Chesapeake Bay Program | Indicator Analysis and Methods Document
Forest Buffers | Updated October 2018

Indicator Title: Riparian Forest Buffers Planted

Relevant Outcome(s): Forest Buffer

Relevant Goal(s): Vital Habitats

Location within Framework (i.e., Influencing Factor, Output or Performance): Performance

A. Data Set and Source

(1) Describe the data set. What parameters are measured? What parameters are obtained by calculation? For what purpose(s) are the data used?
- This data set includes miles of forest buffer planted for each jurisdiction in the Chesapeake Bay watershed. Data are collected for tracking towards the 900 miles per year target in the 2014 Chesapeake Bay Watershed Agreement.
- Acres of forest buffers were measured directly and obtained from annual state reports to the Chesapeake Bay Model. Average width is reported annually directly to Bay Program staff so that miles of buffer can be calculated.

(2) List the source(s) of the data set, the custodian of the source data, and the relevant contact at the Chesapeake Bay Program.
- Source: Bay State partners: Maryland Forest Service (DNR), Pennsylvania DEP, Virginia Dept. of Forestry and DCR, West Virginia Division of Forestry, Delaware Dept. of Environment and Natural Resources, Upper Susquehanna Coalition (NY)
- Custodian: Bay State partners: Maryland Forest Service (DNR), Pennsylvania DEP, Virginia Dept of Forestry and DCR, West Virginia Division of Forestry, Delaware Dept. of Environment and Natural Resources, Upper Susquehanna Coalition (NY)
- Chesapeake Bay Program Contact (name, email address, phone number): Katherine Wares, 410-267-5781, kwares@chesapeakebay.net

(3) Please provide a link to the location of the data set. Are metadata, data-dictionaries and embedded definitions included? N/A

B. Temporal Considerations

(4) Data collection date(s): 1996-2017
Note: Prior to 2010, the reporting procedure only included data from the Signatory states of Maryland, Pennsylvania, and Virginia. From 2010 onward, we began including data from other jurisdictions. Beginning in 2012, the time period for reporting was changed from September-August of each year to July-June of each year to align with

state reporting processes for the Chesapeake Bay model/TMDL. To avoid duplicate counting during the transition reporting year of 2012, buffers planted in July-August 2011 and reported the prior year were removed from the 2012 reporting year.

(5) Planned update frequency (e.g., annual, biannual, etc.):
- Source Data: Annual
- Indicator: Annual

(6) Date (month and year) next data set is expected to be available for reporting:
Tentatively May 2019, dependent on release of Reducing Pollution indicator based on 2018 Progress Run of Chesapeake Bay Watershed Model

C. Spatial Considerations

(7) What is the ideal level of spatial aggregation (e.g., watershed-wide, river basin, state, county, hydrologic unit code)?
Any Bay tributary basin (e.g., Potomac/Susquehanna)

(8) Is there geographic (GIS) data associated with this data set? If so, indicate its format (e.g., point, line polygon).
Point data for individual buffer projects are used where available from state agencies; where not available, BMP acres at the county scale are used, as reported to the Chesapeake Bay model via NEIEN.

(9) Are there geographic areas that are missing data? If so, list the areas. No; N/A

(10) Please submit any appropriate examples of how this information has been mapped or otherwise portrayed geographically in the past.
For 2015, a map of Maryland and Virginia data was produced. Maps from previous years included other states. Contact Katherine Wares (410-267-5781, kwares@chesapeakebay.net) for more information.

D. Communicating the Data

(11) What is the goal, target, threshold or expected outcome for this indicator? How was it established?
The current goal for riparian forest buffers in the 2014 Chesapeake Bay Agreement is: *Continually increase the capacity of forest buffers to provide water quality and habitat benefits throughout the watershed. Restore 900 miles per year of riparian forest buffer and conserve existing buffers until at least 70 percent of riparian areas throughout the watershed are forested.*

The target for this indicator was originally set to be 900 miles/year in 2007 as part of the Forest Conservation Directive. The 900 miles/year was agreed to by the states to be a

"stretch" goal, but one that was necessary to reach water quality standards. The 900 miles/year goal was reaffirmed in the 2014 Chesapeake Bay Watershed Agreement.

(12) What is the current status in relation to the goal, target, threshold or expected outcome?

The 56 riparian forest buffer miles restored in 2017 reflects 6% attainment of the annual goal of restoring 900 miles each year.

(13) Has a new goal, target, threshold or expected outcome been established since the last reporting period? Why?

No, the Bay Program has been working under the same goal (900 miles/year) since 2007. The 2007 Forest Conservation Directive from the Management Board, the 2010 Executive Order Strategy and the 2014 Chesapeake Bay Agreement all reaffirm this goal of 900 miles/year.

(14) Has the methodology of data collection or analysis changed since the last reporting period? How? Why?

