BUFFERING THE BAY

A Report on the Progress and Challenges of Restoring Riparian Forest Buffers in the Chesapeake Bay Watershed

Of the many best management practices (BMPs) used to improve the quality of waters and habitats in the Chesapeake Bay watershed, the single best BMP may be the restoration of riparian forest buffers. Riparian forest buffers provide critical barriers between polluting landscapes and receiving waterways using relatively little land. Forest buffers reduce the adverse effect of excessive nitrogen (N), phosphorus (P), and suspended sediment inputs. Per acre, they likely provide more benefit than any other BMP, especially when considering the added high value habitat of the natural land cover at the critical juncture of land and water. Forest buffers have been part of the fabric of Bay restoration since 1994 when the Executive Council (EC) first called upon the Chesapeake Bay Program (CBP) to develop a policy to *enhance riparian stewardship and efforts to conserve and restore riparian forest buffers* (Directive 94-1).

History of the Forest Buffer Goal

Chesapeake Bay Program partners have shown extensive leadership in implementing riparian forest buffer incentive programs. Bay partners have promoted this practice while dedicating countless hours in providing education, landowner outreach, technical assistance, and contract administration. In the most productive 5 years (2002-2007), the Bay States restored over 4000 miles of riparian forest buffer— an average of 830 miles/year.

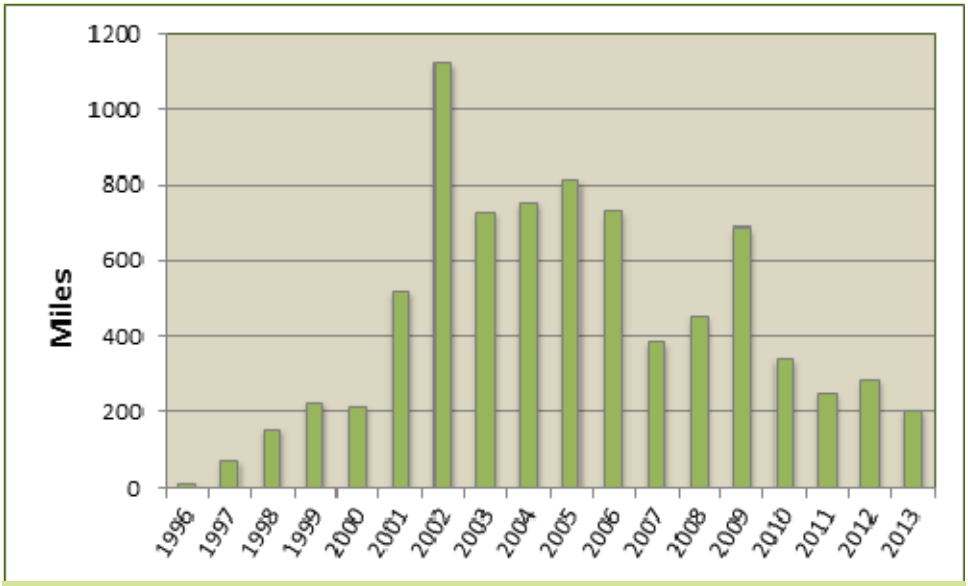

Figure 1. Riparian Forest Buffer Restoration 1996-2013

The current goal for restoring riparian forest buffers — to have a

minimum of 70% of the riparian area forested — was established in 2003. This goal was also adopted in the 2007 Forest Conservation Directive. To achieve this goal, existing forest buffers must be preserved (see "Conservation" section) and additional forest buffers must be restored by planting trees. Based on an estimate of 181,440 miles of streams in the watershed, and 55% of the land being forested, an annual target of 900 new miles of riparian forest buffer is sought every year through 2036 to reach the 70% threshold. In recent years (2011-2013), progress has slowed significantly-- averaging only 244 miles per year.

Currently, the number of new forest buffers being restored is at the lowest point in 14 years. This is despite the fact that forest buffers are one of the most cost-effective practices for improving water quality in the Bay, particularly when considering their longevity and minimal maintenance needs after establishment. Some assessments have averaged the investment for this practice only out to 15 years (life of contract), but 88% of landowners surveyed in Pennsylvania intended to keep their forested buffers in perpetuity (Cooper 2005). Some reasons for the lackluster progress of late are mentioned in this document.

