



watershed resources registry





GIS-Based Watershed Resources Registry Supports Collaboration in Maryland

Ralph Spagnolo, EPA, Region 3
Ellen Bryson, USACE, Baltimore District

with thanks to our many project partners





What is the WRR?

Three essential components

- eight GIS-based analyses that rate Maryland's best areas for resource preservation and restoration
- a powerful, easy-to-use online mapping tool that provides anyone access to the results and to substantial other GIS data
- and, most importantly, an ongoing, collaborative partnership with EPA Region 3, several MD agencies, USACE, Baltimore District, and several others





Unique among mapping tools

Integrates Programs and Agencies

- Green Print and Rural Legacy priorities
- Section 7 (Threatened and Endangered Species)
- Transportation and land use planning
- NEPA review
- Multiple sections of the CWA: 319, 401, 402, 404, 303(d)
 - Watershed planning, permit review, mitigation assessments
 - TMDL and WIP applications
 - Stormwater management
- Resource conservation / environmental resource planning
- And many more ...





GIS-Based Overlay Analysis

Highlights of the Eight Statewide Maps
for Restoration and Protection



The Eight GIS-Based Overlay Analyses

- Preserve Wetlands
- Restore Wetlands
- Preserve the Riparian Zone
- Restore the Riparian Zone
- Preserve Uplands
- Restore Uplands
- Preserve Natural Stormwater Systems
- Restore Degraded Stormwater Systems





Spatial Analyses Details

- Analysis covered entire state of Maryland
- Found and scored areas that might present opportunities to:
 - find mitigation sites for a transportation project
 - evaluate proposals to find least impact potential
 - find areas to re-create a former wetland
 - find degraded infrastructure and improve the stormwater management system
 - and more
- Scored areas between one and five stars or 'not eligible'





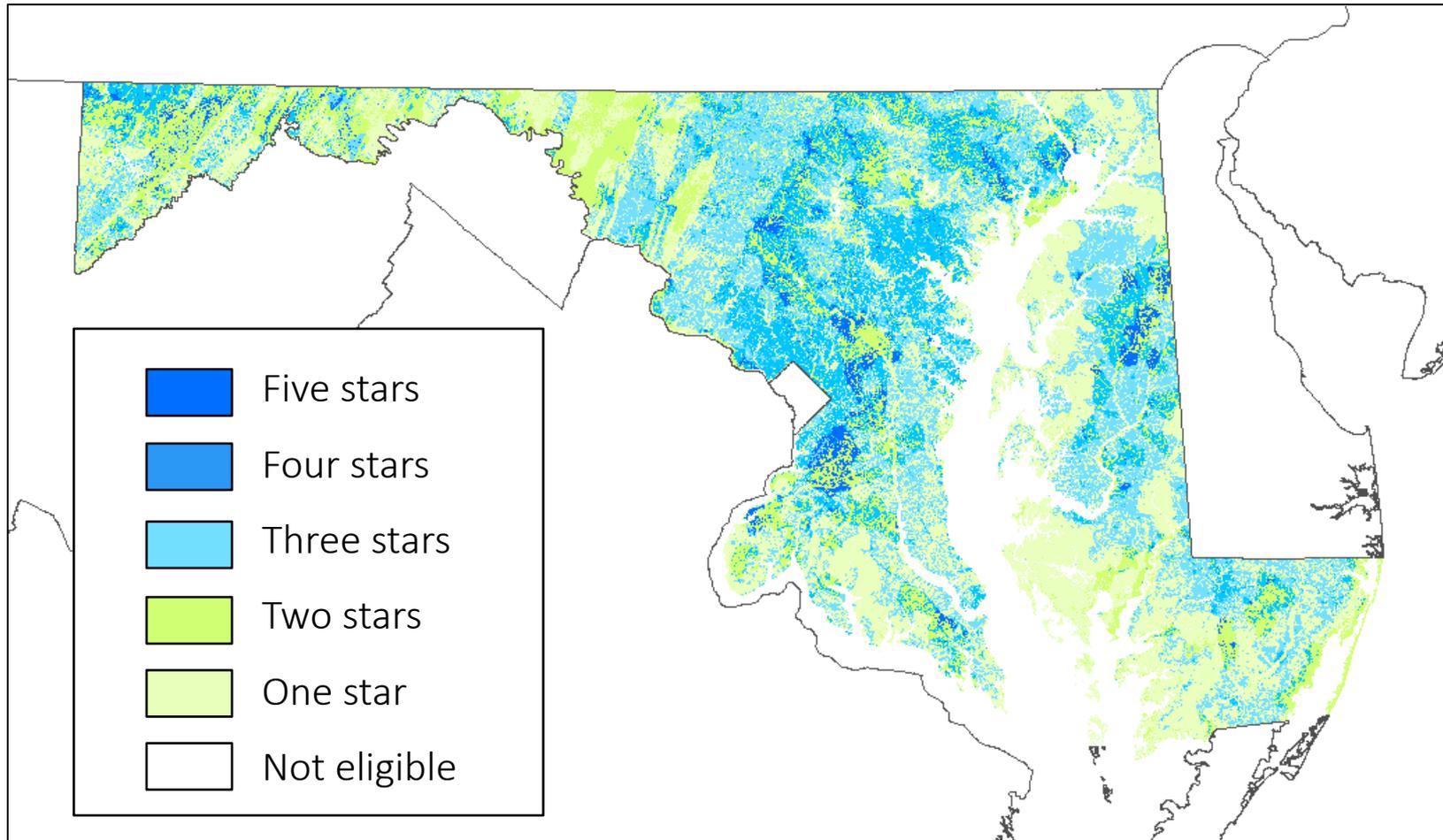
Eight GIS-Based Analyses

- Used ESRI Model Builder
- Simple overlay analysis, where the more “good thing” are found at a location, the higher the star
- Analysis based on
 - resource presence (wetlands, forested areas, protected lands, streams, water bodies, etc.) and
 - Maryland resource priorities (GreenInfrastructure, Targeted Ecological Areas, Blue Infrastructure, Chesapeake Bay Critical areas, etc.)
- “Good things” established by project partners, so it represents their *shared values and shared vision*



