



RECOMMENDATIONS FOR IMPROVING THE APPLICATION OF THE PREVENTED SEDIMENT PROTOCOL

USWVG – SEPTEMBER 17, 2019



REVISITING STREAM RESTORATION

The USWVG formed 4 groups to revisit the stream restoration EPR:

- Group 1: Verifying Stream Restoration Practices
- Group 2: Outfall and Gully Stabilization Practices
- Group 3: Establishing Standards for Applying Protocol 1
- Group 4: Adjusting Protocol 2/3 to Capture Floodplain Restoration

BACKGROUND – NEED FOR GROUP 3

- One of the fastest growing BMPs – hundreds of miles in the pipeline
- Several key concerns based on past 5 years of implementation experience:
 - Over-reliance on default rates
 - Need for a clear “bank armoring” definition
 - Need for guidance on monitoring and modeling methods to improve consistency across practitioner community

BACKGROUND - HISTORY

- Group was recommended at June 2018 joint meeting between USWG and SHWG
- Charge and Membership approved by USWG in Fall 2018
- Group 3 met six times between November and August
- Full Group consensus on recommendations

Table 1. Membership for Group 3

Name	Affiliation
Drew Altland	RKK
Lisa Fraley-McNeal	Center for Watershed Protection
Joe Berg	Biohabitats
Rich Starr	Ecosystem Planning and Restoration
Josh Running	Stantec
Matt Meyers	Fairfax County, VA DPWES
Bill Brown	PADEP
Jeff White	MDE
Josh Burch	DOEE
Reid Cook	RES Consultants
Aaron Blair	EPA
Tess Thompson	Virginia Tech
Joe Sweeney	Water Science Institute

THE RECOMMENDATIONS

- Clear definition of bank armoring
- Emphasis on site-specific data collection
- Clear guidance for monitoring and modeling approaches
- Recommended ways of “calibrating” BANCS assessments

A FEW REMINDERS

- These are Bay guidelines... final authority on any and all regulatory/permitting issues remains with the appropriate local/state/federal agency
- Grandfathering Clause: Any new recommendations would not need to be in place until January 2021
 - This aligns with CBPO model “lock-down” period and prevents disruption of projects already under contract.

BANK ARMORING

Original EPR

- “Projects primarily designed to protect public infrastructure by bank armoring or rip rap do not qualify for a credit.”

Group 3 Memo

- Reinforces EP statement on armoring for the sole purpose of infrastructure protection
- Narrative Definition of Bank Armoring
- Armoring techniques categories as Non-Creditable, Creditable with Limits, and Creditable
- Specific guidance on pollutant load discounts and calculation examples for each category

NON-CREDITABLE

Non-Creditable

Definition: Highly engineered, permanent structures used to protect critical infrastructure and stabilize banks.

- Concrete Retaining Wall
- Sheet Piling/ Planking
- Gabion
- Engineered Block Walls
- A-Jacks
- Dumped Rip Rap

- May not be used unless required for critical infrastructure protection
- Any length of banks using these techniques must be subtracted from total restored length
- May require mitigation to replace lost function



CREDITABLE WITH LIMITS

Creditable w/ Limits

Definition: Large rock or boulder structures that harden a limited portion of a bank or bank toe in a localized area.

- Angular Rip Rap for bank protection or localized toe protection
- Boulder Revetments
- Non-biodegradable soil stabilization mats
- Imbricated Rip Rap

- May be used on up to 30% of total bank length
- Any use over 30% is subtracted from final load reductions
- Should only be used in areas of high shear stress (outer bends, etc.)



CREDITABLE

Creditable

Definition: Structures that mimic naturally occurring streambank materials, features that provide aquatic habitat function, and limited in-stream grade control.

- Root wad Revetments
- Live stakes/coir logs
- Soil lifts
- Riffle-weir series
- Berm-pool cascades
- J-hooks and cross-veins

- No limitations on use
- Full credit provided



DEALING WITH THE DEFAULTS

Original EPR

- Nutrient Concentration Default Rates
- Bulk Density Example Being Used as Default
- Over-Use of Default Nutrient and Sediment Reductions

Group 3 Memo

- Site Specific Monitoring for Bulk-Density and Nutrient Concentration
- Recommended Field and Lab Methods
- Stronger language on need to use the Protocols
- Separate section on recommendations for planning level estimates

DEFAULT RATES

Table 4. Summary of streambank nutrient concentration values (lbs/ton of sediment).