Note: The data reporting process for this indicator is currently being reviewed based on several factors: 1) new 2014 Chesapeake Bay Agreement baseline/tracking considerations, 2) increased use of BMP progress data for Chesapeake Bay model/TMDL, and the associated BMP Verification protocols being developed by the States. Additional detail on these refinements to the indicator will be provided when finalized. We also receive an estimated RFB contracted acres from USDA. This is not used to in indicator reporting, only as a cross check.

In 2018, the Partnership will be transitioning to using Phase 6 of the Chesapeake Bay Watershed Model. This transition will impact the data record for several indicators, including this one, and will provide more accurate data. See the following for more information:
https://www.chesapeakebay.net/news/blog/updated_tools_help_address_pollution_and_plan_for_the_future.

(15) What is the long-term data trend (since the start of data collection)?

8,949 miles have been planted between 1996 and 2017. How much has been completed since 2010 (new reporting baseline for Executive Order)? 2,057 miles were planted between 2010 and 2017, which is well under the 900 mile/year target. An early goal for Forest Buffers, 2,010 by 2010, was met 8 years early. Another goal, 10,000 miles by 2010 came close to being met (73%).

(16) What change(s) does the most recent data show compared to the last reporting period? To what do you attribute the change? Is this actual cause or educated speculation?

For the reporting year 2017, 56 miles of riparian forest buffers have been reported as restored in the Chesapeake Bay watershed. The progress reported by individual States in 2017 is as follows:

- Maryland: 12.8 miles
- Pennsylvania: 17.5 miles
- Virginia: 5.6 miles
- West Virginia: 4.3 miles
- New York: 15.9 miles
- Delaware: 0 miles

(17) What is the key story told by this indicator?

We are making progress but slowly. According to scientific research riparian forest buffers are the most efficient filters for nutrients and other pollutants carried by storm water runoff. The ultimate goal is water quality improvements in the Chesapeake Bay Watershed because of the increase in riparian forest buffer miles.

Reporting of this information creates awareness that efforts are being made to improve the health of the Bay. It also imparts information related to the importance of riparian forest buffers for healthy Bay watersheds.

E. Adaptive Management

(18) What factors influence progress toward the goal, target, threshold or expected outcome?

These factors are technical or relate to management/leadership and have been identified to be of the highest order of priority.

- Federal/state/local leadership lace insufficient emphasis on RFB as a priority practice and allow less beneficial practices to successfully compete for riparian space
- Technical assistance is insufficient
- Lack of interagency coordination and staff training at all levels of government
- Lackluster incentives, and incentives that are not strategic and do not leverage resources wisely
- Federal funds go unused, sometimes for lack of a 20% match
- Federal programs lack the flexibility states and landowners need
- Outreach to landowners with riparian areas needs to stress the importance of RFB, new information, and improved incentives for the enrollment, re-enrollment and permanent protection
- Better understanding of why only 53% of RFB acres are re-enrolling upon expiration of first 15-year contract—work to increase re-enrollment or ease buffer
- Lack of information available to landowners and technical assistance providers

- Unsatisfactory survival of buffer plantings and maintenance issues primarily due to excess deer and vole browse and competing vegetation
- Complicated cost-share program application and implementation process accompanied by unclear communication
- Lack of targeting riparian forest buffers to where they would do the most good
- Lack of focus on permanent protection of riparian forest buffers; they are often lost when agricultural lands are converted to development and small, linear easements are difficult to manage.

(19) What are the current gaps in existing management efforts?
The Management Strategy for the Forest Buffers Outcome includes a fuller discussion of gaps, which include:

- Landowners need clear messages on the best way to manage riparian areas
- Federal programs that pay for RFB are underutilized (additional $5 million offered by FSA to address barriers)
- Need more technical assistance—if landowner is properly informed and incentivized, more may enroll.
- Outreach to landowners needs to improve/increase
- Poor survival of plantings discourages new enrollment
- Existing contract holders need to be re-enrolled or rolled over to permanent easements.
- Targeting tools not often used and can be applied to greater benefit to water quality and brook trout habitat.
- Riparian forest buffer easement programs are not active in most states.
- Suburban areas need programs to protect and establish buffers.

For a full discussion of gaps and barriers, see Appendix A of the Management Strategy.

(20) What are the current overlaps in existing management efforts? N/A

(21) According to the management strategy written for the outcome associated with this indicator, how will we (a) assess our performance in making progress toward the goal, target, threshold or expected outcome, and (b) ensure the adaptive management of our work?

(a) The biennial workplan will be the main tool for focusing collaboration across federal, state, local, and nongovernmental partners on the riparian forest buffer outcome. In addition to looking at program changes made at the regional level, we will track our progress in meeting the state actions set out in the State Task Force reports. Assessment of progress will be aligned with the cycle of state reporting for two-year milestones for the TMDL, because riparian forest buffer data are critical to meeting these milestones.

