

Maryland Watershed Resources Registry (WRR)

The Maryland Watershed Resources Registry (WRR) identifies priority areas for restoration and preservation of three resource types: wetlands, uplands, and riparian buffers. In addition, there are two suitability analyses for stormwater infrastructure preservation and restoration. The goal of this prioritization process is to facilitate the identification of multiple resource restoration and conservation opportunities across various federal, state, and local regulatory and non-regulatory programs. Prioritization outputs are available to the public as an online interactive map, which users can query by watershed, county, priority rating, wetland size, and other attributes to identify restoration and preservation opportunities that fit their specific goals. The WRR is readily transferable because it uses nationally-available datasets and its underlying mechanics are easy to understand and readily adjusted to fit the needs of other states.

OVERVIEW

Partnering Agencies - Technical Advisory Committee (TAC): U.S. Army Corps of Engineers (USACE) Baltimore District, U.S. Environmental Protection Agency (USEPA), Region III, U.S. Fish & Wildlife Service, Federal Highways Administration (FHWA), Maryland Department of the Environment (MDE), Maryland Department of Natural Resources (MDNR), Maryland State Highway Administration (SHA), Maryland Environmental Services (MES), Maryland Department of Planning (MDP)

Year developed:
2011.¹

Geographic area: The WRR prioritizes restoration and preservation projects for all HUC-12 watersheds throughout Maryland. Although the WRR prioritization models were run at the state level, WRR users can select their HUC-12 watershed to identify watershed-specific priorities.

Resource types:
Uplands, wetlands, riparian zones, and stormwater infrastructure.¹



Figure 1. The WRR Web Application encompasses all HUC-12 watersheds throughout the state of Maryland.

www.watershedresourcesregistry.com

Restoration/Preservation: Ecological actions of the suitability analyses,

Stakeholders: include regulatory and non-regulatory agencies and organizations including: federal, state, and local governments, non-government organizations (NGOs), and the general public.

Current status: The first version of the WRR is complete with statewide prioritization results available online. Personnel affiliated with the WRR provided training for staff members of various government agencies.¹

PRIORITIZATION ANALYSIS

Determination of input factors/weightings: WRR was developed by a multi-partner technical advisory committee. The committee meet regularly from 2008-2013 to select data inputs and set weightings for each geographic information system (GIS) tool.¹

Input data QA/QC: WRR TAC completed a desktop review of the model outputs to ensure that they are being calculated correctly within the model.¹ In addition, the WRR is in the process of developing a method for the field validation of the input data sources listed in Tables 1-6, below. These on-the-ground assessments will likely be rapid and will seek to confirm that the factors are present as described by the input maps.

Landscape prioritization tool(s): The eight models that compose the WRR rate the suitability of potential restoration or preservation sites based on various GIS data sources relevant to each model. Six of these models – wetlands, riparian buffers, and stormwater infrastructure – prioritize aquatic resources. For each of these aquatic resource models, several data factors are overlaid in GIS to establish a functional rating for each map pixel. Based on specified factors, each of the map layers that make up the functional maps are assigned a value of one point or one-half point. All data layers are then added to generate final suitability maps for each model.²

Table 1 illustrates the criteria for the Wetland Preservation model. To view the other seven landscape model criteria, refer to “Model Descriptions” on the homepage of the WRR website. (<http://www.watershedresourcesregistry.com>)

Wetland Preservation Tool: Maryland's WRR wetland preservation tool rates the suitability of each 30m² area throughout the state for wetland preservation by scoring and combining data layers representing a variety of relevant features, such as 'must be a wetland', 'is a Wetland of Special State Concern', and 'is in a Sensitive Species Project Review Area' (Table 1). The final score for the model is converted to a ranking of 1-5 stars, which can be queried on an interactive map on the WRR's website.²³

Prioritization objectives assessed:

- Habitat quality
- Water quality

Table 1. Factors, and associated data sources, used to prioritize for wetland preservation.

