



Prince George's County, MD Levee Response and Remediation Plan

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Prepared for:
Prince George's County
Department of Public Works
and Transportation



GREENHORNE & O'MARA
CONSULTING ENGINEERS



Project Background

- As a result of the 2005 Hurricane Katrina devastation, Congress directed the U.S. Army Corps of Engineers (USACE) to develop a national levee inventory and program to locate and document the status of levees under federal jurisdiction.
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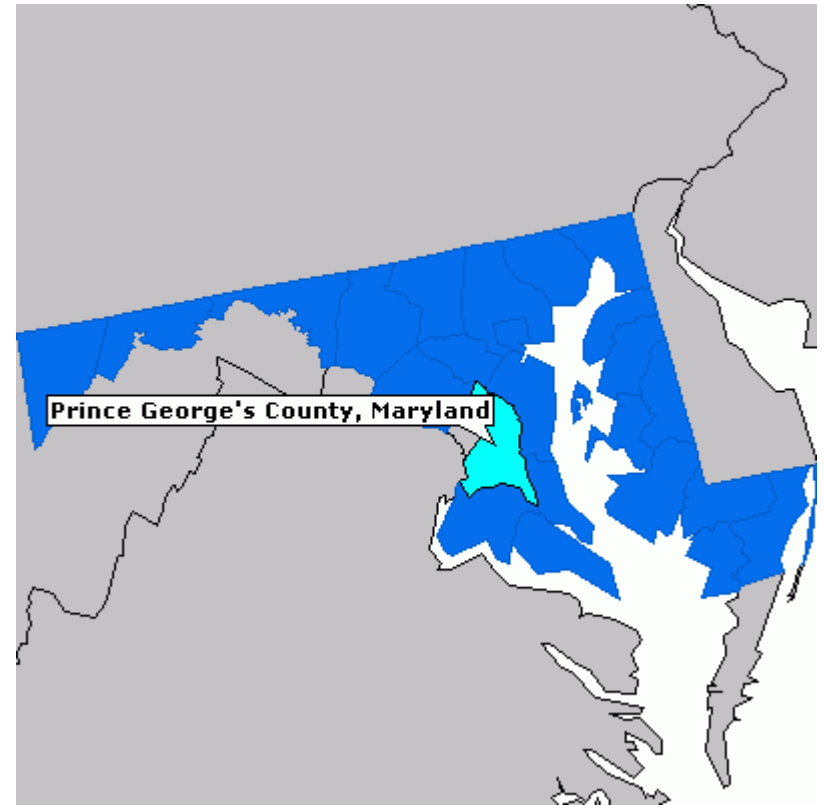
Project Background

- USACE begin a national levee inventory with an initial survey of federal program levees.
 - Three types of levees are included:
 - Federally owned and maintained levees
 - Federally built but locally maintained levees
 - Locally built levee meeting federal standards
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Project Objective

- Prepare a Response Plan to USACE's 2006 Correction Order from the Annual Levee Inspections
- Prepare a Contractor Bid Package to perform Maintenance



