Riparian Buffer Effectiveness for the CBWM

2014 Report of Expert Panel

Conformity to BMP Review Protocol

- Expert Panel
- 21 points of conformity
  - Definitions
  - Loading, land use application,
  - Practice baseline, temporal performance
  - Units of measure
  - Life of BMP
  - Issue to be resolved in future
  - Time line for re-evaluation of panel
  - BMP Maintenance
  - Tracking and Reporting

Expert Panel

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Definition

- **A RIPARIAN BUFFER IS: a newly established area along a stream, on average 100 ft (30m) wide, of either grass or trees, and is managed to maintain the integrity of stream channels and shorelines and reduce the impact of upstream land uses. It is a minimum of 35 ft (10m) wide to receive credit.**

Recommended Credits Applied To Agricultural Lands

2014	Forest on1 side of stream			Grass on1or both sides stream			Forest on both sides stream		
	TN	TP	TSS	TN	TP	TSS	TN	TP	TSS
Coast Plain							New Recommendation 4%>		
Inner	65	42	56	46	42	56	69	42	56
Out well drained	31	45	60	21	45	60	35	45	60
Out poor drained	56	39	52	39	39	52	60	39	52
Tidal Influence	19	45	60	13	45	60	23	45	60
Pied schist	46	36	48	32	36	48	50	36	48
Pied sandstone	56	42	56	39	42	56	60	42	56
Valy/Rdge karst	34	30	40	24	30	40	38	30	40
Valy/Rdge sst/shle	46	39	52	32	39	52	50	39	52
Applach Plateau	54	42	56	38	42	56	58	42	56

Note: Effectiveness credit is applied to upslope land at a ratio of 1:4 for TN, 1:2 for TP and TSS. For each acre of riparian buffer 4 acres of upland are treated at the rate assigned for the location in the watershed. (This is not a new recommendation)

Justification

- **2008 –** Literature review + scientists' opinions related to their research.

2014 – 2008 findings + new information + on the ground experience of Expert Panel scientists

New recommendation for In Stream Processing –
Based on current information that represents forest buffer benefits for stream health, landscape scale nutrient cycling related to the **input** of forest buffers =**Wider streams, more habitat, more TN removal. There are multiple lines of evidence in literature to support this recommendation.**

To further justify, recommendations "hot topics" were addressed

Justification continued…

- **Hydrologic flow paths** – nutrient reduction value always higher where organic matter, root density and soil moisture is highest "hot spots" for denitrification. (hydrogeomorphic values reflect this on regional level**). In forests flow is concentrated and infiltration time >.**

Practice Longevity – For forest can be 40- 120 years. Cost share life 15 yr, however PA study shows 85% landowners will retain forest buffer.

Lag Time–forest = grass for first five years, increased effectiveness 5-15 years a functional uplift ~ + 5%. Current values are conservative, simple and clear for accountability.

In 2008 the need for more research was noted to support a change for crediting grass buffer values of 70% of the nutrient reduction effectiveness of forest buffers. The situation remains and it is recommended to **keep the 2008 effectiveness credits for grass riparian buffers.**

Recent Considerations

- Weller and Newbold (2014) "Cropland Riparian Buffers throughout the Chesapeake Bay Watershed: Spatial Patterns and Effects on Nitrate Loads Delivered to streams" **sheds new light on edge of field loads and movement to and through forest buffers. It is being considered for use in new CBWM versions, but the logistics and transition will take time. The exact transition time is not certain.**

Recent Considerations

- **What about buffers less than 35 ft wide?** States are offering Agricultural practices that feature buffers less than 35ft. wide.
- Ag Work Group questioned "**Where do Narrow Buffers fall on the efficiency scale of buffers"?**
- Not specifically addressed by Expert Panel but it is evident in the literature reviewed and supported by latest literature review by Sweeney and Newbold (2014):

Narrower buffers (10-35ft) do not have the same functional value as wider buffers.

Panel Suggestion

- These are distinct practices to be considered separate from Riparian forest or riparian grass Buffers.
- New terms and definitions :p. 12 of Panel Report

- **Narrow Grass Buffer**
- **Narrow Forest Buffer**

Future Considerations

- Ancillary reasons for planting buffers
- Longevity of research history
- A regenerative practice with a positive cost benefit relationship
- Promote all benefits of buffers beyond nutrient reductions.

Tracking & Reporting

- **Verification** – Will continue to use the technical assistance partners confirmation of establishment at 1 or 2 yr schedule. "Establish means the "buffer" meets the practice 391standards for stocking and survival. We're looking at net gain for forests, because we feel it is an important issue.
- **States report + FWG**– Parcel identification #; State; Latitude; Longitude; Linear Miles; Forest buffer width; Planting date; Ownership (public/private); Watershed name and HUC.

Conclusion

- **Draft of Recommendations available – www.chesapeakebay.net/who'swho/Group/FWG/Feb. 2014 meeting**

Improves on 2008-9 information-More diverse Expert Panel, in depth look at available studies and data.

Acknowledge gaps in understanding buffer function and the difficulty of modeling this function across the watershed.

Future Research needs- groundwater discharge, channelization of surface runoff, map hot spots of denitrification, overbank flow influences.

Suggest a group such as Expert Panel continue to meet and share info, beyond the CBWM needs, but still of value to CB Goals.