CHESAPEAKE BAY COMPREHENSIVE WATER RESOURCES AND RESTORATION PLAN - UPDATE

Angie Sowers, USACE

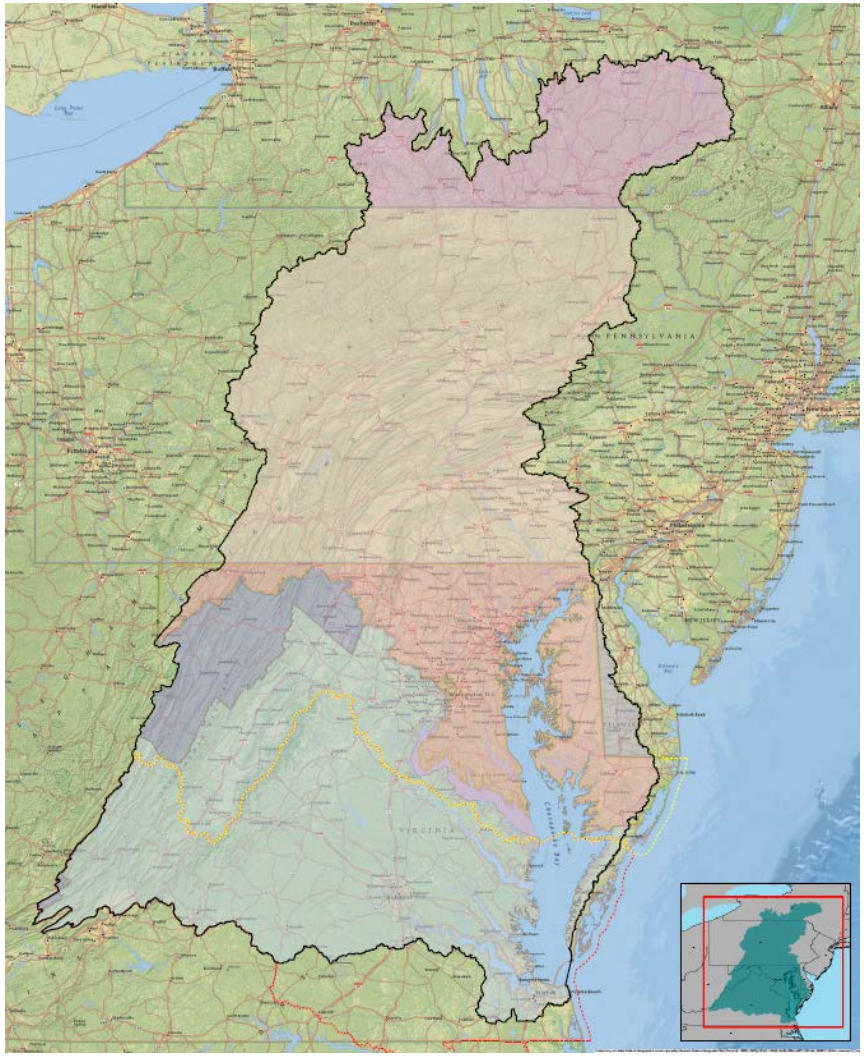
Habitat and Sustainable Fisheries GIT

June 20, 2018

"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."

AGENDA

- Background
- Planning Analyses
- Results
- Findings and Recommendations
- Budget and Schedule
- Next Steps



BACKGROUND - GOAL

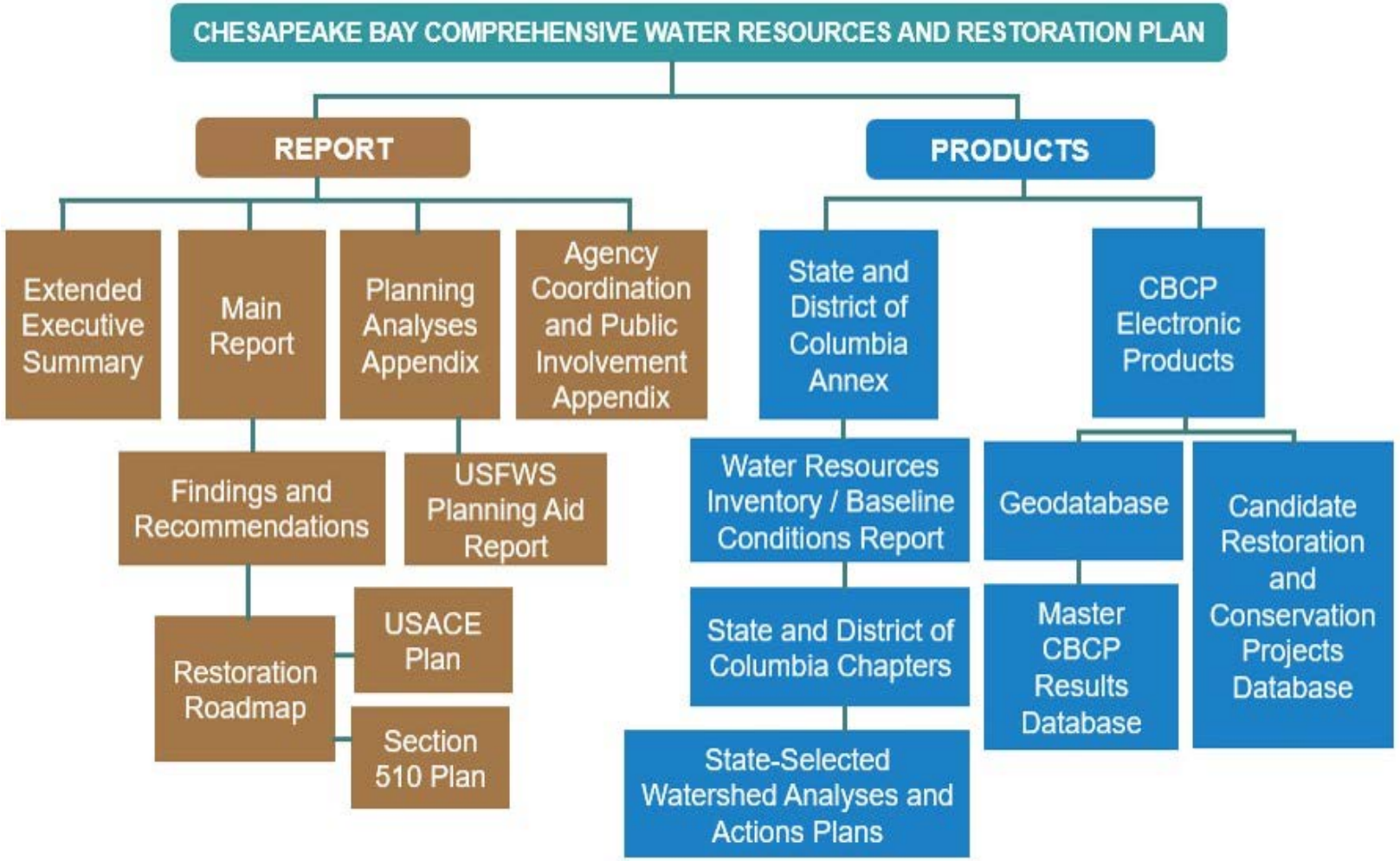
Provide a ***single, comprehensive and integrated restoration plan*** that would assist with implementation of the Chesapeake Bay Agreement by:

- Effectively and efficiently engaging Bay stakeholders to identify problems, needs and opportunities in the watershed and avoid duplication of ongoing or planned actions by others.
- Identifying actions by other federal, state, and local government agencies and NGOs in the watershed to address problems outside of USACE mission areas.
- Determining where and how USACE mission areas could be utilized in the watershed to support the goals of the Chesapeake Bay Agreement.

BACKGROUND - OBJECTIVES

- Develop a comprehensive and strategic, integrated water resources plan to guide the implementation of projects that will assist in meeting the Chesapeake Bay Agreement.
- Identify areas for ecosystem restoration, protection or preservation that will assist in meeting the Chesapeake Bay Agreement.
- Identify at least one project in each state and D.C. that can be considered for implementation or technical assistance by the U.S. Army Corps of Engineers and supports the Bay Agreement.
- Identify new policies or programs or improve upon existing policies and programs that will help achieve an environmentally and economically sustainable and resilient Chesapeake Bay watershed.

CBCP REPORT AND PRODUCTS



PLANNING ANALYSES

US Army Corps
of Engineers
Baltimore District

U.S.ARMY

2014 CHESAPEAKE BAY AGREEMENT

- **Sustainable Fisheries (oysters)***
- **Vital Habitats (fish passage, buffers)***
- Water Quality & Toxic Contaminants**
- **Healthy Watersheds (remote island habitat)***
- Local Governments**
- **Streams and Wetlands***
- Public Access/Work at Reservoir**
- Environmental Literacy**
- **Climate Resiliency (monitoring, assessment, adaptation)***

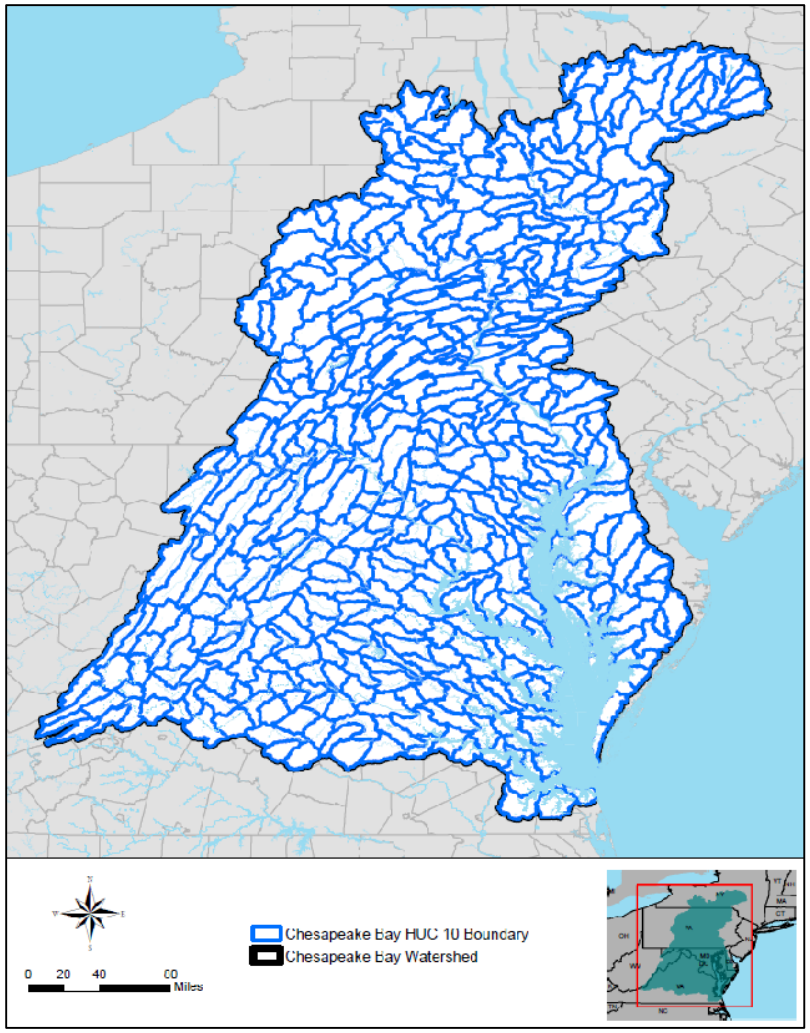
*** Aligns with USACE mission areas for planning, design, construction**

**** Additional opportunity to utilize USACE technical assistance programs**

US Army Corps of Engineers
Baltimore District

U.S.ARMY

MULTI-SCALAR GEOSPATIAL ANALYSES



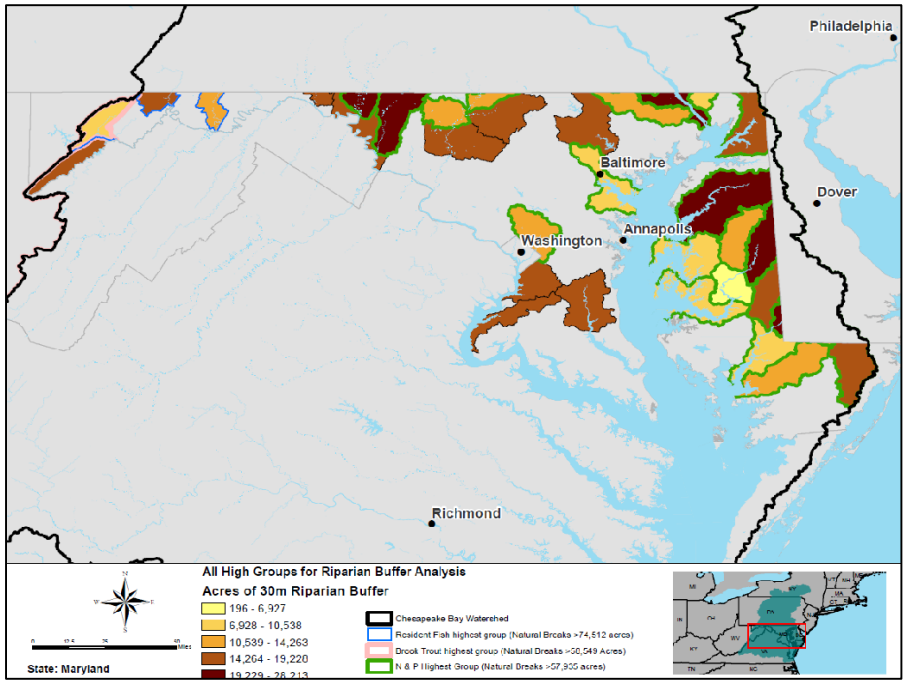
- Baywide *__Roadmap__*
  - Analyses at sub-watershed scale
    - HUC 10
    - 425 sub-watersheds
    - Range in size from 30,000 to 754,000 acres
    - Average size is 103,500 acres
- State
  - Analyses “clipped” to each State and DC for implementation ease
- State-selected watershed
  - One Action Plan completed for each State and D.C.