Prince George's County,
Maryland



Project Focus

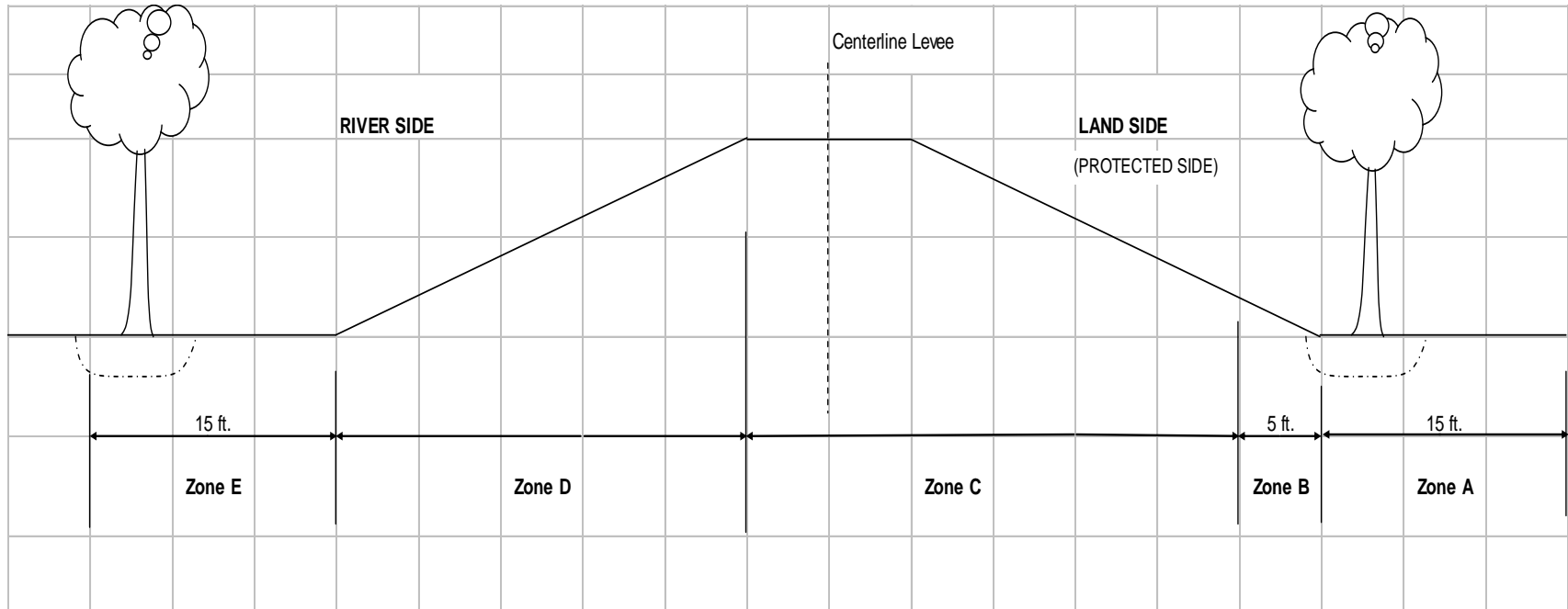
- Levee Maintenance
 - Overgrowth of vegetation
 - Tree growth on levee
 - Erosion
 - Sedimentation
- Stabilization of Levee





Typical Levee Section

- Typical levee section with vegetation treatment zone designations.





Zone Classification

- **Zone A** extends fifteen (15) feet landward of the landside (or protected side) toe of the levee embankment, or to the easement limits if less than 15 feet.[1]
 - **Zone B** extends 5 feet riverward from the landside levee toe. This is a zone of particular concern with respect to seepage discharge and may contain formal levee drainage features such as toe drains or relief wells.
 - **Zone C** includes the landside slope and crest of the levee embankment.
 - **Zone D** includes the riverside slope of the levee embankment.
 - **Zone E** extends fifteen (15) feet riverward of the riverside (or unprotected side) toe of the levee embankment , or to the easement limits if less than 15 feet.
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Tree Removal Methods based on Tree Size and Zones

- Trees Less than 2 inch in diameter
 - Cut Flush to the ground to facilitate mowing
 - Trees between 2 inch and 4 inch in diameter
 - Grind stump to 2 feet Maximum below ground
 - Treatment of the remaining trunk and root system will vary depending upon the location of the tree relative to the levee embankment
 - Trees greater than 4 inch in diameter
 - Grind stump and to about 1 to 2 feet below ground
 - Treatment of the remaining trunk and root system will vary depending upon the location of the tree relative to the levee embankment
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Backfill Material based on Zone

- Zone A and B
 - Material: The fill should consist of PA 2A, VA 21A, or MD graded aggregate base
 - Zone C D and E
 - Material shall consist of impervious fill
 - Moisture content should be in the range of about +/- 2% of optimum.
 - Fill should consist of material classified as CL, ML, CL-ML, SC, or GC with at least 25% fines (<#200 sieve size
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Project Areas

- 3 Major County Flood Control Projects:
 - Anacostia
 - Upper Marlboro
 - Forest Heights

