

Appendix F: Technical Requirements to Enter Phase 6 Urban Tree Canopy Expansion and Urban Forest Planting BMPs into Scenario Builder

Version: August 18~~31~~, 2016

Presented to the WTWG for Review and Approval:

Background: In accordance with the *Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model* (WQGIT, 2015) each BMP expert panel must work with CBPO staff and the Watershed Technical Workgroup (WTWG) to develop a technical appendix for each expert panel report. The purpose of this technical appendix is to describe how the [recommendations of the Urban Tree Canopy Expert Panel's](#) and the [Forestry Workgroup](#) recommendations will be integrated into the Chesapeake Bay Program's modeling tools including NEIEN, Scenario Builder and the Watershed Model.

Part 1. Technical Requirements for Reporting and Crediting Phase 6 Urban Tree Canopy Expansion BMP

Q1. How is the Urban Tree Canopy Expansion BMP defined in the Phase 6 Chesapeake Bay Watershed Model?

A1. The Urban Tree Canopy Expansion BMP is defined as the planting of trees in an urban area that are not part of a riparian forest buffer, structural BMP (e.g. bioretention, tree planter), or do not conform to the definition of the Urban Forest Planting BMP. The land use area conversion factor is based on the panel's recommendation of 144 sq ft average of canopy per tree planted. Thus, 300 newly planted trees are equivalent to 1 acre of tree canopy land use; however, this is not a planting density requirement and each tree converts 1/300 an acre of either pervious or impervious developed area to tree canopy land uses. This BMP does not require trees to be planted in a contiguous area.

Q2. What are the nutrient and sediment reductions a jurisdiction can claim for Urban Tree Canopy Expansion in the Watershed Model?

A2. The expert panel recommended that the Phase 6 Model treat Urban Tree Canopy Expansion BMP as a land use change to either "tree canopy over impervious" or "tree canopy over turfgrass". The nutrient and sediment reduction credit for a land use change BMP equals the relative, or percent change in nitrogen, phosphorus and sediment load achieved by converting the underlying pervious or impervious land use to the appropriate tree canopy land use. No additional upland reduction will be applied.

Q3. What should jurisdictions submit to NEIEN to receive credit for Urban Tree Canopy Expansion in the Phase 6 Model?

A3. For urban tree plantings, jurisdictions should report the following information to NEIEN:

- *BMP Name:* Urban Tree Canopy Expansion
- *Measurement Name:* Number of Trees Planted
- *Geographic Unit:* Qualifying NEIEN geographies including: Latitude/Longitude; or County; or Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); or State
- *Date of Implementation:* Year the trees were planted
- *Land Uses:* Turfgrass, Roads, Buildings and Other

Q4. Is Urban Tree Canopy Expansion an annual or cumulative BMP?

A4. The credit of this BMP is cumulative, which means that the acres reported in a previous year carry over into the next year.

Q5. Is Urban Tree Canopy Expansion a stackable BMP?

A5. This BMP may be considered a 'stackable' BMP, where additional BMPs may be applied to the underlying land use. For example, urban nutrient management may be applied to the pervious area under the tree canopy. As a land use change BMP, the converted acres will be eligible to receive other urban BMPs reported to through NEIEN.

Q6. What is the credit duration for the Urban Tree Canopy Expansion BMP in the Model?

A6. The suggested BMP credit duration is 10 years. Once new high resolution imagery is updated in the model, the trees will be captured through the tree canopy land uses rather than annual BMP submissions. The area of the reported canopy projects within the period of credit duration will continue to be tracked through the BMP history since these projects represent management actions. Once new high resolution imagery is available, changes in the aerial extent of tree canopy will be captured through these data.

Q7. How does the Urban Tree Canopy Expansion BMP avoid the double counting of reductions caused by overlap with the tree canopy land uses or the Urban Forest Planting BMP?

A7. To avoid double counting with ~~the existing tree canopy land use~~, new acres through [Urban Tree Canopy Expansion](#) projects will be tracked and reported as BMPs since they represent on-the-ground management actions. It's assumed that the expansion of canopy through these projects ~~are~~ is part of the net change in canopy tracked ~~through~~ at different points ~~in~~ of time ~~of~~ by the high resolution imagery. The environmental models simulate this net change. If there's an overall reduction in canopy between the two points ~~in~~ of time, the nutrient and sediment loads will increase because of the changing conditions. If there's a net ~~increase~~ gain in canopy, nutrient loads will decrease. Again, reported canopy project are part of the overall net change.

If there's a net ~~decrease~~ [reduction](#) in existing canopy over time through deforestation due to development, the urban tree planting project can be thought of as lessening the degree of the ~~decrease~~ [reduction](#).

Urban Tree Canopy Expansion is reported when planting does not meet the criteria of the Urban Forest Planting BMP. All Urban Forest Planting acres that meet the BMP requirements will be modeled as forest, which is a separate land use than ~~UTC~~ [the tree canopy](#) land uses. ~~UTC~~ [Urban Tree Canopy Expansion](#) converts either ~~previous~~ [developed turfgrass](#) or [developed impervious urban](#) ~~land uses~~ to ~~UTC~~ [tree canopy](#) land uses. Therefore, there is no double counting between these BMPs.