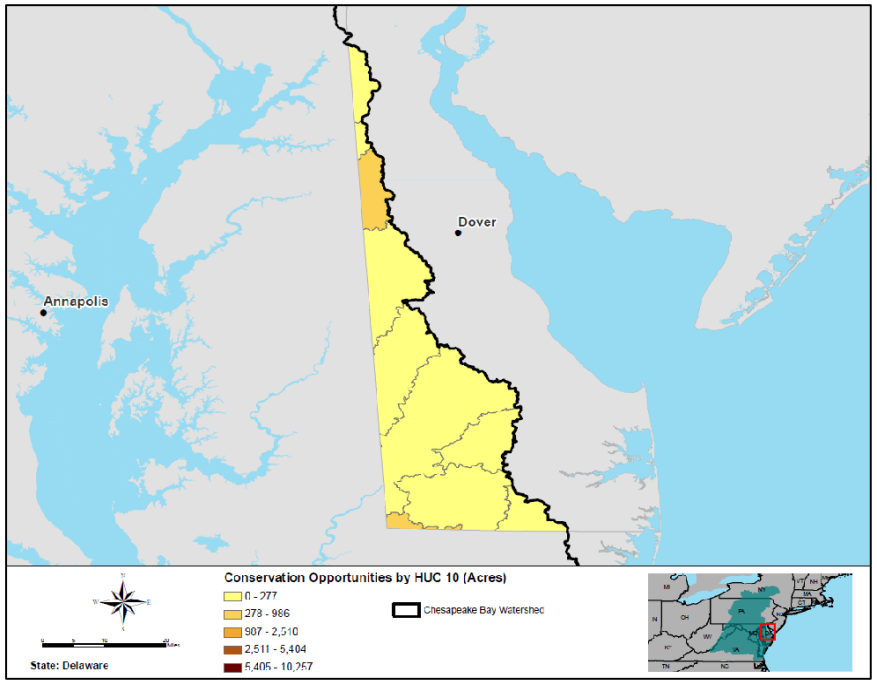
US Army Corps of Engineers
Baltimore District

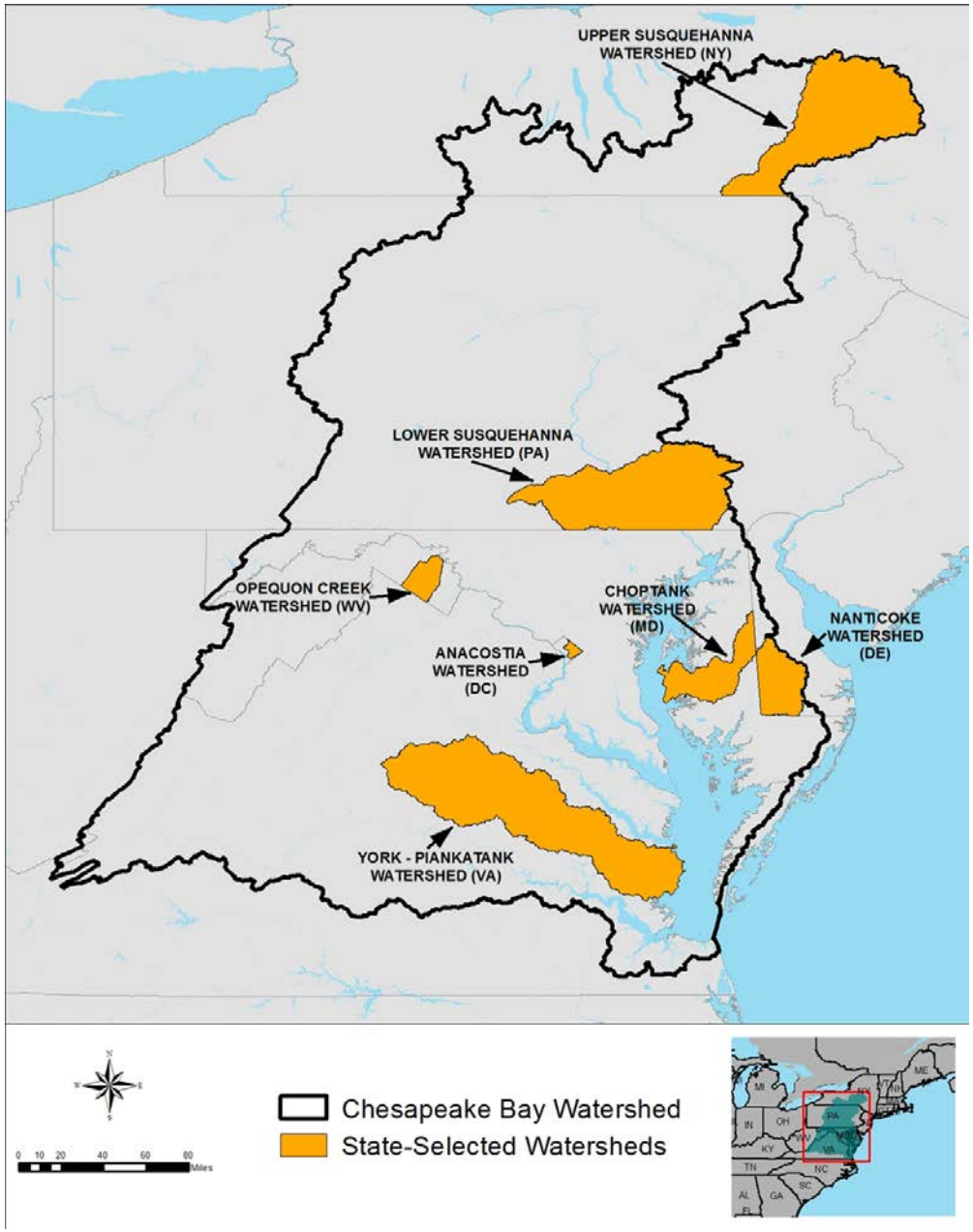
U.S.ARMY

MULTI-SCALAR GEOSPATIAL ANALYSES

- State Scale – no new analyses at state scale
  - Watershed-wide results “clipped” maps per state (NY, PA, WV, MD, DE, and VA) and the District of Columbia (D.C.)
  - Results presented in State and D.C. Annex to report







STATE-SELECTED WATERSHED ACTION PLANS

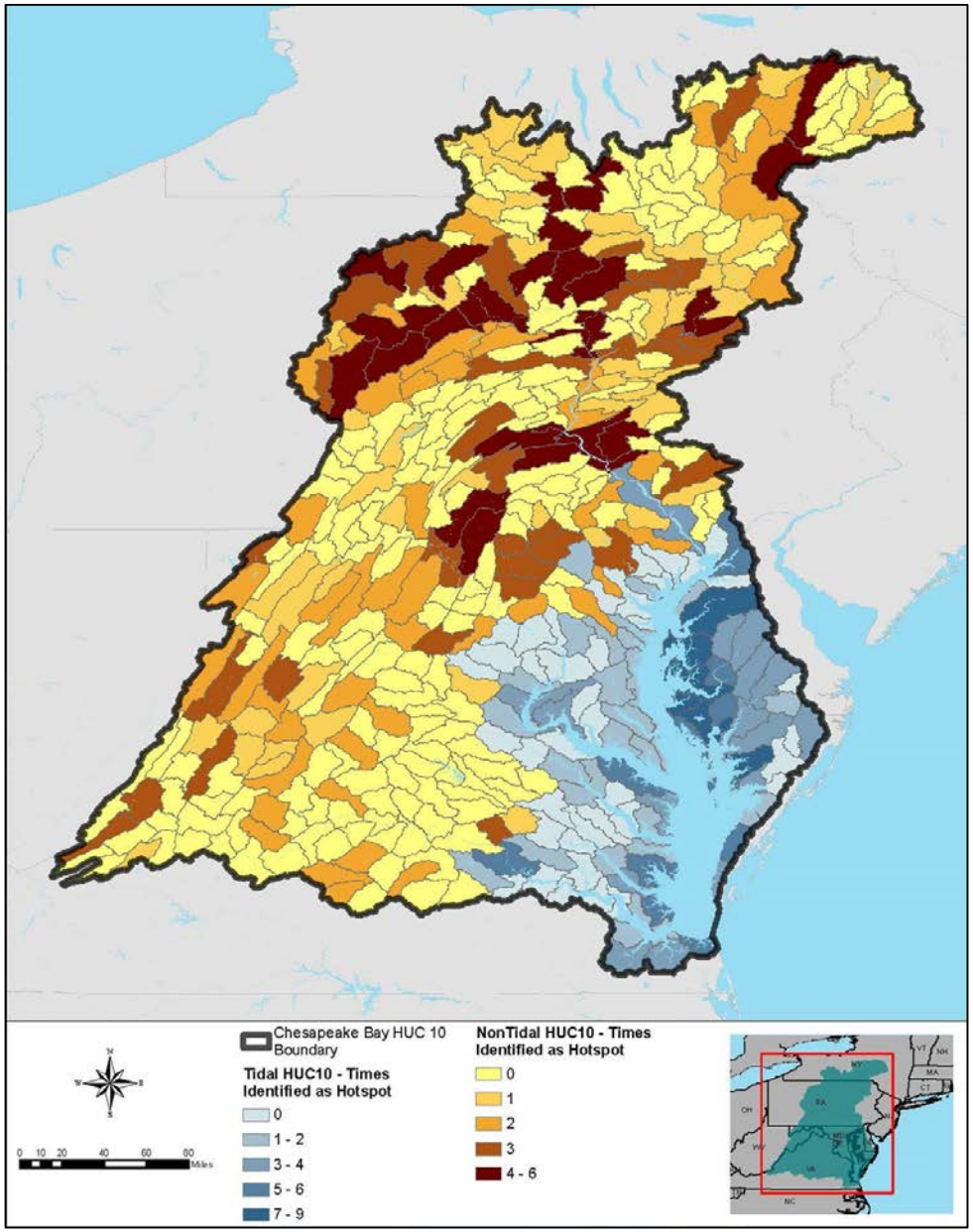
- Identified by each State and D.C.
- Number of Action Plans limited only by 2-year timeframe of Comp Plan
- Action Plans vehicle for identifying projects to then be matched with funding source(s)
- **Critical element to achieving maximum implementation and collaboration**

US Army Corps of Engineers
Baltimore District

U.S. ARMY

RESULTS

RESTORATION ROADMAP



- Chesapeake Bay Agreement 2014 goals and benefits
- Subwatersheds evaluated based on opportunity to contribute to each goal(s) and co-benefits
  - Stream Restoration
  - Fish Passage
  - Wetland Restoration
  - Riparian Buffers
  - SAV
  - Oyster
  - …and More….
- Comp Plan products can beused by many stakeholders toward shared goals
  - Opportunities exist in EACH sub-watershed

US Army Corps of Engineers
Baltimore District

U.S.ARMY

RESTORATION ROADMAP: DETAILED INFORMATION

HUC Name	Management Measure	Area of Opportunity	Cost Range	Benefit	Ecosystem Goods and Services	Who could Implement?	Threats
Lower Choptank	**Tidal Wetland Restoration**	Number of acres	Cost range per acre	*Provide habitat to hundreds of fish, birds, mammals and invertebrates. *Trap polluted runoff and improve water quality.	Hazard mitigation (reduced risks to property, infrastructure, human safety); soil retention.	USACE, USDA, TNC, MDNR, USFWS, DU, EPA, DOI	57 acres highly threatened (54%) - coastal storm flooding; eroding shorelines; more frequent flooding; sea level rise

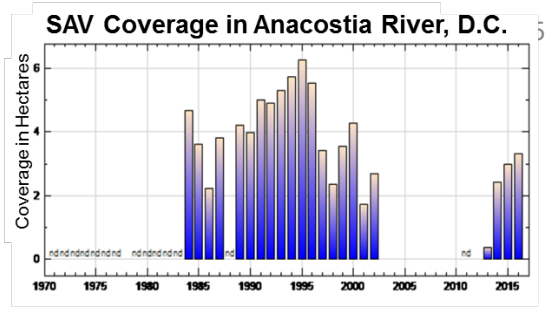
Area in Public Land	Rated high for other restoration analyses	Sequencing/ Dependencies	Bay Agreement Goal	Other Agency Plans and Priorities	Presence of Federally Listed Species
Number of acres and % in public ownership	Yes; 9 areas of opportunity - oysters, SAV, eroding shorelines, tidal wetlands, non-tidal wetlands, dredged material, avian wildlife, marsh migration, streams	*Within 3 mile buffer of a navigation channel. *Dredged material should be an option. *Acres in public land should be a focus. *Area ranks high for co-benefit.	*Create & reestablish 85,000 acres to tidal and non-tidal wetlands *Enhance function of 150,000 acres of degraded wetlands	Audubon Important Bird Area; presence of nesting for wading birds and waterbirds	yes

