

## Work Plan for Cross Goal Team Project: Mapping Geographic Areas that Benefit Multiple CBP Outcomes

Updated September 7, 2016 (for discussion at the September Management Board meeting).

**Need:** The Chesapeake Bay Watershed Agreement recognizes that “to be successful in achieving its goals and outcomes, progress must be made in a strategic manner, focusing on efforts that will achieve the most cost-effective results.” It further acknowledges that using place-based approaches, where appropriate, will help produce recognizable benefits to local communities while contributing to larger ecosystem goals.

There are aspects of the Agreement goals and outcomes that are inter-related (figure 1) however, the current CBP management strategies address mostly individual outcomes. The Goal Implementation Teams (GITs) have started to more effectively collaborate on inter-related outcomes, and the CBP needs this effort to expand. This project provides an approach to help identify places where the CBP can more strategically make progress toward inter-related outcomes.

The guiding principles discussed by the GITs for addressing inter-related outcomes are:

- Providing maximum benefits for “living resources”: fish, wildlife and people (**populations**)
- Through restoration or conservation of the habitats, water quality and lands they depend on (**conditions**)
- By focusing on inter-related outcomes and where practices in the CBP management strategies should be implemented (**interventions**) based on what the science tells us and;
- Considering future threats of population growth and climate change (**drivers of ecosystem change**).

Resources to adequately achieve all 31 outcomes in the Watershed Agreement are limited. Therefore, the GITs are working together with STAR to try to address multiple outcomes to more effectively share resources through these efforts by:

- Identifying inter-related actions between outcomes so they can be done more effectively,
- Mapping geographic areas where effort can be concentrated that benefit multiple outcomes,
- Summarizing the factors that may affect achievement of multiple outcomes so they can better address these potential barriers, and
- Aligning partner efforts (federal, state and local jurisdictions, NGOs) to tackle multiple outcomes (both for 2016-17 work plans and planning for more opportunities in 2018-19).

The CBP is also beginning to design “Chesapeake Decisions”, which will be a valuable tool to inform decision making for addressing CBP outcomes. However, this tool is in early stages of development so the GITs, working with STAR, are taking some initial steps to address multiple outcomes (see Appendix 1 for details). One effort is to have a project for mapping geographic areas where actions could benefit multiple outcomes, which is the purpose of this document.

## CONCEPTUAL DIAGRAM OF CHESAPEAKE BAY ECOSYSTEM

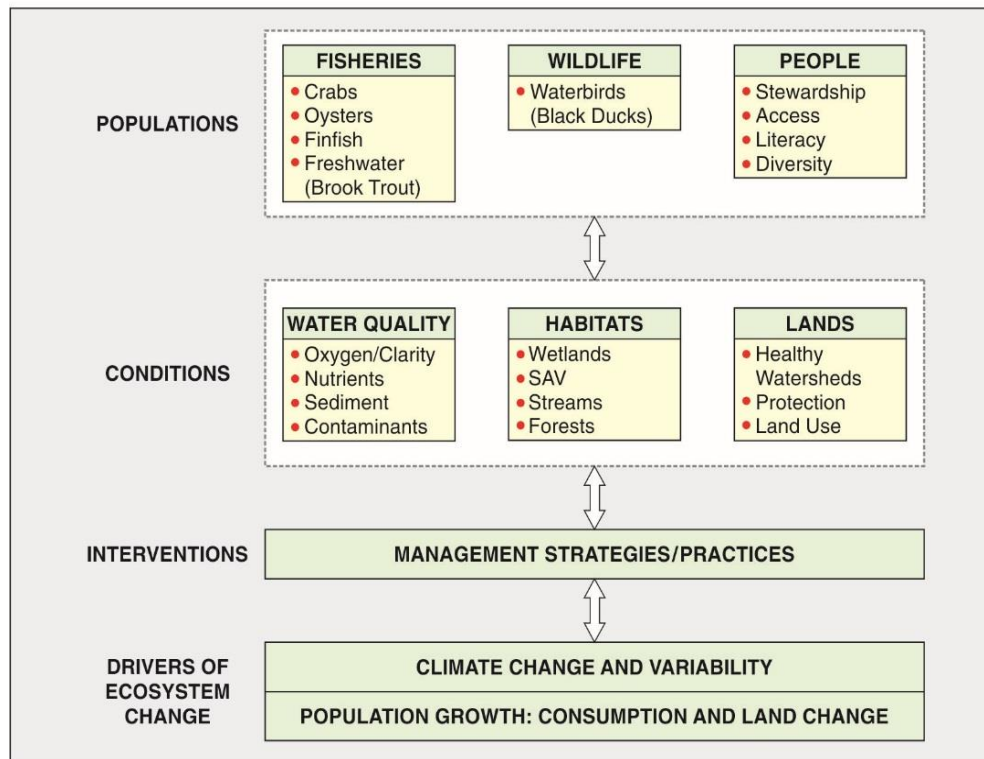


Figure 1 (from Phillips and Blomquist, 2015)

