

Value of Pooled Monitoring Program & Practitioner Stream Restoration Research Needs



CBT Pooled Monitoring Forum
June 2020

www.chesapeakestormwater.net

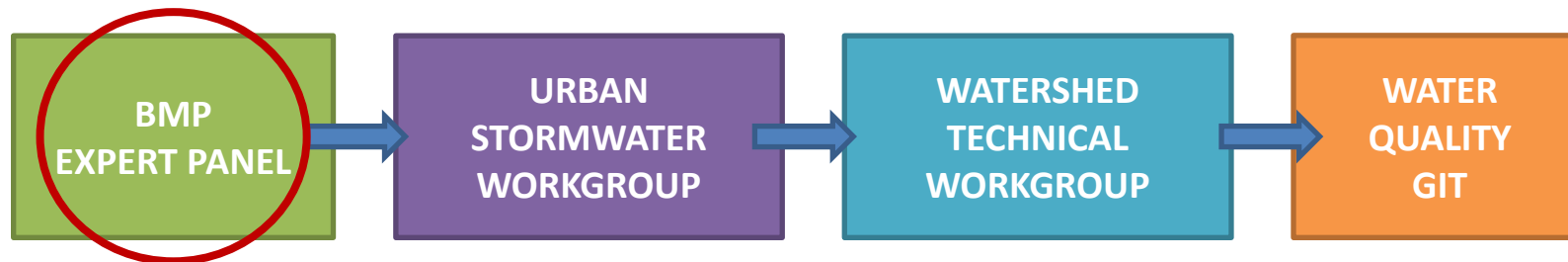
Thanks a ton!

- Past research from the pooled monitoring consortium was “just-in-time” for our most recent round of stream restoration expert panels... and much of it was used to support new protocols and best practices to minimize unintended consequences.
- Pooled research will be critical step to revisit other CBP expert panels in the future