STATE-SELECTED WATERSHED ACTION PLAN DEVELOPMENT

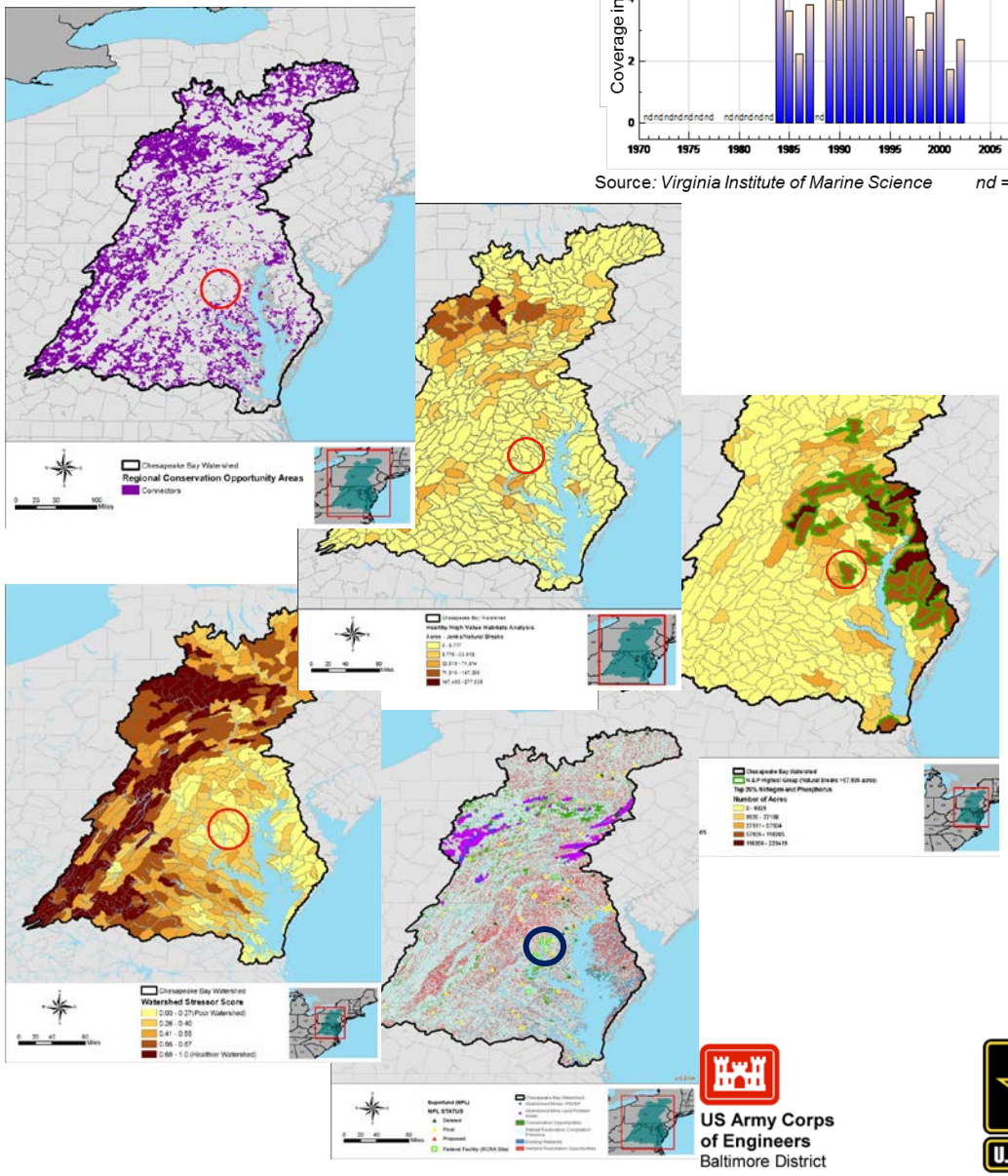
1. CBCP baywide analyses results
   - Identify problems and opportunities
2. Local GIS datasets
   - Municipal and subwatershed boundaries
   - Soils, topography
   - Critical infrastructure
   - Population density and demographics
   - N and P loadings by sector
   - Stream crossings and culverts
   - Land cover of riparian buffers
   - Habitat for important species
3. Review of existing projects, ongoing efforts, planned projects, reports, & studies

ANACOSTIA PROBLEMS

- Anacostia is one of the most heavily stressed watersheds within the Chesapeake
- Limited habitat availability/connectivity
- Limited SAV coverage
- Nutrient loading
- Other contaminants



Source: *Virginia Institute of Marine Science* *nd = not determined*

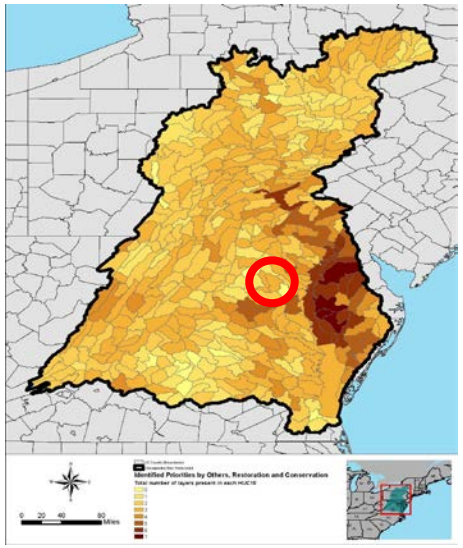


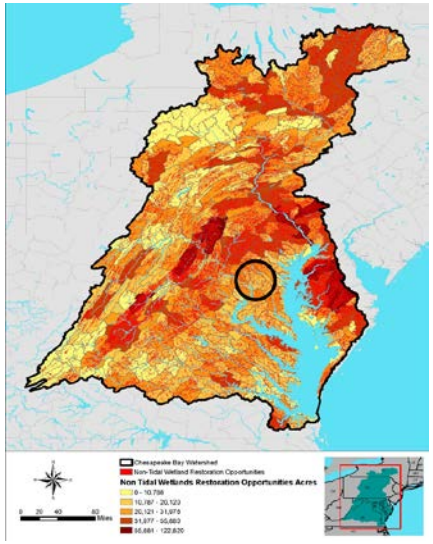
US Army Corps of Engineers
Baltimore District

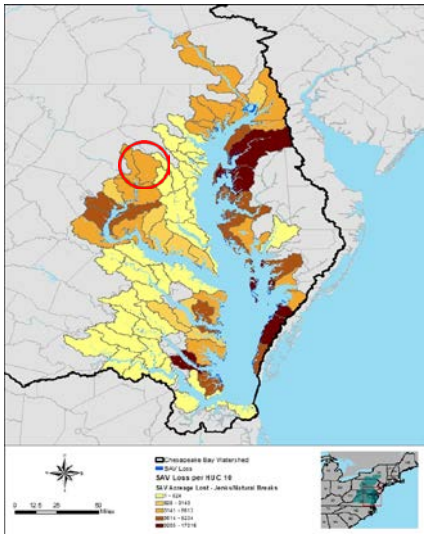
U.S.ARMY

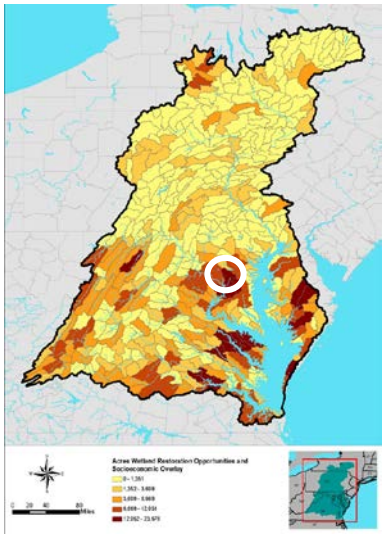
ANACOSTIA OPPORTUNITIES

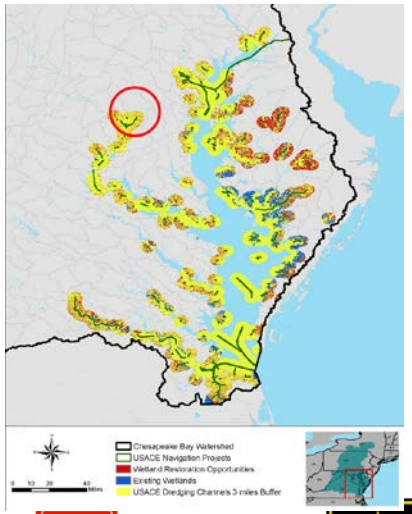
- Moderate priority for restoration and conservation based on work by federal agencies.
- SAV Restoration
- Wetland restoration and enhancement
  - High socioeconomic impact
  - Opportunities to use dredged materials to restore/enhance wetlands