Deficiency Areas





Project Details

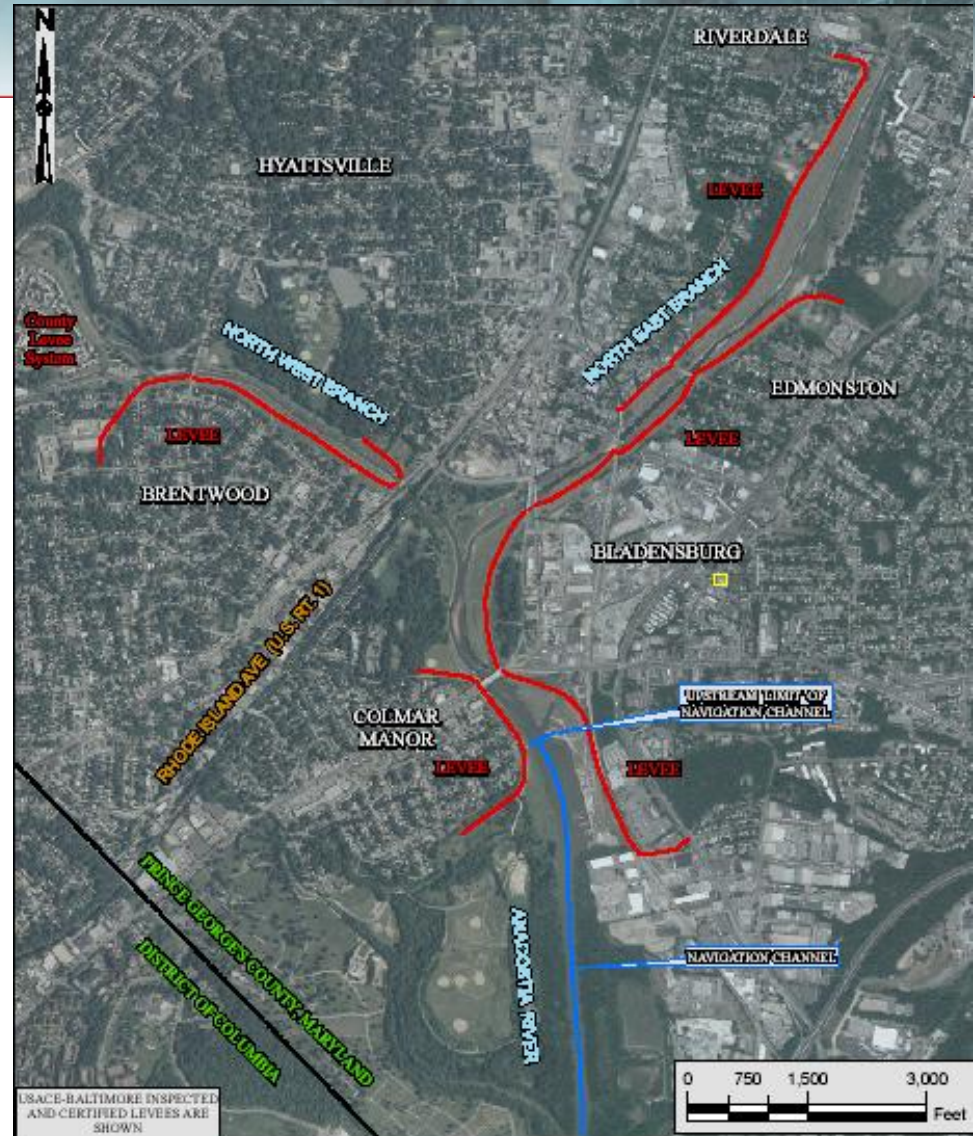
- **Department of Public Works & Transportation (DPW&T)** is the lead governing agency for this project
 - **USACE Baltimore District** is the USACE district responsible for this project
 - **G&O** is the sole contracting firm for this project
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Locations of Levees

