U-3 RESIDENTIAL STEWARDSHIP PRACTICES

PRACTICE AT A GLANCE

- More than forty communities across the Chesapeake Bay now offer some kind of financial incentives to get residential owners to install stewardship practices to help reduce runoff and pollutants from their property.

- The incentives can include rebates, utility fee discounts, technical assistance and direct cost-share to install more than half dozen kinds of stewardship practices.

- Residential stewardship practices are a special class of stormwater retrofit that is applied to private property (see U-1) and/or a pledge to adopt best nutrient management practices for their lawns (see U-5).

- A previous expert panel developed reliable protocols to estimate how much sediment and nutrients are removed by these small on-site practices. The power of residential stewardship practices lies with the multiplier effect across a community. The initial load reductions for the first few dozen projects almost seem trivial, but climb impressively after hundreds or even thousands of projects are installed over time.

- Residential stewardship practices require more effort for reporting, tracking and verification, since there are quite a few of them, and duration of the nutrient reduction credit is 5 years or less (until a field inspection confirms that the practice can be renewed for another 5 years).

- Local governments need to decide how to manage the process of delivering residential stewardship practices, and how to streamline the quality control function for both local staff and residential customers. Several great tools and resources have recently been created to make both a lot easier.

PRACTICE DESCRIPTION

The term “residential stewardship practices” refers to the installation of one or more of the following practices on *existing* residential properties:

- Rain gardens
- Rainwater harvesting/Rain barrels

- Downspout disconnections
- Permeable hardscapes (e.g., sidewalks, driveways)
- Urban nutrient management
- Tree planting
- Impervious cover removal

These practices may be installed by the homeowner or by a private contractor however they must conform to minimum design standards which vary by state. Contact individual states for more information on which residential BMPs are accepted and the specific design criteria required to receive the credit.

UNM Plan for 9200 Bradford Pear Lane: 0.5 acres		
1	Get Expert Lawn Advice	✓
2	Maintain Dense Cover on Turf	✓
3	Choose NOT to fertilize	✓
4	Recycle Lawn Clippings and Compost Fallen Leaves	✓
5	Correct Fertilizer Timing	N/A
6	Use Slow Release Fertilizer	N/A
7	Set Mower Height at 3 inches	✓
8	No off-target fertilization	N/A
9	Fertilizer free buffer zones around water features	✓
10	Increase soil porosity and infiltration	✓

BR = Rain Garden
PP = Permeable Hardscapes
CL = Conservation Landscaping
● = Tree Planting

Example Residential Stormwater BMP Plan

Residential stewardship practices can also provide other important benefits to a community, such as:

- Removing toxic pollutants and harmful bacteria from local waterways
- Preventing basement flooding, backyard erosion and drainage problems on the property
- Increasing tree canopy and provide wildlife and pollinator habitat
- Engaging the public in local watershed protection
- Creating more attractive lawns and landscapes

In addition, some communities have effectively integrated workforce development into their local residential stewardship programs as a means of getting underserved youth and others ready for the job market.

WHERE TO FIND THE BEST OPPORTUNITIES IN YOUR COMMUNITY

Most homeowners may not know which residential stewardship practices will work best for them, or where they should be located on their property to have the most benefit. As a result, it is often a good idea to have a watershed group or extension agent assess the property and recommend a series of options for the homeowner.

In general, residential stewardship practices can be implemented in the following locations:

- **Rain Gardens**: below downspouts or in low areas to where water flows
- **Rainwater Harvesting**: above or below-ground, to where one or more downspouts can be diverted
- **Downspout Disconnection**: below downspouts with sufficient surrounding green space
- **Permeable Hardscapes**: in place of residential driveways, parking areas, sidewalks, and impermeable hardscapes
- **Urban Nutrient Management**: on lawns and landscaping currently being fertilized
- **Tree Planting**: in yards or stream buffers
- **Impervious Cover Removal**: anywhere there is excess asphalt, concrete, or compacted gravel

While most stewardship programs started in residential neighborhoods, many have expanded in recent years to include churches and houses of worship, as well as small businesses and commercial properties. These projects are good targets since they can treat more impervious area and are highly visible in the community. These efforts can help reduce the sting of new stormwater utility fees, and involve more folks in the community who may otherwise not be involved (e.g., renters).

It should be noted that there are other practices that homeowners can install, particularly if they live close to the Chesapeake Bay. These include shoreline management, septic system upgrades and stream buffers. Sediment and nutrient credits for these practices are in the process of development.

RESIDENTIAL STEWARDSHIP PRACTICES

Residential Rain Garden

Rain Barrel

Permeable pavers for parking

GENERAL COST INFORMATION

The cost for residential stewardship practices can range from $100 to $2,500 per property, depending on the specific type of practice used. Oftentimes local governments are able to provide a subsidy, either funded through a utility fee or grants, which defrays some or all of the installation costs. To get the subsidy, the private property owner must agree to maintain the practice(s) over a fixed time-frame and allow access for inspectors.

