A-32. Nontidal Wetland Restoration

General Information

Wetlands provide numerous crucial environmental functions such as wildlife habitat, flood protection and water quality improvements. Many organizations throughout the Chesapeake Bay Watershed work to restore sites that were previously converted from wetlands for other use back to their natural wetland condition; this is known as wetland restoration or re-establishment. Wetland restoration can be done in both tidally-influenced and nontidal freshwater systems, but this BMP is only applicable to nontidal areas. See Sheet N-2: Urban and Non-Urban Shoreline Erosion Control and Management for protocols that are applicable to wetland restoration in tidal areas.

Figure A-2-1. An earthen ditch plug returns marginal cropland to functional wetland condition in Maryland. Source: USDA NRCS.

CBP Definition(s)

Definitions for wetland practices used by the Chesapeake Bay Program do not affect regulatory or other legal definitions that exist for federal, state or local programs. To account for the range of nontidal wetland practices that occur in the Chesapeake Bay Watershed, yet distinguish practices based on key differences, four BMP categories have been established: restoration, rehabilitation, enhancement and creation. All four are defined here for reference, but the nutrient and sediment reductions associated with rehabilitation, enhancement and creation are currently under review by a BMP expert panel and therefore not summarized here.

Wetland Restoration (re-establishment): The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland.

Wetland Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded wetland.

Wetland Enhancement: The manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify, or improve a specific function(s).

Wetland Creation (establishment): The manipulation of the physical, chemical, or biological characteristics present to develop a wetland that did not previously exist at a site

Of these four categories, restoration and creation are considered *acreage gains*, which means there is an increase in the total area of wetlands. The other two – rehabilitation and enhancement – are considered *functional gains* because they do not change the overall acres of wetlands, but they do improve the wetland's function from its current state.

Specifications or Key Qualifying Conditions

Wetland restoration practices are critical to meeting the Chesapeake Bay's water quality 2025 goals under both the Chesapeake Bay TMDL and the 2014 Watershed Agreement. However, the conversion or alteration of high quality wetlands strictly for the purposes of nitrogen, phosphorus or sediment load reductions should be avoided. Changing the functions and/or values of existing high quality wetland systems and high quality non-wetland ecosystems that already provide denitrification and phosphorous or sediment trapping should not be pursued. Also, important ecosystems such as rare and endangered species habitat, older growth forests, unique ecotones (i.e. Delmarva Bays, Magnolia bogs, critical fish spawning areas, among others) should not be priorities for wetland practices solely for the nutrient and sediment reductions under the Bay TMDL. 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.

Nitrogen, Phosphorus and Sediment Reductions

The net reductions in nitrogen, phosphorus and sediment for wetland restoration buffers are significant, but not simple to quantify without the use of CAST (http://cast.chesapeakebay.net/). There is a load source change of the restored area from the previous land use (e.g., cropland) into wetland, which reduces the simulated load. Then there is also an efficiency applied to upland acres that further reduces pollutant loads. The efficiency values applied for nitrogen, phosphorus and sediment are 42, 40 and 31 percent, respectively. The number of upland acres that are treated by the efficiency values varies based on the hydrogeomorphic region where the wetland restoration project was implemented, as summarized in Table A-32-1.

Table A-32-1. Upland acres treated, nutrient and sediment efficiency values for wetland restoration in the Phase 6 Watershed Model, by hydrogeomorphic region

Phase 6 Watershed Model HGMR	Other (Headwater)	Floodplain	Nitrogen efficiency (%)	Phosphorus efficiency (%)	Sediment efficiency (%)
Appalachian Plateau Siliciclastic	1	2	42	40	31
Valley and Ridge Siliciclastic	1	2	42	40	31
Blue Ridge	2	3	42	40	31
Piedmont Crystalline Mesozoic Lowlands	2	3	42	40	31
Western Shore: Coastal Plain Uplands Coastal Plain Dissected Uplands	4	6	42	40	31
Eastern Shore: Coastal Plain Uplands	1	2	42	40	31
Eastern Shore: Coastal Plain Dissected Uplands	2	3	42	40	31
Coastal Plain Lowlands	2	3	42	40	31
Piedmont Carbonate Valley and Ridge Carbonate Appalachian Plateau Carbonate	2	3	42	40	31