10 Levee Segments

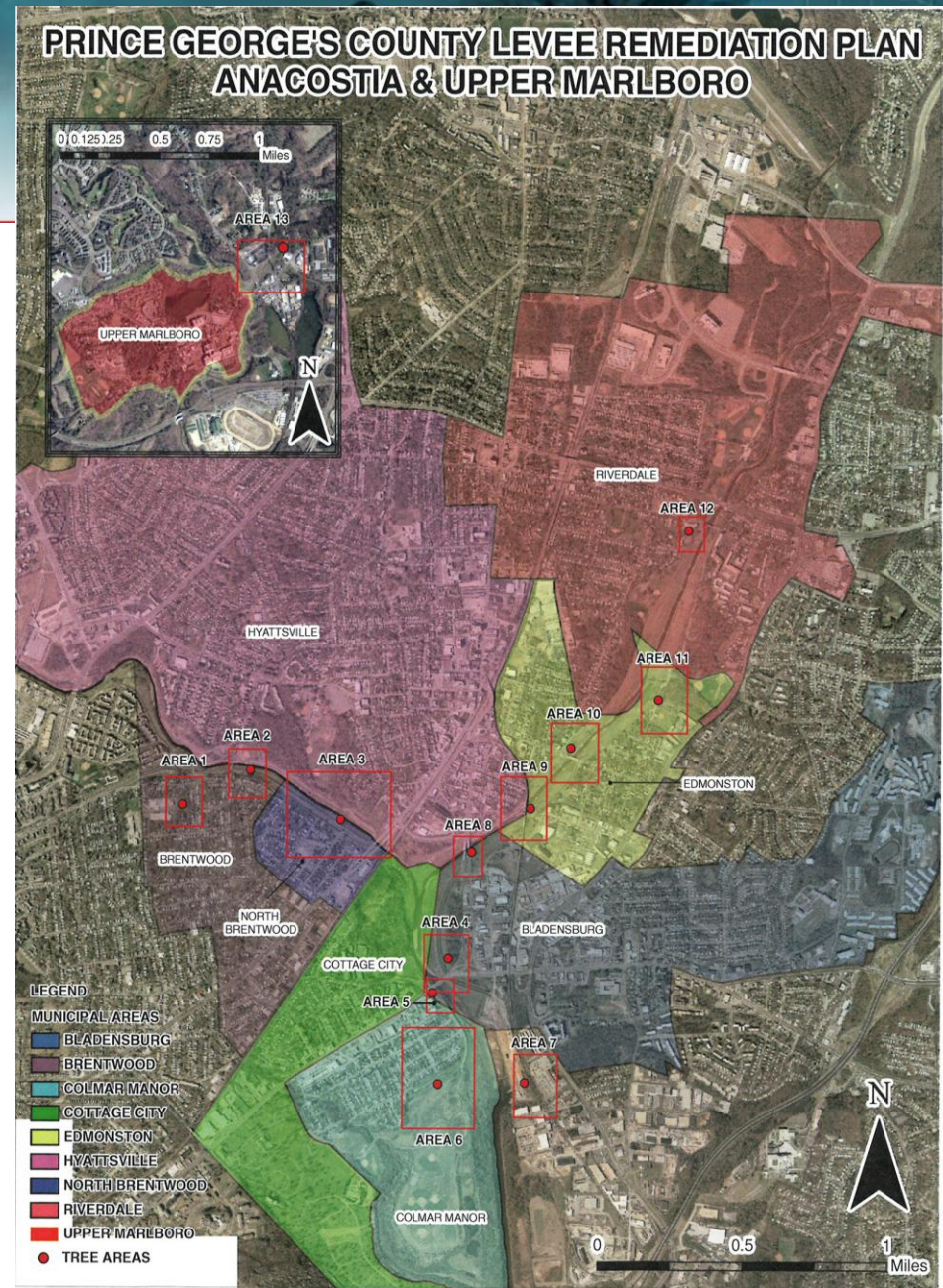
2 Navigation Channels





Remediation Plan: Map of Deficiency Areas

- 13 Areas of Deficiencies
- 9 Municipal Areas





Area Details

**Total Area:
8.23 Acres**

Deficiency Areas	Area (Ac)	Distance to Stream Bank (ft)
Area 1	0.39	400
Area 2	0.04	25
Area 3	0.79	5
Area 4	0.35	50
Area 5	0.48	0
Area 6	3.19	100
Area 7	0.61	300
Area 8	0.29	40
Area 9	1.10	25
Area 10	0.61	10
Area 11	0.22	500
Area 12	0.13	125
Area 13	0.05	0