The local government should also expect to devote some basic costs to administer the program, provide quality control on individual practices, and do basic reporting to the state (see Reporting section).

Stewardship incentives and delivery programs are generally financed with revenues collected from stormwater utilities, although several local programs were originally piloted under demonstration grants from state and/or federal sources.

TIPS FOR GETTING STARTED IN YOUR COMMUNITY

Public outreach is often needed to promote residential stewardship practices in your community. If a locality has an MS4 stormwater permit, they are already required to educate the public about stormwater. Therefore, it is a great idea to leverage your existing outreach programs to get the message out about residential stewardship practices in your community. Even if you don't have an MS4 permit, public education and outreach will lead to a more knowledgeable and engaged citizenry and ultimately cleaner local waterways and the Chesapeake Bay.

Some useful stewardship practices, such as conservation landscaping, leaf composting and pet waste pick-up cannot be credited at this time, however it makes sense to count these practices in your community anyway, under the notion that some of them may be credited in the future.

Consider targeting neighborhoods with: high impervious cover, downspouts connected to the storm drain network, large lawns, and/or fertilizer use to get the most of out of the practices in terms of water quality.

WHAT DEGREE OF TECHNICAL SUPPORT IS NEEDED

Homeowners will likely need some technical support to understand what types of practices are suitable for their properties and where they should be placed. Some homeowners will construct their own stewardship practices, while others must hire contractors. Local governments can provide support to implement residential stewardship practices by:

- Creating a list of local/regional contractors skilled in construction of residential stewardship practices and/or provide training to contractors on the proper design, construction and installation of the practices
- Indicating the type of financial assistance available (e.g., rebates, cost-share, stormwater utility discounts)

- Performing assessments or “audits” of residential properties to identify the best practices to install based on site conditions
- Offering simple but clear standards for design and construction of stewardship practices

Most effective local stewardship programs involve a partnership between local governments, consultants and/or watershed groups. The local government usually provides the money for incentives or subsidies and performs the quality control role to make sure the projects are actually installed and meet their design function. The other partners often perform more of a "retail customer service role" for the homeowner to make sure they get the product they want.

KEY DELIVERY ISSUES TO KEEP IN MIND

Communities have experimented with many different models on how to deliver stewardship practices to their residents. Each reflects the unique size, demographics and development patterns within a community, as well as a unique team of local partners.

Some common features have emerged on what makes a successful local delivery program:

- Contract with a local watershed group or master gardener program to take on the "retail function" associated with residential stewardship practices. These groups tend to be cheaper and can work more effectively with the public than government staff.

- Work with local or regional groups to get your local workforce trained and certified on how to assess, design, install and maintain residential stewardship practices. This enables you to have an approved list of reputable landscape contractors and others that are qualified to perform the assessment and installation work.

COMPUTING THE POLLUTANT REMOVAL CREDIT

The reductions associated with residential stewardship practices use the same basic protocols as outlined for retrofits (U-1) and/or urban nutrient management (U-5), but thankfully, the Chesapeake Stormwater Network (CSN) with help from others has developed streamlined ways to make the calculations for the credit.

For example, the University of Maryland’s SMART (Stormwater Management and Restoration Tracker) tool will automatically compute the load reductions for seven different types of residential stewardship practices, and with some work, can upload the calculations to the state reporting agency for credit (now available only in MD and VA).

If you are not quite ready for the SMART tool, CSN has put together a "nutrient cruncher" spreadsheet which does the same basic load reduction computations for you. Links to both tools are provided in the resources section.

Consult **Table 1** to get a better sense of how each of the stewardship practices works to reduce nutrients from residential land.

Table 1. How Unit Removal Rates Would Be Derived and Default Values					
Residential Stormwater Practice Type	**Credit Duration**	**Input Data[1]**	**Practice Removal Rates[2]**		**Runoff Reduction Practice**
			TN	**TP**	
Rain Garden	5 yrs	sf Treatment Area/sf Rain Garden * RG depth (in)	60	70	Yes
Rainwater Harvesting/ Rain Barrel	5 yrs	sf Roof Area/cf of barrel capacity 2	28	33	Yes
Downspout Disconnection	5 yrs	sf of roof area/sf of filter path 4	45	52	Yes
Permeable Hardscapes	5 yrs	sf of permeable pavement * 0.4 (storage depth)	52	52	Yes
Urban Nutrient Management Pledge	3 yrs	Lawn Size in sf	6	3	N/A
Urban Nutrient Management Plan, High Risk	3 yrs	Lawn Size in sf & Risk factor(s)	20	10	N/A
Tree Planting	5 yrs	# of trees			N/A
Conservation Landscaping*	N/A	Landscaping Area (sf)	N/A	N/A	N/A
*Not currently available for a credit in the Chesapeake Bay Watershed Model [1] Supplied by homeowner and does not apply to practices in series [2]Assumes that the practice treats 1" of runoff					

Local governments may elect to opt out of the residential BMP crediting program if they feel the nutrient reduction credits are not worth the increased staffing costs for reporting, tracking and verification.