Role of Forest Buffers in the Chesapeake Bay TMDL

Because the CBP and its partners could not voluntarily meet water-quality goals for N, P, and suspended sediment in the Chesapeake Bay by 2010, the US Environmental Protection Agency established a Total Maximum Daily Load (TMDL) or limit for these pollutants entering the main stem of the Chesapeake Bay. Bay states are depending on restoring riparian forest buffers to meet the TMDL mandate, especially to reduce nitrogen. In an analysis done by the Chesapeake Bay Program Office, the riparian forest buffer practice is second only to land retirement in BMP's most counted-on for nitrogen reduction according to the states' Watershed Implementation Plans (WIPs) (Figure 2). This analysis includes all implemented and planned BMP's between years 1985-2025.

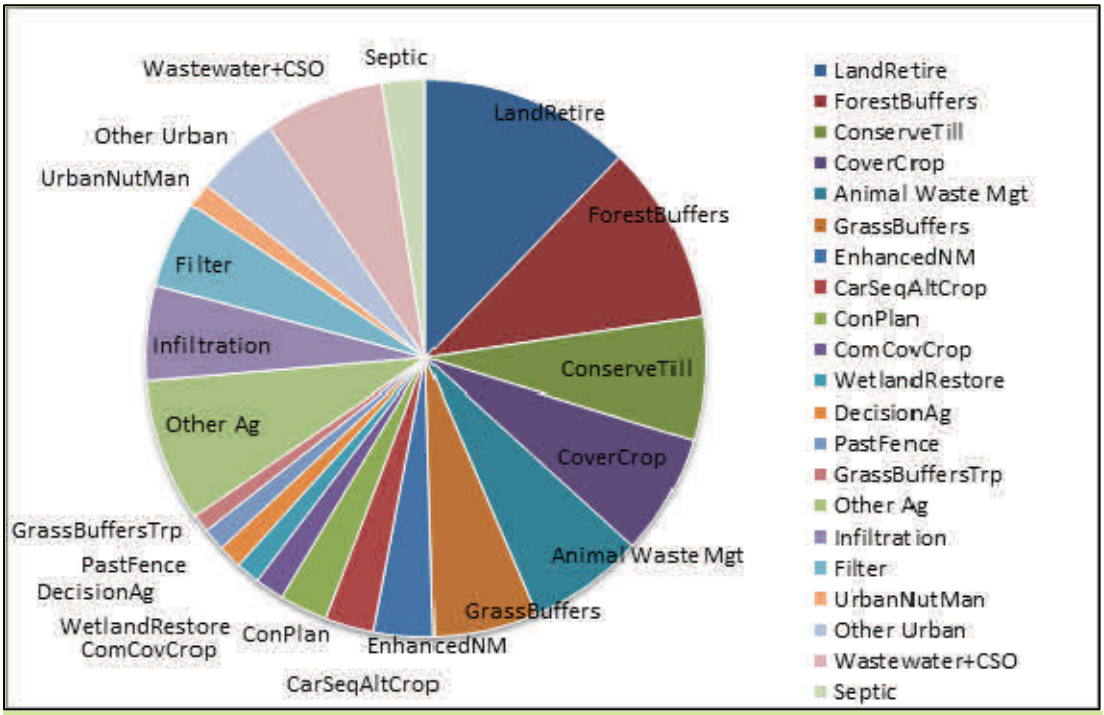

Figure 2. Percent Nitrogen load reductions anticipated in Watershed Implementation Plans

According to the WIPs, the projected need is for an additional 185,000 acres of riparian forest buffers in the next 12 years (average 14,200 acres/year or roughly 1,200 miles/year) — this would be an increase from 2013 implementation of roughly 600% annually until 2025. This scale of increase in riparian forest buffer restoration would be beneficial in reaching other Chesapeake Bay Watershed goals such as brook trout habitat, stream restoration, and healthy watersheds.