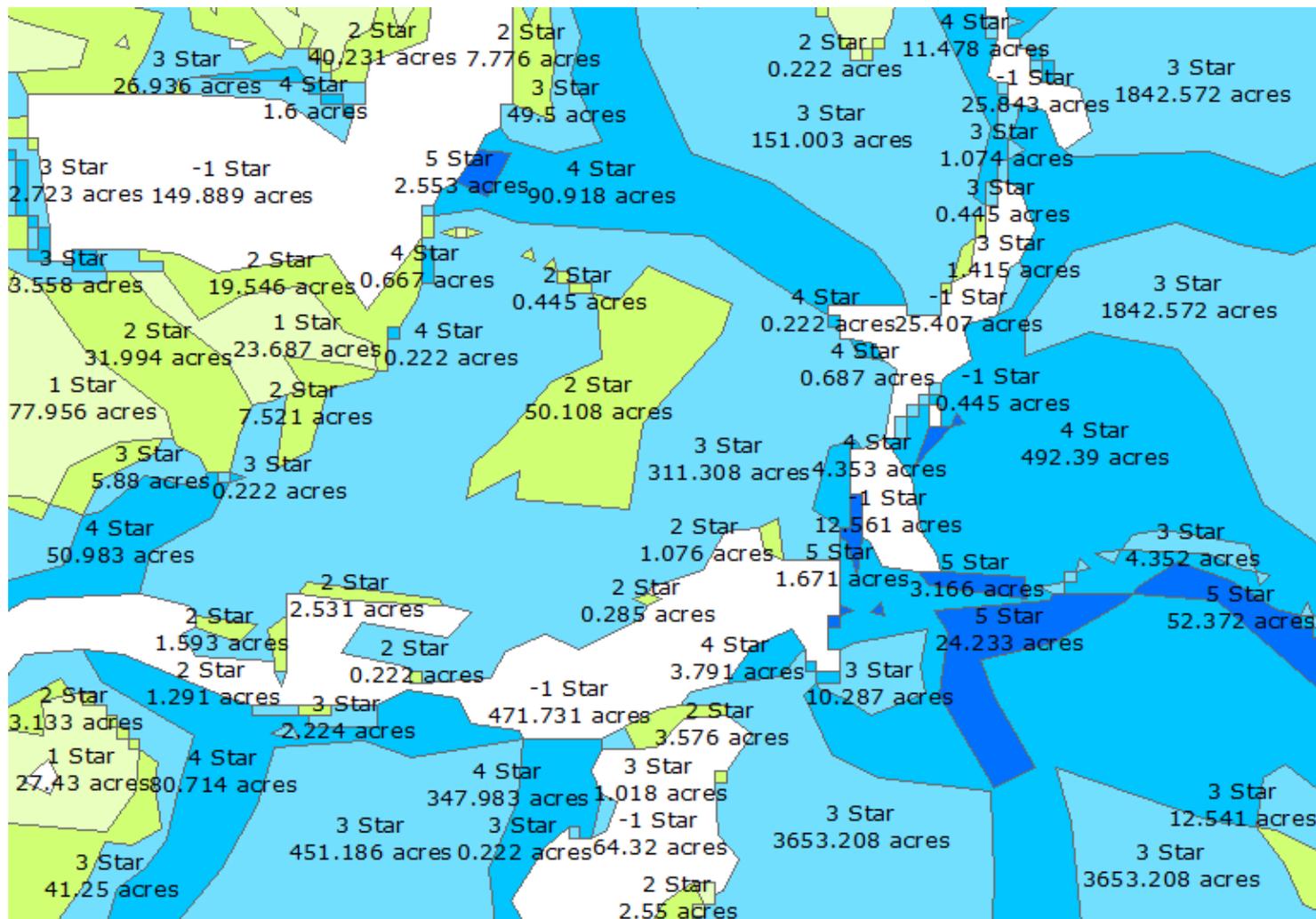


WRR Spatial Analysis Results Example



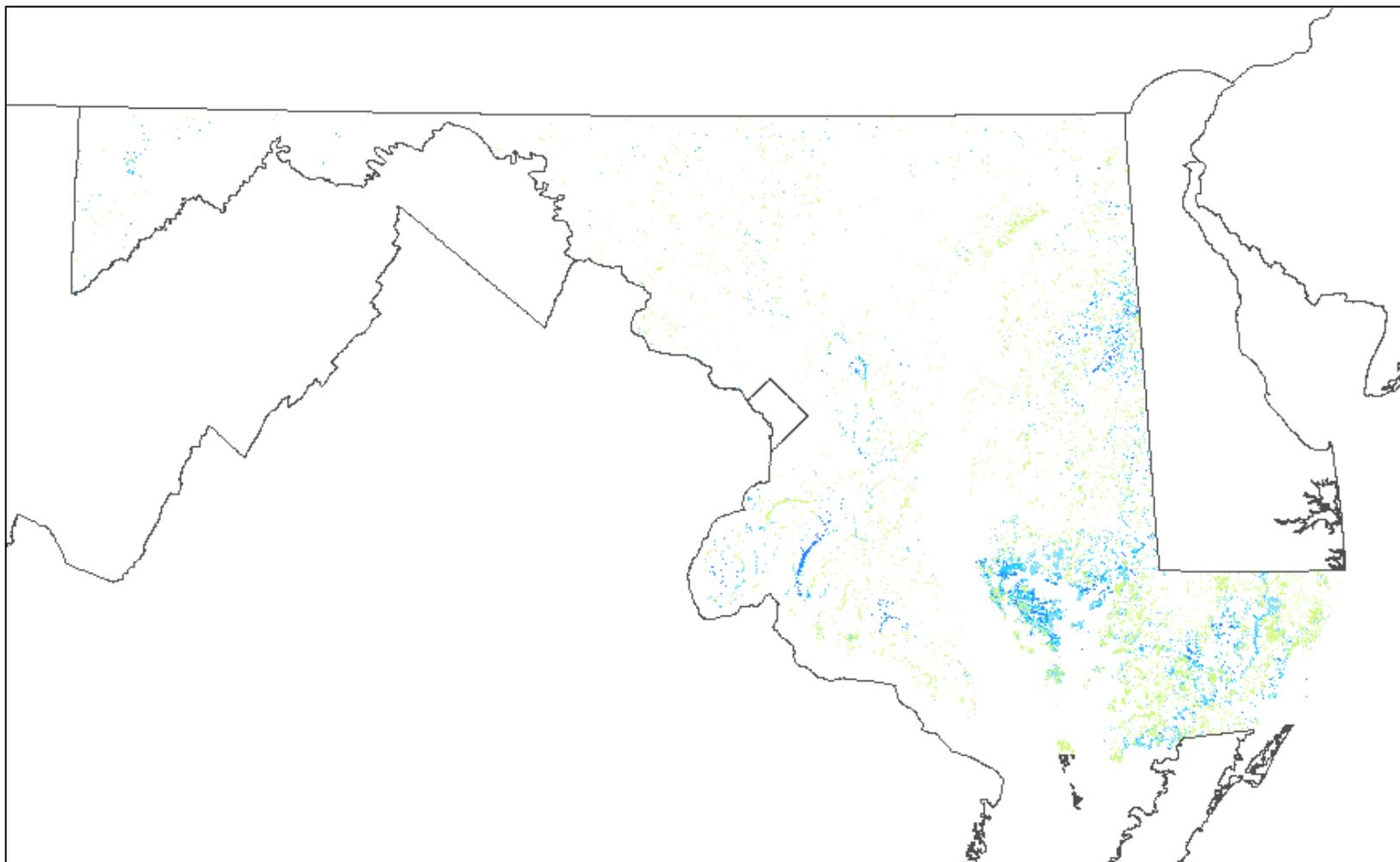


WRR Results: One to Five Stars





WRR Results: Wetlands Preservation





Overlay Analysis: Wetland Preservation

Relative Factors

- in a Blue Infrastructure priority watershed
- in Chesapeake Bay Commission Critical Area (LDA or RCA only)
- is forested
- in a Green Infrastructure area (1 point for “hub”; ½ point for “corridor”)
- near (within 200’) but not in protected lands
- not in a Priority Funding Area
- not in a Sensitive Species Project Review Area (SSPRA)
- within 200’ (1 point) or within 600’ (1/2 point) of a stream designated for uses II, III, IV
- in a Stronghold Watershed are 1 (1 point) or 2 (1/2 point)
- in a Tier II watershed
- in a Wetland of Special State Concern

Absolute Factors

- Cannot already be protected
- Must currently be a wetland



Overlay Analysis: Wetland Restoration

Relative Factors

- in a Blue Infrastructure priority watershed
- in a Biological Restoration Initiative (BRI) watershed
- in Chesapeake Bay Commission Critical Area (LDA or RCA only)
- near (200') or in a Green Infrastructure hub or corridor
- in a Green Infrastructure "gap" area
- in a 100-year (1 point) or 500-year (½ point) flood plain
- in an impaired watershed (as indicated by §303-d)
- in or near (200 feet) of a GreenPrint Targeted Ecologic Area
- near (200') but not in a protected land
- near (within 200') but not in a Sensitive Species Project Review Area (SSPRA)
- near (200') but not in a stream or wetland
- within 200' (1 point) or within 600' (½ point) of a stream designated for uses II, II or IV
- in a Stronghold Watershed area 1 (1 point) or 2 (½ point)
- in a Tier II "watershed"
- in a Trust Fund Watershed - High Priority (1 point) or Medium Priority (½ point)
- is near (200') but not in a Wetland of Special State Concern
- cannot be a wetland

Absolute Factors

- cannot be forested and
- must be on a very poorly drained soils, somewhat poorly drained soils or poorly drained soil



Interactive Website Provides Access to Findings

Easy Access to All WRR Findings and Many Other GIS Data Layers





watershed resources registry

Online, Easy-to-Use Interactive Mapping Tool

Watershed Resources Registry

Navigation: EPA | USACE | FWS | FHWA | SHA | MDE | DNR | Help

Map Contents:

- Parcel Boundaries / Real Property
 - MD Parcels
- Basemap
 - Watershed Resources Improven
 - Watershed Characteristics
 - Waters/Streams
 - Water Quality Impairments
 - Physiographic Region
 - Geology
 - Wetland
 - Soils - Appears If Zoomed In
 - Green Infrastructure
 - Blue Infrastructure
 - Species Related Data
 - Sea Level Rise
 - Base Data
- Imagery
 - MD 6 Inch Imagery

Map Labels: PENNSYLVANIA, NEW JERSEY, DELAWARE, VIRGINIA, WEST VIRGINIA, Garrett, Allegany, Washington, Frederick, Carroll, Baltimore, Harford, Cecil, Kent, Queen Anne's, Anne Arundel, Prince George's, Talbot, Charles, Calvert, Dorchester, St. Mary's, Worcester, Somerset, Wicomico.