Factors used in analysis	Data source(s)
Is a wetland	MDNR wetlands/USFWS NWI wetlands
Not protected	Agricultural Land Preservation Foundation Easements, County Lands, MDNR Lands and Conservation Easements, Environmental Trust Easements, Federal Lands, Forest Conservation Easements, Private Conservation Properties, Rural Legacy Properties
Forested	2010 LULC data (MDE; derived from 2007 NAIP aerial imagery and parcel information from the 2008 Edition of MDProperty View)
In a WSSC	WSSC data (MDNR, Salisbury State University)
In a Blue Infrastructure watershed	Blue Infrastructure Near-Shore Assessment (MDNR)
In a Chesapeake Bay Commission Critical Area Limited Development Area (LDA) or Resource Conservation Area (RCA)	Chesapeake Bay Critical Area Commission critical area maps
Within 200 feet or 600 feet of Stream Classification Use II, III or IV but is not a water body	2010 Integrated Report of Surface Water Quality (MDE)
In a SSPRA	SSPRA data (MDNR, Wildlife and Heritage Service)
In a Tier II watershed	Watersheds containing high quality (Tier II) waters (MDE)
In a stronghold watershed	Stronghold watersheds (MDNR)
In a Green Infrastructure area (hub/corridor)	Green Infrastructure maps (MDNR)
In an unprotected GreenPrint Targeted Ecological Areas	Targeted Ecological Areas (MDNR)
Not in a Priority Funding Area	Priority Funding Areas (MDP)
Near (200 feet) but not in protected lands	Agricultural Land Preservation Foundation Easements, County Lands, MDNR Lands and Conservation Easements, Environmental Trust Easements, Federal Lands, Forest Conservation Easements, Private Conservation Properties, Rural Legacy Properties

NWI = National Wetlands Inventory; LULC = Land Use and Land Cover; WSSC = Wetlands of Special State Concern; ; SSPRA = Sensitive Species Project Review Area; NAIP = National Agriculture Imagery Program

Refinement of priority sites: The WRR provides users with a landscape-level prioritization. This should be followed by a site-specific assessment using rapid assessment/intensive methods to narrow down prospective sites before making a final site selection. In addition, the WRR TAC is developing a method by which users can provide general site-specific feedback on a standardized form.¹

Prioritization products: Users can query each of the eight suitability maps on WRR's website (<http://www.watershedresourcesregistry.com>) by specifying a 12-digit subwatershed, a county, a size criterion (e.g., >5 acres), and a rating criterion (e.g., higher than three stars) to interactively

highlight wetlands that meet those criteria. **Figure 2** shows how the WRR can be used to query wetlands based on location, opportunity, and quality (i.e., “score”) as well as wetland size.