Source	TP AVG	TP Range	TN AVG	TN Range	Location
Land Studies 2005*	1.43	0.93-1.87	4.41	2.8-6.8	PA
Baltimore DPW 2006*	0.439	0.19-0.9	--	--	MD
Walter et al 2007*	1.05	0.68-1.92	2.28	0.83-4.32	PA
Stewart 2012*	1.78	--	5.41	--	MD
Merritts et al 2010	1.2	0.9-1.5	2.6	1.7-3.5	PA
Stantec 2013	0.33	0.02-4.24	0.62	0.06-3.12	VA
Tetra Tech 2013	0.46	0.004-2.8	1.78	0.0066-19.6	NC
Doll et al 2018	0.56	0.30-1.57	1.34	1.01-2.64	NC

*Referenced in original Expert Panel Report.

- Soil sample should be taken from each soil horizon present within the restoration reach.
- Samples should be collected from undisturbed soils using a core and analyzed in the lab using undisturbed sampling methods.
- The number of samples taken along the reach may vary based on best professional judgement. It is recommended that one sample be collected every 200-500 linear feet to get a representative sample

MONITORING GUIDANCE

Original EPR

- Allows for use of “alternative monitoring and modeling approaches” to estimate sediment loss along a proposed reach
- Allows monitoring to be used to demonstrate better pollutant removal than 50% efficiency

Group 3 Memo

- Describes Bank Pin Monitoring, Permanent Cross Sections and Bank Profile Methods
- Describes DEM Differencing Methods
- Provides guidance on monitoring necessary to demonstrate efficiencies higher than 50%

MONITORING GUIDANCE

- Directly measured pre- and post restoration sediment loss from streambank erosion
- Need 3 years of post-restoration monitoring before re-calculating reduction efficiency
- Use same monitoring method for pre and post analysis
- Re-report the back-dated BMP and remove the original record

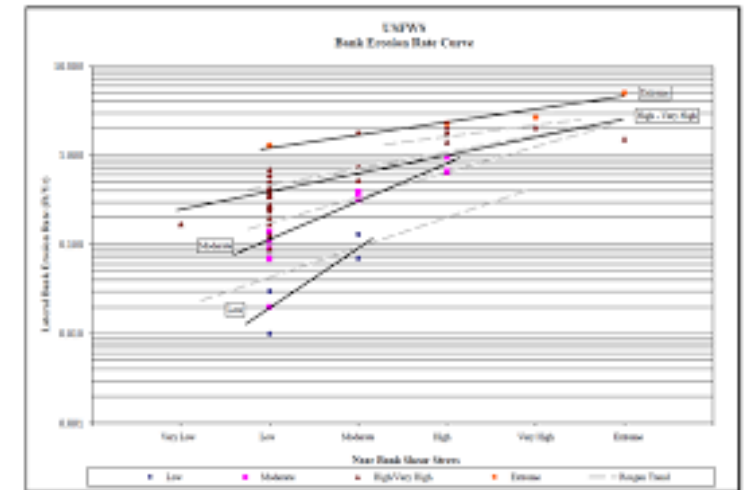


“CALIBRATING” BANCS

- Assessments should be performed by teams of two
- Focus on most sensitive parameters (bank height, root depth, bank angle)
- Develop BANCS manual, QAQC procedures and training program for the Chesapeake Bay
- BEHI, NBS and Bulk Density guidance docs included in appendices

DEVELOPMENT OF NEW BANK EROSION RATE CURVES

- Recommends the development of two new bank erosion rate curves for the Chesapeake Bay watershed: Coastal Plain Curves and Piedmont Curves
- To date, numerous data points have been collected from both the coastal plain and piedmont.... But more data points are still needed
- Several key data needs and decisions were identified
- Development will likely require 2 years and additional funding



TRACKING/REPORTING/VERIFICATION

- No changes to initial reporting requirements to CBPO
- Follows key visual indicators for prevented sediment outlined by Group I

Criteria for Loss	Key Visual Indicators
Evidence of bank or bed instability such that the project delivers more sediment downstream than designed, as defined by exposed soils/fresh rootlets	<ul style="list-style-type: none">• Bank erosion (e.g., exposed bare earth or undercutting bank)• Departure of more than 20% from average post-construction design bank height¹• Incised channel, as indicated by loss of defined pools and riffles and/or presence of an active head cut• Flanking or scour of in-channel structures• Failure or collapse of allowable bank protection practices• Less than 80% ground or canopy cover in the restoration zone²
<p>¹ as measured at riffles from the project as-built drawing, preferably from pre-designated control sections established at its most vulnerable locations</p> <p>² depending on the long-term vegetative community objectives established for the project, may be expressed as a measure of exposed surface soil (>20%) or canopy cover (<80%)</p>	

REVIEW AND NEXT STEPS

- Comment period is open until October 8th
- USWG will be asked to approve the memo at the October 15th meeting
- WTWG and WQGIT approval to follow
- Recommendations have been shared with all other Stream Groups for review and comment



QUESTIONS?

Alger Park Restoration
Courtesy: DOEE