Summary of Comments Received on Stream Restoration Expert Panel Report and Proposed Options for Resolving Them

Urban Stream Restoration Expert Panel

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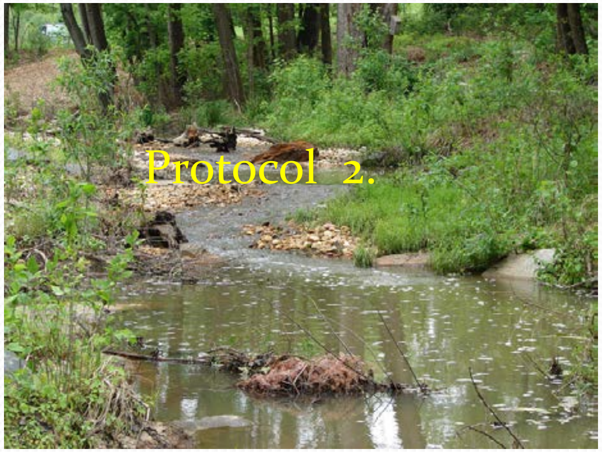
Summary of Stream Restoration Credits for Individual Restoration Projects [1, 2]

No	Name	Units	Pollutants	Method	Reduction Rate
1	Prevented Sediment (S)	Pounds Per Year	Sediment TN,TP	Define Bank Erosion Using BANCS or other	Measured N/P Content in Stream Sediment
2	Instream Denitrification (B)	Pounds Per Year	TN	Define Hyporheic Box for Reach	Measured Unit Stream Denit Rate
3	Floodplain Reconnection (S and or B)	Pounds Per Year	Sediment TN,TP	Apply wetland efficiency curves to runoff volume accessing flood plain	Measured Removal Rates for Floodplain Wetland Restoration Projects
4	Dry Channel RSC as a Retrofit (S/B)	Removal Rate	Sediment TN,TP	Determine Stormwater Treatment Volume	Use Adjustor Curves from Retrofit Expert Panel

[1] Depending on project design, more than one protocol may be applied to each project, and the load reductions are additive.
[2] Sediment load reductions are further reduced by a sediment delivery factor in the CBWM (which is not used in local sediment TMDLs)
S: applies to stormflow conditions
B: applies to base flow or dry weather conditions

Stream Restoration Protocols and Design Examples

1. Prevented sediment approach



2. In-stream denitrification

3. Flood plain reconnection

4. Dry Channel RSC

Issues with Protocol 1, Prevented Sediment Approach

Issues

- Limited studies in Bay Watershed
- Does not account for incision, over predicts consolidated sediments, rating curve only available for Coastal Plain, other issues
- Concern over the 50% reduction efficiency for floodplain reconnection projects

Response

- The report thoroughly documents issues and studies that show how to improve accuracy of BANCS
- Allow states to use monitoring data or alternatives comparable to BANCS
- 50% efficiency was chosen to account for uncertainty
- Will work with USFWF and MSRA to improve accuracy
- Convene a workshop next fall to review legacy sediment data, modify Protocols as deemed appropriate

Issues with Protocol 2, Hyporheic Box Method

Issues

- Limited studies in Bay Watershed
- Does not account for hyporheic exchange in flood plain, palustrine wetlands
- Doesn't account for confined layers in channel bed or shallow bedrock
- Could lead to overly wide channels prone to sediment deposition

Response

- Best science available. Reserachers. Kaushal and Meyer)believe conservative denitrification rates.
- Modify report to account for confined layers and bedrock.
- Allow credit for hyporheic exchange in floodplain for qualifying projects
- Verification process will prevent bad designs

Issues with Protocol 3, Floodplain Reconnection Method

Issues

- Jordan study (2010) for CBP not appropriate
- Doesn't account for hyporheic exchange during base flow
- Design examples biased towards Natural Channel Design method
- Concern over use of 1% floodplain area to watershed ratio

Response

- Jordan study most accurate available and only part of methodology
- Credit for base flow load will be allowed for qualifying projects
- Design examples are urban. Add language to address bias concern
- Some credit given for projects that cannot meet 1% ratio.

General comments.

Issues

- Concerns over sediment transport, deposition, methods don't account for physiographic differences
- Non-urban streams are not adequately addressed.
- Watershed model scale metrics shouldn't be used for site level planning/design

Response

- Will work w/ Modeling Team to improve how streams are modeled in Phase 6
- Add additional language to the revised draft to better account for non-urban streams
- Need tool that translates individual projects to Watershed Model. Phase 6 hopefully will make more accurate

Design Examples

- Protocol 1. Bay City, VA is planning on restoring 7,759 feet of Hickey Run using NCD approach w/ watershed DA= 1100 acres.
- Protocol 2. Credit for In-Stream and Riparian Nutrient Processing within the Hyporheic Zone during base flow for 500 feet of the channel w/ BH ratio of 1.0 on only one side of the channel.
- Protocol 3. Credit for Floodplain Reconnection with 23 acre feet of floodplain storage w/o hyporheic connectivity

Design Examples Summary

Table 7. Edge-of-Stream load reductions for various treatment options (lb/year)

	Total Watershed Loading[1]	Protocol 1 (BANCS)[2]	Protocol 2 (Hyporehic Box)[3]	Protocol 3 (Floodplain Reconnection)[4]	Total Load Reduction[5]	Interim Rate[6]
TN	12,896	1,754	181	220	2,155	1,552
TP	1,382	810	--	50	860	528
TSS[7]	642,226	236,000	--	18,600	254,600	420,926

[1] Edge of stream loadings calculated from Table 6, assuming watershed area of 1102 acres and 41% impervious cover
[2] For the design conditions as outlined in protocol 1 example
[3] For the design conditions as outlined in protocol 2 example
[4] For the design conditions as outlined in protocol 3 example
[5] Assuming the all three protocols are applied to the same project
[6] Applying the unit rate to 7,759 linear feet of the project
[7] For Protocol 1 and interim methods for TSS reductions, a sediment delivery ratio of 0.175 was applied.