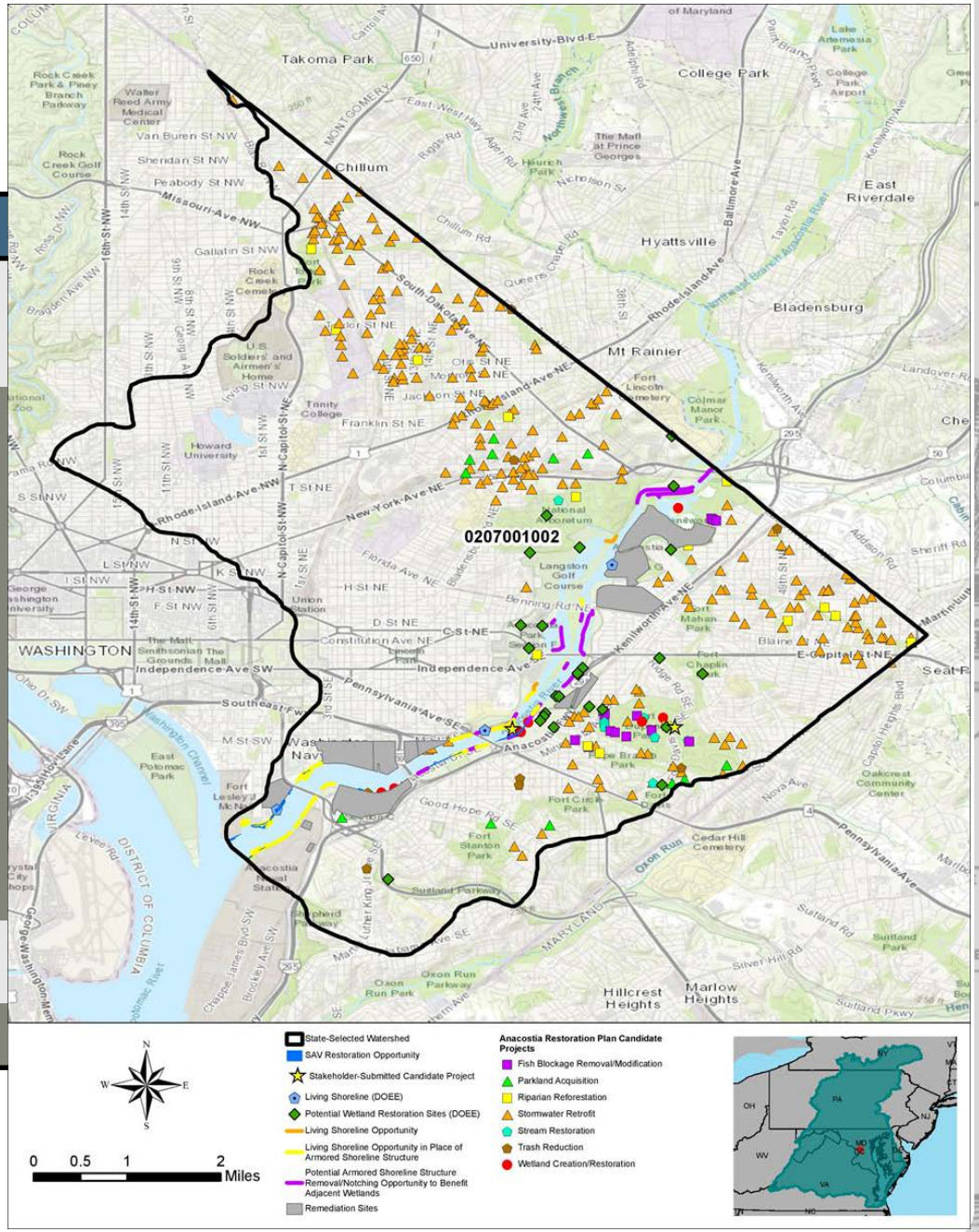


US Army Corps of Engineers
Baltimore District

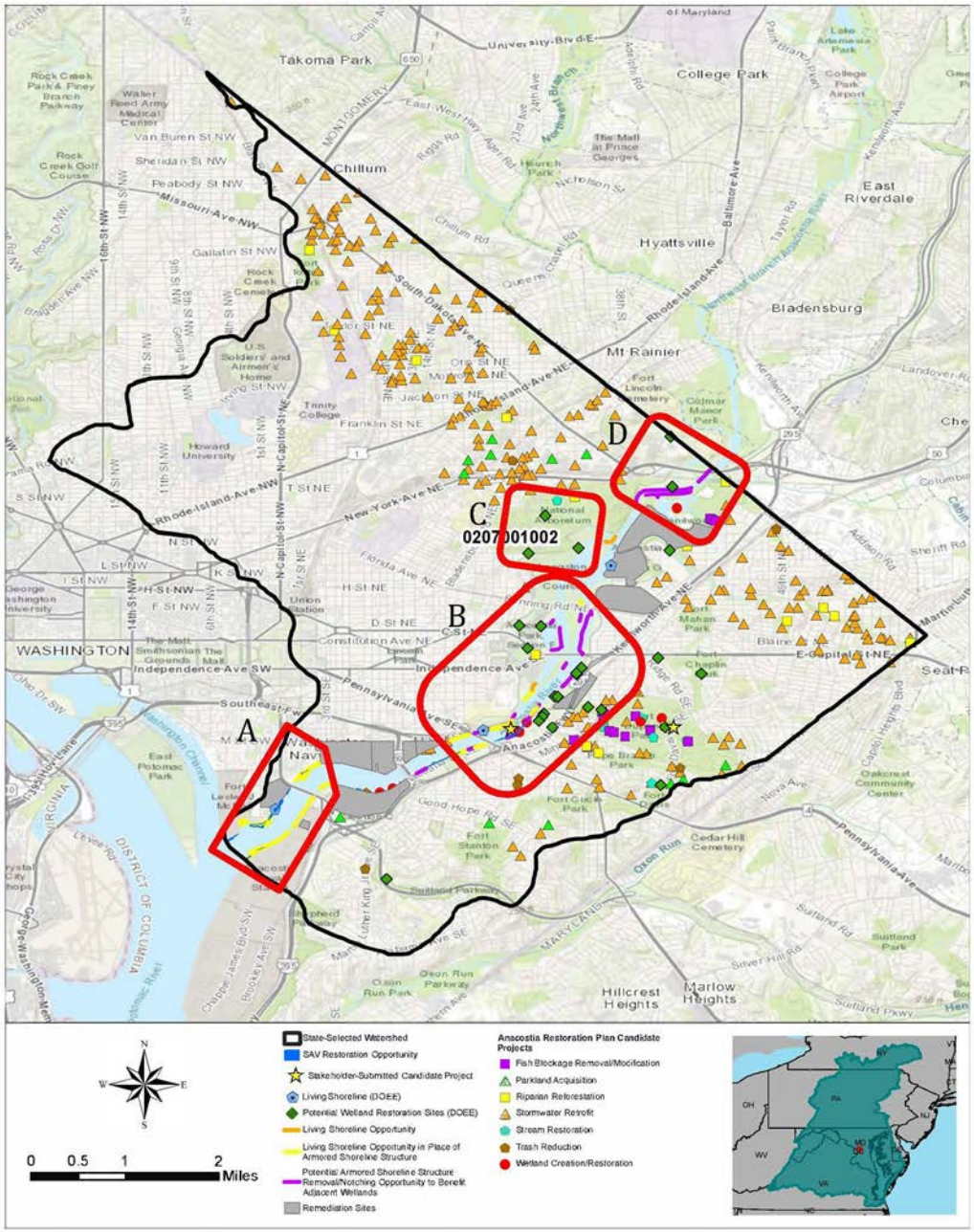
U.S.ARMY

DC: ANACOSTIA RIVER WATERSHED

Suggested Prioritization	Activity	Quantity
1	Stormwater Management/ Runoff Mitigation	Area not available
2	Seawall Removal and Living Shoreline Creation	3.59 miles identified for seawall removal/notching to benefit wetlands; additional 3.87 miles identified for flood mitigation via seawall removal and/or living shoreline creation. Combined total of 7.14 miles of shoreline identified for seawall removal/notching and/or living shoreline creation.
3	Wetland Restoration	25 sites (Area not available)
4	SAV Restoration	13.5 acres



ANACOSTIA RIVER (DC): Proposed Project Identification Focus Areas



Anacostia Watershed Project Areas				
Activity	A	B	C	D
Conservation				
Oyster Restoration				
Stream Restoration			X	
Riparian Buffer Restoration / Reforestation		X	X	X
SAV Restoration	X	X		
Wetland Creation / Restoration		X	X	X
Living Shoreline	X	X		
Removal of Fish Blockages		X		X
Stakeholder-Submitted Candidate Project		X		
Trash Reduction		X		
Armored Shoreline Structure Removal		X		X
Stormwater Retrofit		X	X	X
Parkland Acquisition				

Chesapeake Bay Comprehensive Water Resources and Restoration Plan Watershed Assessment

US Army Corps of Engineers
Baltimore District

U.S.ARMY

PENNSYLVANIA: LOWER SUSQUEHANNA RIVER

PROBLEMS

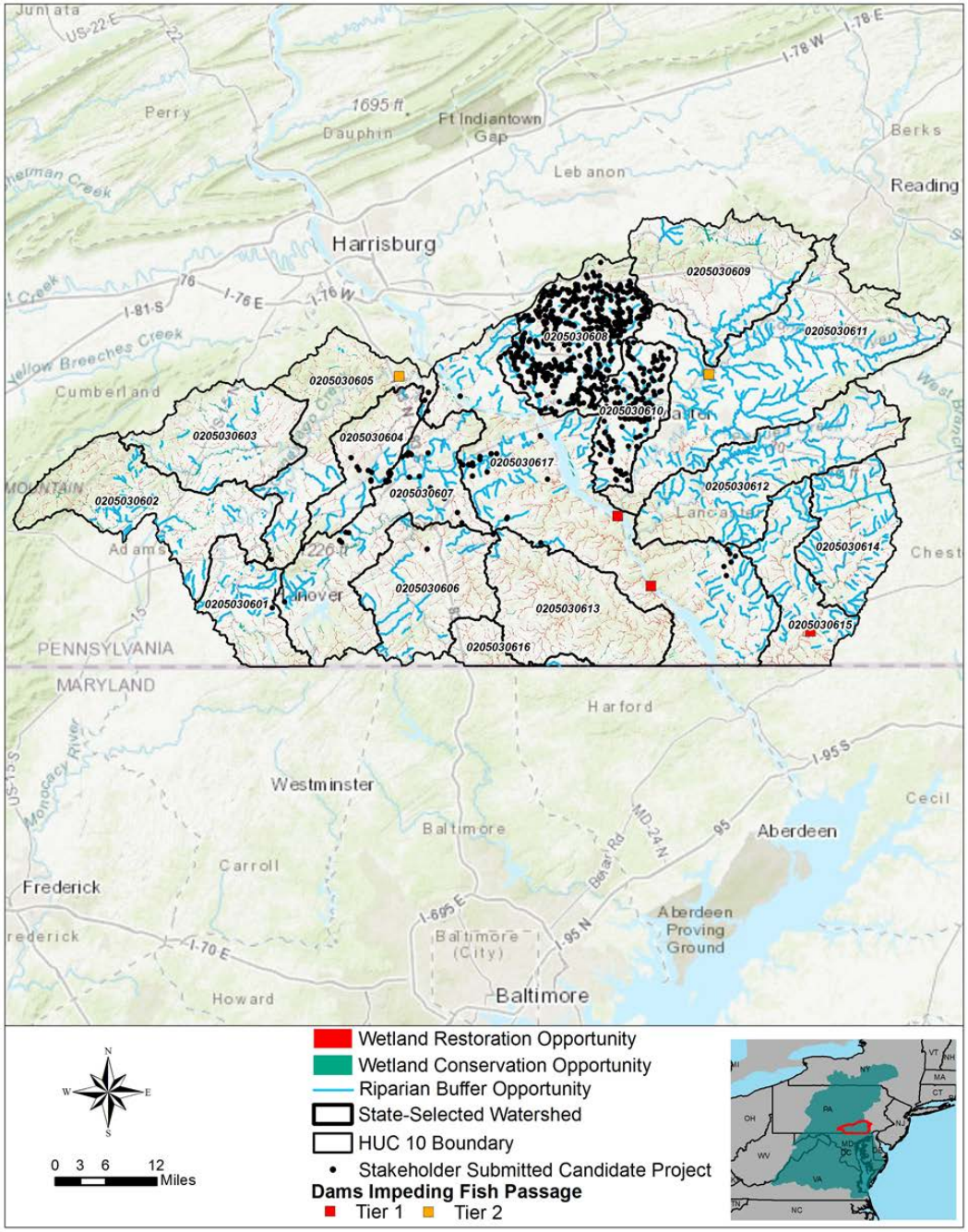
- Lower Susquehanna is one of the most heavily stressed watersheds within the Chesapeake
- High priority for conservation and recreation based on work by federal agencies
- Poor habitat connectivity
- High vulnerability to non-tidal threats such as:
  - Increased flooding
  - Habitat degradation
  - Future predicted development
- Nitrogen and Phosphorus inputs

OPPORTUNITIES

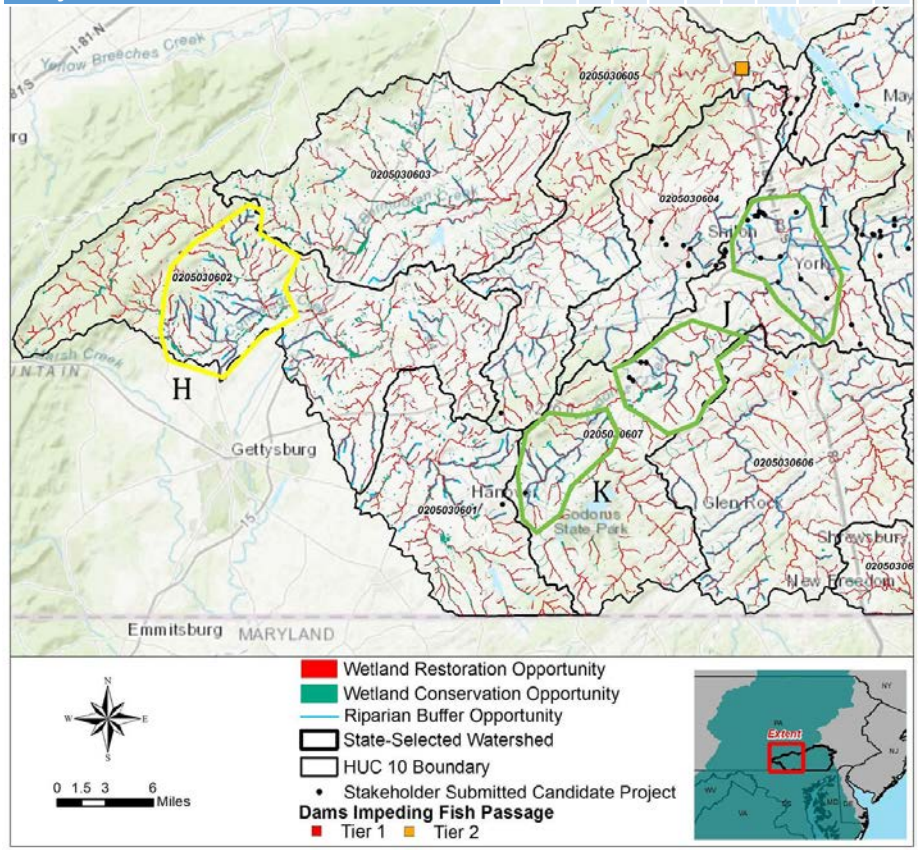
- Riparian Buffer restoration
- Agricultural BMPs
- Habitat Conservation / Restoration
- Dam removal / fish passage

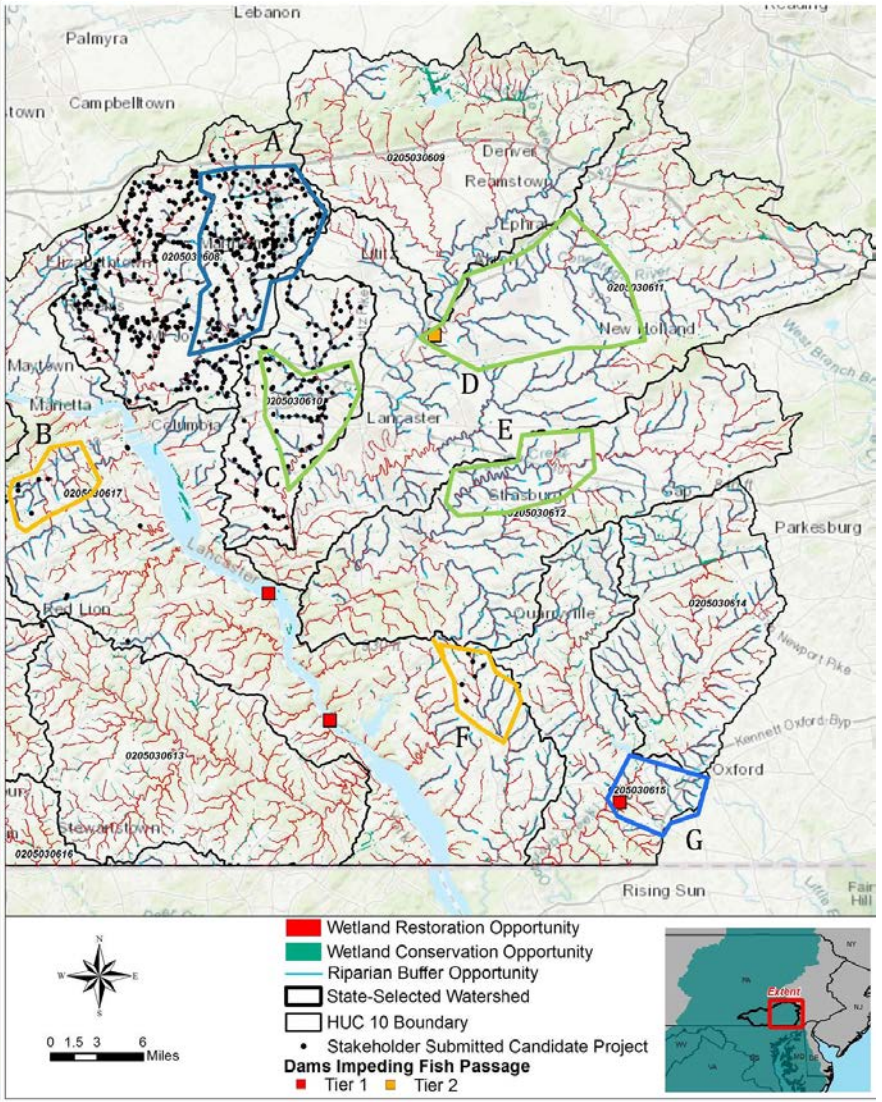
PA: LOWER SUSQUEHANNA RIVER WATERSHED

Suggested Prioritization	Activity	Quantity
1	Agricultural BMPs	Not computed
2	Conservation	14,144 acres
3	Wetland Restoration and Enhancement	29,632 acres
4	Riparian Buffer Restoration	12,182 acres
5	Fish Passage	3 high priority blockages



