WETLAND EXPERT PANEL

PRELIMINARY REPORT FOR PHASE 6 WATERSHED MODEL CALIBRATION

SEPTEMBER 14, 2016

This document is presented to the Wetland Workgroup for their consideration and approval in September 2016. This preliminary report describes recommended methods for simulating four categories of wetland BMPs in the Phase 6 Watershed Model until final recommendations from expert panels amend or update these recommendations. This is intended to ensure that all acres of historical wetland BMP implementation are accounted for in the final calibration of the Phase 6 Watershed Model. It is recommended that the current Wetland Expert Panel's recommendations for Wetland Restoration – as defined below – be used, while other wetland BMPs as defined by the Panel (Creation, Enhancement, Rehabilitation) use existing Phase 5 modeling methods as a placeholder in the calibration. A future expert panel can provide recommendations for new or revised efficiencies or methods for Creation, Enhancement and Rehabilitation in Phase 6, but it is important to have these acres accounted for in the calibration in addition to acres of Wetland Restoration. This preliminary report summarizes the proposed BMP definitions and methods suggested for the four wetland BMP categories in the Phase 6 calibration. More details for the Phase 6 Wetland Restoration BMP will be provided in the Wetland Expert Panel's full report (forthcoming).

IDENTITY AND EXPERTISE OF PANEL MEMBERS

Table 1. Wetland Expert Panel roster

Name	Role (post-CWP)	Organization
Erin McLaughlin	Panel member	Maryland Department of Natural Resources (MD DNR), Wetland Work Group Co-Chair
Steve Strano	Panel member	NRCS
Judy Denver	Panel member	U.S. Geological Survey (USGS)
Ken Staver	Panel member	Wye Research and Education Center
Kathy Boomer	Panel member	The Nature Conservancy
Pam Mason	Co-Chair	Virginia Institute of Marine Science
Dave Davis	Panel member	Virginia Department of Environmental Quality (VA DEQ)
Jeff Hartranft	Panel member	Pennsylvania Department of Environmental Protection
Ralph Spagnolo	Co-Chair	USEPA Region 3
Jeff Thompson	Panel member	Maryland Department of Environment (MDE)
Tom Uybarreta	Panel member	USEPA Region 3
Quentin Stubbs	Panel member	USGS, CBPO
Rob Brooks	Panel member	Penn State
Dr. Jarrod Miller	Panel member	University of Maryland (UMD) Extension
Michelle Henicheck	Panel member	VA DEQ
Denise Clearwater	Panel member	MDE

Panel support		
Jeremy Hanson	Panel Coordinator	Virginia Tech, CBPO
Jennifer Greiner	HGIT Coordinator	USFWS, CBPO
Hannah Martin	Support	Chesapeake Research Consortium (CRC), CBPO
Kyle Runion	Support	CRC, CBPO
Aileen Molloy	Support	Tetra Tech
Jeff Sweeney	CBPO Modeling and WTWG rep	USEPA CBPO
David Wood	CBPO Modeling rep	CRC, CBPO
Peter Claggett	GIS Support	USGS, CBPO
Brian Benham	Va Tech Project Director	Virginia Tech
Additional panel guest participants: Ken Murin (PA DEP), Kristen Saacke-Blunk (former AgWG Co-Chair), Anne Wakeford (West Virginia Department of Natural Resources) Previous participants who contributed previously and are no longer active (post-CWP): Brian Needelman (UMD), Tom Jordan (Smithsonian Environmental Research Center), and Robert Kratochvil (UMD) Other individuals the panel wishes to acknowledge for providing valuable input or services to the panel: Neely Law (Center for Watershed Protection), Bill Stack (Center for Watershed Protection),		

PRACTICE NAME(S) FOR PHASE 6

Wetland Restoration
Wetland Creation
Wetland Enhancement
Wetland Rehabilitation

DEFINITION OF THE PRACTICES

The following table is a guide to the four categories of wetland BMPs considered by the Wetlands Expert Panel for incorporation into the Chesapeake Bay Program (CBP) partnership's Phase 6 Chesapeake Bay Watershed Model (CBWM) for annual progress runs. The table also provides information as to how each category will be tracked towards Watershed Agreement outcomes in addition to the annual progress runs for TMDL purposes. **The table is not intended to be comprehensive, as some projects or practices could count under a different category depending on the design, site location, or other specific factors of the project. The table is intended to help clarify how a type of practice is most likely to be categorized under the Panel's Phase 6 BMP definitions.**

Table 2. Proposed categories for wetland BMPs in the Chesapeake Bay Program's Phase 6 Chesapeake Bay Watershed Model.

