

Forestry BMP Verification – Principals and Protocols – DRAFT

Background: The following Best Management Practices are considered to be part of the Forestry suite of BMP's and will be discussed in this document:

- 1) Expanded Tree Cover (Urban Tree Planting)
- 2) Urban Riparian Forest Buffers
- 3) Agricultural Riparian Forest Buffer and Tree Planting
- 4) Forest Harvesting

Forests cover the majority of the landscape in each Bay state. There has been a notable disparity in how (and whether) jurisdictions collect Forestry BMP data. In Phase II WIPs, Forestry BMP's play an increasingly important role—especially with urban forestry BMP's (#1 and #2 above) --going from not being reported to anticipating thousands of acres. The Forestry BMPs on agricultural land (#3) are both cost-share practices and are tracked and verified at least in part, as agricultural conservation practices. In some states, forest harvesting BMPs (#4) are closely regulated on both public and private land, while in other states, there is no record of where private forests are harvested, much less BMPs on those acres.

This document provides guidance on how to verify these BMPs. The Principles and Protocols described here are consistent with Verification Principles previously established regarding science, performance, technology, and monitoring. This paper does not discuss what the efficiencies for the practices are or should be. Current working definitions from the CB Model documentation are provided for each of the BMPs for context.

Workgroup Process to Develop Protocols- From February through September 2012, the Forestry Workgroup (FWG) developed these protocols. The expert panels for Expanded Tree Cover and Agricultural Riparian Buffers were consulted on the Verification protocols. Comments received up to February 14, 2013 have been incorporated.

Description of Protocols for the 4 Forestry BMPs

- 1) **Expanded Tree Cover** (formerly Urban Tree Planting. The name, definition, and credit for this BMP, is currently being updated, pending recommendations from an Expert Panel.)

Draft Definition: *Increase the area of tree cover within a reporting jurisdiction. The primary strategies for expanding tree cover include 1) conserving existing tree cover as much as possible, 2) planting trees, and 3) allowing for natural regeneration. Credit is applied according to the number of*

new acres intended for tree cover (# 2 or 3 above). If trees are reported as number planted (not acres, non-contiguous) a conversion factor of 100 trees = one acre of new tree cover (#2). Area of intended tree canopy via natural regeneration should be a minimum of ¼ acre (or adjoin to existing forest) and maintained such that after 3 years there is a density of at least 100 trees/acre (not counting invasive species).

There are two steps needed to realize full credit for this practice:

- 1) Annually report acres of new tree cover; and
 - 2) Periodically verify (every ~5 years) that overall tree cover is being maintained/not decreasing.
- This is most easily done using aerial imagery.

Expanded Tree Cover BMP Principle

*Any new acreage of tree cover represents a **net gain** in overall tree cover for a reporting jurisdiction. The following examples support this principle:*

- Conservation measures are in place to help maintain existing canopy.
- Monitoring and maintenance occurs on all acres of tree cover, whether new or existing (e.g., community street trees are watered during periods of drought).
- New plantings are validated by a professional.
- Periodic analysis of existing tree cover within a reporting jurisdiction is used as assurance that overall tree canopy is not decreasing.

Expanded Tree Canopy Protocol:

Part 1: Establish Urban Forestry program support mechanisms

Reporting jurisdiction has an urban forestry program (a.k.a. partner or staff) and therefore has more certainty of survival/net gain in tree cover. Having a program in place will facilitate with all bullets mentioned in the Principle statement above. Additionally land managers and tree stewards are educated about tree care and using good planting techniques (e.g., how, where, and what to plant).

Urban forestry partner— a local government staff or non-governmental partner that is approved by the state forestry agency and likely to satisfy the above 4 principle bullets.

Part 2: Track New Acres of Tree Canopy

- A. **For new plantings**, four pieces of data will help identify the site and provide the correct amount of credit: 1) acres of planting, 2) dates of planting, 3) anticipated stature of trees at maturity (e.g., large or not), and 4) whether the understory will be managed or allowed to develop naturally.
- B. Other factors that can make a difference in the pollution-reducing credit of the practice include: whether planting was designed or engineered to receive stormwater run-off

(e.g., continuous tree pits, notched curbs, etc.), whether new planting is adjacent to impervious surface, whether it will be “open grown” or adjoining an existing forest, and whether it has sufficient space and soil to thrive. Recording this information is optional.