CREP *is a land retirement program designed to help protect water and soil by removing marginal agricultural land from production. Riparian forest buffer restoration, known as CP22, is a common CREP practice.*

CREP is a program of the U.S. Department of Agriculture (USDA) administered by the Farm Service Agency (FSA). The National Resources Conservation Service (NRCS), a USDA agency, provides either provides technical assistance for CREP itself or offers funding for another partner to do so. States are program implementation partners. After its debut in Maryland in 1998, other states were quick to adopt the CREP program.

The CREP program covers 50% of a project's installation costs from federal funding. State partners provide matching financial assistance so that 90% or more of the costs often come from public funds. Further financial benefit reaches the landowner via an initial incentive payment and annual "land rental" payments for the life of the 10-15 year commitment.

FSA reports that 63,000 acres of riparian forest buffers are currently under CREP contract in the Chesapeake Bay watershed.

Importance of the Conservation Reserve Enhancement Program (CREP)

Riparian forest buffers cost money to establish, but unlike some other restoration practices, federal cost-share funding is available to defray expenses. The vast majority of riparian forest buffers that are restored in the Chesapeake Bay Watershed are funded through the CREP program. There is no established funding limit for this program and the acreage cap has not been reached in any Bay state (Table 1). For this reason, CREP advocates say CREP is undersubscribed and "money is being left on the table" when it could be used to restore buffers. In fact, most states have ample availability in the CREP acreage cap and associated federal funding to achieve their WIP goals. States that will exceed their acreage caps for CREP should be working to extend it.

Riparian forest buffer plantings can also be cost-shared using the USDA Environmental Quality Improvement Program (EQIP) funding. In the Chesapeake Bay, EQIP funding has been at an all-time high since 2009 when funding for the Chesapeake Bay Watershed Initiative (CBWI) was added to that program. CBWI was initiated in the 2008 Farm Bill to help USDA meet its overall goal to improve water quality in Chesapeake Bay. For a landowner restoring forest

State	CREP acreage cap	Type of cap- state or CB only	CREP acres enrolled under cap (6-30-13)	Acres avail. under cap (cap-enrolled)	New acres needed 2012-2025 for WIP
DE	10,000	state	5,540	4,460	4790
MD	100,000	state	67,660	32,340	1190
NY	40,000	state	10,970	29,030	6180
PA	219,746	CB	125,110	94,636	89,630
VA	25,000	CB	14,800	10,200	80,820
WV	9,160	state	5,690	3,470	3250

Table 1. Acreage caps for all practices in CREP

buffers, EQIP is usually less preferred because the landowner receives significantly more financial compensation through CREP. Very few riparian forest buffers have been established with EQIP/CBWI funding: in three years (2009-2011), only 23 acres of riparian forest buffers were restored through the program. During that period $138 million was spent on conservation practices in the watershed using CBWI.

Establishment and Maintenance

Restoring riparian forest buffers to agriculture and urban landscapes is a formidable task. Many of the buffers restored in the early years (1998-2003) encountered problems. Lack of proper site preparation and maintenance contributed to the failure of many plantings. Specific problems were attributed to competing vegetation, vole damage, lawn mowing, and deer browse, among other issues. Problem sites were often replanted, but these initial failures left many landowners, producers, and technical assistance providers discouraged.

Lessons were learned to address these problems. A proven method — herbicide applications and proper use of tree tubes — has greatly improved restoration success. One study cites a 6-fold increase in survival coupled with a 2-fold increase in tree growth when this method is followed (Sweeney 2002). More attention to this method is needed along with continued technical assistance and post-planting care until the riparian forest is considered established (~3-8 years). In 2008, USDA approved a first-in-the-nation cost-share on post-planting care for buffers in Pennsylvania. A more regimented post-planting monitoring program would help minimize problems with buffer planting establishment. A good example of monitoring comes from Virginia where the Department of Forestry works closely with NRCS to conduct detailed annual survival on every CREP forest buffer planting. Each project site receives multiple visits from a professional forester until it is deemed established.