G&O's Steps to Levee Maintenance Response

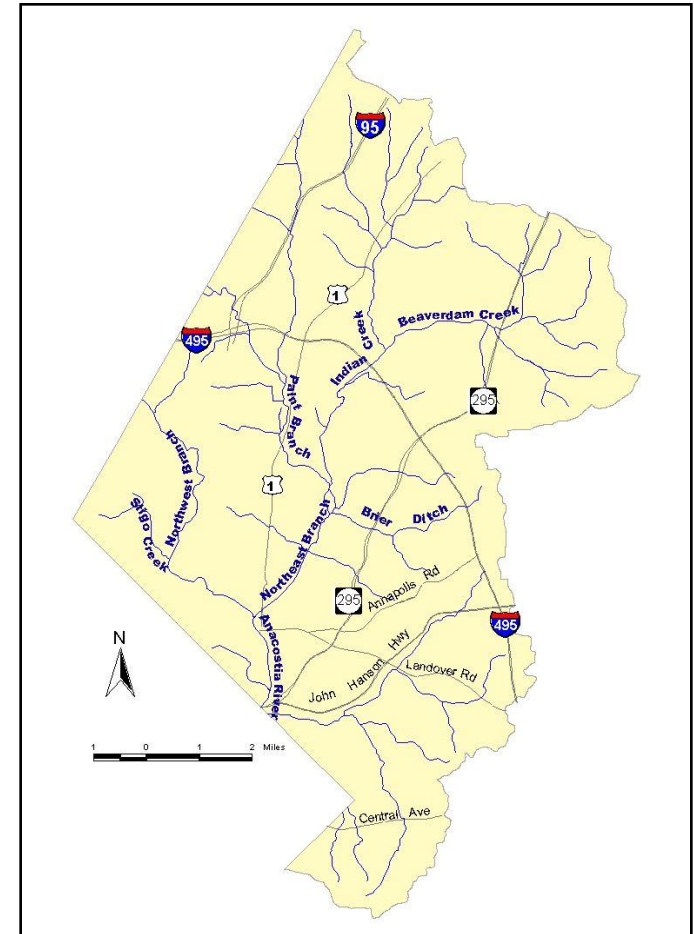
- First Step:
 - Update Current Evacuation Plan
- Second Step:
 - Field Observations
 - Assess/Identify Deficiencies:
 - GPS Use
 - Visual Inspection
 - Photo Documentation





Updates to Current Evacuation Plan

- Prince George's County currently has an adequate Evacuation Plan in effect
 - No Specified Revisions Made Based on Levee Remediation





Deficiencies Identified

- Tree growth on the levee or trees with drip line 15 feet of the levee toe
- Trees along walls of the concrete structures



Tree located within 15 feet of the
Anacostia Levee System



Deficiencies Identified (cont.)

- Erosion
- Rutting
- Settlement
- Deposition



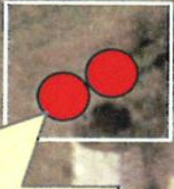
Typical Erosion on the Anacostia Levee



AREA 1

REMOVE ALL TREES WITHIN RED BOUNDARY SHOWN
SEE FIG 1A, 1B, 1C, 1D.
NOTE: TREES OUTSIDE OF BOUNDARY SHALL REMAIN.

REMOVE SELECTIVE TREES WITHIN BOUNDARY SHOWN
See FIG 1D.
NOTE: Trees outside of boundary shall remain.

