



Maryland
Department of
the Environment

Biological Uplift in Stream Restoration Projects

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Presentation by:

Wetlands and Waterways Program

Integrated Water Planning Program

Maryland Department of the Environment



Wetlands & Waterways Program

MDE's Wetlands and Waterways Program (WWP) implements three main statutes and regulations:

Waterway construction - Changes to course, current, and cross sections in nontidal waters and floodplains

Tidal wetlands

Nontidal wetlands



Integrated Water Planning Program

- The Integrated Water Planning Program performs several functions:
 - ***Develop TMDLs for impaired waterbodies in MD***
 - Tracking, reporting, and WIP development for the Chesapeake Bay TMDL
 - Water and Sewer plan review, and....
 - ***Implementation of local, State TMDLs***



Local Non-tidal Sediment TMDLs

- **Derived from biological endpoints**
 - **303(d) listings for biological impairments**
 - **non-attainment of aquatic life designated use**
 - **i.e., IBI scores < 3**
 - **Biological stressor identification analyses to determine stressors to aquatic life**
 - **Result in sediment impairments listings on MD's Integrated Report**
 - **Sediment TMDLs developed to address these stressors**



Local Sediment TMDL Example

- Benthic IBI < 3
- BSID indicates sediment impairment based on habitat assessment metrics, i.e.....
 - Embeddedness
 - Poor epifaunal substrate
 - Riffle/run quality
- Sediment TMDL developed
 - Sediment TMDL calculated based on comparison of impaired watershed to reference watershed, where habitat/sediment stressors are not present
- Restoration done to make progress with local sediment TMDLs should be consistent with improving the various habitat metrics indicative of sediment related stressors to biology



Permitting Process

Most stream restoration projects are in highly degraded areas and authorized with short review time

Review is extended if there is debate about degradation and potential loss of existing resource benefits

Existing stream and adjacent wetland habitat condition has been concern in some cases



Project Issues

For stream restoration projects, the following issues have arisen that could be viewed as related to biological uplift:

- **Loss of trees resulting in potential thermal impacts**
- **Direct construction impacts**
- **Changes in hydrology**
 - **Conversion of vegetated wetland to open water**
 - **Conversion of forested wetland to another wetland type**
- **Changes in resource benefits and habitat**
- **Temporary changes in water quality????**

Cause: Too much emphasis in design on reducing loads to downstream tidal waters and maximizing credits, potentially at expense of ecological function of local reach?



Recommendations

- **Pre-construction assessments**
 - should include some assessment of current biological condition, regardless of “level” of restoration
 - Assessments should better merge channel metrics with metrics characterizing condition and function of adjacent riparian/wetland area
 - Most assessments lacking in merged metrics, PA method has some promise
 - Some physical metrics vary greatly from year to year
- **Site specific design**
 - Don’t force a design
 - Install practices closer to sources wherever feasible—recognizing that there are a lot of legitimate reasons why that can’t always happen
 - Consideration not only for in-stream biotic and habitat metrics in restored reach but also associated stream health metrics, i.e., riparian buffer extent, wetland conditions, etc.
- **Continued research looking at restoration effects on in-stream water quality, habitat, and biotic integrity as well as riparian/wetland condition, etc.**



Challenge Questions

How can we create incentives for more biological uplift as a project goal?



Resources

Wetlands and Waterways Program

http://www.mde.state.md.us/programs/Water/WetlandsandWaterways/Pages/Programs/WaterPrograms/wetlands_waterways/index.aspx

IWPP

<http://www.mde.state.md.us/programs/Water/TMDL/Integrated303dReport/Pages/index.aspx>

http://www.mde.state.md.us/programs/Water/TMDL/Pages/bsid_studies.aspx

http://www.mde.state.md.us/programs/Water/TMDL/Pages/summittals_a-l.aspx