Outreach and Technical Assistance

Each new riparian forest buffer represents a considerable amount of promotion and time invested in landowner relations by technical service providers. Initial outreach is conducted to interest landowners and can be done through direct mailings, paid advertising, signs, toll-free call-in centers, and earned media, to name a few. Outreach is especially needed for forest buffers — to educate the landowner of their importance and the incentives available for restoring them. Often the most effective type of outreach is direct contact through a trusted farm technical assistance professional.

Technical assistance helps ensure that conservation practices are correctly installed and a landowner's questions are answered. NRCS administers the technical assistance of CREP and other farm bill programs (like CBWI and EQIP) and can engage in cooperative agreements with partners who also provide technical assistance. The absence of sufficient technical assistance can be a bottleneck for not getting more forest buffers on the ground.

Some counties in the watershed have been exemplary at prioritizing the forest buffer practice through CREP (Figure 3). In fact, 75% of the riparian forest buffers in the watershed occur in just 25% of the counties. This is, in part, because of outreach and technical assistance provided in that county, and in some cases, a ranking approach that favors forest buffer restoration.

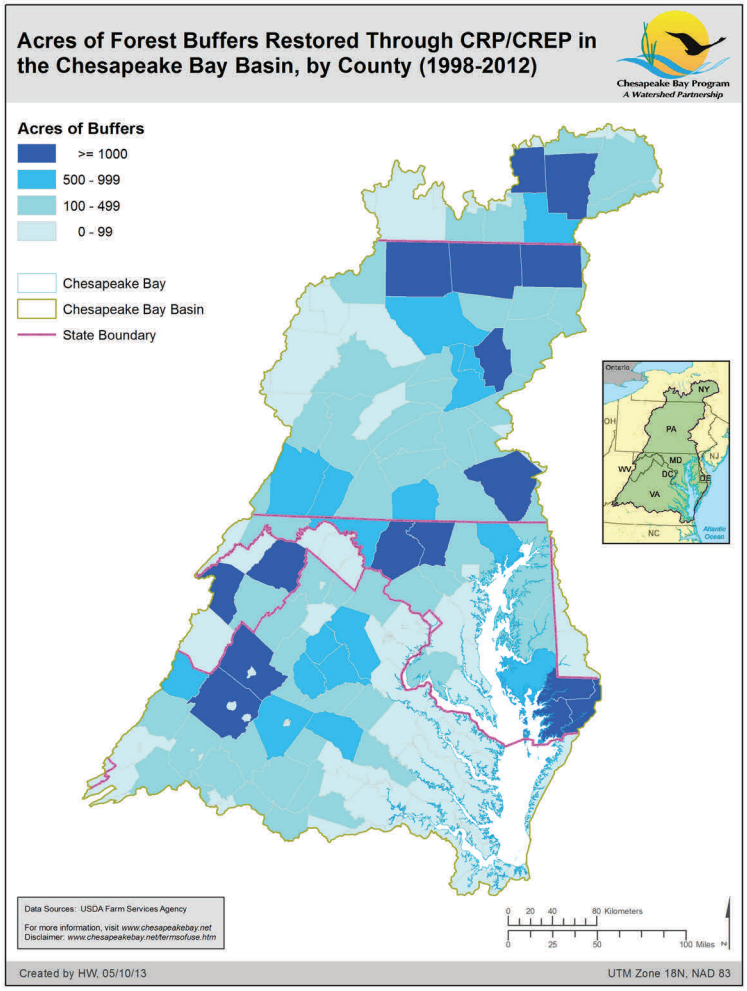

Figure 3. Acres of forest buffers restored through CREP and Conservation Reserved Program (CRP) in the Chesapeake Bay watershed by County (1998-2012)

NEW CHALLENGES

CREP Availability

A new Farm Bill was signed into law in February 2014. Now, CREP should be re-opened to new sign-ups and any programmatic changes will be executed. From October 2012 through April 2013, CREP was closed to new sign-ups while other Farm Bill programs stayed open. In October 2013, CREP closed again. Such interruptions in program delivery greatly increases skepticism about program viability, a particular concern for long-term contract programs like CREP.