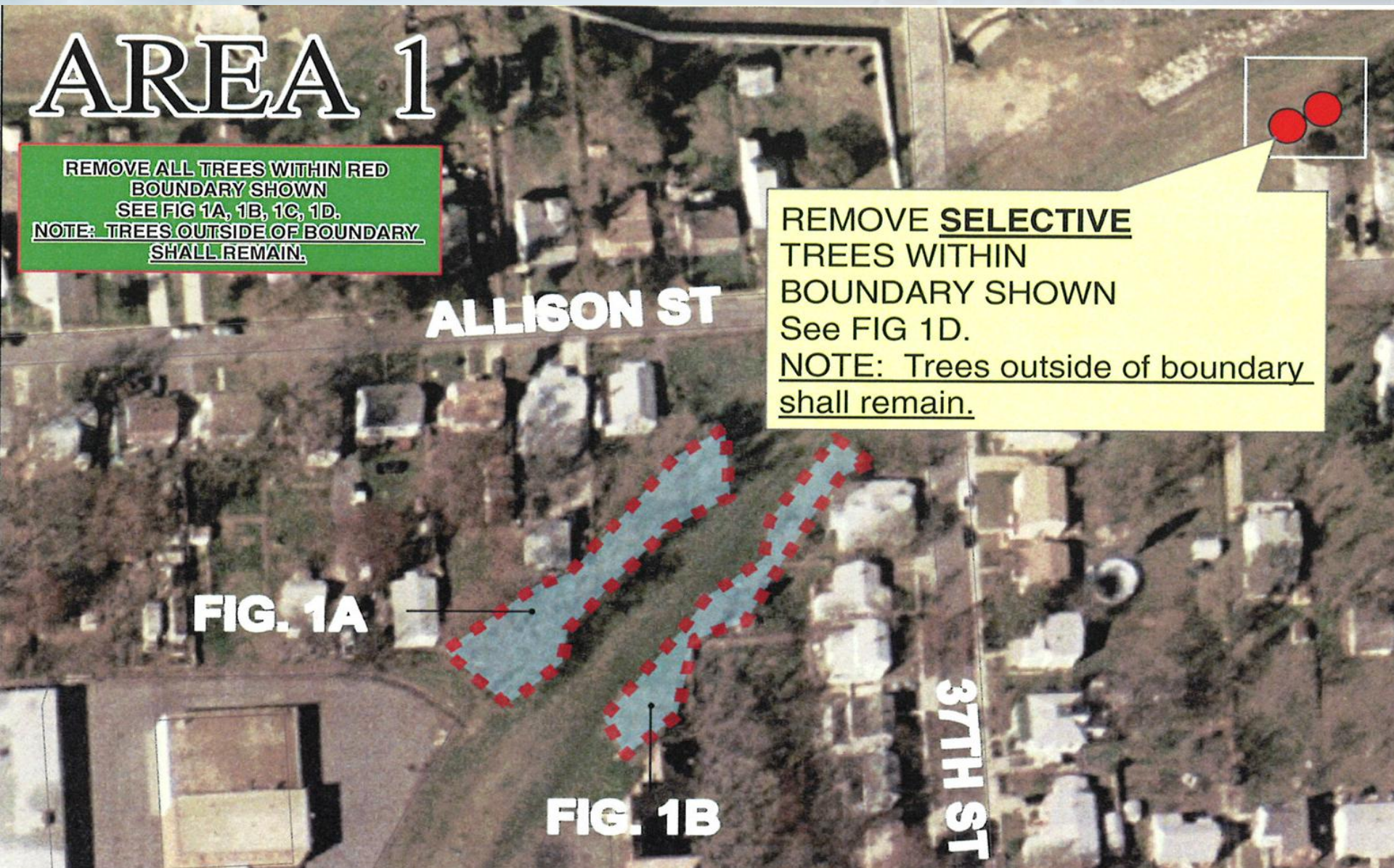


ALLISON ST

FIG. 1A

FIG. 1B

37TH ST





Tree Removal Areas

- Figure 1A





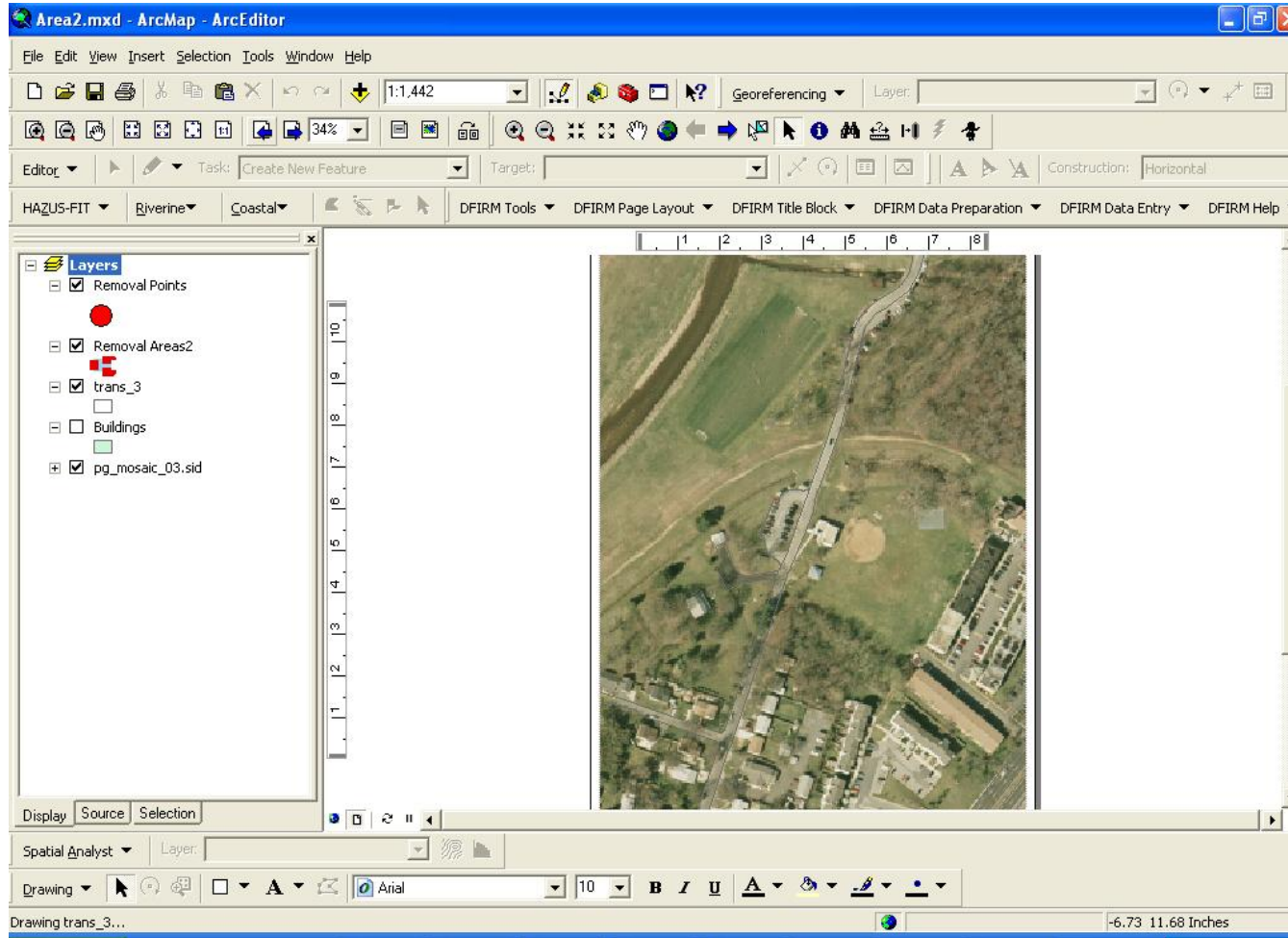
Tree Removal Areas

- Figure 1D





- GIS was used to locate and show deficiencies





Communication Between County Staff and USACE

- A meeting between Prince George's County staff and USACE Baltimore District was held to assess managing deficiency corrections
 - Discuss the findings of the USACE Baltimore District
 - Establish a partnering effort between the USACE and DPW&T to develop a plan to address all items in the inspection report
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Corrective Actions

- Two Phases
 - Phase I
 - Cut all growth located within identified areas to a max of two feet above grade
 - Phase II
 - Remove all tree root balls where the tree trunk diameter is four inches or greater
 - Backfill (overseen by USACE)
 - Fill and stabilize disturbed areas using vegetation
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DEFICIENCY CORRECTIVE ACTION SCHEDULE

CORRECTIVE ACTION	START DATE	COMPLETION DATE
Project Initiation		
Field Identification of Impacted Tress	March 2007	March 2007
Response Plan Prepared and Submitted	March 2007	April 2007
Public Outreach	April 2007	Continuous
Phase I	April 2007	April 2007
Tree Cutting	April 2007	April 2007
Phase II	April 2007	November 2007*
Contract Award	April 2007	September 2007*
Tree Trunk and Root Removal	October 2007	November 2007*
Erosion Stabilization	October 2007	November 2007*



County Public Meeting

- A public meeting was held on June 5 by Prince George's County staff to inform residents of:
 - Identified Deficiencies
 - Correction Activities
 - Goals of the Corrective Action Schedule
 - Hazard Mitigation Initiatives
 - GOAL: Educate the Public
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Outcomes

- Tree Removal Guidelines :
 - Specify tree removal methods based on tree location in relation to levee embankment
 - Specify backfill material and methods
 - Stabilization material and methods
 - Prepare Bid Document
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Conclusion of Project

- All actions have been successfully completed





Outcome

- Prince George's County was very pleased with the outcome and the County has benefitted from these actions
 - Established a successful example of levee maintenance
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