(b) The partnership will use the following approaches to ensure adaptive management:

- Tracking progress toward the annual 900-mile goal, as well as identifying trends and priority areas.

- Riparian Forest Buffer Initiative provides a means to engage additional partners in helping make progress on actions in the Management Strategy and workplan.
- Chesapeake partners involved in related goals, i.e., conservation, brook trout, wetlands, healthy watersheds and others, provide an important source of mutual feedback on what works well and what does not.
- Throughout the year, the partnership's communication tools, including websites, webinars and special announcements, will inform progress toward the RFB goal and highlight needs or opportunities for partnership members to engage.
- Monthly Forestry Workgroup meetings provide a regular venue for evaluating and adjusting particular strategies that support the annual 900-mile goal.
- Annual reporting by the partnership and its members of best practices, success stories and other qualitative and quantitative successes is another means to recognize the impacts of existing programs, reflect on and adapt existing and new strategies, and grow the capacity and stewardship required to increase the amount of riparian forest buffers in the watershed.

F. Analysis and Interpretation

Please provide appropriate references and location(s) of documentation if hard to find.

(22) What method is used to transform raw data into the information presented in this indicator? Please cite methods and/or modeling programs.

The data are summarized in a spreadsheet by geographic location with related extent of project sites. It is also mapped in GIS format, for states that have detailed project data.

(23) Is the method used to transform raw data into the information presented in this indicator accepted as scientifically sound? Yes. If not, what are its limitations? N/A

(24) How well does the indicator represent the environmental condition being assessed?

BMP data submitted include only acre measurements, so supplemental data from state agencies are reported directly to the Forestry Workgroup from several states, including more detailed buffer data (length/width) so that forest buffer miles can be calculated or estimated.

(25) Are there established reference points, thresholds, ranges or values for this indicator that unambiguously reflect the desired state of the environment? N/A

(26) How far can the data be extrapolated? Have appropriate statistical methods been used to generalize or portray data beyond the time or spatial locations where measurements were made (e.g., statistical survey inference, no generalization is possible)? N/A

G. Quality

Please provide appropriate references and location(s) of documentation if hard to find.

(27) Were the data collected and processed according to a U.S. Environmental Protection Agency-approved Quality Assurance Project Plan? If so, please provide a link to the QAPP and indicate when the plan was last reviewed and approved. **If not, please complete questions 29-31.**

Yes – beginning in 2014, reported data align with the riparian forest buffer BMP data submitted to the Chesapeake Bay model, covered by state QAPPs with EPA. However, these BMP data only include acre measurements, so supplemental data from state agencies are reported directly to the Forestry Workgroup from several states, including more detailed buffer data (length/width) so that forest buffer miles can be calculated or estimated.

(28) *If applicable:* Are the sampling, analytical and data processing procedures accepted as scientifically and technically valid?

Yes - The supplemental forest buffer data are input by field personnel and submitted to State Agencies listed above for QA/QC checks.

(29) *If applicable:* What documentation describes the sampling and analytical procedures used?

The data and metadata are sent to the Forestry Work Group by the participating State Coordinators. The data is documented and saved electronically.

(30) *If applicable:* To what extent are procedures for quality assurance and quality control of the data documented and accessible?

State records and Forestry Work Group records are kept, and GIS maps are produced by the UMD Center for Environmental Science. We also review information posted to CAST for progress to the TMDL.

(31) Are descriptions of the study design clear, complete and sufficient to enable the study to be reproduced?

Verified data can be used to determine miles of restored riparian forest buffers.

(32) Were the sampling, analytical and data processing procedures performed consistently throughout the data record? N/A

(33) If data sets from two or more sources have been merged, are the sampling designs, methods and results comparable? If not, what are the limitations?

Yes (States' data are merged to get cumulative miles). Submission criteria have been set and agreed to by State agencies.

(34) Are levels of uncertainty available for the indicator and/or the underlying data set? If so, do the uncertainty and variability impact the conclusions drawn from the data or the utility of the indicator? No; N/A

(35) For chemical data reporting: How are data below the MDL reported (i.e., reported as 0, censored, or as < MDL)? If parameter substitutions are made (e.g., using orthophosphate instead of total phosphorus), how are data normalized? How does this impact the indicator? N/A

(36) Are there noteworthy limitations or gaps in the data record?
The data are only as good as what was originally submitted by the States.

H. Additional Information (*Optional)*

(37) Please provide any further information you believe is necessary to aid in communication and prevent any potential misrepresentation of this indicator.
This information passes through many hands before being merged into the annual cumulative miles. Human error enters into this type of record. The data is compiled and released with utmost attention to accuracy and validation of locations and extents of restored riparian forest buffers.