**Forestry Workgroup Meeting**

**September 5, 2012**

**Briefing Paper**

**Forest Cover Information for Reporting**

Forest cover in the Chesapeake Bay watershed is an indicator tracked on the website that has not been updated for a decade or more. The current forest cover indicator shows that 58% of the watershed land area is forested and this indicator has not changed since originally reported.

There are three sources of forest cover data that have been used at the Bay Program: 1) the Forest Inventory and Analysis (FIA) data from the US Forest Service; 2) the Chesapeake Bay Land Change Datasets, and 3) the CB Watershed Model calibration land use data. All of these sources have caveats that will be discussed. A fourth option would be to use high-resolution imagery to derive information on forest cover extent and trends.

**Points about the Various Options**

Option 1: FIA data.

* FIA is the scientific standard for estimating forest cover in the US. It only looks at true forest (i.e., wooded areas with an unmanaged understory and non-wooded areas planted with trees or undergoing natural succession). Currently, FIA reports CB forest cover to be 55%.
* The CB Watershed Model does not use FIA data.
* Since FIA is a large statistical dataset, the best usable confidence interval is 68%, and must be reported with the associated sampling error (i.e., 55% plus or minus 1%). Comparing years, i.e., examining forest trends, can increase the sampling error substantially.
* The most recent estimate (year 2009) of percent forest area in the watershed is 55% but should not be compared to the 58% reported previously because these estimates were derived differently, even though both were based on FIA data. In order to compare numbers (i.e., show trends) the decadal estimates have been adjusted using the new means of deriving FIA information. The most recent decadal estimates of forest area are: 1980”s- 24.168 million acres, 1990”s- 23.692 million acres and 2000’s- 23.689 million acres.

Option 2- CBLCD:

* The CBLCD represents four dates of comparable land cover data derived from Landsat 5 and Landsat 7 imagery and covering the entire Chesapeake Bay watershed. These data represent the years 1984, 1992, 2001, and 2006.
* Over the 22-year period from 1984 – 2006, tree canopy (deciduous, evergreen, mixed forest? , and woody wetlands) decreased from 25.489 million acres (1984) to 25.050 million acres (2006) and represented roughly 57% of the watershed land area in 2006. If shrub-scrub is included in the forest class due to its representation of early successional stages of forest, the trend shows that tree canopy and shrub-scrub decreased from 26.547 million acres (1984) to 26.186 million acres (2006) -- roughly 60% of the watershed land area in 2006.
* Landsat satellite derived land cover products are able to represent tree canopy but are not able to characterize forest understory conditions or urban tree canopy where the canopy features are typically smaller than the spatial resolution of Landsat (30m cells). For these reasons, forested low-density residential neighborhoods appear similar to natural forest lands and urban tree canopy is underestimated.
* Including scrub/shrub in a "forest" definition may be consistent with an FIA definition of forest.

Option 3- CB Watershed Model calibration data

* “Forests” in the Watershed Model include any and all land uses that are not classified as either agriculture, urban, extractive, or water. Therefore, this land use is more appropriately called “Open/Woody” because it is inclusive of non-forest areas and overestimates of the extent of true forest. In phase 5.3.2 of the Watershed Model, the “open/woody” land use represents 63.3% of the watershed land area.
* While the watershed model urban land uses (mapped data from satellite and road information combined with estimates of residential area based on Census reported housing units) provide a more accurate representation of the extent of urban land compared with the CBLCD and the model agricultural land use is based on the USDA’s Census of Agriculture which is more accurate that the CBLCD for assessing the extent of farmland, the remaining “open/woody” class does not account for understory characteristics which FIA references as a distinguishing factor separating true forests from woodlots. Moreover, non-forested areas such as road and power transmission right-of-ways, landfills, and tidal marshes are included in the watershed model “open/woody” class.

Option 4- Forest Cover Using High Resolution Imagery:

* There is the potential to track and estimate Bay-wide forest cover with high levels of accuracy and precision using a combination of Landsat and high-resolution satellite or aerial imagery.
* This effort would require the development of two sampling frameworks, one for assessing a baseline of forest extent and another to assess forest trends. This would be a new effort at CBPO but it would likely be more accurate than FIA (e.g., more data points and a design emphasizing change detection) and could potentially help explain the difference between FIA and the CB Model forest area estimates.

Recommendations:

1. Track trends in “forests” using FIA data but unlike previous efforts, include standard errors and confidence limits when reporting any and all FIA statistics for the Bay watershed, states, and major sub-basins.
2. Assess whether the precision of FIA trend data for the Chesapeake Bay watershed is sufficient to inform forest restoration and preservation management decisions.
3. If the precision of the FIA trend data is insufficient to inform management decisions in the Chesapeake watershed, explore the feasibility of Option #4- sampling the extent and changes in forest cover using a combination of moderate and high-resolution satellite imagery.

Note: USGS and USFS are exploring this option currently.

Other Topics:

Mid-Point Evaluation of TMDL Process—Input for the Water Quality Goal Team

Proposed 2013 Actions for Riparian Forest Buffer Outcome: See separate briefing document.

Proposed Future FWG Meeting Topics:

**October 2012** conference call—

**November 2012** meeting—Forest and floodplain wetlands (joint meeting with Habitat Goal Team)

**December 2012** (may be 2 day meeting, and may be the last week of November)—Review of ongoing watershed-wide projects (e.g., Growing Native, Forestry for the Bay, Bay Bank, Potomac Watershed Partnership, NFWF, etc.)

**February 2013** conference call—RFB Restoration best new methods

**March 2013** meeting—Living BMPs

**April 2013** conference call—

**May 2013** meeting—

**June 2013** conference call—