

## Appendix C

### Maryland's Natural Filter BMP Screen: Integrating broader state restoration and conservation priorities into BMP implementation decisions.

Project targeting, prioritization, and selection are integral parts of DNR's in-house habitat restoration and conservation efforts. A number of GIS-based targeting exercises exist to identify and prioritize areas and/or watersheds where streams, waterways, wetlands, and habitats are degraded and qualify for restoration. The following screening process can be used throughout targeting exercises to 1) identify sites that align with broader DNR programmatic priorities, and 2) flag sites with potential programmatic, ecological, or cultural and historic conflicts. This screen selects for sites with the potential for long life-spans and ecosystem-wide benefits. Because project objectives are site-specific, users may limit the number sites under consideration based on any or all of the below factors. This screen serves as an additional tool to help with decision-making and final site selection.

**A. Restoration Potential:** *Identify restoration potential to ensure selected sites will survive over the long term. We aim to provide water quality and habitat benefits throughout the project's life-span, whether the project is used for a set timeframe or indefinitely. Select for sites with the greatest recovery potential.*

1. Are the land use, hydrology, and/or soil characteristics appropriate for the selected project?
  - a. Within opportunities identified by the general natural filter BMP targeting model <sup>1</sup> or the Watershed Resources Registry.<sup>2</sup>
  - b. Outside the GIS-identified opportunities but restoration potential confirmed by field visit/s (i.e. on-site evaluation of land use, hydrology, and/or soil characteristics).
2. Does the site fall within priority watersheds?
  - a. Within a Biological Restoration Initiative Watershed. These watersheds contain biologically impaired waters with high potential for removal from Maryland's 303(d) list of impaired streams.<sup>3</sup> +1
3. Do plans for adjacent or upstream future land use/development complement the project's success?
  - a. No adjacent or upstream land use change is anticipated. +1

**B. Water Quality Improvement:** *To improve the health of Maryland's estuarine systems, water quality goals were developed through a Total Maximum Daily Load (TMDL) framework. Natural filter projects offer a means of reducing nitrogen, phosphorus, and sediment loads into the Chesapeake Bay. To help meet water quality goals, identify restoration sites that will best reduce nutrient loading.*

1. Are the land use, landscape, hydrology, soil, and elevation characteristics appropriate for enhanced nutrient removal?

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1 Maryland Department of Natural Resources. Water Quality and Climate Change. Website <http://bit.ly/1jhYctg>

2 Watershed Resources Registry. Website <http://watershedresourcesregistry.com/home.html>

3 Maryland Department of the Environment. Biological Restoration Initiative. Website <http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Pages/programs/waterprograms/tmdl/implementation.aspx#bioresti>  
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- a. Within opportunities identified by the priority natural filter BMP targeting model.
  - 1. Low Priority +2
  - 2. Medium Priority +3
  - 3. High Priority +4
- b. Within high nutrient loading watersheds.
  - 1. Trust Fund Priority Watershed – Medium +1
  - 2. Trust Fund Priority Watershed – High +1.5

**C. Conservation Value:** *The State protects and/or manages land for recreational, cultural, environmental, and scenic purposes through the Program Open Space, Rural Legacy, and Maryland Environmental Trust programs. Restoring land within these protected landscapes will enhance their value while planning for future habitat and species migration needs and increasing coastal resiliency.*

1. Does the site fall within protected lands?

- a. Within agricultural or conservation easements, or state owned/managed protected lands. +1

**D. Ecological Value:** *Maryland has developed a number of data layers to target management efforts in areas of high ecological value. Restoring water quality, habitat, and natural landscapes within or adjacent to these areas will enhance overall watershed health while aiding future habitat and species migration.*

1. Does the site fall within or adjacent to targeted or protected areas?

- a. Within Greenprint Targeted Ecological Areas (TEAs).<sup>4</sup> +3
- b. Adjacent to TEAs. +1.5
- c. Adjacent to easements, state owned/managed protected lands, previously restored sites, or historic/cultural sites. +1.5
- d. Outside TEAs, but within or adjacent to Green Infrastructure.<sup>5</sup> +1
- e. Outside TEAs, but within stronghold watersheds. +1
- f. Outside TEAs, but within or adjacent to wildlife/rare species habitat. +1
- g. Outside TEAs, but within High Priority Blue Infrastructure watersheds. +1
- h. Outside TEAs, but within High Priority Forest Watershed (≥ 30). +1
- i. Within a Tier II watershed.<sup>6</sup> These watersheds exceed minimum water quality standards. +1