Scale: 0 7 14 28 42 56 Miles

Windows Taskbar: start | 2 Internet Explorer | 2 Microsoft Office... | Search Desktop | 5:18 PM



Using the WRR: Find Opportunities

Watershed Resources Registry - Windows Internet Explorer
http://mesgisservices.com/SHA_WRR/wrr/Default.aspx

Watershed Resources Registry

EPA | USACE | FWS | FHWA | SHA | MDE | DNR | Help

Find Opportunities

Select a County: Wicomico

Select a Watershed: All Watersheds

Select Potential Opportunities:

- Upland Preservation
- Upland Restoration
- Wetland Preservation
- Wetland Restoration
- Riparian Preservation
- Riparian Restoration
- Stormwater Natural Infrastructure Preservation
- Stormwater Compromised Infrastructure Restoration

Select Score: ★ ★★ ★★★ ★★★★ ★★★★★

Select Score Operator: <=

Where Acres is Greater Than (>): 5

Where Acres is Less Than (<): 25

Map Content: Opportunities Results, Address Results, Map Contents

Find Opportunities



Using the WRR: Location Details

The screenshot displays the Watershed Resources Registry web application in a Windows Internet Explorer browser. The browser's address bar shows the URL: http://mesgisservices.com/SHA_WRR/wrr/Default.aspx. The page title is "Watershed Resources Registry".

The main content area is divided into several sections:

- Location Details Results:** This section provides a summary of watershed resources improvement opportunities and characteristics. It includes links for "View Watershed Profile" and "Stronghold".
- Watershed Resources Improvement Opportunities:** This section lists various preservation and restoration opportunities with their suitability status:
 - Upland Preservation: Not Suitable
 - Upland Restoration: Not Suitable
 - Wetland Preservation: 5
 - Wetland Restoration: Not Suitable
 - Riparian Preservation: 4
 - Riparian Restoration: Not Suitable
 - Stormwater Natural Infrastructure Preservation: 3
 - Stormwater Compromised Infrastructure Restoration: 1
- Watershed Characteristics:** This section provides metadata and identifiers:
 - HUC: 020801090406
 - HUC Name: Gales Creek-Nanticoke River
 - Maryland 8 Digit Watershed: 02130305
 - Maryland 12 Digit Watershed: 021303050584
- Waterways:** This section identifies the nearest stream and its use designation:
 - Nearest Stream: Reconow Creek
 - Stream Use Designation: I
- Opportunities Results:** This section provides a summary of the results for the watershed.
- Address Results:** This section provides a summary of the address results for the watershed.
- Map Contents:** This section provides a summary of the map contents for the watershed.

The map shows a watershed boundary in cyan, with several roads and streams. A red circle highlights the "Location Details" button in the "Find Opportunities" menu. A "Location Details" popup window is open, displaying the following information:

- Latitude/Longitude: 38.50259, -75.71742
- Watershed Resources Improvement Opportunities:
 - Upland Preservation: Not Suitable
 - Upland Restoration: Not Suitable
 - Wetland Preservation: 5
 - Wetland Restoration: Not Suitable
 - Riparian Preservation: 4
 - Riparian Restoration: Not Suitable
 - Stormwater Natural Infrastructure



Using the WRR: Site Selection

The screenshot displays the Watershed Resources Registry web application. The browser window title is "Watershed Resources Registry - Windows Internet Explorer" and the address bar shows the URL http://mesgisservices.com/SHA_WRR/wrr/Default.aspx. The application header includes navigation links for EPA, USACE, FWS, FHWA, SHA, MDE, DNR, and Help. The main content area features a map with a sidebar on the left containing a legend titled "Map Contents". The legend includes the following items:

- Parcel Boundaries / Real Property
 - MD Parcels
- Basemap
 - Watershed Resources Improven
 - Watershed Characteristics
 - Waters/Streams
 - Water Quality Impairments
 - Physiographic Region
 - Geology
 - Wetland
 - Soils - Appears If Zoomed In
 - Green Infrastructure
 - Blue Infrastructure
 - Species Related Data
 - Sea Level Rise
 - Base Data
- Imagery
 - MD 6 Inch Imagery

A callout box on the map indicates a site size of "5 - 16.0 acres". The bottom of the browser window shows the Windows taskbar with the Start button and several open applications: Microsoft Office Word, Internet Explorer, DE Wetland..., and Inbox - Microsoft Outlook. The system clock shows 5:23 PM.



watershed resources registry

Using the WRR: Print Map

The screenshot displays the Watershed Resources Registry web application in a Windows Internet Explorer browser. The browser address bar shows the URL: http://mesgisservices.com/SHA_WRR/wrr/Default.aspx. The application header includes navigation links for EPA, USACE, FWS, FHWA, SHA, MDE, DNR, and Help. The main content area features a map of a watershed area with a blue overlay. A 'Print Map/Results' dialog box is open, showing a 'Map Size' dropdown set to 'Small' and a 'Submit' button. A red circle highlights the 'Print Map/Results' option in the 'Close WRR Tools' sidebar. The sidebar also includes options for 'Find Opportunities', 'Location Details', and 'X/Y Location'. The left sidebar contains a 'Location Details Results' section and a 'Map Contents' section with various map layers, including 'Parcel Boundaries / Real Property', 'Basemap', and 'Watershed Resources Improvement Opportunities'.



Using the WRR: Print Map Results

Watershed Resources Map - Windows Internet Explorer

http://mesgisservices.com/SHA_WRR/wrr/Print.htm

Watershed Resources Map



Map Projection: State Plane Maryland (NAD83 - Meters)

Selected Location - Coordinates

- Latitude/Longitude: 38.50263,-75.71737

Watershed Resources Improvement Opportunities

- [Upland Preservation](#): Not Suitable
- [Upland Restoration](#): Not Suitable
- [Wetland Preservation](#): 5
- [Wetland Restoration](#): Not Suitable
- [Riparian Preservation](#): 4
- [Riparian Restoration](#): Not Suitable
- [Stormwater Natural Infrastructure Preservation](#): 3
- [Stormwater Compromised Infrastructure Restoration](#): 1

Watershed Characteristics:

- [View Watershed Profile](#)
- HUC: 020801090406
- HUC Name: Gales Creek-Nanticoke River
- Maryland 8 Digit Watershed: 02130305
- Maryland 12 Digit Watershed: 021303050584

Selected Location Information

Waterways

- Nearest Stream: Reconow Creek
- Stream Use Designation: I
- Distance: 21 ft.
- Water Body: Type - Swamp/Marsh

Metadata: [Stream Use Designations](#) | [Water Body](#)

Water Quality Impairments

- Impairments: Bacteria, Biological

Metadata: [Metadata](#)

Wetlands

- Wetlands of Special State Concern: Location inside a wetland.
- DNR: Type - PFO1C
- NWI: Type - Freshwater Forested/Shrub Wetland

Metadata: [WSSC](#) | [DNR](#) | [NWI](#)

Green Infrastructure

- Location inside a hub
- Gap Distance: 266 ft.
- There are no corridors within 500 ft.

Metadata: [Hub](#) | [Gap](#) | [Corridor](#)

Blue Infrastructure

- There is no blue infrastructure within 500 ft.