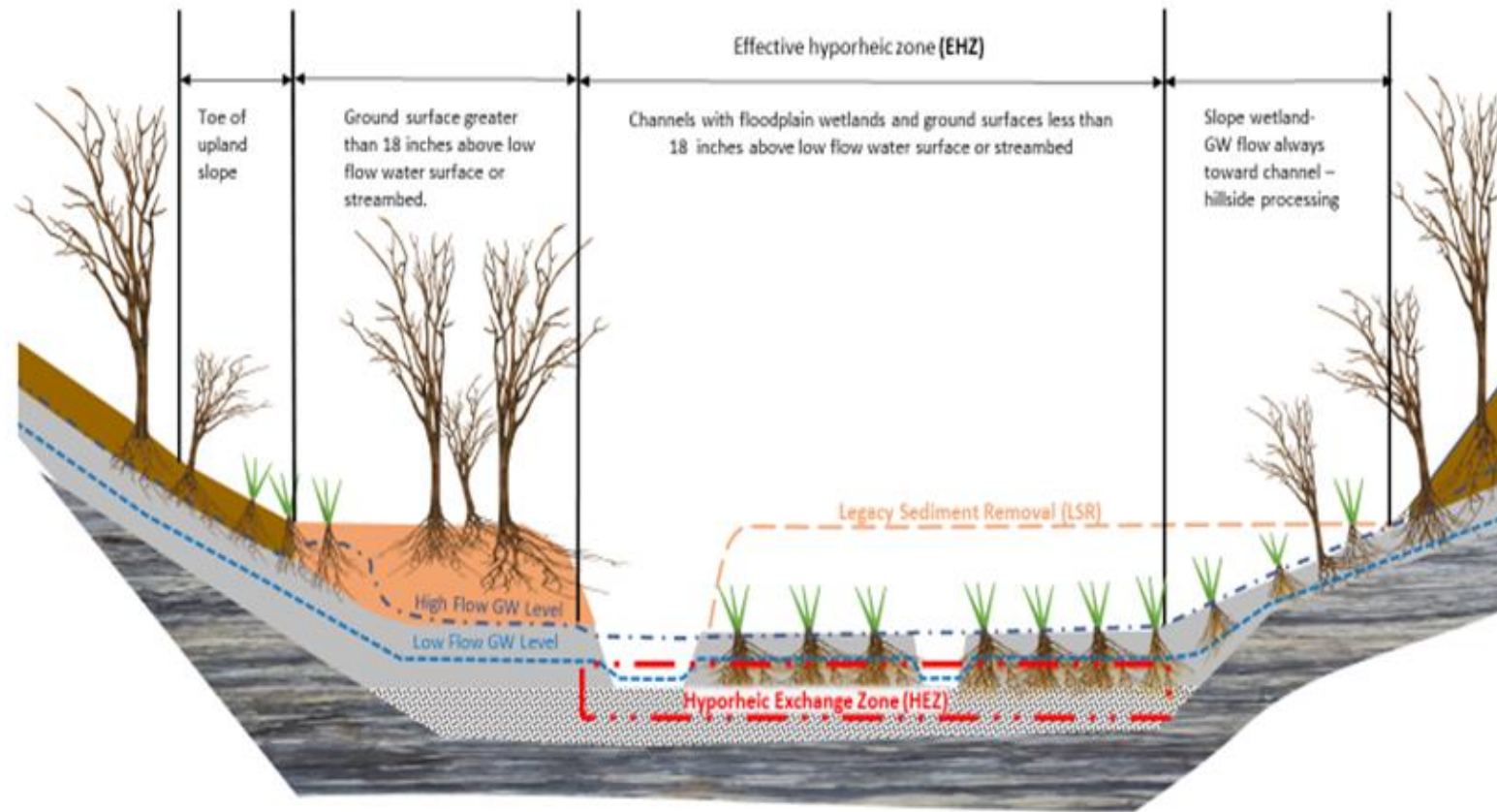
Revisiting Stream Restoration



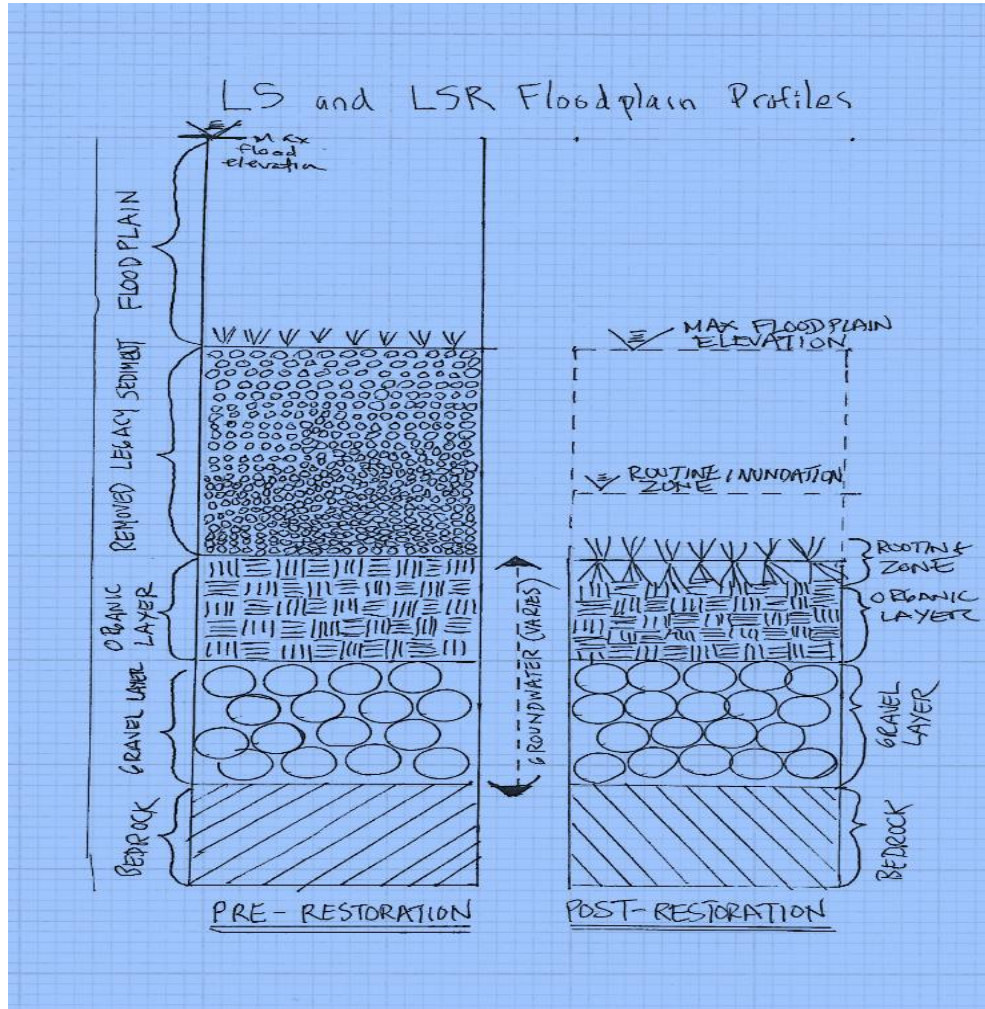
- All 5 Groups of Experts Have Come to Consensus!
- Last Memo (group 4&5) out for External Comment til 6/19
- Seek USWG Approval in July
- Develop Consolidated Crediting Guidance in Fall
- State by state SR crediting outreach (upon request)
- Further CSN work on practice resilience to climate change



