Restoring the Anacostia Watershed:

A Citizen’s Stormwater Management Guide

Prepared for: Anacostia Watershed Restoration Partnership/AWCAC

Prepared by: Metropolitan Washington Council of Governments

June 2009
Anacostia Watershed Restoration Effort

The Anacostia River watershed is a 176-square mile area draining portions of Montgomery and Prince George’s counties, Maryland and the District of Columbia. Over the last 300 years farming, urbanization, loss of wetlands and forest habitat, erosion, sedimentation, and toxic pollution have taken a tremendous toll on this river. In 1987, after centuries of neglect, a concerted and focused effort to restore and protect the Anacostia watershed began with the signing of the Anacostia Watershed Restoration Agreement and in the establishment of the Anacostia Watershed Restoration Committee (AWRC), which later became the Anacostia Watershed Restoration Partnership (AWRP).

Since 1987, much has been accomplished through the restoration effort, including the reduction of storm flows and associated pollutants from 11 square miles of developed areas, restoration of degraded habitat in over nearly 10 miles of streams, restoration of 129 acres of tidal wetlands, creation of approximately 7.0 acres of non-tidal wetlands, acquisition of hundreds of acres of stream valley parkland, and riparian buffer reforestation of nearly 10.0 linear stream miles. However, there are still many hurdles to overcome before fixing the Anacostia River. Controlling stormwater runoff remains the number one challenge. Visit www.anacostia.net for more information on Anacostia River restoration efforts.

What Is Stormwater Runoff?

“Stormwater runoff is the rain or snowmelt that drains off streets, rooftops, parking lots and other impervious surfaces.”

Stormwater is the flow of water that results from rainfall or snowmelt. When it rains, several things can happen to the water. Some of the water infiltrates into the soil, some is taken up by plants, and some is evaporated into the atmosphere. Stormwater runoff is the remainder that runs off land surfaces and impervious areas.

Impervious surfaces such as roads, parking lots and rooftops do not allow rainfall to infiltrate naturally into the soil; hence, far more of the rainfall becomes stormwater runoff.

Imperviousness levels in the Anacostia watershed range from a low of 6.5 percent in Upper Beaverdam Creek to a high of 48 percent for the Tidal Northwest Bank, with an overall average of 25 percent. The map above depicts the general imperviousness levels present across the watershed.
Where Does Stormwater Go?

Stormwater typically flows into storm drain inlets present along streets and parking lots where it enters underground pipes called storm drains. Unlike sanitary sewers, which carry sewage from toilets, storm drains do not lead to a treatment plant. So, stormwater runoff directed to storm drains receives no treatment before entering local streams, rivers, ponds, lakes and coastal waters. The result can be the contamination of our drinking water supplies or fishing waters; prohibition on swimming, fishing or boating uses; and injury to aquatic plants and animals. Portions of the District of Columbia and other older cities still have something called a combined sewer system. A combined sewer system conveys both sanitary sewage and stormwater in one pipe system, so when the system receives a lot of runoff an ‘overflow’ may occur, sending a mix of sewage and stormwater into the receiving water body.

Stormwater Impacts

Stormwater also picks up a many pollutants as it flows across land surfaces. Pollutants can include:

- Sediment (i.e., soil particles of various sizes) from bare areas like construction sites
- Nutrients from lawns and landscaping practices (e.g., fertilizers, decomposing leaves and grass clippings), leaks from sanitary sewers, and animal wastes
- Oil and grease from roads, parking lots, gas stations and industrial areas
- Pesticides and chemical fertilizers from lawns, parks and roadsides
- Bacteria and other disease causing organisms from pet and wildlife waste, leaking sewer lines, and failing septic systems
- Salt used on roads and driveways
- Toxic chemicals and materials from leaks and spills (e.g., household chemicals, cooking grease, paint thinners, etc.) illegally dumped directly into storm drains and waterways
- Heavy metals from automobiles, industrial waste, corrosion of pipes and roof materials
Polluted stormwater runoff can have many adverse effects on aquatic life and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats making it hard for macroinvertebrates (bugs), fish, and other organisms to survive.

- Excess nutrients (i.e., phosphorus and nitrogen) can cause algae blooms. When algae die, they sink to the bottom of the waterbody and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms generally can’t survive in water with very low dissolved oxygen levels.

- Bacteria and other pathogens can contaminate swimming areas and create potential health hazards, resulting in beach closures. People and pets can also become sick or die from eating diseased fish and shellfish or ingesting polluted water.

- Trash, such as plastic bags, bottles, and cigarette butts, that gets into water bodies can impair the intended use and aesthetics, and choke, suffocate, or disable animals like ducks, fish, turtles, and birds.

- Household hazardous chemicals like insecticides, pesticides, paint solvents, used motor oil, and other auto fluids can poison aquatic life.

- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

Stormwater’s Other Effects

- Stormwater can erode and expose buried water, sewer, and other utility lines weakening them and sometimes causing them to leak or break.

- As streambanks erode due to high flows, property owners may actually lose land. The business to the left lost their rear access road.

- As excessive amounts of stormwater are added to streams and rivers, the likelihood of flooding increases.

CAR FACTS!

Your car can contribute to pollution that can kill aquatic life and make receiving water unusable for swimming, drinking and fishing. Proper car maintenance and disposal of oil and other fluids is critical to protecting our water resources.

- One quart of oil can contaminate 1,000,000 gallons of water (equal to a swimming pool 50 feet wide by 267 feet long and 10 feet deep)

- Four quarts of oil (enough from one car engine) can produce an eight acre oil slick, about the area of 6 football fields.