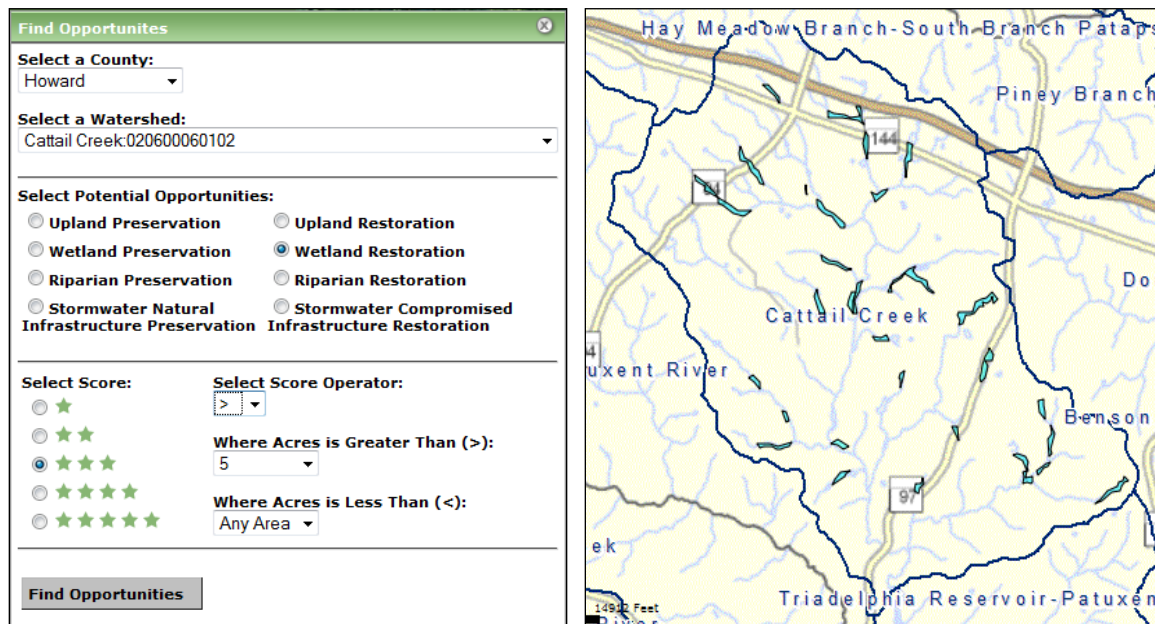


Figure 2. By entering wetland parameters for location, opportunity of interest, score, and size, users of WRR’s interactive map can find wetland polygons that meet their needs. In the example application above, all wetlands larger than 5 acres and ranked higher than three out of five for wetland restoration (*left*), were selected within Cattail Creek, a HUC-12 watershed in Howard County, MD (*right*).

IMPLEMENTATION

Regulatory/non-regulatory programs:

- A major goal of the WRR is to facilitate the identification of multiple aquatic resource restoration and conservation opportunities across various federal, state, and local regulatory and non-regulatory programs.¹
- Section 404.
 - WRR prioritization maps may be used to guide permitting decisions for aquatic resource impacts.¹
 - Watershed approach to compensatory mitigation: Practitioners can readily use existing assessments of watershed needs, such as those available through EPA’s Surf Your Watershed Tool to identify watershed objectives. By using the ‘find opportunities’ query tool that is part of WRR’s online interactive map (Figure 2), users can then search specific watersheds for aquatic resource restoration and preservation opportunities that will satisfy these objectives.¹
- CWA §303(d), §305(b), §319, §401, §402, §404.¹
- Development of Watershed Improvement Plans (WIPs), required by many local communities under the Chesapeake Bay TMDL.¹
- Maryland’s Green Infrastructure Assessment.¹

- Transportation planning: Planning road projects that satisfy Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) §6000. In addition, the Maryland Department of Transportation is incentivized to build roads in areas in which the WRR has identified fewer regulatory barriers – by selecting sites using the WRR it could avoid costly transportation project delays.¹
- U.S. Fish and Wildlife Partners for Fish and Wildlife program.¹
- Rural Legacy Program.¹
- Program Open Space.¹
- NRCS Wetland Reserve Program (WRP). NRCS awards additional points for WRP if proposed wetland restoration or conservation sites fall within prioritized areas.¹

Transferability:

- The WRR uses national, publicly-available datasets.¹
- Spatial datasets that other states may want to add or substitute into the model can readily be incorporated.¹
- The fundamental design of the model is easy to understand.¹

Data gaps:

- High-resolution land cover data: Higher resolution land cover data would improve the overall resolution of outputs from the eight WRR prioritization tools (GIS outputs are limited to the resolution of the lowest resolution data input).¹
- High resolution Digital Elevation Model (DEM) data: High resolution DEM data would allow hydrology to be modeled, facilitating analyses of whether particular points drain into impaired waters.¹

Barriers:

- The WRR TAC have developed a video to train users on the functionality of the mapping tools, but insufficient time and money for outreach and training on the tool and its use have been barriers to its implementation.¹

Future goals:

- Expansion of the tool to other states.¹
- Develop techniques for incorporating field validation of prioritization results into the tool.¹
- Updating the tool on a regular basis.

¹ Interviews on 8/3/2011 with Ellen Bryson, USACE Baltimore District, and on 8/11/2011 with Ralph Spagnolo, USEPA Region III.

² Documentation provided on 8/4/2011 by Ellen Bryson, USACE Baltimore District.

³ Document edited by Brittany Smith, EPA Region 3; Kelly Neff, MDE; and Ralph Spagnolo, EPA Region 3.