Specific Reporting and Modeling Information

Applicable Land Use Types (or other load sources) Treated by the BMP:

- Agriculture
- Agriculture without Open Space
- Cropland
- Cropland and Hay
- Cropland and Hay Eligible for Manure
- Cropland Eligible for Manure
- Grains not Double Cropped
- Hay
- Leguminous Hay
- Other Hay
- Pasture
- Pasture and Hay
- Row Crops
- Row Crops Eligible for Manure
- Specialty Cropland

Wetland restoration can be reported on any of the above load source groups. The default load source group is Agriculture, or "AG."

Brief Description of BMP Simulation in the Model

The wetland restoration practice is simulated as a *Load Source Change with an Efficiency Value* in the Watershed Model. Each acre reported under the practice is converted to either the Nontidal Floodplain Wetland or Headwater/Isolated Wetland load sources, and then there is an additional reduction to upland loads using the efficiency values in Table A-32-1. For example, one acre of marginal cropland that is restored back to its historical wetland condition will increase the overall acres of wetland by one and reduce the amount of cropland by that same amount. Additionally, the nitrogen load from four other acres will be reduced by 42 percent (assuming the restored wetland is not in the floodplain and is in a Western Shore Coastal Plain Upland setting for this example); the phosphorus and sediment loads from four acres will be reduced by 40 and 31 percent, respectively. While it is difficult to estimate the net reductions of this practice without the use of CAST, the net load reduction can be significant.

Annual or Cumulative? Cumulative (15-year credit duration)

Can this practice be combined with other BMPs? Yes, acres of upland load sources treated by wetland restoration can also receive other eligible agriculture BMPs. The area of land converted to either Nontidal Floodplain Wetland or Headwater or Isolated Wetland, however, cannot receive additional BMPs since wetland enhancement and wetland rehabilitations are the only two BMPs applied to wetland load sources. See [insert link to overview] for example credit calculation for multiple practices.

Key Elements for State BMP Reporting through NEIEN

- *BMP Name:*
  - Wetland Restoration – Floodplain
  - Wetland Restoration – Headwater
- *Measurement unit:* Acres
- *Land Use:* Approved NEIEN agricultural land uses; if none are reported the default will be AG
- *Geographic location:* Approved NEIEN geographies: County; County (CBW only); Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); State (CBW only)
- *Date of implementation:* Year wetland restoration was completed.

Table A-32-2. Synonymous BMP names for Watershed Model, NEIEN and other sources

CBP or Expert Panel term	NEIEN BMP name	Other common practice names
Wetland Restoration	Wetland Restoration – Floodplain Wetland Restoration – Headwater	Wetland restoration (NRCS 657); CRP or CREP wetland restoration (CP23) and wetland restoration, non-floodplain (CP23A); restore hydrology to prior-converted agricultural land (cropland or pasture); elevate subsided marsh and re-vegetate; ditch plugging on cropland; legacy sediment removal

Additional Information

Expert panel report:
Mason, P., Spagnolo, R., Boomer, K., Clearwater, D., Davis, D., Denver, J., Hartranft, J., Henicheck, M., McLaughlin, E., Miller, J., Staver, K., Strano, S., Stubbs, Q., Thompson, J. & T. Uybarreta. 2016. Wetlands and wetland restoration: Recommendations of the Wetland Expert Panel for the incorporation of non-tidal wetland best management practices (BMPs) and land uses in the Phase 6 Chesapeake Bay Watershed Model. CBP/TRS-314-16.

https://www.chesapeakebay.net/documents/Wetland_Expert_Panel_Report_WQGIT_approved_December_2016.pdf

Nontidal Wetland BMPs fact sheet:
URL TBD

Version and History Statement

This info sheet was first published on MM DD, YYYY and reflects the BMP definitions and reductions approved by the WQGIT in December 2016.

All BMP effectiveness estimates are subject to potential future reviews according to the availability of new scientific information and CBP partnership needs, as defined in the BMP Review Protocol.