Lower Susquehanna River Watershed Project Focus Areas											
Activity	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
Riparian Buffer Restoration	X	X	X	X	X	X	X	X	X	X	X
Wetland Restoration	X	X	X	X	X	X	X	X	X	X	X
Wetland Conservation	X	X	X	X	X	X	X	X	X	X	X
Removal of Fish Blockages				X			X				
Stakeholder-Submitted Candidate Project	X	X	X			X			X	X	X





LOWER SUSQUEHANNA RIVER (PA): Proposed Project Identification Focus Areas

Chesapeake Bay Comprehensive Water Resources and Restoration Plan Watershed Assessment

US Army Corps of Engineers
Baltimore District

U.S.ARMY

MARYLAND: CHOPTANK RIVER WATERSHED

PROBLEMS

- Choptank is one of the most heavily stressed watersheds within the Chesapeake
- High priority for conservation and restoration based on work by federal agencies.
- Poor habitat connectivity
- High vulnerability to tidal threats such as:
    - Sea level change
    - Frequent flooding
    - Coastal storm risk
    - Erosion
    - Future development
- Lost SAV Habitat

OPPORTUNITIES

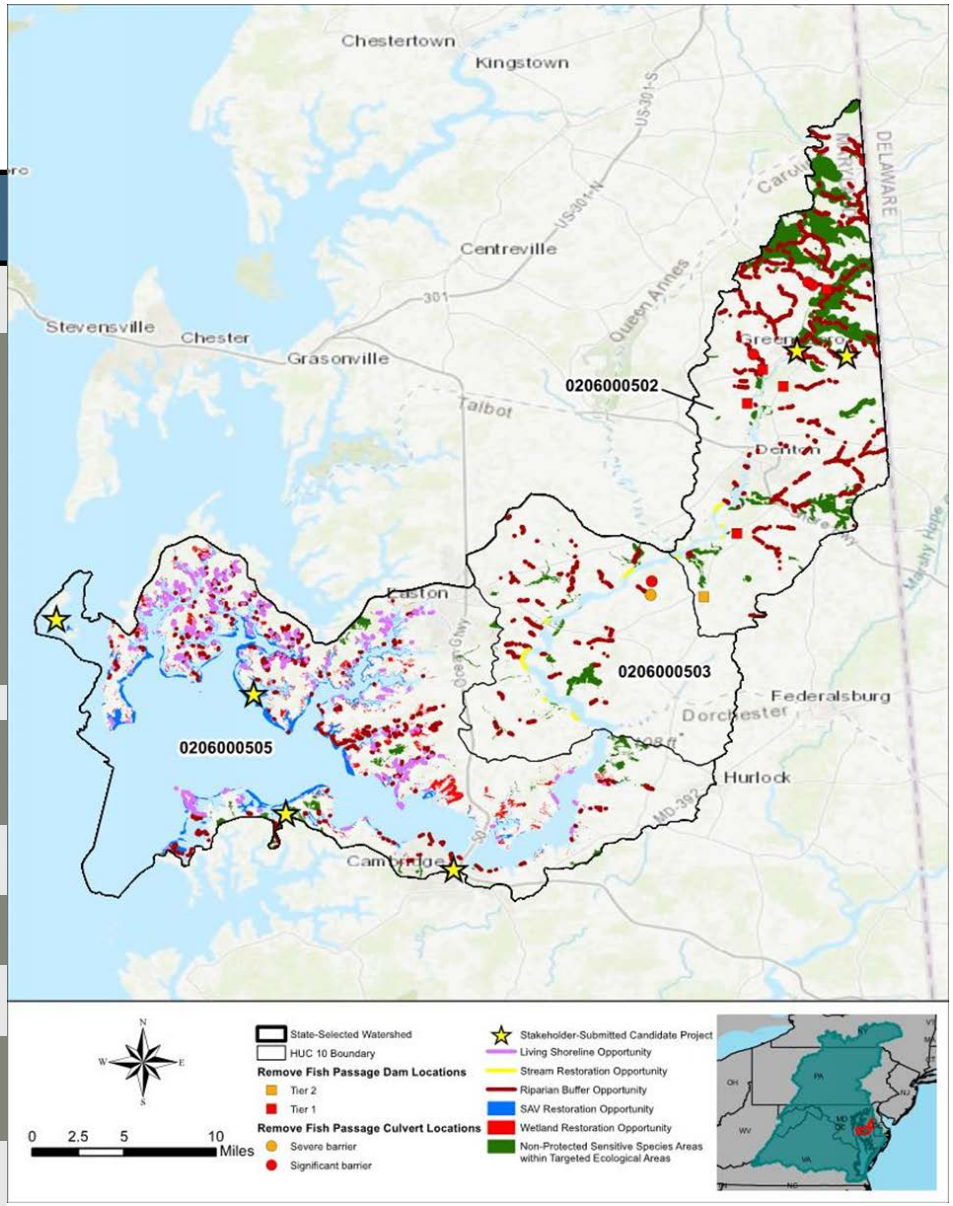
- Stream restoration to benefit anadromous fish & removal of fish passage blockages
- Oyster restoration
- Wetland/marsh restoration
    - Shoreline stabilization
    - Marsh migration
    - Restoration through substrate deposition

US Army Corps of Engineers
Baltimore District

U.S.ARMY

MD: CHOPTANK RIVER

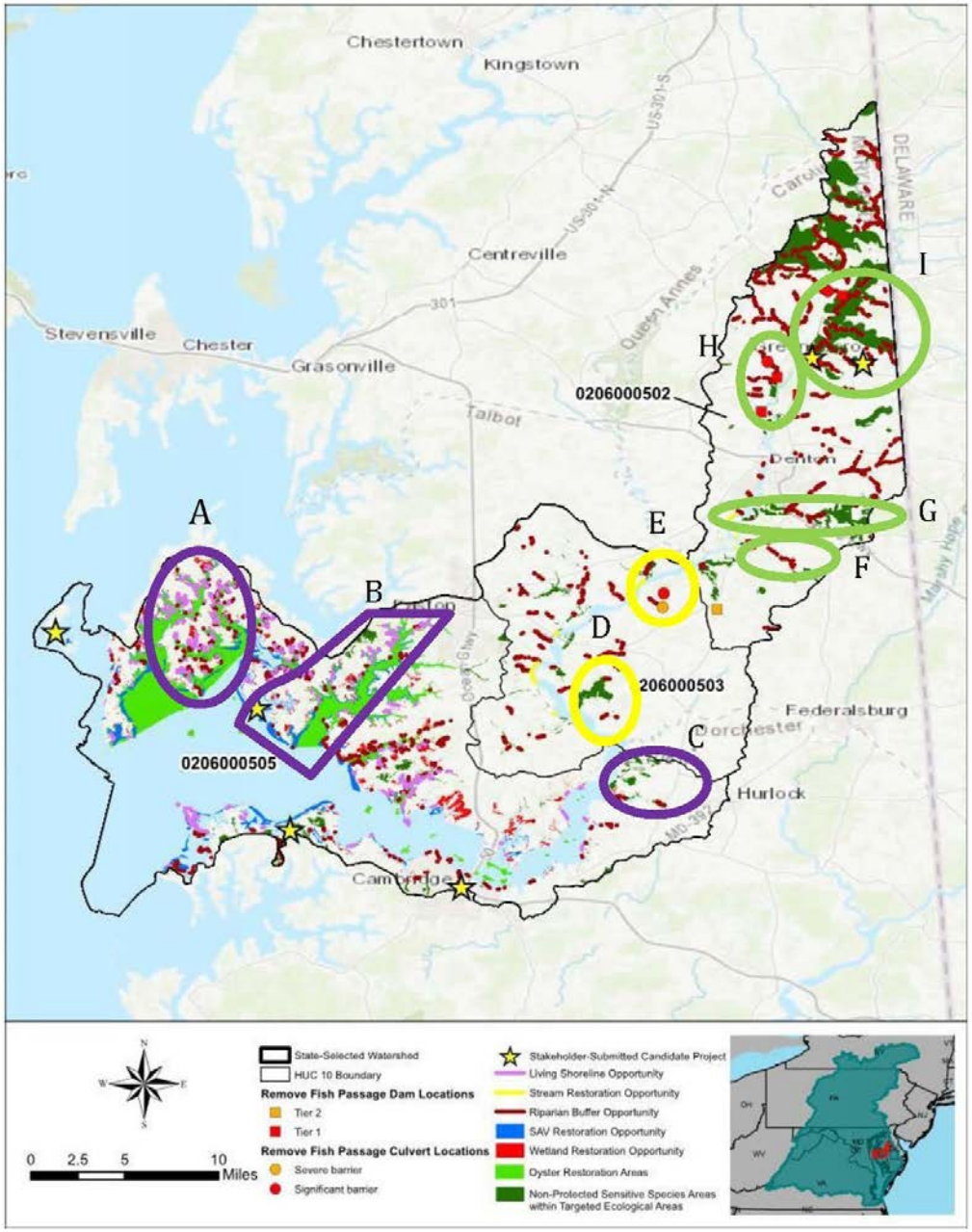
Suggested Prioritization	Activity	Quantity
1	Agricultural BMPs	Not computed
2	Oyster Restoration and Monitoring	1424 acres (504 acres in Tred Avon and Harris Creek, 920 acres additional areas of restoration from 2000 – 2014 and activity in seven tributaries within the Choptank through the Maryland Grow Oysters Program)
3	Conservation	17,931 acres
4	Riparian Buffer Restoration	1,033 acres
5	Priority Fish Passage	11 priority blockages
6	Stream Restoration	2.6 miles
7	Living Shorelines	29.2 miles
8	Wetland Restoration and Migration	26,504 acres
9	SAV Restoration	6,824 acres



US Army Corps of Engineers
Baltimore District

U.S.ARMY

CHOPTANK RIVER: Proposed Project Identification Focus Areas



Choptank River Watershed Project Focus Areas									
Activity	A	B	C	D	E	F	G	H	I
Conservation	X	X	X	X	X	X	X	X	X
Oyster Restoration	X	X							
Stream Restoration				X	X		X		
Riparian Buffer Restoration	X	X	X	X	X	X	X	X	X
SAV Restoration	X	X							
Wetland Restoration	X	X	X				X		X
Living Shoreline	X	X	X						
Removal of Fish Blockages					X	X		X	X
Stakeholder-Submitted Candidate Project		X							X

US Army Corps of Engineers
Baltimore District

U.S.ARMY

VIRGINIA: MIDDLE PENINSULA (PAMUNKEY, MATTAPONI, THE PIANKATANK AND YORK WATERSHEDS)