Metadata: [Metadata](#)

Species Related Data

- Sensitive Species ID: 1601
- Sensitive Species Group: GROUP 2
- Location inside a targeted eco area.
- High Quality FIDs: no

Metadata: [SSPRA](#) | [Target Eco](#) | [FIDs](#)

Soils

- [Metadata](#)
- Soil Type: Zk
- Hydric: Hydric
- Drainage: Poorly Drained
- Prime Farm Land: Not prime

Land Use/Land Cover

- Land Use Type (2002): Evergreen Forest
- Land Use Type (2007): Evergreen forest

Metadata: [Metadata](#) | [Metadata](#)

Physiographic Region

- [Metadata](#)
- Province: Atlantic Coastal Plain Province

Geology

- [Metadata](#)
- Name: Quarternary Deposits Undivided

Internet 100%

start Microsoft... Internet... DE Wetland... Inbox - Mic... 5:37 PM



Example Use for the WRR

Wetland Preservation in Wicomico, MD





Wicomico Example: Wetland Preservation

The screenshot displays the Watershed Resources Registry web application in a Windows Internet Explorer browser window. The browser's address bar shows the URL http://mesgisservices.com/SHA_WRR/wrr/Default.aspx. The application header includes navigation links for EPA, USACE, FWS, FHWA, SHA, MDE, DNR, and Help. The main content area features a map of a rural landscape with a blue-shaded wetland area. A legend on the left side of the map is titled "Map Contents" and includes the following items:

- Parcel Boundaries / Real Property
 - MD Parcels
- Basemap
 - Watershed Resources Improvement
 - Upland Preservation
 - Upland Restoration
 - Wetland Preservation
 - Not Suitable
 - 1
 - 2
 - 3
 - 4
 - 5
 - Wetland Restoration
 - Riparian Preservation
 - Riparian Restoration
 - Stormwater Natural Infrastru...
 - Stormwater Compromised Ir...
 - Watershed Characteristics
 - Waters/Streams

The map shows a blue-shaded area representing wetland preservation, with a scale bar at the bottom indicating distances from 0 to 1256 feet. The browser's taskbar at the bottom shows the Start button, several open applications (Microsoft Office, Internet Explorer, DE Wetland..., Inbox - Micr...), and the system clock showing 5:30 PM on 5/30/2008.



Wicomico Example: Wetland Restoration

The screenshot displays the Watershed Resources Registry web application in a Windows Internet Explorer browser window. The browser address bar shows the URL: http://mesgisservices.com/SHA_WRR/wrr/Default.aspx. The application header includes navigation links for EPA, USACE, FWS, FHWA, SHA, MDE, DNR, and Help. The main content area features a map of a rural landscape with various land parcels highlighted in shades of orange and yellow, indicating different restoration opportunities. A green circle on the map marks a specific location. On the left side, a legend titled "Map Contents" lists several categories with checkboxes and expandable options:

- Parcel Boundaries / Real Property
 - MD Parcels
- Basemap
 - Watershed Resources Improvement
 - Upland Preservation
 - Upland Restoration
 - Wetland Preservation
 - Wetland Restoration
 - Not Suitable
 - 1
 - 2
 - 3
 - 4
 - 5
 - Riparian Preservation
 - Riparian Restoration
 - Stormwater Natural Infrastru
 - Stormwater Compromised Ir
 - Watershed Characteristics
 - Waters/Streams

The map includes a scale bar at the bottom indicating distances from 0 to 1256 feet. The browser's taskbar at the bottom shows the Start button, several open applications (Microsoft Office, Internet Explorer, DE Wetland..., Inbox - Micr...), and the system clock showing 5:31 PM on 5/31/2008.



Wicomico Example: Riparian Preservation

The screenshot displays the Watershed Resources Registry web application in a Windows Internet Explorer browser window. The address bar shows the URL: http://mesgisservices.com/SHA_WRR/wrr/Default.aspx. The browser's Favorites bar includes "Watershed Resources Registry". The application header features a logo and navigation links for EPA, USACE, FWS, FHWA, SHA, MDE, DNR, and Help. The main content area is divided into a left sidebar and a central map.

Location Details Results
Opportunities Results
Address Results
Map Contents

- Parcel Boundaries / Real Property
 - MD Parcels
- Basemap
 - Watershed Resources Improvement
 - Upland Preservation
 - Upland Restoration
 - Wetland Preservation
 - Wetland Restoration
 - Riparian Preservation
 - Not Suitable
 - 1
 - 2
 - 3
 - 4
 - 5
 - Riparian Restoration
 - Stormwater Natural Infrastru
 - Stormwater Compromised Ir
 - Watershed Characteristics
 - Waters/Streams

The map shows a satellite view of a rural area with various colored overlays representing different watershed resources. A green dot is visible on the map, and a scale bar at the bottom indicates distances up to 1256 Feet. The browser's taskbar at the bottom shows the Start button, several open applications (Microsoft Office, Internet Explorer, DE Wetland...), and the system tray with the time 5:32 PM.



watershed resources registry

Wicomico Example: Stormwater Natural Infrastructure Preservation

The screenshot displays the Watershed Resources Registry web application in a Windows Internet Explorer browser window. The browser's address bar shows the URL: http://mesgisservices.com/SHA_WRR/wrr/Default.aspx. The page title is "Watershed Resources Registry".

The application interface includes a navigation menu at the top with links for EPA, USACE, FWS, FHWA, SHA, MDE, DNR, and Help. Below the menu is a search bar and a "Watershed Resources Registry" title bar. The main content area is divided into a left sidebar and a central map.

The left sidebar contains the following sections:

- Location Details Results
- Opportunities Results
- Address Results
- Map Contents
 - Properties / Real Property
 - Watershed Resources Improvement Opportunities
 - Upland Preservation
 - Upland Restoration
 - Wetland Preservation
 - Wetland Restoration
 - Riparian Preservation
 - Riparian Restoration
 - Stormwater Natural Infrastructure Preservation
 - Not Suitable
 - 1
 - 2
 - 3
 - 4
 - 5
 - Stormwater Compromised Infrastructure Restoration
 - Watershed Characteristics
 - Streams

The central map shows a watershed boundary with various colored overlays representing different resource categories. A scale bar at the bottom of the map indicates distances in feet (0, 157, 314, 628, 942, 1256). The browser's taskbar at the bottom shows the Start button, several open applications (Microsoft Office, Internet Explorer, DE Wetland..., Inbox - Micro...), and the system clock showing 5:32 PM.



watershed resources registry

Example: Wicomico County, MD

Mapping Waters- Stream, Floodplain, Water Bodies

Watershed Resources Registry - Windows Internet Explorer

http://mesgisservices.com/SHA_WRR/wrr/Default.aspx

Watershed Resources Registry

EPA USACE FWS FHWA SHA MDE DNR Help

Location Details Results

Opportunities Results

Address Results

Map Contents

- Parcel Boundaries / Real Property
 - MD Parcels
- Basemap
 - Watershed Resources Improven
 - Watershed Characteristics
 - Waters/Streams
 - Stream
 - Floodplain
 - Water Body
 - Water Quality Impairments
 - Physiographic Region
 - Geology
 - Wetland
 - Soils - Appears If Zoomed In
 - Green Infrastructure
 - Blue Infrastructure
 - Species Related Data
 - Sea Level Rise

Open WRR Tools

Done

start

3 Microsoft... 2 Internet... DE Wetland... Inbox - Mic...

Internet 100%

5:28 PM



Wicomico Example: Viewing Wetlands

The screenshot displays the Watershed Resources Registry web application in a Windows Internet Explorer browser window. The browser's address bar shows the URL http://mesgisservices.com/SHA_WRR/wrr/Default.aspx. The page header includes navigation links for EPA, USACE, FWS, FHWA, SHA, MDE, DNR, and Help. The main content area features a map of a rural landscape with a stream and surrounding fields. The stream and adjacent areas are highlighted with green and blue hatched patterns, indicating wetland areas. A legend on the left side of the map lists various categories, with 'Wetland' and its sub-categories checked. The legend includes:

- Stormwater Natural Infrastructure P
- Stormwater Compromised Infrastru
- Watershed Characteristics
- Waters/Streams
- Water Quality Impairments
- Physiographic Region
- Geology
- Wetland
 - Wetlands of Special State Concern
 - NWI
 - DNR
 - Wetland
- Soils - Appears If Zoomed In
- Green Infrastructure
- Blue Infrastructure
- Species Related Data
- Sea Level Rise

The map also includes a scale bar at the bottom, showing distances in feet (0, 157, 314, 628, 942, 1256 Feet). The browser's taskbar at the bottom shows the Start button, several open applications (Microsoft Office, Internet Explorer, DE Wetland..., Inbox - Mic...), and the system clock indicating 5:30 PM on 5/30/2008.