Expiring Contracts

Many CREP contracts will expire in the next few years (Figure 4). These contracts represent an enormous amount of effort and financial investment. They also represent a lot of acres that are already being counted toward the TMDL. Partners for the Chesapeake Bay need to seize the opportunity to re-enroll as many of these acres of forest buffer as possible to minimize the loss of acres and safeguard the investment. Even for a willing landowner, it may take 1-3 years to make some acres eligible for re-enrollment if stocking (tree survival) is inade-

quate. While the contract is still active, outreach is needed to 1) learn the landowner's intentions regarding the buffer, 2) ensure the landowner is aware of the re-enrollment opportunity and 3) encourage re-enrollment.

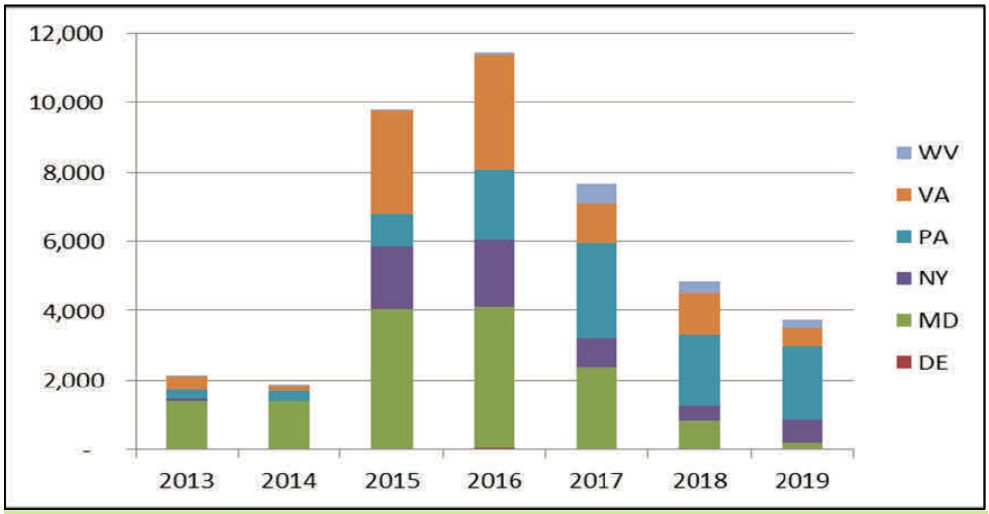

Figure 4. Acres of CREP riparian forest buffers in the Chesapeake Bay watershed with expiring contracts (2013-2019)

Targeting

Water quality contributions of forest buffers vary by physiographic region, but they also vary on a more local scale depending on adjacent land use and other factors such as the amount and direction of subsurface flows. Targeting can help answer the question of where to get the greatest nutrient load reduction from an acre of riparian forest buffer restoration. This cost-effective approach could be used more widely as localized geographic analyses are conducted. At present, no additional monetary incentives are available to targeted areas where high pollution reduction is expected, but some partners have used additional outreach and technical assistance to restore forest buffers in these places. Improved targeting in program delivery would be a worthwhile investment.

Conservation

Even though conservation of forest buffers was called out back in the 1994 Directive, it has taken a back seat to restoration. Yet conservation is an easier, more successful, and cost-effective means toward ecosystem integrity when compared to restoration. With 55% of riparian areas forested, opportunity for further loss of existing buffers is significant. An easement program exists that pays extra ($500/acre) for permanent retirement of the land under a CREP contract. This program is not active in most Bay states. Ideally a targeted conservation framework should be implemented that emphasizes conservation of forest buffers through various state and local laws and ordinances. For instance, Maryland has the Critical Areas Law and Forest Conservation Act and counties of Baltimore and Howard have regulations to protect buffers.

When public funding is used to protect farmland, could be a point of leverage to ensure all streams on that farm are buffered. Likewise, conservation could be targeted to places where public funding has been invested in restoration practices. Linking permanent easement programs with forest buffer restoration benefits both programs.