### Audiences and Benefits of the Mapping Project

The initial audience for the project is the GITs since they (1) are focused on implementing activities to achieve outcomes, and (2) have representation of federal, jurisdictional, and NGO partners. We want to have the GITs work effectively with both the:

- The Management Board, which includes the GITs Charis and CBP signatories, can further identify ongoing efforts and help direct resources to areas identified important for both restoration and conservation.
- Principal Staff Committee, who can consider policy implications to better achieve inter-related outcomes.

### Benefits

The value of this cross-outcome, place-based work reflects the original purpose of creating the CBP—to bring together the intellectual and financial resources of each individual partner to protect and restore the watershed in a smarter, more efficient manner. Specifically, it will help:

- Improve our work and enhance work already being planned. It will help individual partners go beyond what they can do alone. Partners will provide support to each other as they implement their work plans and management strategies. Cross-outcome work will help maximize ecosystem benefits, result in multiple benefits and create synergies that would not happen otherwise.
- Prioritize where we work and put resources where they can do the most good (smarter funding). Prioritization can help identify and address current geographic and funding gaps.

- Communicate the work and value of the partnership as a convener and collaborator and showcase CBP as a leader in adaptive management.
- Enhance interaction among multiple stakeholders, local communities and with each other.

The mapping project will allow the GITs to better identify “regional” locations to better coordinate and focus resources that will benefit multiple, inter-related outcomes. The result will be better integration of efforts between multiple partners to make progress toward multiple outcomes. The project will also provide an improved understanding of focusing in key geographic locations to achieve maximum benefits for restoration and conservation activities.

## Considerations to identify geographic areas

There are several approaches or considerations for mapping geographic areas:

- Focus on places most important for living resources (fish, wildlife, and people)
- Identify areas to focus restoration and conservation activities
- Consider threats from land and climate change
- Identify areas where multiple partners are already working or consider priorities.

Mapping considerations for each of the items are discussed below.

### 1. Focus on places more important for living resources.

The initial focus is on living resources that are specified in the Bay Agreement:

- Fish: crabs, oysters, forage fish, and brook trout (as an indicator for freshwater species),
- Wildlife: black ducks (as an indicator for other waterfowl)
- People: outcomes related to stewardship, public access, literacy, and diversity.

The geographic extent for different species varies across the watershed. For example, the tidal waters contain a unique set of shell and finfish species compared to remainder of the watershed. Wildlife has similar distinctions in the range they occur in the watershed. Initially, the project team and GITs considered dividing the watershed into different provinces (Highlands, Piedmont, and Coastal Plain) given the different occupancy ranges of living resources. However, the initial mapping will just consider the entire watershed and make some distinctions for fishery habitat in tidal areas.

Each GIT identified a list of initial outcomes they would like to have mapped (see table xxx) considering the needs for fish, wildlife, and people. Almost every outcome has areas we want to 1. Protect because they are already providing a function to benefit an outcome, or 2. Restore, where they function needs improved to help achieve an outcome (next item has more details)

### 2. Identify areas for conservation and restoration activities that benefit multiple outcomes

Where habitats and lands need to be protected or restored for fish, wildlife, and people. These are usually different and distinct areas. Two examples include the map on the left showing areas important to protect based on ecological integrity and water quality (figure 2) and map on the right (figure 3) showing areas important to restore based on nitrogen loads to local waters.