Proposed BMP Category	**Proposed CBP Definition (for Phase 6 CBWM)**	**CBP will count the BMP acres as...**	**Practice and Project Examples**

Restoration	Re-establish The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland.	Acreage gain *(toward Watershed Agreement outcome of 85,000 acre wetland gain and in Phase 6 annual progress runs)*	Restore hydrology to prior-converted agricultural land (cropland or pasture); re-establishing needed vegetation on cropland with wetland hydrology; native wetland meadow planting; elevate subsided marsh and re-vegetate; ditch plugging on cropland; Legacy Sediment Removal NRCS Practice 657
Creation	Establish (or Create) The manipulation of the physical, chemical, or biological characteristics present to develop a wetland that did not previously exist at a site.	Acreage gain *(toward Watershed Agreement outcome of 85,000 acre wetland gain and in Phase 6 progress runs)*	Modifications to shallow waters or uplands to create new wetlands. Placement of fill material or excavation of upland to establish proper elevations for tidal wetland; Hydrologic measures such as impoundment, water diversion and/or excavation of upland to establish nontidal wetlands NRCS Practice 658
Enhancement	Enhance The manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify, or improve a specific function(s).	Function gain *(toward 150,000 acre outcome and Phase 6 annual progress runs)*	Flood seasonal wetland for waterfowl benefit; regulate flow velocity for increased nutrient uptake; invasive species removal NRCS Practice 659
Rehabilitation	Rehabilitate The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded wetland.	Function gain *(toward 150,000 acre outcome and Phase 6 annual progress runs)*	Restore tidal flow to degraded wetland; ditch plugging in a forested wetland area; moist soil management*; invasive species removal, floodplain reconnection May include some NRCS Code 657 practices. *Moist soil management should only be counted if there are predominantly native wetland plants; and site can sustain itself as wetland without active management, meaning whether water control structure is operated or not.
Other categories related to wetland activities, but not relevant to this panel's charge or scope. Provided for clarification purposes only.			
Preservation	Protect (or Preserve) Acquisition of land or easements of at least 30 years' duration	Neither acreage nor function *(will track toward protection goal)*	Non-mitigation acquisitions; easements of 30+ years duration

Compensatory mitigation	N/A for CBP Watershed Agreement and Chesapeake Bay TMDL purposes. 33CFR Part 332 (2008) defines compensatory mitigation as "the restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved."	N/A for CBP purposes. Compensatory mitigation projects are not reportable or creditable for Chesapeake Bay TMDL purposes.	N/A for CBP purposes

Table 3. Summary of how BMPs currently mapped to Phase 5 Wetland Restoration BMP will translate to Phase 6 wetland BMPs

BMP in current Phase 5 NEIEN appendix	**Associated FSA or NRCS practice code, if applicable**	**Suggested wetland BMP using Phase 6 BMP definitions**
CREP Wetland Restoration	CP23, 327, 657	Wetland Restoration
Wetland and Buffer Restoration, Wetland Restoration		N/A
Wetland Buffer		N/A
Wetland Creation	658	Wetland Creation
Wetland Functional Gains - Enhanced	659	Wetland Enhancement
Wetland [Acreage] Gains - Established	658	Wetland Creation
Wetland [Acreage] Gains - Reestablished	657	Wetland Restoration
Wetland Restoration	657	Wetland Restoration
N/A		Wetland Rehabilitation

QUALIFYING PRACTICE CONDITIONS

Wetland Restoration, Creation, Enhancement and Rehabilitation projects are implemented by a wide range of entities with support from an equally wide range of federal, state and non-government resources. Thus, the specific qualifying conditions for each type of BMP will conform to the standards and requirements of the implementing program associated with a given project. It is

understood that each project should be assessed based on Federal, state, and local regulatory requirements, according to best professional judgments in the field, and supported by benchmarks presented in state and federal guidance documents. While this minimizes the risk of implementing extraneous wetland BMPs that could potentially harm habitat or other functions at the expense of nutrients and sediment, the panel wants to emphasize that practitioners, permit reviewers, and other stakeholders should not take these safeguards for granted. It is the intention of the panel that wetland BMP projects only earn nutrient and sediment reductions if they are implemented at appropriate sites which do not damage existing ecological conditions. For instance, the panel believes BMPs should not compromise existing high quality habitat resources. The panel does not recommend the conversion or alteration of high quality wetlands for the purposes of nitrogen, phosphorus or sediment load reductions.

PRACTICE MODEL SIMULATION DESCRIPTION

The simulation will vary between the acreage gain practices (restoration and creation) and the functional gain practices (enhancement and rehabilitation).

*For Acreage Gain practices (**Wetland Restoration** and **Wetland Creation**)*
Type of reduction: Land use change plus treatment of upland acres. Creation will treat 1 upland acre per acre of created wetland, using the current Phase 5 approach. Restoration will treat a number of upland acres based on physiographic region, as summarized in Table 4 below.
Frequency: Cumulative.
Credit duration: 15 years

Table 4. Summary of relative retention efficiencies and upland acres treated by each acre of restored wetland by landscape position (floodplain or other) and physiographic subregion.

