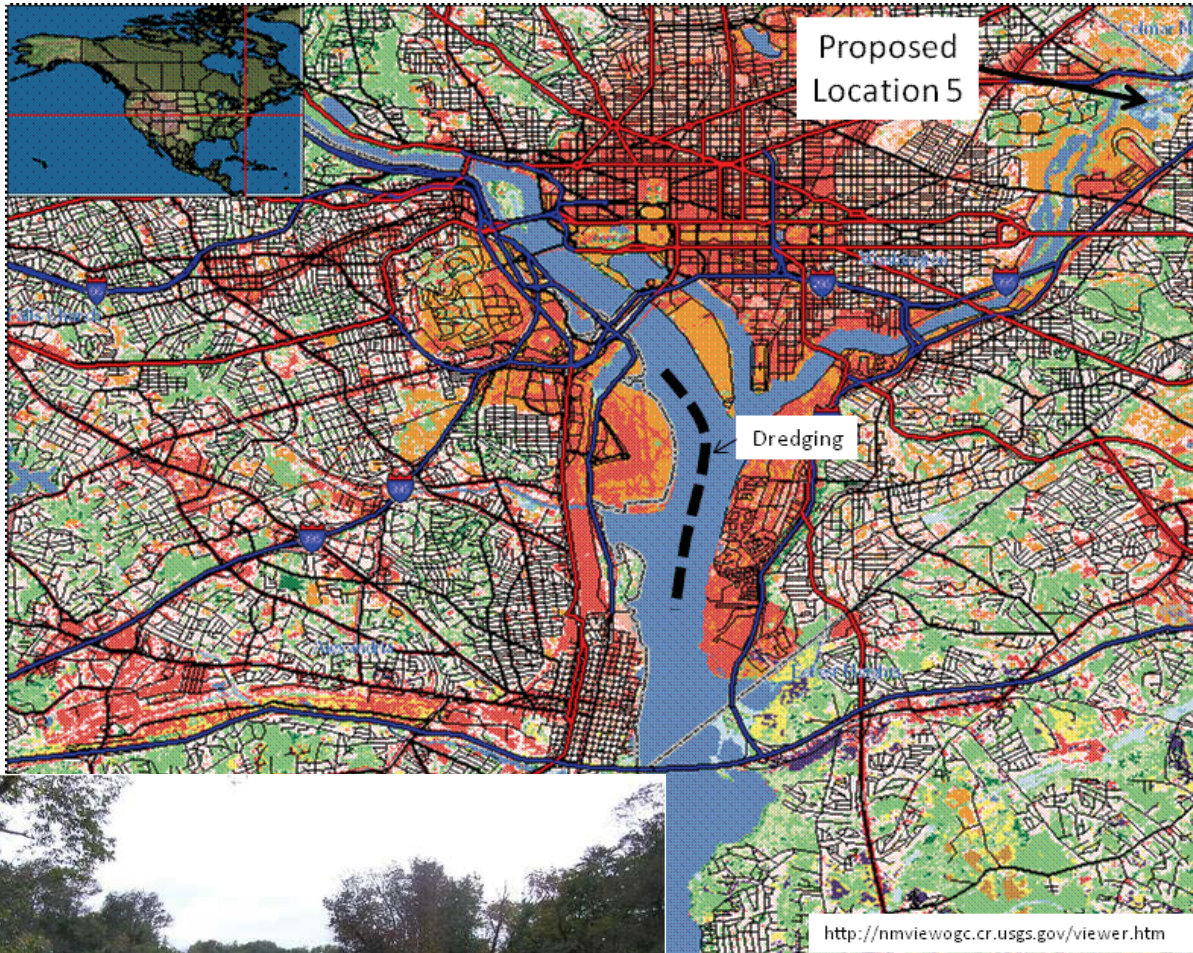


Aerial photograph of Four-Mile Run during a historic flash-flood before flood management control. Photo courtesy of the Northern Virginia Regional Commission. <http://www.novaregion.org/PhotoView.aspx?PHID=1>

Location 5 – Anacostia

Along the Anacostia River in Washington, DC

The Anacostia River is a tidal freshwater river that flows through Washington, DC, and enters the Potomac River just downriver of the White House and across from National Airport. Wetland areas along the Anacostia River have recently been restored and it is thought that the dredge material could add onto the recently restored areas.



Kenilworth Marsh, a successful restoration of a tidal freshwater marsh on the Anacostia River. Area that would be adjacent to proposed dredge material created wetland. Photo taken 2004.

Map of All Five Proposed Locations

Numbers are placed over the proposed location of wetland creation on the map. The numbers correspond with the location handouts above.

- Location 1 = Airport
- Location 2 = Pentagon
- Location 3 = Daingerfield
- Location 4 = Four-Mile Run
- Location 5 = Anacostia