- C. **For natural regeneration acres**, three pieces of data should be recorded: 1) acres of treatment, 2) date started, and 3) whether the regeneration area adjoins existing forest. (Note: may request that this information is reported only after 4 year establishment period.). Regeneration areas could be mowed, fenced or signed as deemed necessary.

Part 3: Maintain new areas of tree canopy and sample overall canopy cover.

- A. **New urban plantings** can have a high rate of mortality succumbing to weed suppression, dehydration, physical damage, or other injury. Removing competing vegetation is often necessary. Density of surviving trees at 4 years should be a minimum of 100 trees/acre. An individually planted tree (e.g., tree pit) that dies should be replaced, or removed from NEIEN.
- B. **For natural regeneration** areas, ensure desirable tree growth is not suppressed, until a density of 100 trees/acre is reached and the trees are of a height where they can grow unhampered (“out of the weeds” and above deer browsing level of 4 feet”).
- C. **For existing tree cover** within reporting area/jurisdiction, a periodic sampling (e.g., every ~5 years) regime should be established to re-assess overall cover and show that there has not been a decrease. Use of free aerial imagery and assessment tools such as iTree Canopy (v 5) or the Land Image Analyst can be a cost-effective means of sampling.

2) Urban Riparian Forest Buffers

Working Definition: An area of trees at least 35 feet wide on one side of a stream, usually accompanied by trees, shrubs and other vegetation that is adjacent to a body of water. The riparian area is managed to maintain the integrity of stream channels and shorelines, to reduce the impacts of upland sources of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals.

Verification of this practice is similar to the Expanded Tree Cover practice that was just discussed; the principle and protocol are the same with some slight changes for this practice in Part 2 of the Protocol for accurate tracking of data (below). Urban riparian forest buffers are any riparian buffer not in agriculture or forest setting-- it is on developed land (the jurisdictions can make a more precise determination for when it is on agriculture and when on urban land). Software tools and aerial imagery have become prevalent and sophisticated enough to isolate urban riparian forests and determine a practice baseline for a reporting area.

Maintain information at local level of each new planting or regeneration area.

- i. **For new plantings**, suggested data to record includes: 1) location, 2) #acres of planting (if appropriate) and width, 3) dates planted, and 4) whether it will be managed or allowed to develop a natural understory.
- ii. **For natural regeneration acres**, data to be recorded includes: 1) location, 2) #acres of treatment, 3) width, and 4) date started.

3) Agricultural Riparian Forest Buffer

Working Definition: Agricultural riparian forest buffers are linear wooded areas along rivers, stream and shorelines. Forest buffers help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width for riparian forest buffers (agriculture) is 100 feet, with a 35 feet minimum width required.

The vast majority of Forest Buffers and Tree Planting are a cost-shared conservation practice on agricultural land that are long-term in nature (once established, the practice often continues in perpetuity without need for management or maintenance). The verification of this practice can be accounted for similar to other cost-shared agricultural practices (please see additional verification guidance in the Agriculture Workgroup BMP Verification Protocol). This practice differs from other agriculture BMPs in its Principle (new acres are a net gain in forest buffer), the need to account for width of the buffer (not currently tracked in USDA databases), and the appeal for monitoring 10 years after planting to ensure proper functioning.

Agricultural Riparian Buffer BMP Principle

*Any new acreage of riparian forest buffer reported represents a **net gain** in overall buffer for a county or watershed segment. The following examples support this principle:*

- Laws or ordinances that encourage conservation of existing buffers are in place.
- Monitoring and maintenance occurs on both USDA cost share and non-cost share practices.
- Periodic sampling of existing buffers indicates that overall riparian buffer cover in the county or watershed segment is increasing (Protocol 2).

