

Appendix G. Enhance Collection and Reporting of Cost Shared Practices

The Bay Program’s Agriculture Workgroup has identified opportunities to enhance the recordkeeping associated with USDA conservation practices in order to capture specific information that can be used to more efficiently integrate the data with jurisdictional datasets and to more accurately represent the practices in the Bay Program’s Scenario Builder tool and in the various Bay Program’s Chesapeake Bay watershed and water quality models. A number of USDA conservation practices are identified in Table G-1 and are described below as having substantial limitation in the amount of data available for translating between USDA conservation practice codes and Bay Program approved practice definitions. Other conservation practices not represented here may also have data limitations depending on their use and reporting. In many cases, these limitations could be addressed through simple techniques such as the use of modifying letter codes to distinguish among the various conservation techniques that fall within each practice code definition. The Bay Program’s protocols generally assume the lowest available estimated load reductions for conservation practices whenever there is not detailed information available to support a higher conservation effectiveness estimate.

Table G-1: Possibilities for improved recordkeeping for USDA conservation practices. (Source: Hively et al. 2013)			
Category	USDA code	Possibility	Relation to currently collected data
Land Use	Many	Record land use and land use change "from" and "to," and integrate datasets to make land use information consistently available in the National Conservation Planning (NCP) dataset.	NRCS has a data field for land use ID, but it is generally not populated in the NCP database. The change "from" and "to" are not available in any NRCS business tool.
Livestock Animal Type	Many	Record livestock animal type (for example, beef, dairy, poultry) for relevant conservation practices.	NRCS has a data field for livestock_ID in ProTracts, but in the 2012 dataset it was only sparsely populated in the NCP database.
Cover Crops	340	Record cover crop management details including species, planting date, planting method, commodity vs. regular, and if manure was applied (for example., commodity early drilled rye-aerial-no manure).	Cover crop is defined broadly in NRCS data, whereas the CBP applies nitrogen conservation effectiveness values that range from 5% to 45%, depending on management. This information is currently not available in any NRCS business tool, so Scenario Builder assigns conservative estimates for NRCS cover crops.
Fencing	382	Identify the location and use of the fencing, or the associated components of the management system.	NRCS currently defines, tracks, and reports livestock fencing under a single Conservation Practice Code (382). The practice Access Control could show where animals are excluded from stream corridor, but this currently is not in any current NRCS business tool.

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Nutrient Management	590, 104/105	Differentiate various nutrient management planning and implementation strategies to match CBP definitions.	NRCS currently defines, tracks, and reports nutrient management under a single Conservation Practice code (590), and nutrient management plans are contracted as practice 104 (written) and 105 (applied).
Feed Management	592	Record the animal type, management strategy, and differentiate between nitrogen- vs. phosphorus-based feed management.	NRCS currently tracks and reports feed management under a single Conservation Practice code (592) for multiple livestock species and does not typically track the type and amount of manure nutrient reductions resulting from changes in feed management.
Forestry Practices	CP-22	Record length and width of the buffer rather than acreage. Indicate consistently and accurately if a buffer is re-enrolled vs. newly installed.	Forest buffers are currently tracked by FSA in units of acres. Including length and width would take into account different load reductions for narrower vs. wider buffers. Double counting could be avoided if FSA indicates consistently and accurately whether a buffer is re-enrolled vs. newly installed.
Tillage Practices	324, 329, 345, 346, 761, 778	Include the residue cover amount in the practice standard to indicate minimum percent of cover remaining after harvest.	Current NRCS practice standards for tillage do not include a minimum amount of residue remaining after harvest. CBP Expert Panels have found that water quality benefits for tillage practices vary greatly depending on the amount of cover, and jurisdictions can more accurately show improvement if they have this information.

The NRCS is currently undertaking a Conservation Delivery Streamlining Initiative (CDSI) and has plans to integrate the NCP and IDEA data systems. Similarly, the FSA is reengineering its conservation practice database under the Modernize and Innovate the Delivery of Agricultural Systems (MIDAS). It will be important to maintain the level of discussion and collaboration achieved in 2012 and 2013 to smoothly integrate these expected changes with jurisdictional datasets and facilitate data transfer between State and Federal agencies.

The BMP Verification Committee recommends continued close collaboration with NRCS and FSA on working to enhance data collection and reporting in the areas identified below and in Table G-1. NRCS has committed to taking advantage of the opportunities afforded the Bay Program through the CDSI to work to address the needs identified by the Bay Program's Agriculture Workgroup.