Wicomico Example: Viewing Soils

The screenshot displays the Watershed Resources Registry web application in a Windows Internet Explorer browser. The browser's address bar shows the URL: http://mesgisservices.com/SHA_WRR/wrr/Default.aspx. The application header includes navigation links for EPA, USACE, FWS, FHWA, SHA, MDE, DNR, and Help. The main content area features a map of the Wicomico watershed with soil types overlaid in yellow, tan, and brown. A legend on the left side of the map, titled "Map Contents", lists various categories with checkboxes. The "Soils - Appears If Zoomed In" category is checked, and its sub-items are: "Non Hydric" (yellow square), "Complex" (tan square), and "Hydric" (brown square). Other categories include "Wetland Preservation", "Wetland Restoration", "Riparian Preservation", "Riparian Restoration", "Stormwater Natural Infrastructure", "Stormwater Compromised Infrastr...", "Watershed Characteristics", "Waters/Streams", "Water Quality Impairments", "Physiographic Region", "Geology", "Wetland", "Green Infrastructure", "Blue Infrastructure", and "Species Related Data". A scale bar at the bottom of the map indicates distances from 0 to 1256 feet. The browser's taskbar at the bottom shows the Start button, several open applications (Microsoft Office, Internet Explorer, DE Wetland..., Inbox - Micr...), and the system clock showing 5:33 PM.



Example Use for the WRR

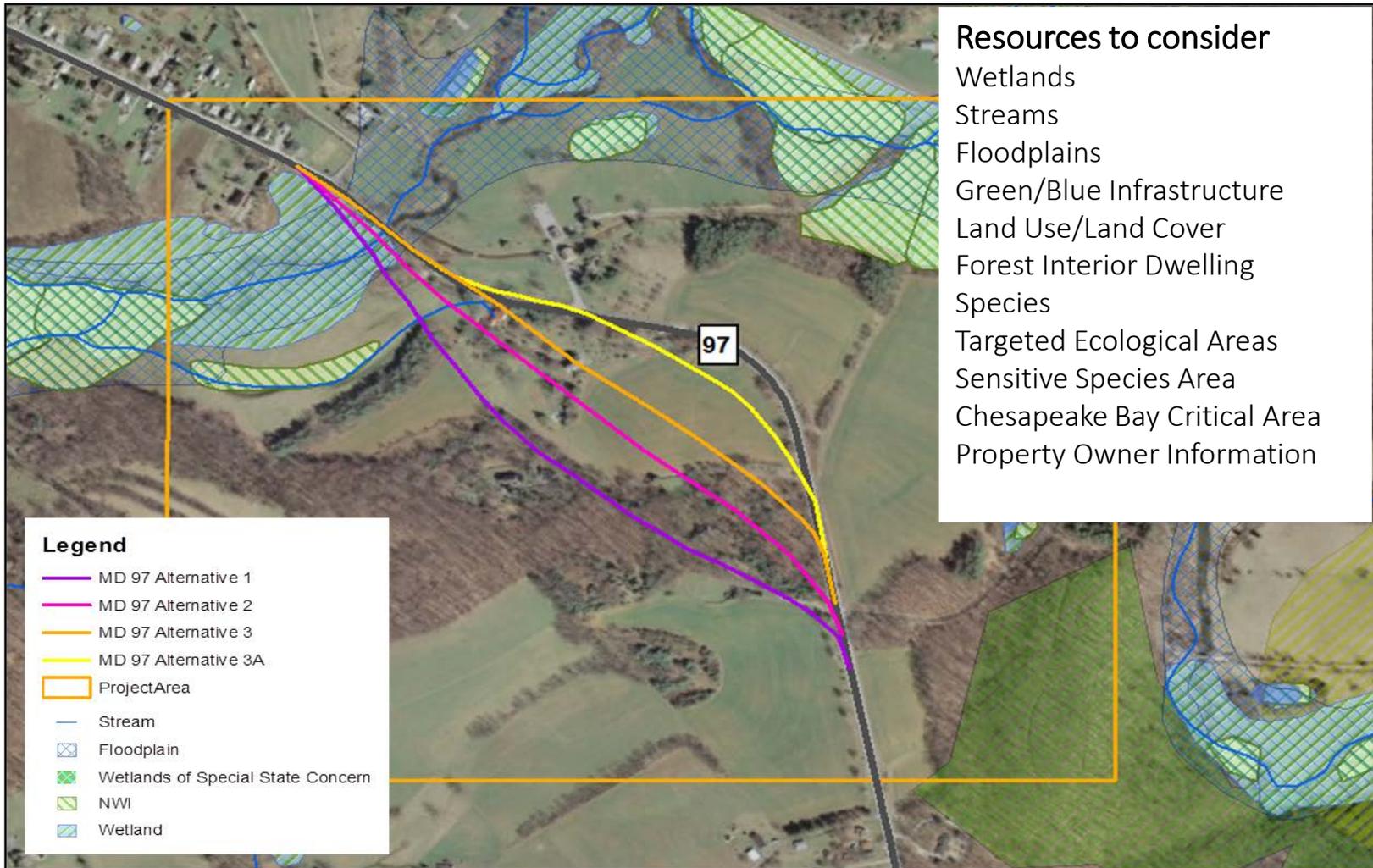
MD State Highway Planning for MD Route 97 Realignment