PROBLEMS

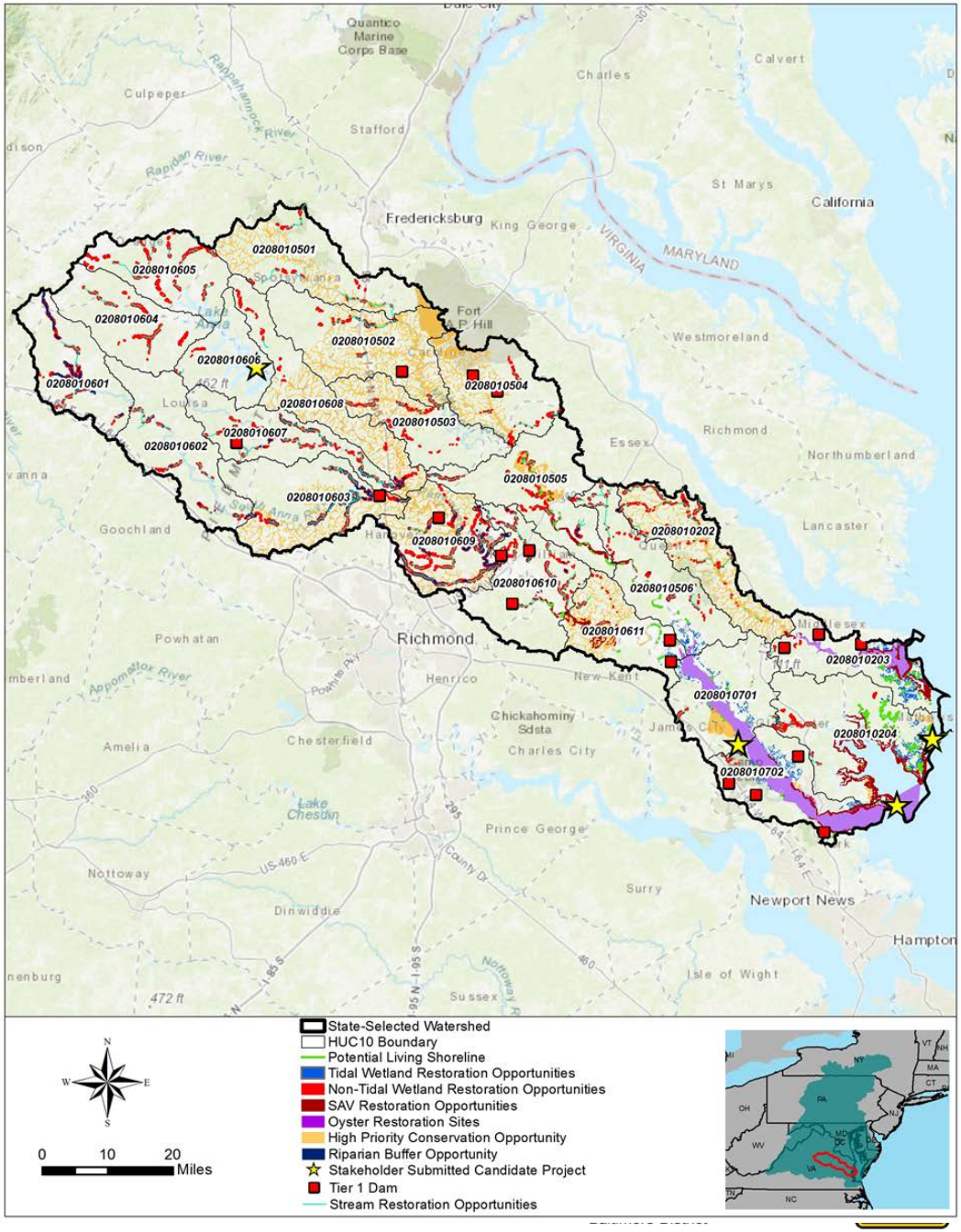
- Lost SAV habitat
- Shoreline erosion
- Oyster populations
- Fish Passage

OPPORTUNITIES

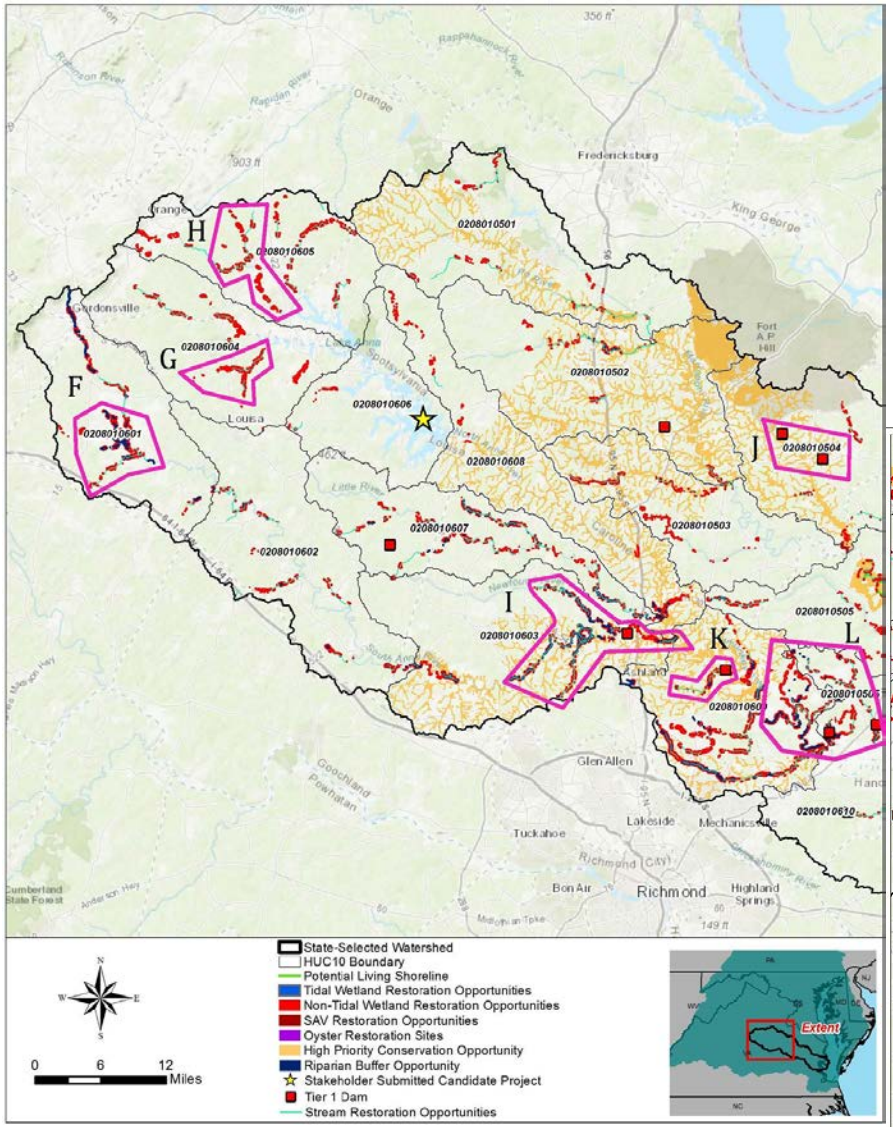
- Oyster restoration opportunities
- Tidal Wetland/marsh restoration
  - Shoreline stabilization
  - Restoration through soil deposition
- Non-tidal wetland restoration opportunities
- Fish passage

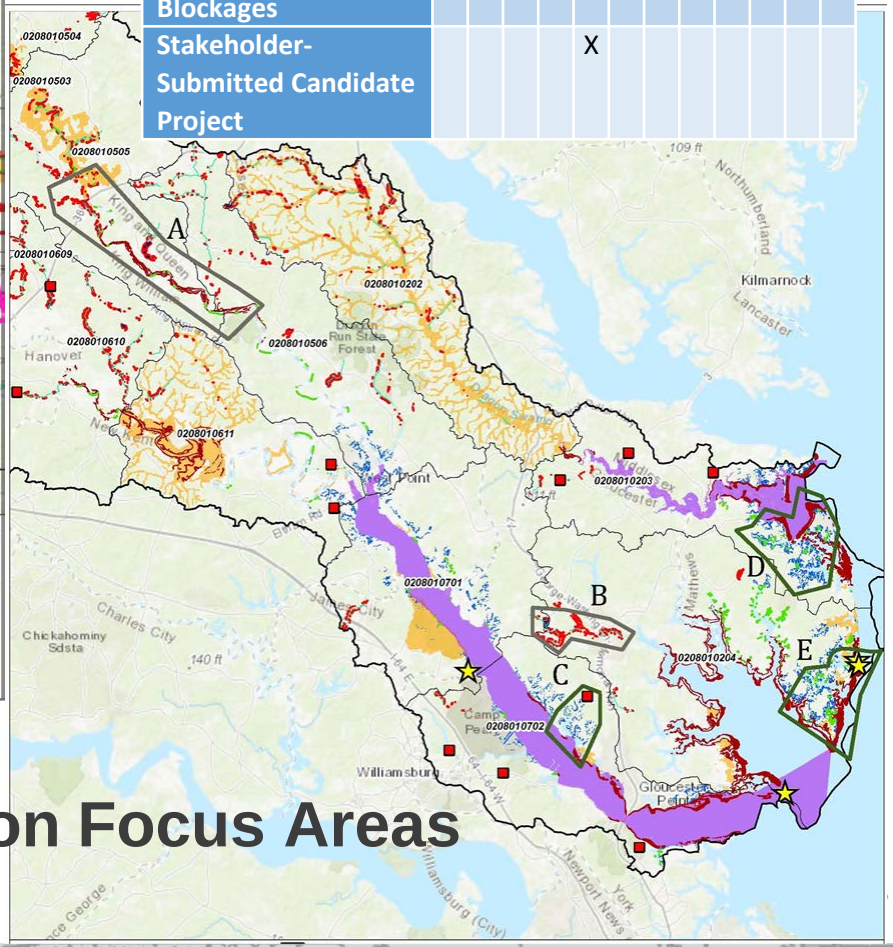
VIRGINIA: MIDDLE PENINSULA

Suggested Prioritization	Activity	Quantity
1	Agricultural BMPs	Not computed
2	Oyster Restoration Monitoring	3 major tributaries
3	Conservation	270.3 Square Miles
4	Riparian Buffer Restoration	307.2 acres (with 120.5 acres of overlap with wetland restoration opportunities)
5	Fish Passage	18 priority blockages
6	Stream Restoration	332.6 miles
7	Living Shorelines	32.2 miles
8	Wetland Restoration and Migration	12,475 acres (with 120.5 acres of overlap with riparian buffer restoration opportunities)
9	SAV Restoration	8,888.5 acres



Middle Peninsula Watershed Project Focus Areas												
Activity	A	B	C	D	E	F	G	H	I	J	K	L
Conservation	X		X		X				X	X	X	X
Oyster Restoration			X	X								
Stream Restoration	X	X				X	X	X	X		X	X
Riparian Buffer Restoration	X	X				X			X		X	X
SAV Restoration	X		X	X	X							
Wetland Restoration	X	X	X	X	X	X	X	X	X		X	X
Living Shoreline	X			X	X							
Removal of Fish Blockages			X						X	X	X	X
Stakeholder-Submitted Candidate Project					X							





MIDDLE PENINSULA:
Proposed Project Identification Focus Areas

DELAWARE: NANTICOKE RIVER WATERSHED

PROBLEMS

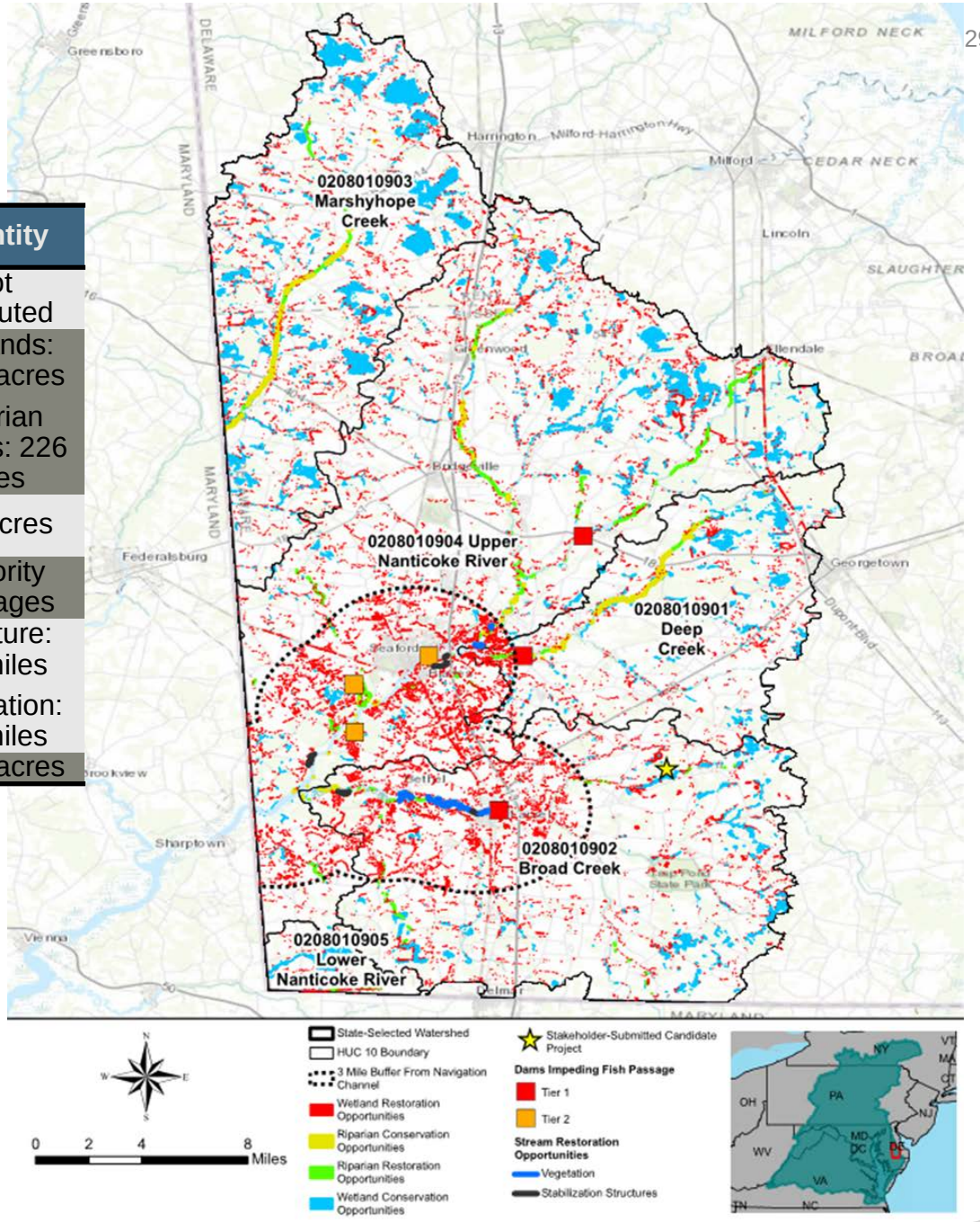
- Nanticoke River is one of the most heavily stressed watersheds within the Chesapeake
- High priority for conservation and recreation based on work by federal agencies
- Poor habitat connectivity
- Nitrogen and Phosphorus inputs