The following text extracted, from Hively et al. 2013, with permission of the authors, provides clear examples of where limitations in NRCS and FSA data collection are directly impacting the ability of the six Chesapeake Bay watershed states to get full credit for their farmers implemented agricultural conservation practices.

Land Use and Livestock Animal Type

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Limitation: The NRCS currently has fields in its data collection system for land use and livestock type, associated with a variety of conservation practices. However, these data fields were rarely populated in the 2012 NRCS dataset provided to the USGS from the NCP database. The Bay Program's BMP definitions place practices in the context of land use (for example, pasture fencing receives a reduction only when applied to riparian areas).

Opportunities: Populating the data fields for land use and livestock type could allow the six watershed jurisdictions to receive more accurate crediting for many different conservation practices whenever conservation practice efficiency in reducing nutrient and sediment loads is modified by land use (for example, farm headquarters, forest, crop/hay, range/pasture) or animal type (for example, manure management, feed management). Currently, default values are assigned to unreported elements by using conservative effectiveness values. Although populating these fields would represent additional effort on the part of NRCS staff, the benefit could be more accurate recognition of increased pollutant load reductions from agricultural lands.

The current land-use and animal-type information may possibly exist in other NRCS datasets such as the IDEA system, in which case the problem becomes one of linking the data to the NCP records rather than ensuring data entry in the Service Center Offices. The land use changes "from" and "to" do not presently exist in NRCS databases, only the current land use. The livestock animal type is available in ProTracts, but is not in Toolkit or the field is not populated in the NCP database. The number of animals or animal units associated with a livestock conservation practices could also be useful for obtaining full nutrient conservation credits in the Bay Program's water-quality models. [Note: data for land use and livestock types were successfully acquired in October 2013 by USGS. This acquisition was made possible by changes in the NRCS database that fully linked the land use and livestock type to the practice implementation data. However, numerous cases of missing land use and livestock type data entries persisted.]

Cover Crops

Limitation: The NRCS currently defines, tracks, and reports cover crops under a single conservation practice code (340) and standard. The Bay Program currently defines cover crops by four attributes (species, planting method, timing of planting, and harvest strategy) to determine their effectiveness in reducing the loss of nutrients and sediments to the environment. In particular, the NRCS lumps leguminous cover crop types with all cover crops. The Bay Program does not currently consider leguminous cover crops as having a nitrogen benefit since they fix nitrogen in the soil. These additional attributes presently are not currently available in any NRCS business tool.

Opportunities: Enhancements to record keeping for the USDA conservation practice code for cover crops that could track and report additional management details identifying all four cover crop attributes, or even a single attribute such as species, could allow the six watershed jurisdictions to receive more accurate crediting of cover crops and more thorough representation in the Bay Program's models. In the Bay Program's Scenario Builder tool, conservative default values are assigned to unreported elements when clarifying information is

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not available. At present, NRCS staff have indicated that they are unlikely to track cover crops with more specificity because the present system does not allow for enhancements to record keeping.

Fencing

Limitation: The NRCS currently defines, tracks, and reports fencing practices under a single conservation practice code (382) and standard, whereas the Bay Program's Scenario Builder tool defines the nutrient benefits associated with fencing as a component of the management change the practice creates. Examples include the establishment of riparian buffers versus rotational grazing of livestock.

Opportunities: Enhancements to recordkeeping for the USDA conservation practice code for fencing that could identify the location and use of the fencing, or the associated components of the management system, could allow for better utilization within the CBP water-quality models. One example would be to link riparian forest buffers (391), riparian herbaceous cover (390), or stream crossings (578) by using a modifier to the fencing code representing riparian fencing. For grazing and pasture management improvements, the fencing code could be linked with prescribed grazing (528) or animal trails and walkways (575). Other conservation practices that potentially could be associated with fencing-related agricultural land management changes include watering facilities (614) and spring developments (574). The Pennsylvania State Office for USDA-NRCS has been investigating opportunities to enhance data collection for conservation practice code 382 (fence) through linkage to associated conservation management practices. The NRCS maintains a practice code for access control (472) where animals are excluded from the stream corridor, but the other information is not currently present in any NRCS business tool.

Nutrient Management

Limitation: The NRCS currently defines, tracks, and reports nutrient management under a single conservation practice code (590) and standard, with additional codes for Comprehensive Nutrient Management (304) and Nutrient Management Planning (104, 105). The Bay Program currently defines nutrient management under three management levels including crop group nutrient application management, enhanced application nutrient management, and decision/precision agricultural nutrient application management, with different associated effectiveness values for reducing nutrient losses to the environment. The 'crop group nutrient application management' category was recently developed to replace the former category of nitrogen-based nutrient management. The Bay Program is also currently reviewing the enhanced and decision/precision nutrient application management practices, and will likely revise the definitions for these practices so they are more focused on the use of field-scale nutrient applications.

