

Forestry BMP Verification – Principles 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
- 2) Urban Riparian Forest Buffers
- 3) Agricultural Riparian Forest Buffer and Agricultural Tree Planting
- 4) Forest Harvesting

Forests cover the majority of the landscape in each Bay state. There has been a big 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) --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.

Workgroup Process to Develop Protocols- From February through September 2012, the Forestry Workgroup (FWG) developed and then provided feedback on several versions of these protocols. The Principles and Protocols proposed here are consistent with specific Verification Principles previously established regarding science, performance, technology, and monitoring. The expert panels for Expanded Tree Cover and Agricultural Riparian Buffers were consulted on the Verification protocols. The FWG will look at this revised paper at their next meeting on December 5.

Description of Protocols for the 4 Forestry BMPs

1) Expanded Tree Cover (formerly Urban Tree Planting)

For this BMP, we are proposing to change the name and definition to more directly address what will improve water quality—tree cover. Tree cover improves water quality in the following ways: interception, infiltration, and evapo-transpiration. All of these reduce stormwater volume; infiltration also reduces concentration of pollutants.

Expanded Tree Cover Definition (new): *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). Planting 100 trees is equivalent to one acre of new tree cover (#2). Area of intended tree canopy via natural regeneration should be a minimum of $\frac{1}{4}$ acre (or adjoin to existing forest) and maintained such that after 3 years there is a density of at least 100 tree stems/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 maintained or increasing. This is most easily done using aerial imagery

Expanded Tree Cover BMP Principle

*Insure that any new acreage of tree cover represents a **net gain** in overall tree cover for a reporting jurisdiction. The following are examples of insurances:*

- Conservation measures are in place
- 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 increasing.
- Landowner education of tree care and placement (instruct about trees being planted in the proper location, e.g., avoid planting large trees under utility lines, and avoid planting trees that are not salt-tolerant along roadways.)

Protocol 1: Urban forestry programmatic support elements

A. Full Credit when the reporting jurisdiction:

- Has an active urban forestry program (a.k.a. partner or staff) and therefore has more certainty of survival/net gain in tree cover.

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

- Conducts a periodic review (~5 years) to show there has not been a loss of tree cover overall (see Protocol 3c below).
 - Shows complete tracking and monitoring reports (see Protocol 2 and 3 below).
- B. Partially Reduced Credit (e.g., 75%) when the reporting jurisdiction:**
- Is without an urban forestry program
 - Conducts a periodic review (~5 years) to show there has not been a loss of tree cover overall.
 - Shows incomplete tracking and monitoring reports
- C. Reduced Credit (40%) when the reporting jurisdiction:**
- Is without an urban forestry program
 - Does not conduct a periodic review (~5 years) of overall tree cover.
 - Shows incomplete tracking and monitoring reports

	Full Credit	Partially Reduced Credit (75%)	Reduced Credit (40%)
Periodic review of tree canopy does not show loss	Yes	Yes	No
Urban forestry program support	Yes	Yes	No
Tracking and monitoring complete	Yes	No	No

Table 1. Summary of proposed credit applied to the Expanded Tree Cover practice when a reporting jurisdiction meets or doesn't meet certain qualifications.

Protocol 2: Accurate Tracking of New Acres

- A. Maintain information at local level** of each new planting or regeneration area.
1. **For new plantings**, data to be recorded includes: acres and dates of planting (if appropriate), number and stature of trees (large, medium, small), whether planting was designed or engineered to receive stormwater run-off (e.g., continuous tree pits, notched curbs, etc.), type of planting (e.g., whether trees will be open grown with no forest understory, whether they will be allowed to develop a forest understory, or are adjoining an existing forest). These factors can make a difference in the pollution-reducing efficiency of the practice.

2. **For natural regeneration acres**, data to be recorded includes: acres of treatment, date started, and whether the regeneration area adjoins existing forest.
- B. Produce annual report to appropriate state forestry contact for timely entry into NEIEN.

