Riparian Buffer Effectiveness for the CBWM

2014 Report of Expert Panel

Expert Panel

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Definition

- **A RIPARIAN BUFFER IS: a newly established area along a stream, at least 35 ft wide, of either grass shrubs or trees, and is managed to maintain the integrity of stream channels and shorelines and reduce the impact of upstream agricultural land uses.**

•Proposed Forest and Grass Riparian Buffer Load Reduction Efficiencies

Recommended Credits Applied To Agricultural Lands

	Forest on one side of stream (same as 2008)			**Grass** on one of stream (same as 2008)		
	TN	TP	TSS	TN	TP	TSS
Inner Coastal Plain	65	42	56	46	42	56
Outer Coastal Plain (well-drained)	31	45	60	21	45	60
Outer Coastal Plain (poorly drained)	56	39	52	39	39	52
Tidal Influenced	19	45	60	13	45	60
Piedmont (schist/gneiss)	46	36	48	32	36	48
Piedmont (sandstone)	56	42	56	39	42	56
Valley and Ridge (karst)	34	30	40	24	30	40
Valley and Ridge (sandstone/shale)	46	39	52	32	39	52
Appalachian Plateau	54	42	56	38	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)

New recommendation for In Stream Processing Credit

Based on current information that represents forest buffer benefits for stream health, and landscape scale nutrient cycling related to the organic **input** of forest buffers = **Wider streams, more habitat, more TN removal. There are multiple lines of evidence in literature to support a recommendation of 0.014 lbs N reduction/ln ft of stream/yr . Applied only if there is a "forest" buffer newly established on both sides of the stream.**

Recent Considerations

- Weller and Baker (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 flow through forest buffers. The expert panel supports transition to integrate methods of this model in the future, but for now will use default of 1:4 ratio for TN reduction and 1:2 for P and Sediment.

Clarification – Narrow Buffers

- **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"?**

The literature reviewed including the latest literature review by Sweeney and Newbold (2014):

Narrower buffers (10-35ft) do not have the same functional value as wider buffers(35ft and >) and will not be considered for the RFB assigned nutrient reduction effectiveness.

The narrower buffers will only get a land use change credit.

Hot Topics

Hydrologic flow paths – nutrient reduction value is 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, verification at end of contract will determine if practice is renewable and remains in model.

Lag Time–forest increased effectiveness 5-15 years a functional uplift ~ + 5%. Current values are conservative, simple and clear for accountability from time of establishment

In 2008 the need for more research was noted to support a change for crediting grass buffer values at rate 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.**

Future Considerations

- There are many ancillary reasons beyond nutrient reduction for planting buffers(habitat, soil health, recreation, agroforestry)
- Because Riparian Forest Buffers are regenerative practice with a positive cost benefit relationship-
- In future effectiveness reviews all benefits of buffers beyond nutrient reductions will be considered.

Conclusion

- **Draft of Recommendations available – www.chesapeakebay.net/who'swho/Group/FWG/Nov. 5, 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.