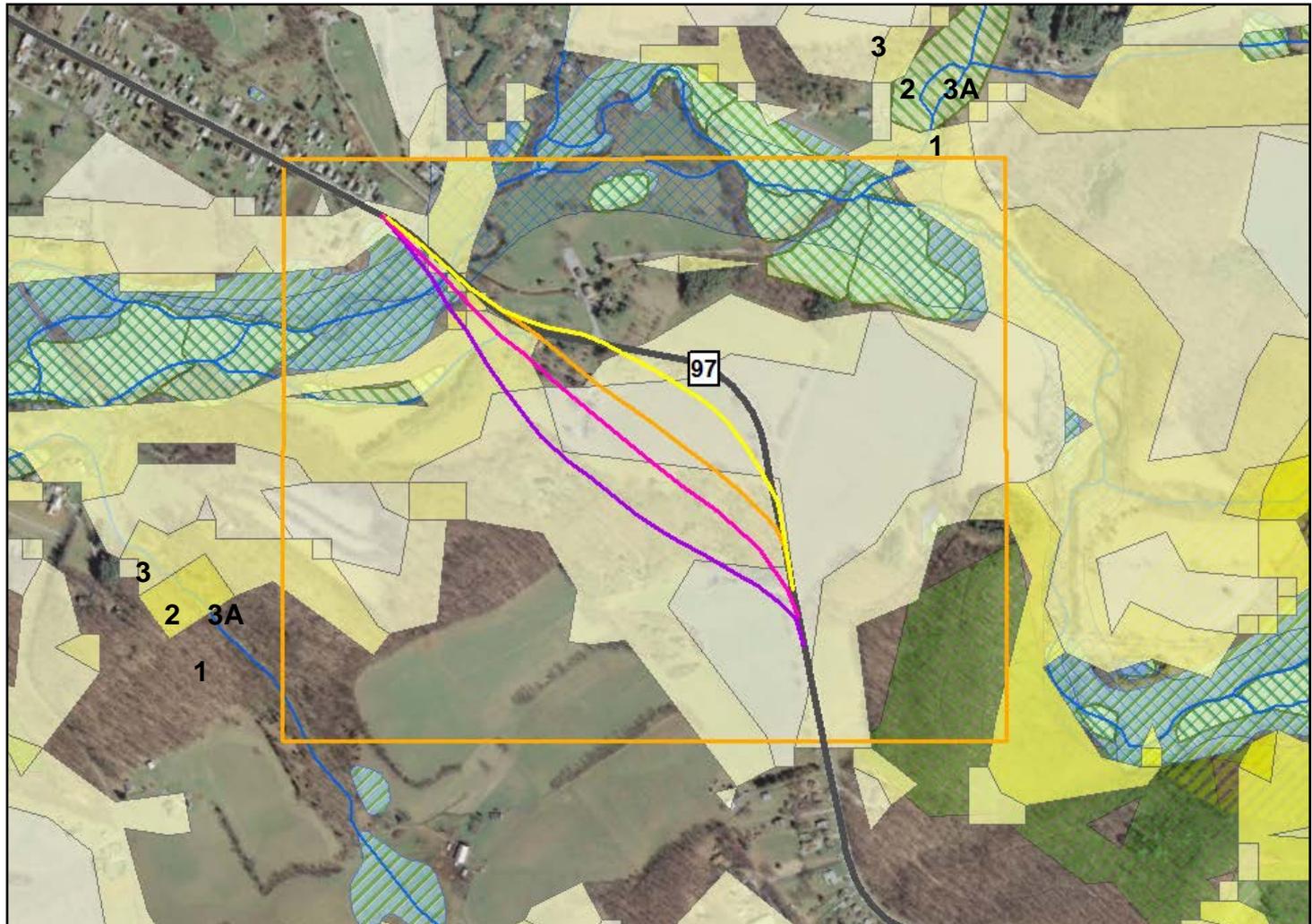
watershed resources registry

Maryland State Highway Example: Avoid and Minimize Impacts Using the WRR



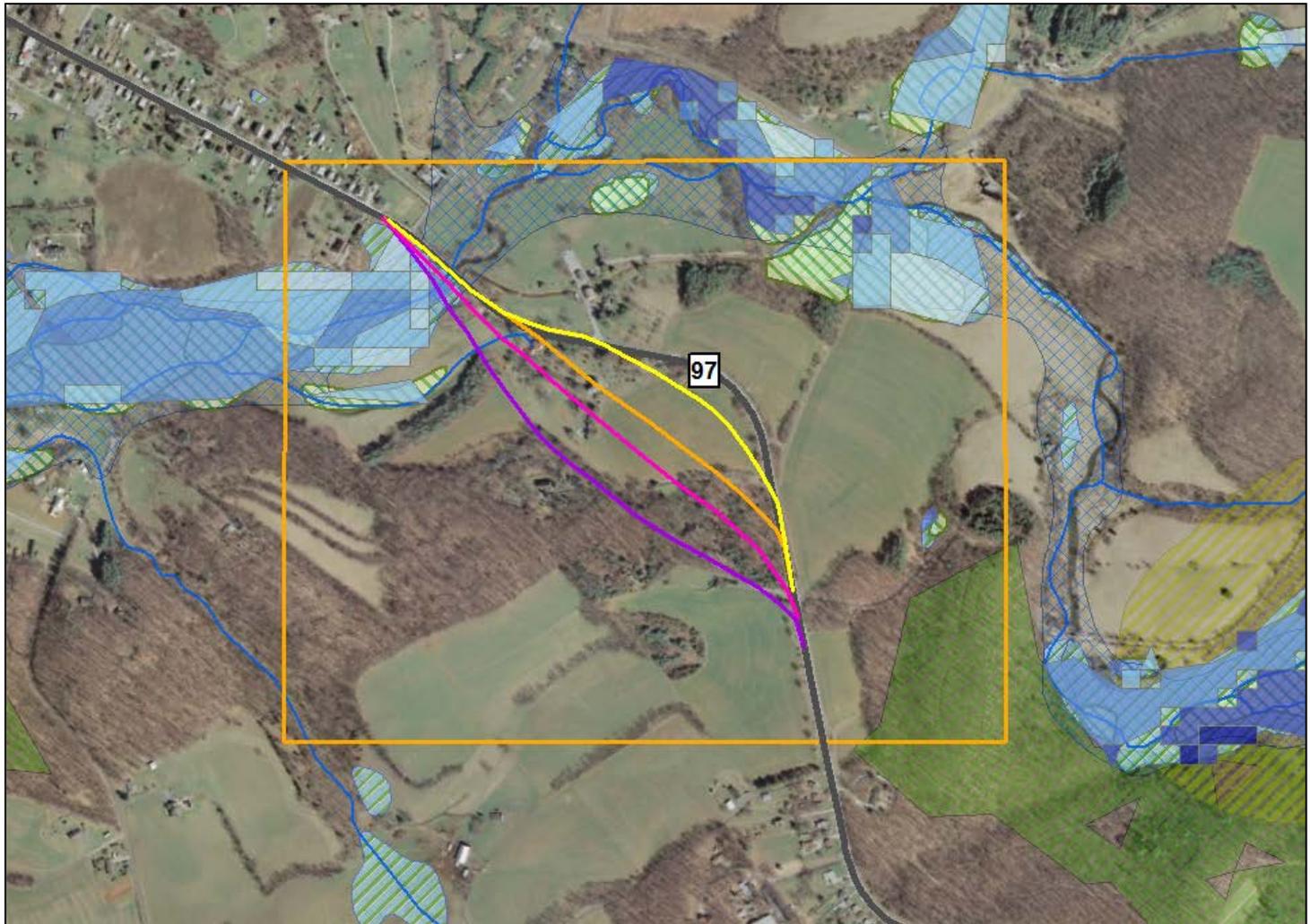


MD Route 97 Realignment Analysis: Upland Preservation



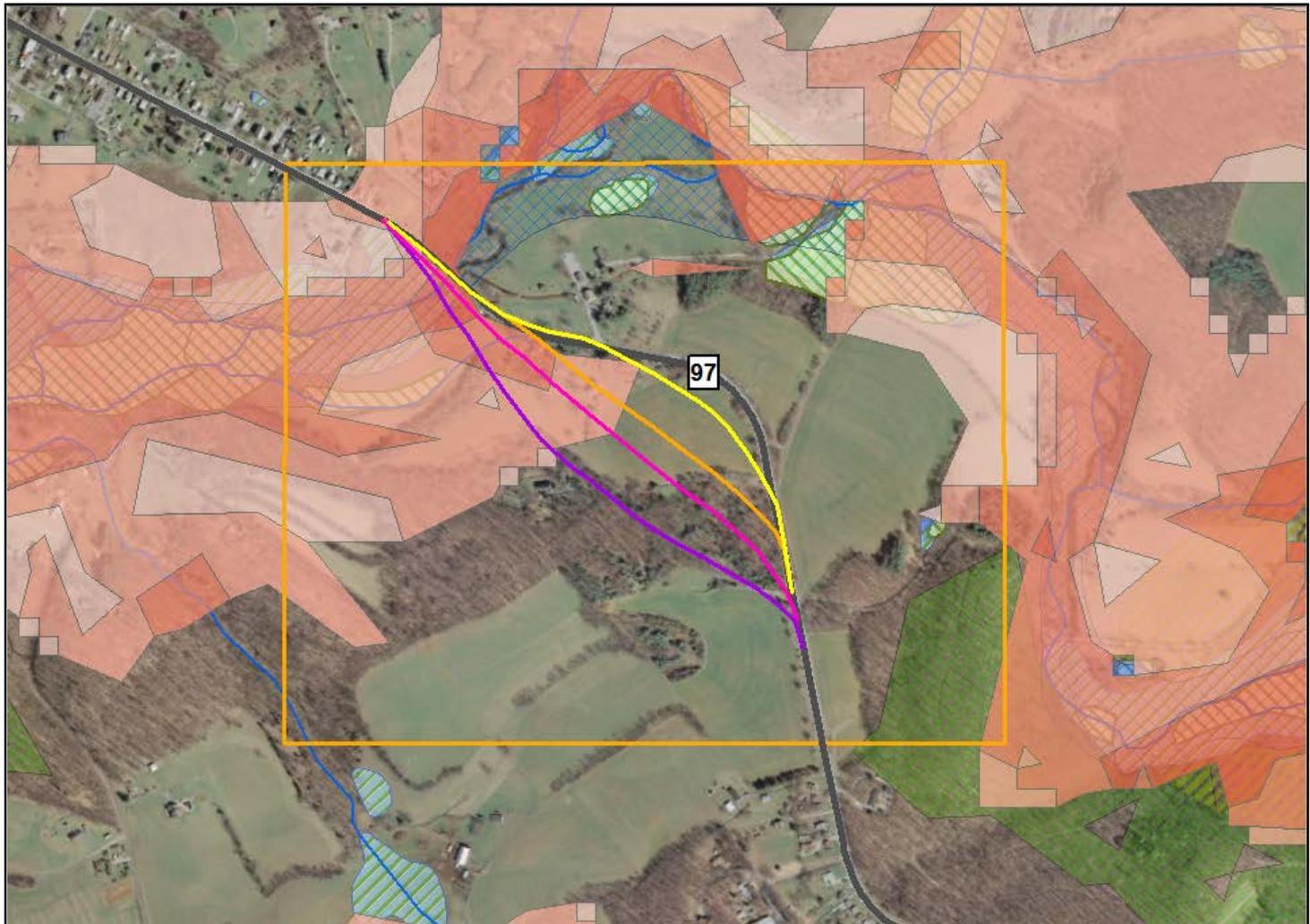


Route 97 Realignment Analysis: Potential Wetland Impacts



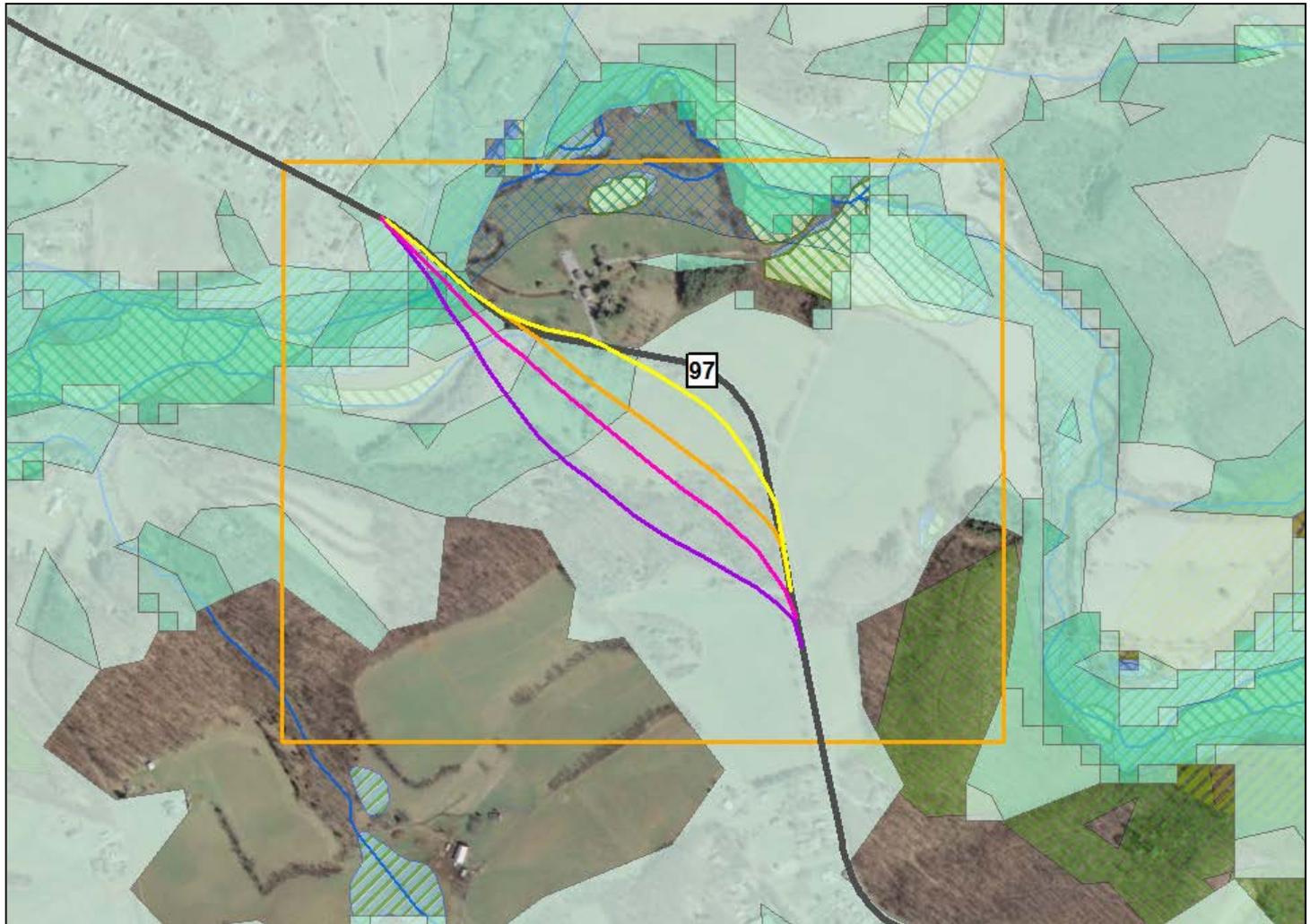


Route 97 Realignment Analysis: Potential Riparian Impacts





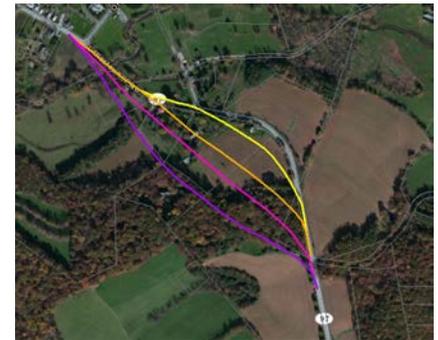
Route 97 Realignment Potential Stormwater Preservation Impacts





Avoidance and Minimization Results: Typical PACM Matrix Using WRR Results

| Impact Types | No-Build Alternative | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 3A |
|-----------------------------------------------|----------------------|---------------|---------------|---------------|----------------|
| Community Impacts | | | | | |
| Residential Displacements | 0 | 1 | 1 | 2 | 0 |
| Residential Properties Impacted | 0 | 7 | 9 | 9 | 6 |
| Range of Natural Environmental Impacts | | | | | |
| 100-Year Floodplain Affected (acres) | 0 | 1.64 | 1.78 | 1.77 | 0 |
| Wetlands Affected (acres) | 0 | 1.35 | 1.36 | 0.56 | 0 |
| Streams (lf) | 0 | 289.3 | 409 | 113.7 | 11.1 |
| Woodlands Affected (acres) | 0 | 7.6 | 3.8 | 4.1 | 1.1 |
| WRR Preservation Opportunity Impacts | | | | | |
| Wetland Preservation (acres) | 0 | 1.77 | 10.6 | 0.6 | 0 |
| Upland Preservation (acres) | 0 | 15.4 | 11.45 | 11.29 | 8.5 |
| Riparian Preservation (acres) | 0 | 8.9 | 6.6 | 5.09 | 3.02 |
| TOTAL ACRES | 0 | 26.07 | 28.65 | 16.98 | 11.52 |