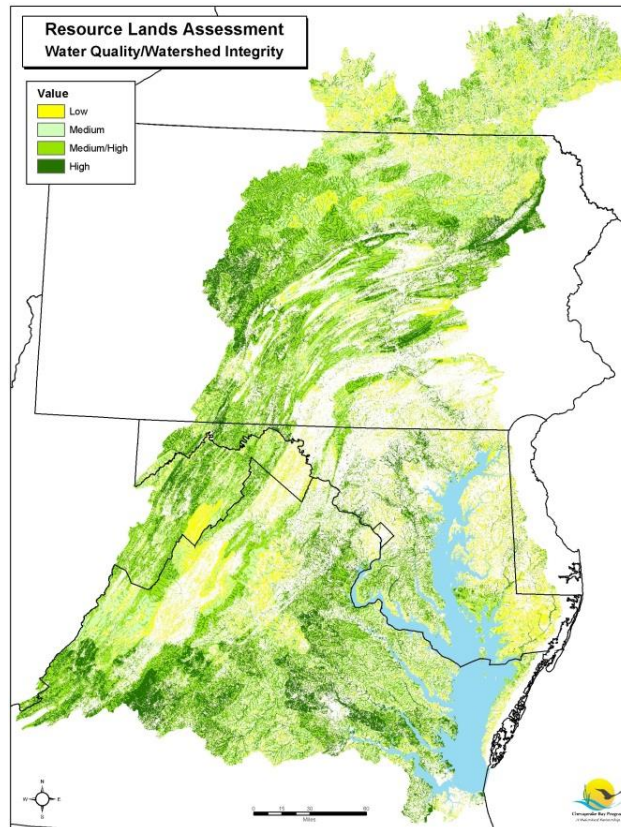


Figure 2: Map of areas of ecological integrity and important water quality protection (from CBP Resource Lands Assessment).

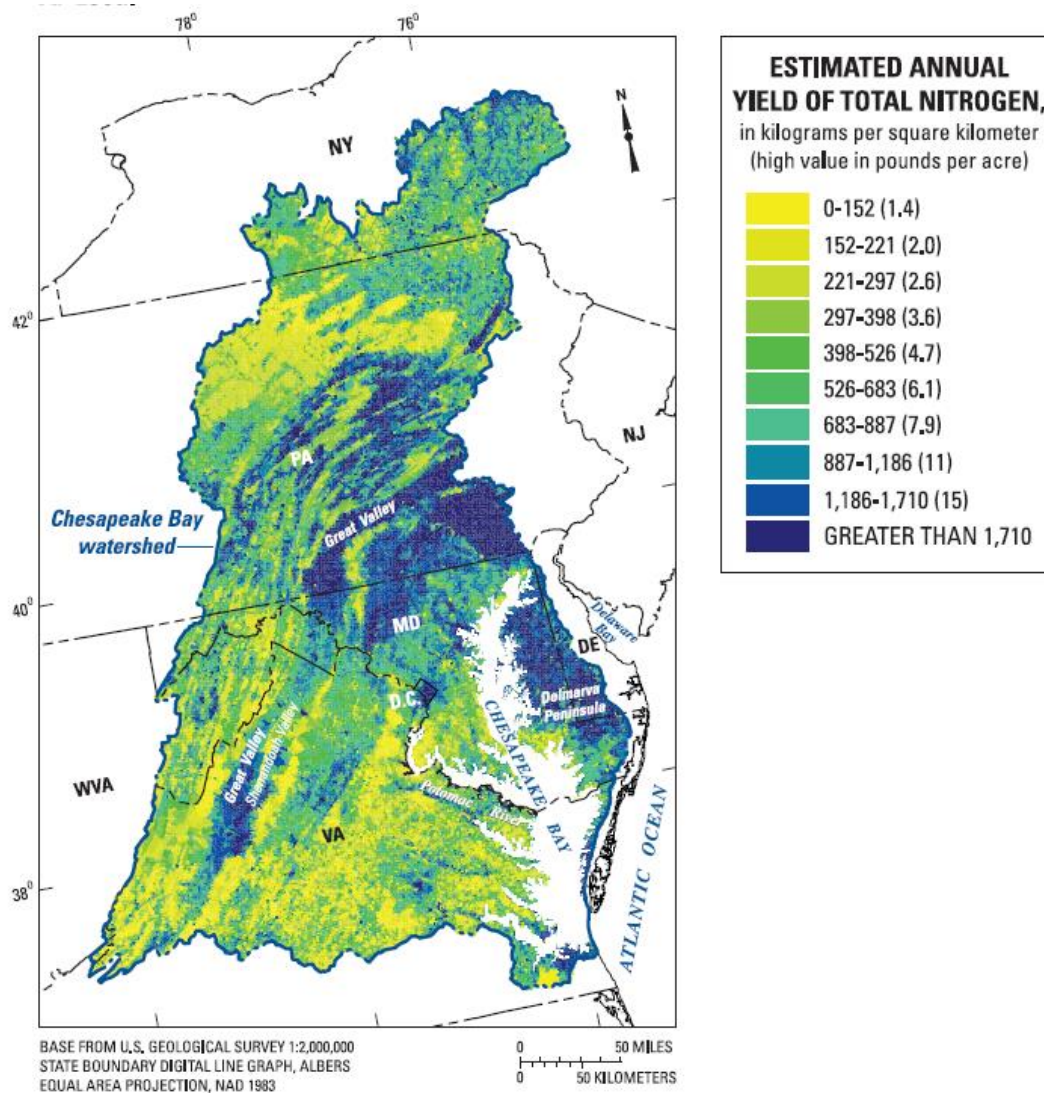


Figure 3: Map of nitrogen loads to local streams in the Chesapeake Bay Watershed (from Ator and other, 2011)