Protocol 3: Monitoring

- A. **For new plantings**, monitor and maintain for three years. New plantings of small trees are usually maintained by mowing or other form of weed suppression. Density of surviving trees at 3 years should be a minimum of 80 stems/acre. For new street tree or container plantings, ensure survival after 3 years or replace.
- B. **For natural regeneration** areas, monitor and maintain for 5 years to ensure desirable tree growth is not suppressed, until a density of 100 tree stems/acre is reached and the trees are of a height where they are beyond suppression (“out of the weeds”).
- C. **For existing tree cover** within reporting area, monitor at least every 5 years using aerial imagery to ensure no overall loss. This should be done if data of tree loss is not directly tracked on an annual basis. An aerial assessment of change in tree cover can be done by comparing a recent aerial image to one from 3-5 years ago (could use rapid assessment tools such as iTree Canopy (v 5) or Land Image Analyst). If a state is monitoring tree cover for jurisdiction, 20% of reporting jurisdictions should be sampled annually using the mentioned tools or similar ones. Another aerial monitoring method is to compare existing tree cover to a previously established baseline Urban Tree Canopy assessment map. Whatever tool is being used, enough points should be sampled to reach a 90% confidence interval that tree canopy is stable or increasing in a reporting jurisdiction.
- D. Projects not monitored as described should be discounted 40% as specified in Protocol 1 above.

2) Urban Riparian Forest Buffers

Verification of this practice is similar to the Expanded Tree Cover practice that was just discussed; the principles and protocols are the same. 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. Urban riparian forest buffers are any riparian buffer not in agriculture or forest setting-- it must be on developed land. There are slight changes for this practice in Protocol 2 for accurate tracking of data:

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

1. **For new plantings**, data to be recorded includes: location, #acres of planting (if appropriate), dates, width of planting, density of planting, and whether they will be allowed to develop a forest understory.
2. **For natural regeneration acres**, data to be recorded includes: location, #acres of treatment, width, and date started.

3) Agricultural Riparian Forest Buffer and Tree Planting

Principle: Ensure that any new acreage of riparian forest buffer reported represents a ***net gain*** in overall buffer for a county or watershed segment:

- Look for laws or ordinances that encourage conservation of existing buffers
- Monitoring and maintenance occurs on both USDA cost share and non-cost share practices.
- Some analysis of agricultural riparian buffer loss should be used to adjust what would otherwise be reported as a gain.

Protocol 1: Data Collection

- a. Review data reported as cost-share practice to ensure proper design and no double-counting.
- b. Capture width of buffer in reporting documentation (not just acres of practice). Narrower buffers (>35' and <100') could eventually be discounted. (Could NRCS/FSA begin tracking buffer length or width?)
- c. State forestry agency reviews cost-share project data from USDA/USGS prior to NEIEN input. This should include both riparian forest buffers and tree planting.
- d. Establish a unique identifier for each project to avoid duplicate records (USDA/USGS).
- e. Need to differentiate re-enrolled CREP acres from new CREP acres (USDA action).
- f. Details of non-cost shared buffers should be reported to the state by the primary partner to a degree similar to cost-share practice (i.e., acres, date, width, who planted, location).

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

- a. For existing buffers, ascertain buffer baseline for a given area using high resolution imagery (Land Image Analyst or other tool). State should re-sample 20% of the area every 5 years to verify there has been a net gain in those watershed segments (or counties) reporting such. (Question about whether the

- state-level is the appropriate scale to show maintenance of buffer cover/have conservation policies in place.)
- b. For non-cost share new plantings, revisit 10% of RFB installations after one year (in keeping with USDA cost-share practice).
 - c. Buffers to be maintained at no more than 80% canopy closure to encourage vertical structure (or basal area 60-80 ft²/acre) OR assess healthy condition of understory. Must have minimum 60% survival for re-enrollment.
 - d. Revisit at least 10% of projects every 5 years and 50% every 10-15 years to see that there is adequate survival (see “c” above) and proper sheet flow (no channelization through buffer) –VA example. Remove practice from database/model if it is no longer functioning.

4) Forest Harvesting BMP

Principle and protocols: Forest harvest acres should be tracked annually and rate of BMP implementation need to be determined every 5-10 years by state (e.g., sampling or survey method is OK).

- a. Need to distinguish forest harvesting from development (including shale gas). Sometimes developers claim a clearing is a forest harvest. One way to differentiate is to look for road development soon after “harvest”.
- b. Focus should be on those forest harvesting BMPs that are most important to water quality.
- c. If states have information on forest harvesting (both public and private land), they can submit actual acres, overriding the 1% harvest rate assumption currently made by the CB model. States that don’t track private land harvest could further discount of forest harvest BMP from sampled rate.
- d. States with regulations and monitoring programs in place should use the actual implementation of forest harvest BMPs in lieu of a sampling rate. Some states have more than one agency tracking/permitting. Could establish a field checklist for forest harvest site visits
- e. To assure performance/effectiveness of practice, incorporate BMP monitoring to determine if a practice worked (WV example, and USFS BMP Monitoring protocol).