Using WRR to Identify Mitigation Sites

EPA USACE FWS FHWA SHA MDE DNR Help

Watershed Resources Registry

Location Details Results

Watershed Resources Improvement Opportunities

- [Upland Preservation](#): Not Suitable
- [Upland Restoration](#): 3
- [Wetland Preservation](#): Not Suitable
- [Wetland Restoration](#): 2
- [Riparian Preservation](#): Not Suitable
- [Riparian Restoration](#): 2
- [Stormwater Natural Infrastructure Preservation](#): Not Suitable
- [Stormwater Compromised Infrastructure Restoration](#): 4

Watershed Characteristics:

[View Watershed Profile](#)

HUC: 020700090404
 HUC Name: Upper Big Pipe Creek
 Maryland 8 D
 Maryland 12 D

Find Opportunities

Metadata: [HU](#)

Select a County:
 Carroll

Select a Watershed:
 Upper Big Pipe Creek:020700090404

Select Potential Opportunities:

- Upland Preservation
- Upland Restoration
- Wetland Preservation
- Wetland Restoration
- Riparian Preservation
- Riparian Restoration
- Stormwater Natural Infrastructure Preservation
- Stormwater Compromised Infrastructure Restoration

Select Score:
 ★
 ★★
 ★★★
 ★★★★
 ★★★★★

Select Score Operator:
 >=

Where Acres is Greater Than (>):
 Any Area

Where Acres is Less Than (<):
 Any Area

Find Opportunities



Current and Future WRR Initiatives

- Moving to other mid-Atlantic states
- Field Assessment of WRR Using DERAP
- Enhancing the web site to support mobile devices like tablets, smart phones, etc.
- Support login by authorized users to upload site descriptions from the field or desktop ~ moving toward 'crowd' sourcing





Build a WRR in Delaware?