Agricultural Riparian Forest Buffer Protocol

Part 1: Collect and review data

- a. State forestry agency in consultation with other appropriate agencies will coordinate the reporting of all acres to keep from double counting.
- b. Capture width of buffer in addition to acres of practice. Narrower buffers (>35' and <100') could eventually have separate credit. (Could NRCS/FSA begin reporting buffer length or width?)

- c. Need to differentiate re-enrolled CREP acres from new CREP acres (USDA action). Only new CREP acres should be reported.
- d. Details of non-cost shared buffers should be reported to the state by the primary partner to a degree similar to cost-share practice (e.g., #acres, date, width, location).

Part 2: Monitor and maintain new plantings or regeneration areas, as well as existence and functioning of other riparian buffers.

- a. Ascertain buffer baseline for a given area using free high resolution imagery and Land Image Analyst or other tool. Periodically sample (e.g., every 5 years) the same area to show there has not been a loss in total buffer cover.
- b. For non-cost share new plantings, revisit 10% of RFB installations after one year (in keeping with USDA cost-share practice).
- c. Buffers should have a healthy, unmanaged understory. To help with this and to encourage vertical structure, canopy should not be fully closed at 15 years. Stocking should be adequate for re-enrollment.
- d. Jurisdictions develop a monitoring regime to ensure proper functioning of buffer (e.g., sheet flow, not channelization); with a goal of visiting 10% of sites by the time they are 10 years. Remove practice from NEIEN if it is not functioning properly, and make management adjustments if problems are routinely encountered.

4) **Forest Harvesting BMP**

Working Definition: Forest harvesting practices are a suite of BMPs that minimize the environmental impacts of road building, log removal, site preparation and forest management. These practices help reduce suspended sediments and associated nutrients that can result from forest operations.

Most acres that are logged have BMPs applied to reduce harmful effects to primarily water quality. Most watershed states have good reporting on forest harvest practices on public land, but there is a big disparity among the states on how forest harvest BMP's on *private* land are tracked. The premiere example of how to do this is provided by Virginia below. Other Bay states don't track forest harvest on private land but have devised a "proxy" for how many acres are harvested and how many BMP's are applied. Other states have done periodic field sampling to verify an average rate of implementation of this BMP in their state.

Forest Harvesting BMP Principle

Track forest harvest acres annually and determine rate of harvest BMP implementation every 5-10 years by state (e.g., sampling or survey method is OK).

Forest Harvesting BMP Protocol

Part 1-- Submit actual acres of forest harvest to NEIEN, overriding the 1% harvest rate assumption, if possible. States that don't track private land harvest can still report harvest BMP's applied to public land (but much less public land is harvested in any given year).

Part 2--- Use the actual implementation of forest harvest BMPs in lieu of a sampling rate, if possible.

Part 3--- Incorporate monitoring of harvest BMPs to determine if a practice was effective in a given setting (WV example, and USFS BMP Monitoring protocol).

Two Examples of How Forest Harvesting BMP's Are Documented on Private Land

Maryland Example:

- DNR hires staff to collect data from Sediment and Erosion Control (SEC) Plan approvals (harvest permit) for each county and State Forest harvest acres.
- Harvest permit valid for 2 years and not all acres approved for harvest are necessarily cut, especially not in the year permitted.
- Tracked through PMAS (Performance Measurement Accountability System) or, when funded, Cooperative Extension, who prepares a quarterly report of timber stumpage prices, and includes a summary of SEC plans reported as summed acreage
- All private harvest plan approvals were assumed to have an 81-82% BMP implementation rate based on the most recent field sampling survey.

Virginia Example:

- Virginia Department of Forestry (DOF) has been monitoring BMPs on forestry operations since the early 1990's.
- The Virginia Silvicultural Water Quality Law requires that harvest operators notify the DOF of their operations.
- DOF has an automated system, IFRIS (Integrated Forest Resource Information System) that records the harvest information and prompts inspections of the site for water quality protection under the law.
- DOF keeps a geo-referenced database of approximately 5000 logging operations per year.