### 3. Consider threats from land and climate change

Understanding the threats to restoration and conservation areas would be based the two primary stressors to the Bay ecosystem (fig 1):

- Population growth and associated land-use change
- Climate change and variability.

The CBP has a Land-Change Model (Claggett, USGS) that can be used to show likely areas of land-use change. The CBP has multiple assessments of climate change being conducted through the Climate Change Workgroup. Selected results of these assessments, such as extent of projected sea-level rise, will be used to display potential geographic areas.

#### **4. Identify areas where multiple partners are already working or consider priorities**

Many groups have already identified areas where they are focusing efforts that can be used for the mapping project. Some examples include Harris Creek Oyster restoration effort, Delmarva RCPP wetlands restoration, and federal partner focus areas. These areas will be gathered for the mapping project so areas of benefits (maps produced in items 1 and 2) can be compared with current areas where partners are focused. This will help partners decide if the location of current efforts should be modified.

#### **5. Conduct joint planning with multiple partners to enhance efforts in selected geographic areas**

The areas identified from steps 1-3 will provide the most “strategic geographic areas” for protection and restoration efforts for multiple outcomes. The next step is compare these areas with those in step 4 where partners are already focusing efforts or consider a priority. Where both ideas line up, it provides an opportunity to enhance activities. Other areas identified in steps 1-3 may not have much current effort, so areas could be considered for future CBP activities.

### **Proposed Approach and Next Steps**

(Status as of Sept 7)

#### **Create base maps for Chesapeake Bay watershed and selected tidal reaches**

Who: CBP GIS team (J. Wolf and C. Wright).

Status: Initially, the project team and GITs considered dividing the watershed into different provinces (Highlands, Piedmont, and Coastal Plain) given the different occupancy ranges of living resources. However, the initial mapping will just consider the entire watershed and make some distinctions for fishery habitat in tidal areas. We will need to consider how to subdivide tidal waters into major salinity regions given their influence on fisheries.

#### **Compile list of GIS layers that will be helpful to identify geographic areas**

Who: GIT staffers with Lindsey Gordon as lead.

Status: Team identified over 100 layers to be considered and where gathered from:

- Fish habitat mapping, particularly for forage, migration and spawning location priorities (GITs 1 and 2)
- North Atlantic Landscape Conservation Cooperative (NALCC) and Appalachian LCC to bring in layers that depict index of ecological integrity and the synthesis mapping of the State Wildlife Action Plans. They will have mapped Regional Conservation Opportunity Areas (RCOA) in July 2016 – which will show state priorities within a regional context and the layers are supposed to be compatible with our system. (GITs 1 and 2)
- Water quality maps of high loading areas to local streams and the Bay (GIT3)
- Landscape Chesapeake priority conservation lands, public access points and healthy watersheds mapping (GITs 4 and 5)

#### **Begin to analyze information to identify geographic areas.**

Who: GIT staffers and coordinators working with CBP GIS team and STAR. Analysis would include:



- Identify areas of intersection where multiple priorities coalesce based on the science
- Then begin to bring in other layers (actions in the work plans or outcomes not yet mapped) and discuss opportunities to add other disciplines to these geographic areas where work is either already happening or could happen in the context of restoration and protection
- Categorize map layers in terms of positive or negative factors (vulnerabilities, threats, opportunities)
- Conduct structured decision making (SDM) to decide on the target focus areas with an eye toward geographic distribution, input from partners and signatories.
- Environmental justice screen to see what gaps or opportunities surface
- Identify the emerging stories, sound bites, story maps to communicate the work

Status: During July STAR meeting, the GITs identified initial priorities (table 1). The Goal Team chairs are meet on August 30 and generally agreed with the initial priorities.