Explorations ...





Factors for Wetland Preservation (Maryland)

- Better score if
 - in a Blue Infrastructure priority watershed
 - in Chesapeake Bay Commission Critical Area (LDA or RCA only)
 - is forested
 - in a Green Infrastructure area (1 point for “hub”; ½ point for “corridor”)
 - in a GreenPrint Targeted Ecologic Area
 - near (within 200’) but not in protected lands not in a Priority Funding Area
 - in a Sensitive Species Project Review Area (SSPRA)
 - within 200’ (1 point) or within 600’ (½ point) of a stream designated for uses II, II or IV
 - in a Stronghold Watershed area 1 (1 point) or 2 (½ point)
 - in a Tier II watershed
 - in a Wetland of Special State Concern
- Absolute factors:
 - Must be a wetland
 - Cannot already be protected





Factors for Wetland Preservation (Delaware)

- Better score if
 - ~~in a Blue Infrastructure priority watershed~~
 - ~~in Chesapeake Bay Commission Critical Area (LDA or RCA only)~~
 - is forested
 - in a Green Infrastructure area (~~1 point for “hub”; ½ point for “corridor”~~)
 - ~~in a GreenPrint Targeted Ecologic Area~~
 - near (within 200') but not in protected lands
not in a Priority Funding Area
 - ~~in a Sensitive Species Project Review Area (SSPRA)~~
 - within 200' (1 point) or within 600' (½ point) of a stream designated for uses II, III or IV
 - ~~in a Stronghold Watershed area 1 (1 point) or 2 (½ point)~~
 - ~~in a Tier II watershed~~
 - ~~in a Wetland of Special State Concern~~
- Absolute factors:
 - Must be a wetland
 - Cannot already be protected





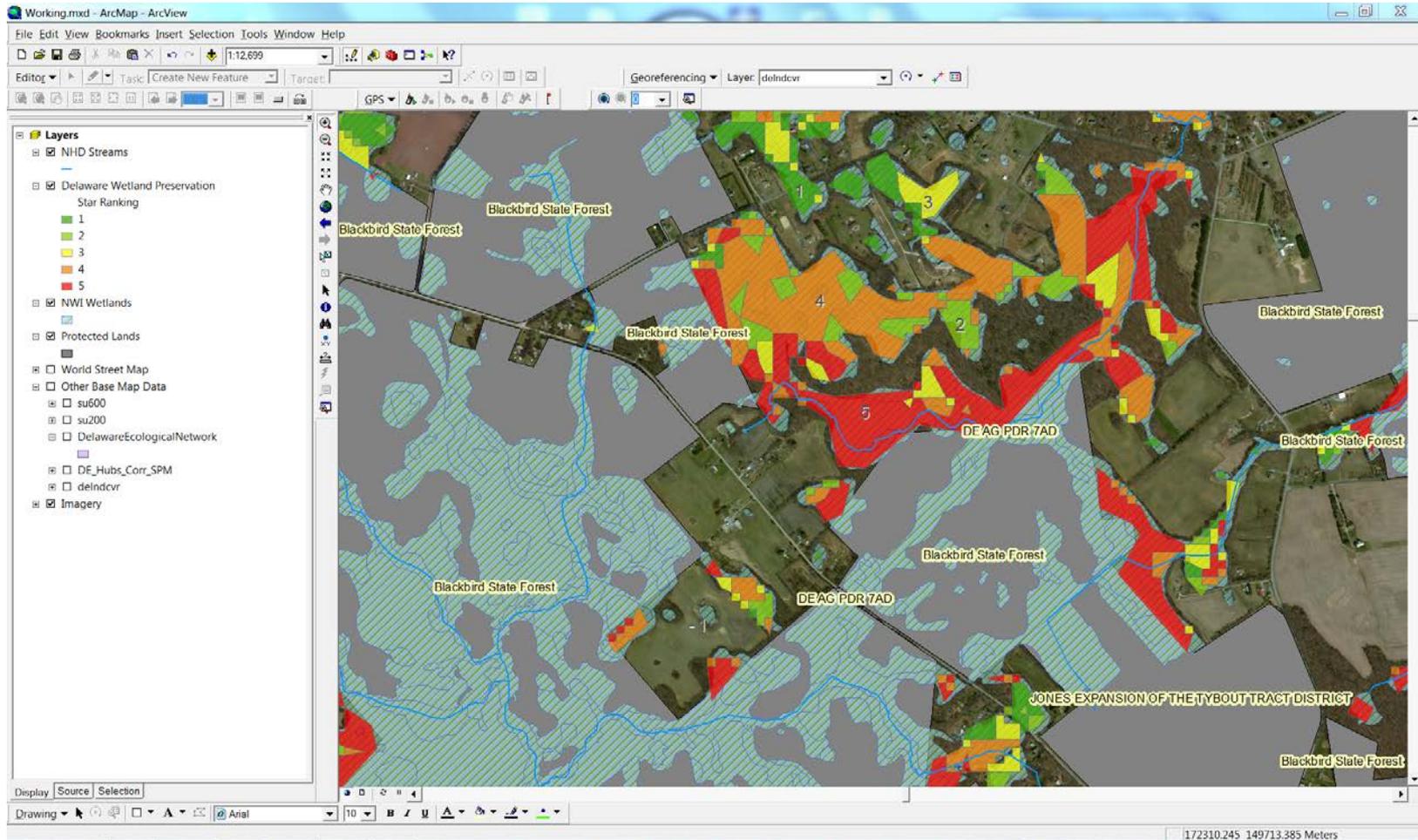
Factors for Wetland Preservation (Delaware)

- Better if:
 - is forested
 - in a Green Infrastructure area (1 ½ points for “core areas”; 1 point for “hub”; ½ point for “corridor”)
 - near (within 200’) but not in protected lands
 - within 200’ (1 point) or within 600’ (½ point) of a stream
- Absolute conditions
 - Must be a wetland
 - Cannot already be protected



watershed resources registry

Potential WRR in Delaware: Wetland Preservation Prototype





How it Might work in Delaware (prototype)

The screenshot shows a web browser window displaying the Watershed Resources Registry. The browser's address bar shows the URL `staging.mesgis.com/wrr/index.html`. The page title is "Watershed Resources Registry". The interface includes a navigation menu with "Overview", "Contents", "Details", and "Results" tabs. A sidebar on the left contains instructions: "To begin, please follow the steps below:" followed by a list of steps: "Use the 'Address Locator' tool or 'Zoom/Pan' tools above to find your location.", "Select the 'Find Opportunities' tool to locate resources within the study area.", and "Select the 'Location Details' tool above and then click the location of interest on the map." The main area is a map showing a residential and agricultural area with blue overlays representing watershed resources. The map is overlaid with a grid and various tool icons (XY, zoom, pan, search, grid, and a user icon) are visible in the top right corner. A "Login to add Site Assessments: Log In" button is also present in the top right corner.

Watershed Resources Registry

Overview Contents Details Results

To begin, please follow the steps below:

- Use the 'Address Locator' tool or 'Zoom/Pan' tools above to find your location.
- Select the 'Find Opportunities' tool to locate resources within the study area.
- Select the 'Location Details' tool above and then click the location of interest on the map.

XY [Zoom] [Pan] [Search] [Grid] [User Icon]

Login to add Site Assessments: Log In



watershed resources registry

Summary: WRR

- Comprehensive
- Replicable in Other States
- Integrates and streamlines regulatory programs
- Guides resource planners
- Saves time and money
- Increases program efficiencies
- Screens for preferred actions and maximizes watershed benefits
- Is transparent, predictable and reliable
- Facilitates multiagency input and coordination





Thank you!

Ralph Spagnolo

Spagnolo.Ralph@epa.gov

(215) 814-2718

Ellen Bryson

Ellen.Bryson@usace.army.mil

(410) 962-6084

Contact us for additional questions and information

Or visit the WRR website at

www.watershedresourcesregistry.org