Floodplain Restoration: Legacy Sediment Removal

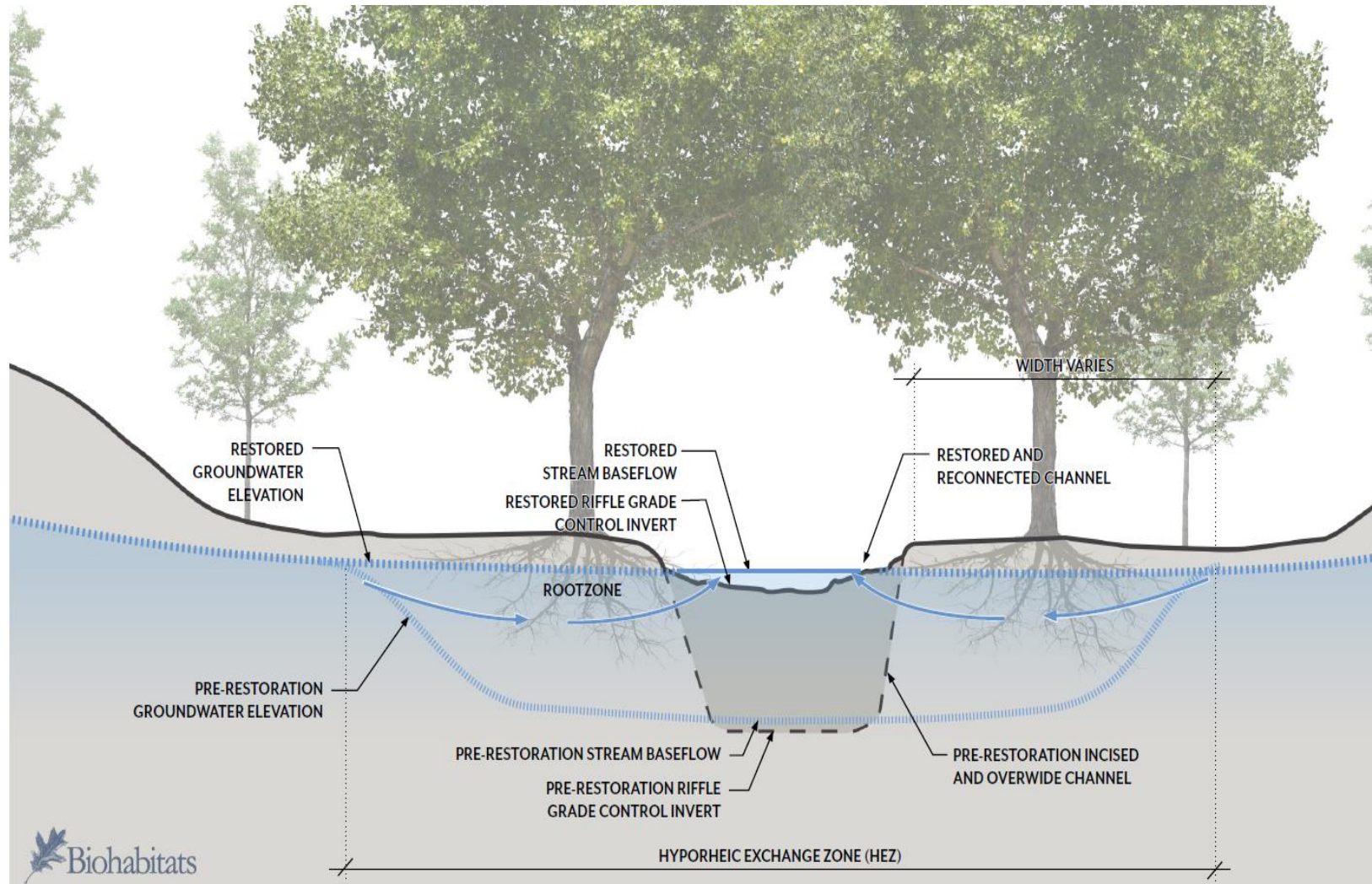


Floodplain Profiles, before and after restoration



Floodplain Restoration

Raised Stream Bed



Environmental Considerations



*Credit: Mike Rahnis, UNAVCO,
Dorothy Merritts and Robert Walter*

Unintended Environmental Consequences of Stream Restoration Practices

Project Stream Channel

- Depleted Dissolved Oxygen
- Iron Flocculation
- Warmer Summer Stream Temperatures
- More Instream Primary Production
- Turbidity During Project Construction
- Initial Decline in Benthic IBI