	Retention Efficiency			**Upland Acres Treated**		**Watershed Model HGMR**
Physiographic Subregion	**TN**	**TP**	**TSS**	**Floodplain Wetlands**	**Other Wetlands**	
Appalachian Plateau	42	40	31	2	1	Appalachian Plateau Siliciclastic
Appalachian Ridge and Valley	42	40	31	2	1	Valley and Ridge Siliciclastic
Blue Ridge	42	40	31	3	2	Blue Ridge
Piedmont	42	40	31	3	2	Piedmont Crystalline Mesozoic Lowlands
Inner Coastal Plain	42	40	31	6	4	Western Shore: Coastal Plain Uplands Coastal Plain Dissected Uplands
Outer Coastal Plain- Poorly Drained	42	40	31	2	1	Eastern Shore: Coastal Plain Uplands

	Retention Efficiency			Upland Acres Treated		Watershed Model HGMR
Physiographic Subregion	**TN**	**TP**	**TSS**	**Floodplain Wetlands**	**Other Wetlands**	
Outer Coastal Plain- Well Drained	42	40	31	3	2	Eastern Shore: Coastal Plain Dissected Uplands
Coastal Plain Lowland	42	40	31	3	2	Coastal Plain Lowlands
Karst Terrain	42	40	31	3	2	Piedmont Carbonate Valley and Ridge Carbonate Appalachian Plateau Carbonate

*For Functional Gain practices (**Wetland Enhancement** and **Wetland Rehabilitation**)*
Type of reduction: Treatment of upland acres.
Frequency: Cumulative.
Credit duration: 15 years

Table 5. Summary of proposed upland treatment efficiencies for wetland BMPs in the Phase 6 calibration

	TN removal (%)	TP removal (%)	TSS removal (%)	Upland acres treated per acre of implementation
Restoration*	42	40	31	See Table 4
Creation**	16.75	32.18	9.82	1
Enhancement**	16.75	32.18	9.82	1
Rehabilitation**	16.75	32.18	9.82	1

Note: The efficiency values of 16.75% TN, 32.28% TP and 9.82% TSS are the average of the Phase 5 Wetland Restoration efficiencies for the Coastal Plain, Piedmont and Appalachian Plateau HGMs.

*The efficiency values and the upland acres for Phase 6 Wetland Restoration are based on the Wetland Expert Panel's recommendations for the Restoration practice. This is a change from the Phase 5 approach which assumed 1 upland acre treated per acre of implementation, and applied the efficiency rates summarized in the other rows.

**The efficiency value for these practices will treat one upland acre for each acre of created, enhanced or rehabilitated wetlands. This is based on the current Phase 5 approach for Wetland Restoration. A future panel can recommend different ratios. Furthermore, the efficiency values are equal to the Phase 5 TN, TP and TSS values applied to upland acres for these practices. A future panel can also recommend different efficiency values based on their evaluation of the science and the expected performance of these practices.

For Wetland Restoration or other wetland BMPs in tidal areas, the implementation can be reported under the existing protocols (protocols 2-4, NOT protocol 1) for the Shoreline Management BMP.

The Shoreline Management BMP is simulated as a load reduction per acre, as summarized in Table 6 below.

Table 6. Summary of load reductions from Shoreline Management Expert Panel Protocols 2, 3 and 4

Shoreline Management Protocol		TN	TP	Sediment
Protocol 2 – Denitrification	Acres of re-vegetation	85	NA	NA
Protocol 3 - Sedimentation	Acres of re-vegetation	NA	5.289	6,959
Protocol 4 – Marsh Redfield Ratio	Acres of re-vegetation	6.83	0.3	NA
Tidal wetland restoration		91.83 lbs/ac	5.589 lbs/ac	6,959 lbs/ac

LAND USES TO WHICH THE PRACTICE IS APPLIED

Phase 6 land uses: All agricultural land uses and land use groups for Wetland Restoration and Wetland Creation. Wetland Enhancement and Wetland Rehabilitation are applied to the two nontidal wetland land uses: Floodplain and Other.

UNIT OF MEASURE

Unit: Acres. Report the area (acres) of wetland restored/created/enhanced/rehabilitated.

LOCATIONS WITHIN THE CHESAPEAKE BAY WATERSHED WHERE THIS PRACTICE IS APPLICABLE

These practices are applicable to nontidal areas throughout the entire watershed, though with varying expectations of effectiveness based on physiographic region and landscape setting as summarized in Table 4 above.

POTENTIAL METHODS TO ESTIMATE HISTORIC IMPLEMENTATION UNITS

N/A. Jurisdictions already have implementation data through the calibration period for the practices listed in first column of Table 3.

POTENTIAL FOR PANEL ADJUSTMENTS IN FINAL REPORT

The panel's final report is available, but only provides new recommendations for Wetland Restoration at this time. Changes to the proposed Phase 6 Wetland Restoration BMP are possible, and will be worked out through the partnership review and comment process.

It is likely that the existing Phase 5 effectiveness estimates for Creation, Enhancement, and Rehabilitation practices will change, given they will be re-evaluated by a future expert panel.