### **Gather information on existing partner efforts and priorities**

Who: *Kristin Saunders and Greg Barranco working with GITs, other partners, and MB*

- Coordinate efforts with Army Corps of Engineers to see how this work might inform or glean information from the Chesapeake Bay Comprehensive Water Resource and Restoration Plan watershed assessment.
- Discuss with NFWF their ideas for selecting priority areas.
- Engage MB and PSC (integrates with signatories at “levels” above staff on the GITs)
- Assess the opportunity to have habitat restoration and other outcome benefits reflected in the Phase 3 WIPs for each state.

Status: discussions held with USCOE and NFWF, who will share their ideas and consider information gathered from mapping project

### **Coordinate project efforts and interaction with CBP entities**

Who: Kristin Saunders and Greg Barranco coordinate efforts between GITs and interacting with CBP partners and entities (such as MB). Scott Phillips provided collaboration with STAR.

Status: GIT Chair meeting held on August 30. Presentation to MB scheduled for Sept 15.

Table 1: Initial layers to consider for restoration and conservation

	<b>Data Layer</b>	<b>Topics</b>
GIT 1	Priority Living Resources Areas	Conservation
	(surrogate for Fish Habitat)	
	Oyster Restoration Areas	Restoration
	National Fish Habitat Action Plan (risk of current habitat degradation)	
GIT 2	Regional Conservation Opportunity Areas	Conservation
	Index of Ecological Integrity (NALCC)	Conservation or Restoration
	Brook Trout	Conservation
	Black Duck Energetics Model	Conservation?
GIT 3	SPARROW Nutrient Loads	Restoration
	Waters Impaired for PCBs	Restoration
	Long Term WQ Monitoring Trends	Restoration
	Water Quality Standards Attainment	Restoration
GIT 4	Healthy Watersheds	Conservation
	Protected Lands	Protection Overlay
GIT 5	Public Access	Conservation
	Land Protection Priorities (via Chesapeake Conservation Partnership)	Conservation
Climate	Sea Level Rise/Inundation	Threat
	Flood Hazard Risk (riverine)	Threat
	Wetland Adaptation Areas	Threat/Conservation
Diversity	High Poverty	
	Ethnic Minority	
	Public Health Indicator ((e.g. cancer rates, asthma, birth defects))	
Land Change	CB Land Change Model	Threat



## Appendix 1: Objectives of Cross Goal Team Collaboration

The goal is to more effectively coordinate actions and resources to achieve inter-related outcomes. The ideas around this project were discussed by the GIT chairs in the fall of 2015 and have evolved since that time. The CBP Scientific, Technical Assessment and Reporting (STAR) and other partners have offered to apply their capabilities to help carry out the approach working closely with the GIT teams. The project has these primary phases:

- **Phase 1: Identify inter-relation between outcomes.** Common actions that are needed to address 2 or more inter-related outcomes would be gathered from the Management Strategies and 2016-17 associated work plans.
- **Phase 2: Mapping: Identify geographic areas important for inter-related outcomes.** Conduct geospatial analysis to determine where the geographic areas overlap for inter-related outcomes. These geographic results can be used to:
  - (1) Identify areas where addressing multiple outcomes should be considered. This would include unique areas where restoration and/or protection need to be emphasized.
  - (2) Choose a subset of locations where multiple partners want to focus efforts.
- **Phase 3: Summarize the factors that affect achievement of 2 or more inter-related outcomes.** Use the information in the management strategies to summarize the most common factors that affect achieving outcomes. Also identify regions where the drivers of ecosystem change (population growth and climate change) will most likely affect achieving outcomes.
- **Phase 4: Identify the interrelated outcomes and factors most important to achieve the goals of Chesapeake Agreement.** This phase will help identify those outcomes and factors which are “keys” (the most inter-relation) to making progress on multiple outcomes in the agreement. Results of this analysis would most likely be used in the next phase of the work plans (2018-19) but some initial findings could help implement the current work plans.

Phase 1 would be carried out by the Coordinators/Staffers based on reviewing all the management strategies and draft work plans and their knowledge of the outcomes. Phase 2 would be done with support from the STAR and the CBP GIS team. Phase 3 would be carried out by the Staffers/Coordinators. Phase 4 would utilize structured-decision making (SDM), which is an approach to help groups discuss and prioritize options to solve an issue. USGS and FWS have staff experienced in SDM. If staffers/coordinators find it useful toward accomplishing the above task, a more comprehensive approach could also be considered with information from all management strategies /work plans put into a data base for a more detailed assessment of each tier. The results from the project can be used through the CBP decision framework to consider refinements to work plans in 2018-19 and ultimately adaptively manage implementation.