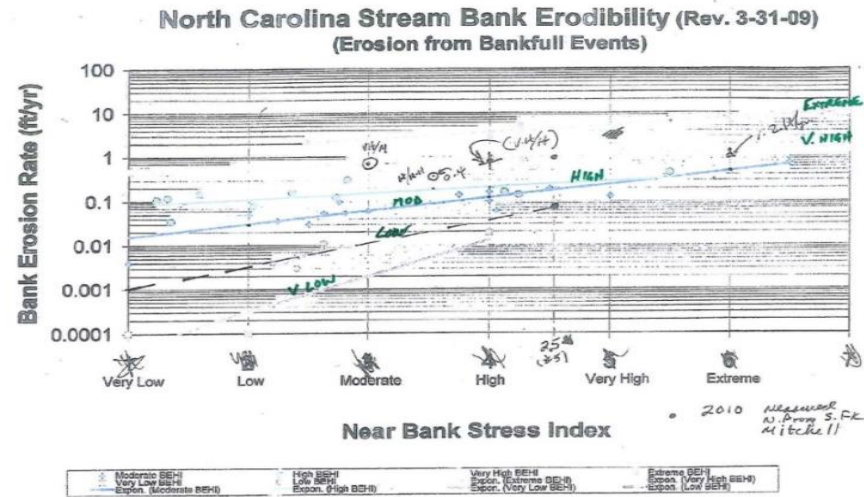
Floodplain/Downstream

- Project Tree Removal
- Post Project Tree Loss
- Vector for Invasive Plant Species
- Shift in Wetland Type/Functions
- Increased Flooding
- Initial Decline in Downstream IBI
- Upstream Blockage for Aquatic Life

Best Practices (BP) for TMDL Stream Restoration Projects

- Choosing the Right Stream Restoration Projects
- Project Design Principles
- Good Construction Practices
- Post-Construction Practice for Inspecting, Verifying and Maintaining Projects

Perhaps a shift to more applied engineering research?



G 1/2 Research Recommendations

- Good field guides to train crews on how to rapidly inspect projects to ensure they are meeting their performance objectives
- How to cost-effectively integrate stream restoration projects into municipal asset management systems
- How to assess functional uplift in gullies and zero order streams that lack many traditional stream metrics (bugs/fish/flow)

G3 Research Recommendations

- Update Regional Curves to improve predictions of the BANCS method
- Bay-wide standardization of all methods to measure bank retreat for Protocol 1
- Better environmental guidelines for working in zero-order streams and gullies in the stream network

G4/5 Research Recommendations

- Long-term, interdisciplinary studies on innovative floodplain restoration projects, like BSR in PA
- Effect of best practices to minimize UIC for stream restoration projects (e.g., tree removal and riparian nutrient concentrations)
- Forensic investigation of “failed” stream restoration projects
- New metrics to measure functional uplift in the floodplain, as well as the stream channel

Other G4/5 Engineering Recommendations

- Numeric triggers for unacceptable inundation or pooling for floodplain restoration projects
- Standard process for analyzing USGS gage data to support downstream diversion modeling

Existing Urban BMP Expert Panels that might be good candidates for pooled research

Major BMPs

- BMPs for New and Redevelopment Projects
- Urban Stream Restoration
- Stormwater Retrofits
- **Urban Nutrient Management**
- **Street Cleaning**
- Nutrient Discharges from Grey Infrastructure
- Residential Stewardship Practices

Contributing BMPs

- Enhanced Erosion and Sediment Control
- Floating Treatment Wetlands
- Septic System Upgrades
- Impervious Cover Disconnection
- Urban Tree Planting
- Urban Canopy Expansion
- **Shoreline Management Practices**
- Filter Strips

Stream Restoration, Ponds, and LID Practices

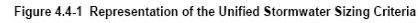
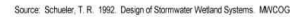


FIGURE 2.5: FOUR CLASSES OF RAINFALL DISTRIBUTION



Comments and Feedback



Photo Credit: G. Noe, USGS