OPPORTUNITIES

- Stream restoration to benefit anadromous fish & removal of fish passage blockages
- Culvert assessments for fish passage
- Riparian Buffer restoration
- Wetland restoration and enhancement
- Undertake restoration and conservation to benefit avian wildlife
- Agricultural BMPs

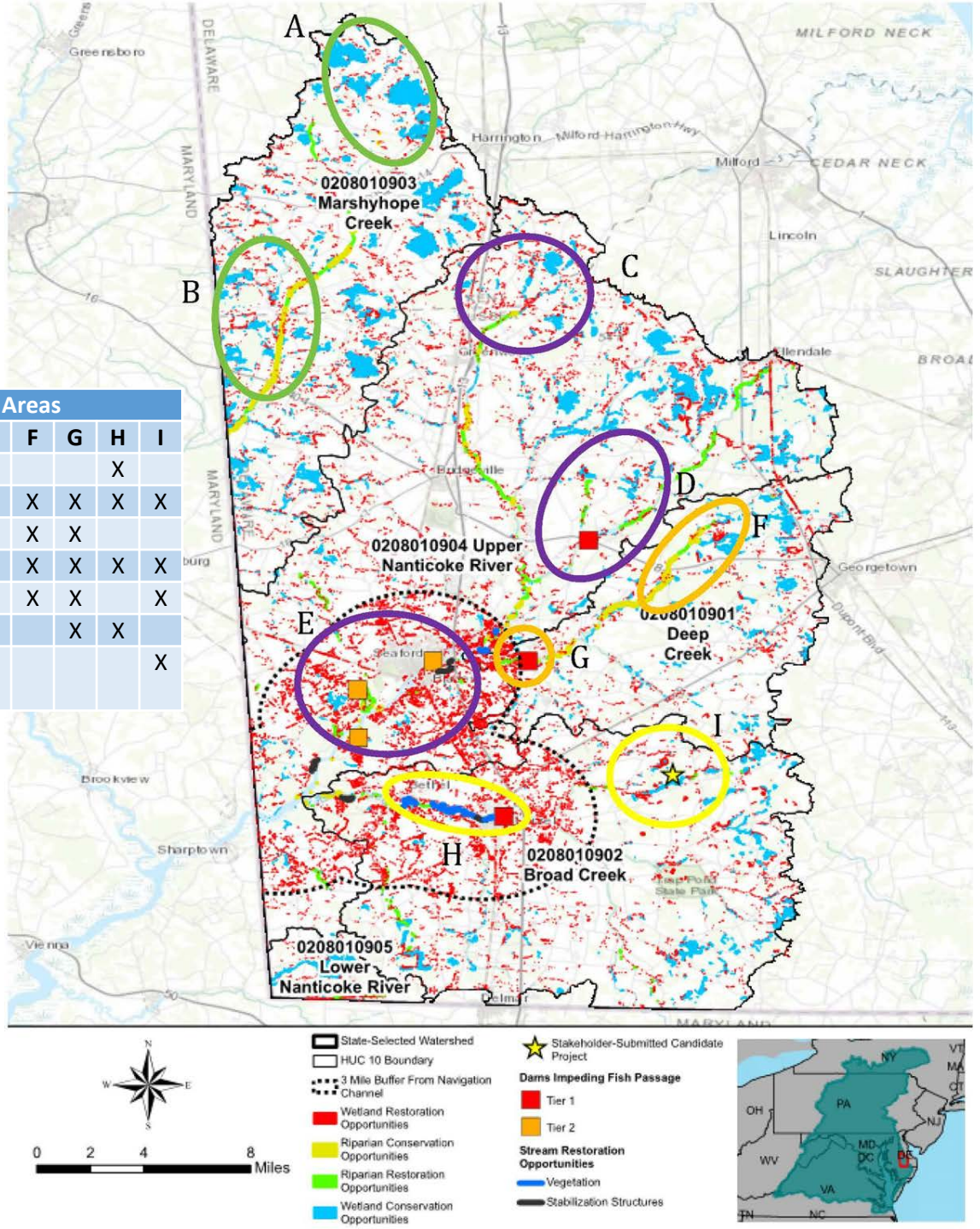
DELEWARE: NANTICOKE RIVER

Suggested Prioritization	Activity	Quantity
1	Agricultural BMPs	Not computed
2	Conservation	Wetlands: 9,996 acres Riparian Buffers: 226 acres
3	Riparian Buffer Restoration	314 acres
4	Fish Passage	3 priority blockages
5	Stream Restoration	Structure: 2.2 miles Vegetation: 5.2 miles
6	Wetland Restoration	1,729 acres



NANTICOKE RIVER: Proposed Project Identification Focus Areas

Nanticoke River Watershed Project Focus Areas									
Activities	A	B	C	D	E	F	G	H	I
Stream Restoration					X			X	
Riparian Buffer Restoration		X	X	X	X	X	X	X	X
Riparian Buffer Conservation		X	X		X	X	X		
Wetland Restoration	X	X	X	X	X	X	X	X	X
Wetland Conservation	X	X	X	X	X	X	X		X
Removal of Fish Blockages				X	X		X	X	
Stakeholder-Submitted Candidate Project									X



WEST VIRGINIA: OPEQUON CREEK WATERSHED

PROBLEMS

- Opequon Creek is a heavily stressed watershed within the Chesapeake Bay Watershed
- Poor habitat connectivity
- Non-tidal threats

OPPORTUNITIES

- Riparian buffer restoration
- Wetland restoration
- Undertake restoration and conservation to benefit rare, threatened, and endangered species

STAKEHOLDER IDENTIFIED:

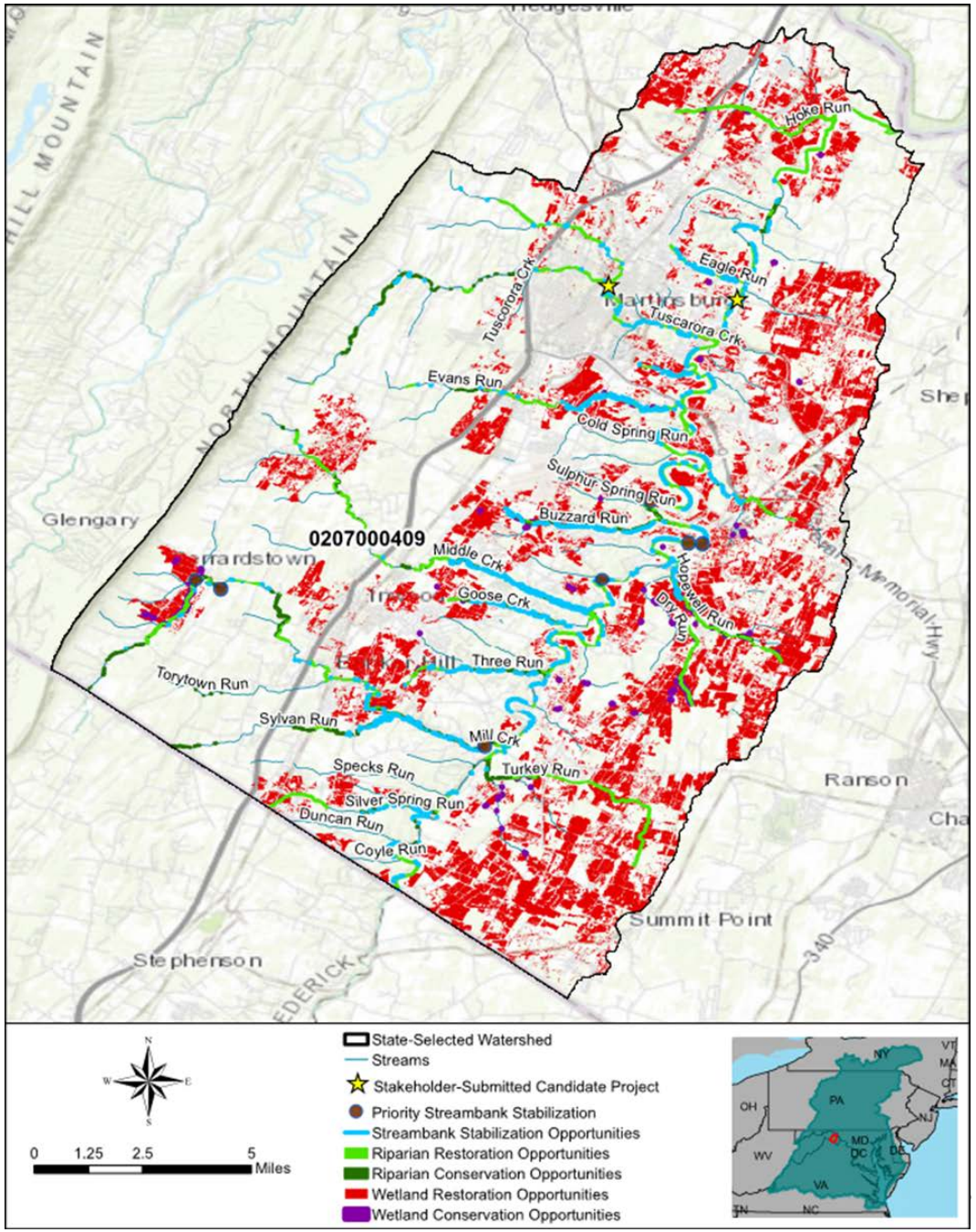
- Technical services and possible design-build opportunities
- Green Infrastructure

US Army Corps of Engineers
Baltimore District

U.S.ARMY

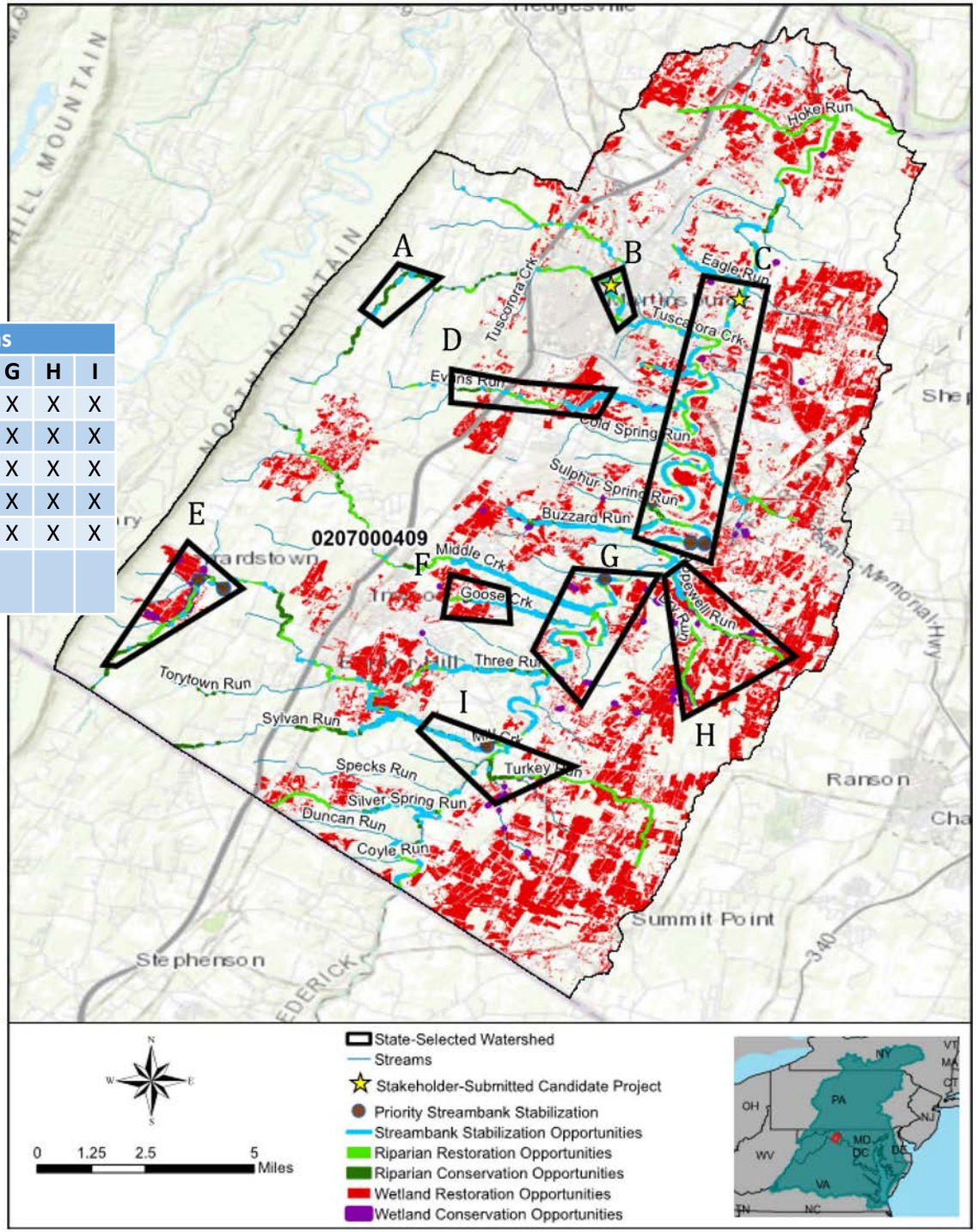
WEST VIRGINIA: OPEQUON CREEK

Suggested Prioritization	Activity	Quantity
1	Agricultural BMPs	Not computed
2	Wastewater Management Systems Improvements	Not Computed
3	Conservation	443 acres
4	Stream Restoration	13 miles
5	Riparian Buffer Restoration	25 Miles
6	Fish Passage	Not Computed
7	Wetland Restoration	21,425 acres