Learning from Pennsylvania's CREP Partnership

There are several innovations from Pennsylvania within the CREP riparian forest buffer program that have enabled them to restore more than twice as many buffers as other Bay states. A federal-state-nonprofit partnership focuses specifically on forest buffers and provides coordination and programmatic guidance at the state level. In addition to doing countless hours of outreach and technical assistance to get more forest buffers, the partnership has improved survival by established new funding and policies around post-planting care.

So, how did they get all those acres of forest buffer? First, Pennsylvania state cost-share dollars are available as a CREP incentive only for riparian forest buffers, not grass buffers. This is an effective way to communicate to the landowner the importance the state places on the riparian forest practice. Second, some counties will improve the ranking of other conservation practices (e.g., EQIP practices) if the landowner has or agrees to put a riparian forest buffer (can use CREP for this). This is known as a tiered system of practice ranking—the value of a forest buffer leverages other Farm Bill program funding. A voucher system is another model for incentivizing buffers. Vouchers (cash payment) are given to a landowner that, when asked, agrees to put in a riparian forest buffer. These vouchers are used to pay for the landowner's share of other conservation practices implemented on the farm. Funding for vouchers is most likely to come from state or private grants.

The Chesapeake Bay Foundation found that 117 out of 120 Pennsylvania farmers were willing to do CREP forest buffers when additional incentive funding (i.e., a voucher) was made available to pay for other agricultural BMPs that the farmer needed. In the process, limited conservation funding is leveraged to encourage both forested buffers as well as traditional agricultural BMPs. This data is encouraging as it stands in contrast to the oft cited "low hanging fruit" argument: that the landowners willing to plant forest buffers have already been reached.

Verification

Given the ever increasing importance of accounting for restoration practices like riparian forest buffers — Bay Program partners agreed to a framework whereby tracking and reporting of practices can be expanded AND also verifiable. This framework is called verification.

One of the first tasks under verification for riparian forest buffers is to determine a baseline of existing buffers. Only a net gain in riparian forest buffers can be reported, so any loss of buffers needs to be tracked. Other than closer monitoring of gains and losses, an expected result of Verification guidelines will be bolstering of forest buffer conservation and education programs and increased maintenance until a planted buffer is established.

CONCLUSION

The need to meet the Bay TMDL necessitates a significant acceleration of current efforts in establishing riparian forest buffers. Common reasons cited for not getting more of this practice on the ground are:

- willing landowners have already been reached;
- higher commodity prices for crops reduce landowner willingness to retire land;
- desire to keep land available for sale and development—many landowners/farmers are of retirement age;
- the confusing mix of programs and funding sources;

These are not new challenges, yet it is not known how much any one of them hampers progress in restoring buffers. No surveys have been done, and there is no information about how many landowners have turned down forest buffers or why. In fact, there is evidence, such as that from Pennsylvania, to suggest that if landowners are educated, incentivized, and encouraged, they are usually willing to plant forested buffers as part of good farm stewardship.

Overcoming the challenges laid out in this paper will require concerted attention by key decision makers and program managers. Innovative approaches and changes to existing programs will likely be needed. To get more riparian forest buffers on the ground, partnership strategies and policies to consider include:

- Increasing outreach and technical assistance;
- Adding bonus payments;
- Expanding tiered ranking systems;
- Offering vouchers to landowners;
- Improving buffer survival with more focus on post-planting care; and,
- Extending establishment period from 3 years to 5 years.

REFERENCES

Cooper, Emilie 2005. Preserving CREP Forested Riparian Buffers through Conservation Easements. Pennsylvania State University, Masters Thesis. May 2005.

Sweeney, Bernard et al. 2002. Riparian Forest Restoration: Increasing Success by Reducing Plan Competition and Herbivory. *Restoration Ecology* Vol. 10, No. 2, pp 392-400. June 2002.

USDA 2013. U.S. Department of Agriculture. Financial Management Modernization Initiative (FMMI) April 2013. Foundation Financial Information System (FFIS) December 2011. ProTracts Program Contracts System October 2012. National Conservation Planning Database November 2012 Natural Resources Conservation Service, Washington, DC. 23 December 2013* <http://soils.usda.gov/survey/rca/viewer/reports/fb08_cp_cbwi.html>