HOW TO REPORT THE PRACTICE TO THE STATE

Due to both their small size and potentially large numbers, residential stewardship practices present unique challenges when it comes to reporting them to the state each year for reduction credit. Consequently, the Chesapeake Bay Program developed a streamlined reporting process for residential stewardship practices. The main data locals must submit is the:

- Aggregate impervious acres treated by each kind of residential stewardship practice each year
- River-basin segment in which they are located
- Year in which credit for the practice expires, unless it is verified (see next section)

Individual states may have additional reporting requirements. Contact the local state representative listed in the back of this document for further information on the data required to receive credits.

The preferred tool to report residential stewardship practices is the SMART tool. The Stormwater Management and Restoration Tracker (SMART) is a tool that local governments can use to track and report sediment and nutrient reductions for small-scale residential stormwater practices regardless of whether they are covered by an MS4 permit. Available online through the University of Maryland Extension's website, residents input some basic data for each stormwater practice installed in the ground. Once submitted through the web, the information is sent to the University of Maryland and the local government. A trained SMART volunteer or other authorized individuals then go out to the site to ensure that the practice exists, was built correctly and is functioning properly and answer any questions of the resident. Once practices have been 'certified', local governments can download a report that provides the data required for reporting to the state.

WHAT IS REQUIRED TO VERIFY THE PRACTICE OVER TIME

Local governments will need to keep good records on the individual owners of the residential stewardship practices, such as their address and other contact information, so that the practices can be physically verified. In addition, the following information should be noted:

- The actual installation of each residential stewardship practice must be verified by a designated third party or a local government
- Homeowner submitted data will require validation by spot checking it against typical default values for the practice
- The credit for any residential stewardship practice may be renewed based on verification that the practice still exists and is working
- The credit duration for residential stormwater practices is five years
- Credit duration for Urban Nutrient Management Pledge is three years
- Homeowners can submit digital photos to confirm their practices, with the final decision on stewardship practice condition made by the locality or designated third party

To reduce the verification burden, local governments are allowed to substitute a statistically valid, field sub-sampling protocol to establish how well their residential stewardship practices are performing.

RESOURCES

The following resources are available for help with all aspects of this practice:

Type of Resource	Title of Resource	Web link
Archived webcast(s)	Make Your Lawn More Bay-Friendly This Spring! Webcast (2014)	http://chesapeakestormwater.net/events/webcast-homeowner-stormwater-controls/
	Creating or Enhancing Your Local Residential BMP Program (2014)	http://chesapeakestormwater.net/events/webcast-ms4-implementers-and-the-bay-tmdl-local-residential-bmp-program/
Protocol for Crediting Residential Stewardship Practices in the Chesapeake Bay	Background on the Crediting Protocols for Nutrient Reduction Associated with Installation of Homeowner BMPs (2014)	http://chesapeakestormwater.net/wp-content/uploads/downloads/2014/03/USWG-MEMO-ON-HOMEOWNER-BMP-CREDITING12312013.pdf
	Application of CBP-Approved Urban BMP Protocols to Credit Nutrient Reduction Associated with Installation of Homeowner BMPs (2014)	http://chesapeakestormwater.net/wp-content/uploads/downloads/2014/03/WQGIT-HOMEOWNER-BMP-CREDITING-MEMO_02062014_1-1.pdf
Do It Yourself Guide to Building and Installing Residential Stewardship Practices	Homeowner Guide For a More Bay-Friendly Property (2014)	http://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2013/04/Homeowner-Guide.pdf
Report on Residential Behavior Survey	Adoption of Household Stormwater Best Management Practices (2013)	http://extension.umd.edu/sites/default/files/_docs/Household_Stormwater%20BMPs_UMD%20Extension%20Bulletin%202013.pdf
SMART Tool	Stormwater Management and Restoration Tracker Tool	http://extension.umd.edu/watershed/smart-tool
More Tools & Resources	Nutrient Cruncher Spreadsheet	http://chesapeakestormwater.net/bay-stormwater/baywide-stormwater-policy/urban-stormwater-workgroup/crediting-residential-bmps/
	Directory of Residential BMP Assistance Programs in the Bay Watershed	http://chesapeakestormwater.net/be-bay-friendly/directory-residential-bmp-programs/
		http://chesapeakestormwater.net/be-bay-friendly/