OPEQUON CREEK: Proposed Project Identification Focus Areas

Opequon Creek Watershed Project Focus Areas									
Activity	A	B	C	D	E	F	G	H	I
Stream Restoration	X	X	X	X	X	X	X	X	X
Riparian Buffer Restoration		X	X	X	X	X	X	X	X
Riparian Buffer Conservation	X		X	X	X	X	X	X	X
Wetland Restoration		X	X	X	X	X	X	X	X
Wetland Conservation			X	X	X	X	X	X	X
Stakeholder-Submitted Candidate Project		X	X						



NEW YORK: UPPER SUSQUEHANNA RIVER WATERSHED

PROBLEMS

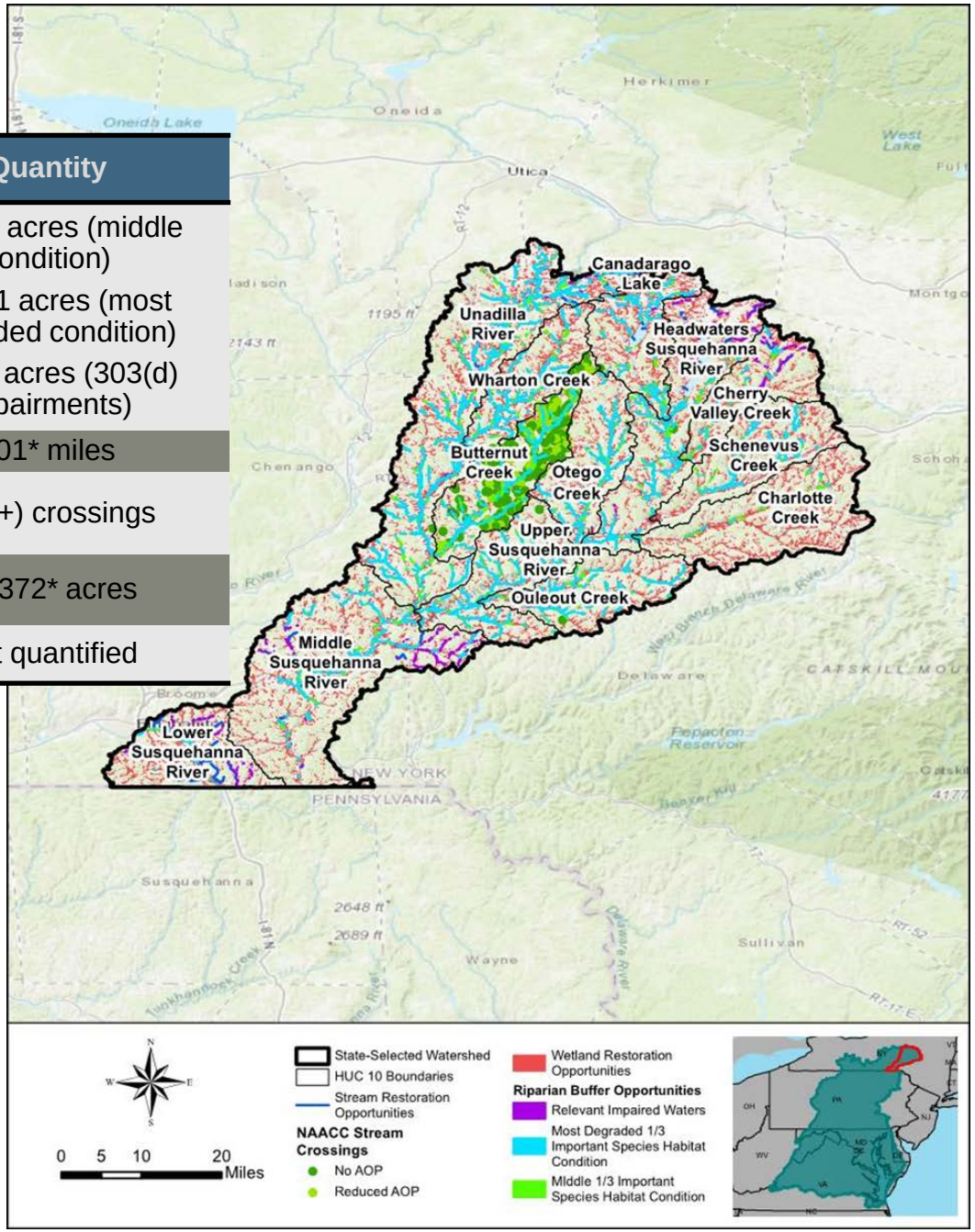
- Medium-stressed watershed
- Low-medium priority for conservation and recreation
- Moderate habitat connectivity:
- Low vulnerability to non-tidal threats
- Low nitrogen and phosphorus output relative to watershed
- High nitrogen output but low phosphorus
- No prioritized fish blockage data

OPPORTUNITIES

- Riparian Buffer restoration
  - High nitrogen areas
- Resident Fish habitat Restoration
- Non-Tidal Wetland Restoration Opportunities

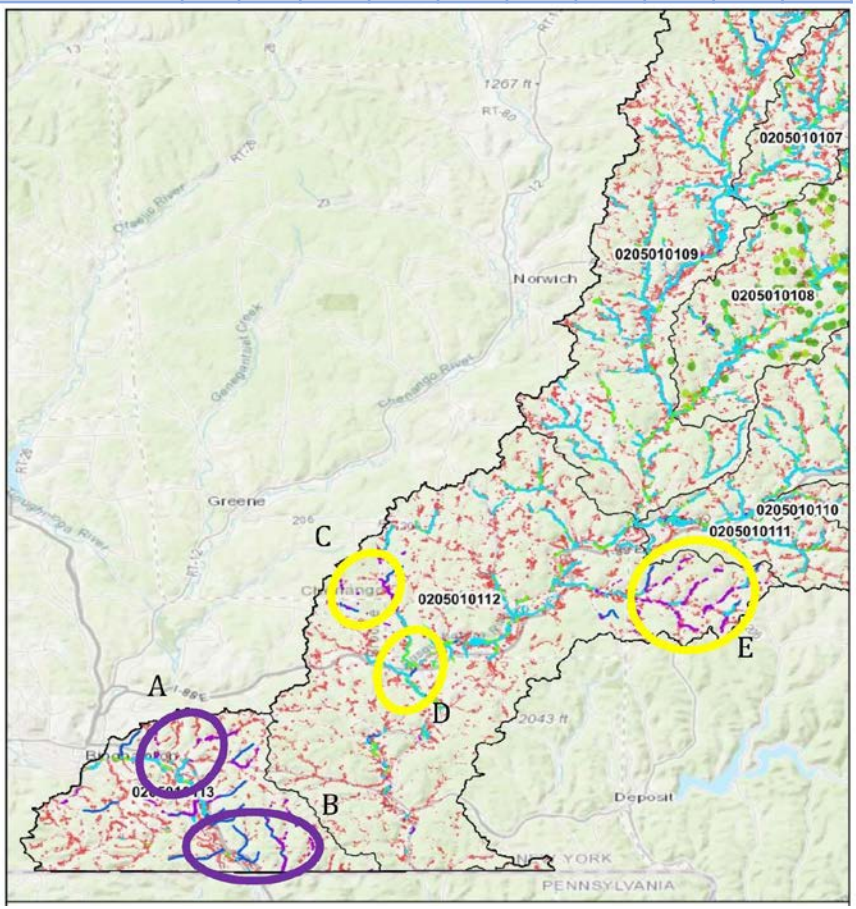
NY: UPPER SUSQUEHANNA RIVER

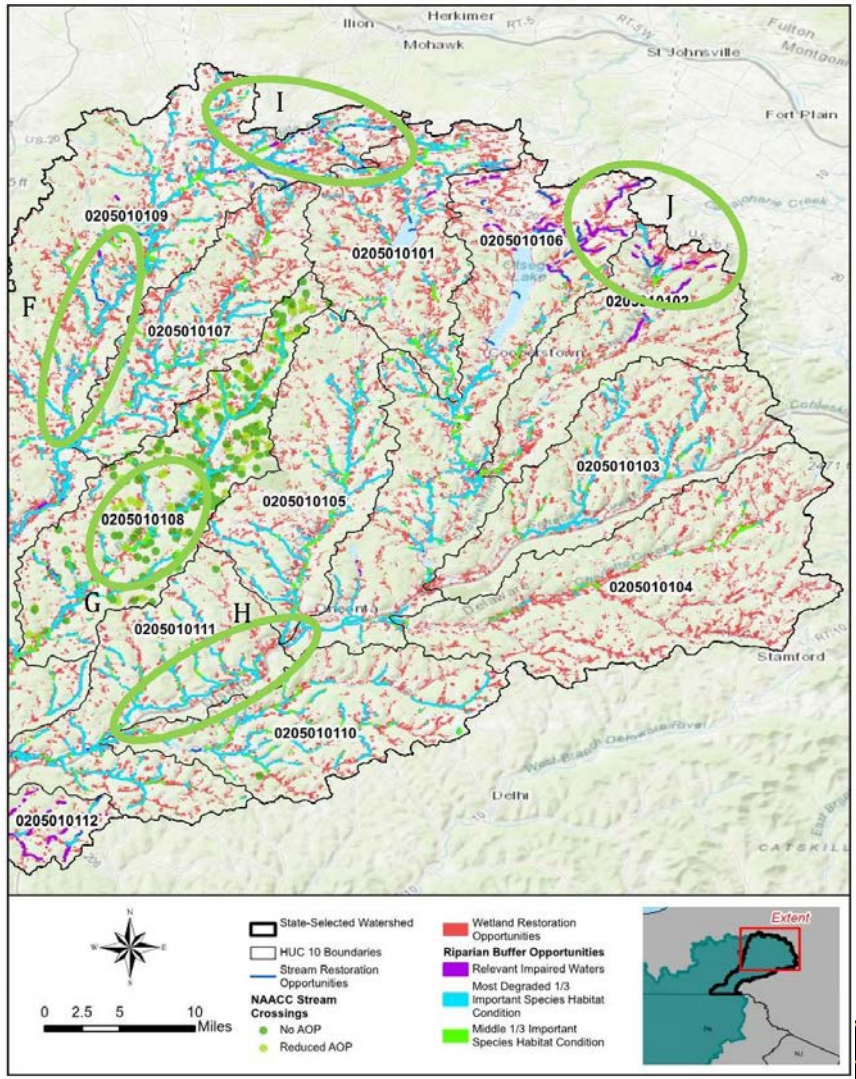
Suggested Prioritization	Activity	Quantity
1	Riparian Buffer Restoration	• 1,448 acres (middle condition) • 2981 acres (most degraded condition) • 1324 acres (303(d) impairments)
2	Stream Restoration	101* miles
3	Fish Passage	190(+) crossings
4	Wetland Restoration and Creation	99,372* acres
5	Agricultural BMPs	Not quantified



UPPER SUSQUEHANNA RIVER: Proposed Project Identification Areas

Upper Susquehanna River Watershed Project Focus Areas										
Activity	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Stream Restoration		X	X	X	X	X	X	X	X	X
Riparian Buffer Restoration	X	X	X	X	X	X	X	X	X	X
Wetland Restoration	X	X	X	X	X	X	X	X	X	X
Removal of Fish Blockages							X*			





US Army Corps of Engineers
Baltimore District

U.S.ARMY

FINDINGS AND RECOMMENDATIONS

FINDINGS AND RECOMMENDATIONS

- **Prioritize Actions Geographically** to Maximize Benefits and Contribution to Bay Goals
- **Promote Conservation/Enhancement** Adjacent to Existing Healthy, High-Value Habitat and **Restoration** in Highly Degraded Areas
- Utilize NEIEN to **Track Restoration Actions**
- **Develop Relationships** to Support Implementation Partnerships
- ***USACE leadership role in watershed planning and IWRM***
  - Communities need planning and engineering assistance
  - Utilize USACE Programs – Section 510, Technical Assistance, CAP, General Investigations
- **Promote Integrated Water Resource Management** and Plan for Future Threats
  - Protect restoration gains from past investments
  - Minimize adverse impacts from future stressors (population, SLC, etc.)
    - Non-Tidal Wetlands, Streams and Climate Change
    - Tidal Wetlands and Marsh Migration
    - Population Growth and Consumptive Use

BUDGET/SCHEDULE

BUDGET

- Total Federal Funding - $2.1M
- Total Nonfederal funding - $704K (In-Kind Services)
- Cumulative expenditures (FY16-FY17) as of Sept 2017 - $1.2M
- Proposed expenditures for FY18 - $800K
- Funding
  - FY17 completion funds - $1.46M

SCHEDULE

- Draft Report Submittal – May 31, 2018
- Public Input Period Concludes – July 16, 2018
- Final Report Submittal to NAD/HQ – Jul-Sep 2018, pending level of public input
- HQUSACE submittal to ASA(CW)

NEXT STEPS

- House of Representatives Congressional Watershed Caucus and Chesapeake Bay Commission Briefing – 10 April 2018
- Senate Congressional Watershed Caucus briefing – 10 May 2018
- Stakeholder Webinar: Draft Results – 7 May 2018
- Chesapeake Bay Management Board – 10 May 2018
- Release of draft report for public input – 31 May 2018
- Agency coordination and Stakeholder Webinar (office hours) – 28 June 2018