2. Does the site fall within targeted watersheds for fisheries habitat restoration?

- a. Within a watershed containing 5 – 15% impervious surface. +2  
Recovery potential becomes marginal at > 15%

**E. Climate Change:** *Over the next century, Maryland expects increased winter-spring precipitation and runoff, warmer air and water temperatures, and relative sea level rise of at least 3.7 feet.<sup>7</sup> Projected impacts are based*

4 Maryland Smart, Green & Growing. Greenprint. Website <http://www.greenprint.maryland.gov/faq.asp>

5 Maryland Merlin Metadata. Green Infrastructure Hubs and Corridors. Website [http://www.mdmerlin.net/metadata/brief/GIhub\\_corridor.html](http://www.mdmerlin.net/metadata/brief/GIhub_corridor.html)

6 Maryland Department of the Environment. Tier II High Quality Waters Maps. Website <http://www.mde.state.md.us/programs/Water/TMDL/Water%20Quality%20Standards/Pages/HighQualityWatersMap.aspx>

7 Boesch, D.F. et al. 2008. Comprehensive Assessment of Climate Change Impacts in Maryland. Maryland Commission on Climate Change.; Boesch, D.F., L.P. Atkinson, W.C. Boicourt, J.D. Boon, D.R. Cahoon, R.A. Dalrymple, T. Ezer, B.P. Horton, Z.P. Johnson, R.E. Kopp, M. Li, R.H. Moss, A. Parris,

on the best available science for the Mid-Atlantic Region. As sea level rises, inundation and saltwater intrusion will alter the current coastal landscape. Restoration efforts should not be prioritized in areas at risk of permanent inundation. Maryland has identified potential wetland migration areas based on sea level rise projections for 2050 and 2100.<sup>8</sup> By conducting restoration activities within or adjacent to these areas, Maryland will facilitate future wetland and habitat migration while increasing wetland connectivity.

1. Is the site resilient to climate change?
  - a. > 2 foot elevation. +1
  - b. < 2 foot elevation with room for migration. +0.5
  - c. Within a wetland migration area. +2
  - d. Adjacent to a wetland migration area. +1

**F. Potential Conflicts and Concerns:** *Sites with potential programmatic, ecological, or historic conflicts should be flagged for more in-depth review before proceeding. If one or more of these factors are applicable, then project design or construction may be impacted.*

1. Is the site within a sensitive species project review area?<sup>9</sup>  
These areas may contain habitats of special interest (i.e. bog turtles, tiger beetles, state plants, etc.) that could be impacted by restoration activities.
2. Does the site fall within a wellhead protection area (WHPA)?  
Excavation and construction may impact the natural infiltration capability or soils within WHPAs by reducing the depth to water table. While construction may impact natural soil infiltration, restoration within WHPAs can also improve well water quality if restoration occurs at sites that were previously pollutant sources – such as agricultural lands – or if the restoration site draws groundwater for additional filtration before entering wells.
3. Is the site adjacent to submerged aquatic vegetation (SAV), potential SAV habitat, shellfish, oyster beds, wetlands, or beach dune habitat?  
Construction activities may impact sensitive environments.
4. Does the site contain cultural or historic components?  
Projects should avoid, reduce, or mitigate adverse effects to historic and/or cultural sites.
5. Does the site fall within 0-2 feet of sea level?  
These areas may be at risk of permanent inundation if conditions are not conducive for migration.
6. Does the site have potential barriers to habitat migration, such as hardened shorelines, bare bank cover, steep bank height, high erosion rates, or impervious surfaces?  
Migration potential is an essential component for any project to ensure long-term benefits.

**G. Outreach Needs:** *Sites within privately owned lands may require a strategic outreach plan.*

1. Does the site fall outside of federal, state, or county owned lands?

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C.K. Sommerfield. 2013. Updating Maryland’s Sea-level Rise Projections. Special Report of the Scientific and Technical Working Group to the Maryland Climate Change Commission, 22 pp. University of Maryland Center for Environmental Science, Cambridge, MD  
 8 Papiez, C. 2012. Coastal Land Conservation in Maryland: Targeting Tools and Techniques for Sea Level Rise Adaptation and Response.  
 9 Sensitive Species Project Review Areas represents the general locations of documented rare, threatened and endangered species. This data layer contains buffered polygons and does not delineate or strictly represent habitats of threatened and endangered species. The data layer incorporates various types of regulated areas under the Critical Area Criteria and other areas of concern statewide, including: Natural Heritage Areas, Listed Species Sites, Other or Locally Significant Habitat Areas, Colonial Waterbird Sites, Nontidal Wetlands of Special State Concern, and Geographic Areas of Particular Concern.