Opportunities: Enhancements to recordkeeping for the USDA conservation practice codes for nutrient management that could more readily identify differences among the three tiers of practice categories, and allow for improved data utilization by the jurisdictional partners and within the Bay Program's models. The new nutrient management standards for practice 590 standards have substantially expanded the categories of nutrient management that are eligible

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for NRCS technical support, but without an associated identifying code that can be used for reporting. Nutrient management plans for cropland are contracted as NRCS activities 104 (written) or 105 (applied) using a single practice code, which does not allow for differentiation among the planning strategies identified in the Bay Program's nutrient management planning definitions. An example of possible practice code enhancements was developed by the Maryland State Office of USDA-NRCS to track and report multiple (four) nutrient management categories through the use of a letter suffix to the conservation practice code.

Feed Management

Limitation: The NRCS currently defines, tracks, and reports feed management under a single conservation practice code (592) and standard for multiple livestock species and does not typically track and report the type and amount of manure nutrient reductions resulting from changes in feed management. Feed management systems can focus on nitrogen and phosphorus individually or in combination, leading to different results. The Bay Program defines feed management effectiveness as the change in pounds of nitrogen and phosphorus reduced in a particular animal type's manure as a result of the reduction or enhancement of feed nutritional components.

Opportunities: Enhancements to recordkeeping for the USDA conservation practice code for feed management that could identify differences in feed management focused on nitrogen and phosphorus separately or in combination, and could track and report changes in manure nutrient concentrations as a result of the practice, could allow for improved data utilization by the jurisdictional partners and within the Bay Program's water-quality models. Associated livestock type and number could also be useful. The Pennsylvania State Office of USDA-NRCS has taken the initiative to obtain copies of farm feed management plans and to work with agricultural technical service providers to record and analyze these data and enable tracking of the results. This information is currently not available in any NRCS business tool.

Forestry Practices

Limitation: Forest buffers are tracked by the FSA in units of acres. As part of the [2007 Forest Directive](#)¹ adopted by the Bay Program's Chesapeake Executive Council, forest buffer goals were established and are tracked by length and width of stream miles buffered, rather than acres. Also, in the FSA CRP/CREP database, the distinction between new forest buffers versus re-enrollment of existing forest buffers is not recorded consistently, so avoiding double counting can be difficult.

Opportunities: Jurisdictions provide the length and width of implemented forest buffers to the Bay Program's [Forestry Workgroup](#) for assessment of goal achievement. However, jurisdictions rely on the FSA data for reporting to the Bay Program's Annual Progress Review. The tracking of forest buffer length and width by the FSA could provide more precise information that could take into account different load reductions for narrower versus wider buffers (for example, 35 feet versus 100 feet). In addition, potential double counting between historic and current implementation could be avoided if the FSA were to record consistently

¹ http://www.chesapeakebay.net/content/publications/cbp_27761.pdf

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and accurately whether a buffer was re-enrolled as opposed to newly installed. A similar issue of re-enrollment may exist for land retirement.

Wetlands

Limitation: The NRCS currently defines, tracks, and reports wetland conservation practices under four separate conservation practice codes (644, 658, 657, and 659) and standards. The Bay Program currently defines wetland conservation practice efficiencies on the basis of a single practice of wetland restoration that includes restoration, enhancement, or creation of wetlands, and distinguishes between streamside and other areas. The NRCS practice definition includes *Phragmites* spraying for invasive weed control, whereas the Bay Program's BMP definition does not accommodate *Phragmites* spraying. The Bay Program is addressing this discrepancy through its [Wetlands Workgroup](#).

Opportunities: Enhancements to the Bay Program's practice definitions for wetlands could enable more accurate calculation of nutrient and sediment loads associated with the variety of NRCS wetland conservation practices and could allow for improved data utilization by the jurisdictional partners and within the Bay Program's Chesapeake Bay watershed and estuarine water quality models.

Tillage

Limitation: The NRCS tillage practice definitions do not define the minimum amount of residue remaining on the field. All Bay Program approved tillage BMPs include a minimum residue coverage percent. This is because water-quality benefits are most tied to the residue coverage.

Opportunities: Refine the NRCS tillage practice definitions to include the minimum residue coverage. Because a high degree of soil cover dramatically increases water infiltration and storage and decreases soil erosion and soil-bound nutrient losses, encouraging the use of tiers of residue management could benefit water-quality conditions.