Q8. How do the panel's recommendations for Urban Tree Canopy Expansion affect ongoing historical BMP data cleanup efforts of the jurisdictions?

A8. Jurisdictions should report tree canopy expansion projects with the associated planting date going back to 1985 – for which they have data. Jurisdictions should not report overall net changes in canopy since these are captured through changes in imagery data with prescribed methods. Jurisdictions should consult the BMP definitions to determine which historical BMP acres align with the Phase 6 definitions for Urban Tree Canopy Expansion or Urban Forest Planting.

Part 2. Technical Requirements for Reporting and Crediting Phase 6 Urban Forest Planting BMP

Q9. How is the Urban Forest Planting BMP defined in the Phase 6 Chesapeake Bay Watershed Model?

A9. The Urban Forest Planting BMP is defined as tree planting projects in urban or suburban areas that are not part of a riparian buffer, structural BMP, or ~~U~~ [Urban T](#) [tree e](#) [Canopy e](#) [Expansion](#) BMP, with the intent of establishing forest ecosystem processes and function. This requires that urban forest plantings be documented in a planting and maintenance plan that meets state planting density and associated standards for establishing forest conditions, including no fertilization and minimal mowing as needed to aid tree and understory establishment. Under this BMP, trees are planted in a contiguous area as documented in the planting plan and the acreage of this BMP is converted from the developed [turfgrass](#) land use into forest in the modeling tools.

Q10. What are the nutrient and sediment reductions a jurisdiction can claim for Urban Forest Planting in the Watershed Model?

A10. Urban Forest Planting is a land use change BMP converting ~~urban pervious~~ developed turfgrass to forest. The nutrient and sediment reductions will correspond to the unit area loading of converting ~~pervious urban~~ the developed turfgrass land use to forest land use in the model segment the BMP is applied.

Q11. What should jurisdictions submit to NEIEN to receive credit for ~~u~~Urban ~~f~~Forest ~~p~~Planting in the Phase 6 Model?

A11. For urban forest plantings, jurisdictions should report the following information to NEIEN:

- *BMP Name:* Urban Forest Planting
- *Measurement Name:* Acres Planted
- *Geographic Unit:* Qualifying NEIEN geographies including: Latitude/Longitude; or County; or Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); or State
- *Date of Implementation:* Year the trees were planted
- *Land Uses:* Turfgrass

Q12. Is Urban Forest Planting an annual or cumulative BMP?

A12. The credit of this BMP is cumulative, which means that the acres reported in a previous year carry over into the next year.

Q13. Is Urban Forest Planting a stackable BMP?

A13. No. Since this BMP is a conversion to the ~~F~~forest land use, additional urban BMPs are not applicable.

Q14. What is the credit duration for the Urban Forest Planting BMP in the Model?

A14. The suggested BMP credit duration is 15 years. Once new high resolution imagery is updated in the model, the trees will be captured through the forest land use rather than annual BMP submissions.

Q15. How does the Urban Forest Planting BMP avoid the double counting of reductions caused by overlap with the forest land use or the Urban Tree Canopy Expansion BMP?

A15. To avoid double counting with ~~the existing tree canopy~~ or forest land use, ~~new acres through Urban fForest pPlanting projects will be tracked and reported as BMPs since they represent on-the-ground management actions. It's assumed that the expansion of forest through these projects are is part of the net change in forest tracked through at different points in of time of by the high resolution imagery. The environmental models simulate this net change. If there's an overall reduction in forest between the two points in of time, the nutrient and sediment loads will increase because of the changing conditions. If there's a net increase gain in forest, nutrient loads will decrease. Again, reported forestry projects are part of the overall net change. If there's a net decrease reduction in forest over time due to deforestation~~

or fragmentation from development, the urban forest planting project can be thought of as lessening the degree of the ~~decrease~~[reduction](#).

Urban Tree Canopy Expansion is reported when planting does not meet the criteria of the Urban Forest Planting BMP. All Urban Forest Planting acres that meet the BMP requirements will be modeled as forest, which is a separate land use than ~~UTC~~[the tree canopy](#) land uses. ~~UTC~~[Urban Tree Canopy Expansion](#) converts either ~~previous~~[developed turfgrass](#) or [developed impervious urban](#) to ~~UTC~~[tree canopy](#) land uses. Therefore, there is no double counting between these BMPs.

Q16: How does the recommended Phase 6 Urban Forest Planting BMP affect ongoing historical BMP data cleanup efforts of the jurisdictions?

A16. Jurisdictions should report forest planting projects with the associated planting date going back to 1985 – for which they have data. Jurisdictions should not report overall net changes in forest since these are captured through changes in imagery data with prescribed methods. Jurisdictions should consult the BMP definitions to determine which historical BMP acres align with the Phase 6 definitions for Urban Tree Planting or Urban Forest Planting.