- One car battery contains 18 pounds of lead, enough to make 500,000,000 gallons of water undrinkable

- Antifreeze leaking from a car can be ingested by pets or wildlife causing blindness and/or death.
Stormwater runoff in the Anacostia Watershed

Depending on the degree of development, water quality, stream channel stability, flooding frequency and aquatic and riparian habitats may all be negatively affected by stormwater. The two principal impacts relate to both the increase in the volume and the velocity of water flowing into the receiving stream.

Prior to 1971, erosion/sediment and stormwater management controls were not required in the Anacostia watershed. In 1971, both erosion and sediment control and stormwater water quantity control became a requirement for all new development. In 1984, stormwater water quality control requirements were added as a requirement for all new development. Unfortunately, because so much of the Anacostia watershed was developed prior to the advent of stormwater management requirements, most of the stormwater runoff is not managed for either water quantity or quality. It is well known that uncontrolled stormwater runoff leads to accelerated streambank and streambed erosion, flooding, and the transport of sediment, as well as a myriad of other pollutants.

Approximately 70-75 percent of the annual sediment load delivered to the Anacostia River is associated with stream channel erosion. The fine-grained sediments released in this process, including sand, silt, and clay, impair river and stream habitat. They also serve as binding sites for various contaminants, reduce water clarity and at extremely high levels, may clog the gills of many aquatic organisms.

This map shows areas (in orange) that have either stormwater management controls or land uses (like forests or other low-density uses) that do not require stormwater management.

Approximately 70-75 percent of the annual sediment load delivered to the Anacostia River is associated with stream channel erosion. The fine-grained sediments released in this process, including sand, silt, and clay, impair river and stream habitat. They also serve as binding sites for various contaminants, reduce water clarity and at extremely high levels, may clog the gills of many aquatic organisms.

The monitoring of suspended sediments and Total Suspended Solids (TSS) loads provide one of several measures of the potential impacts of erosion and sediment delivery on aquatic ecosystems.

The typically high level of imperviousness in the Anacostia watershed (average 25 percent) coupled with an inadequate number of stormwater management controls, high numbers of storm drain outfalls (i.e., approximately 3,000 watershed-wide) which often discharge runoff directly to the river and/or its tributaries, and combined sewer systems all contribute to the problem.

Based on currently available data, MWCOCG (2007) estimated that approximately 36 percent of the Anacostia watershed has either stormwater management controls or low-density land uses (which do not require stormwater management) in place.
10 Things You Can Do To Help:

1. **DISCONNECT YOUR DOWNSPOUTS**
   Disconnecting downsputs from your driveway and/or street allows roof water to drain to lawns and gardens. It’s a more natural way to manage roof runoff because it allows water to soak into the ground, rather than running down the street.

2. **PREVENT RUNOFF AND REDUCE SOIL EROSION**
   Plant and maintain vegetation on bare and sloped areas, and install porous material(s) along driveways/patios to allow stormwater to infiltrate into the ground. Remember to cover piles of dirt or mulch being used in landscaping projects.

3. **REDUCE LAWN WASTES**
   - **Dispose of your grass clippings properly**
     Leaves and grass clippings that enter the storm drains can decrease the amount of oxygen in the streams and rivers as they decompose. Released nutrients from lawn fertilizers can cause excessive algal growth which may lower dissolved oxygen levels, possibly resulting in a fish kill. Dispose of yard waste per local regulations, or even better start a compost pile (if room permits).
   - **Minimize fertilizer/pesticide/herbicide use**
     If pesticides or fertilizers are necessary follow the label for application amounts, and remember to never apply before heavy rain events. Use organic mulch or safer pest control methods whenever possible. Mulching your garden also helps to control weeds and reduces the need for herbicides.

4. **INSTALL A RAINGARDEN OR A RAIN BARREL**
   - **Raingarden**
     Specially designed and graded areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop or paved areas can be diverted into these gardens rather than into storm drains.
     Below the surface of the garden, a number of processes are occurring which mimic the soils of a healthy forest. Soils are engineered and appropriate plants selected for the rain garden. The garden is a small bioretention cell in which stormwater is filtered and reduced in volume. Nitrogen and phosphorus levels and overall sediment loads in the stormwater are reduced by the action of the plants and growing media on the water and filtration through the underlying loamy soil. Multiple rain gardens over an area will have a positive cumulative effect on both reducing the volume and improving the quality of stormwater runoff.
   - **Rain Barrel**
     A rain barrel is a system that collects and stores rainwater from your roof that would otherwise be lost to runoff and conveyed to storm drains and streams. Usually a rain barrel kit includes a 55 gallon drum, a vinyl hose, PVC couplings, a screen grate to keep debris and insects out, and other off-the-shelf items. A rain barrel is relatively simple and inexpensive to install and can sit conveniently under any residential gutter downspout.
     Lawn and garden watering make up nearly 40% of total household water use during the summer. A rain barrel can save most homeowners about 1,300 gallons of water during the peak summer months.
**5 GREENROOF**

Green roofs are vegetated roof covers, with growing media and plants taking the place of shingles or tiles. Also called eco-roofs, living roofs, and roof gardens they are an innovative stormwater management solution that can simultaneously improve the energy performance of buildings, air quality and urban ecology— all without taking up additional land. A green roof system involves a special water proof and root repellent membrane, a drainage system, filter cloth, a lightweight growing medium and plants.

**6 REDUCE PAVED AREAS**

Traditional concrete and asphalt do not allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

**7 HOUSEHOLD HAZARDOUS MATERIALS**

Do not pour oil or any chemicals down any storm drain or in the street. Dispose of them properly through your local collection programs.

**Disposal information:**
- District of Columbia: (202) 535-2290
- Montgomery County: 240-777-6400
- Prince George’s County: (301) 883-5045

**Wastes include:**
- Unwanted pesticides
- Oil based paints
- Paint thinner
- Varnishes and stains
- Household cleaning fluids
- Drain cleaners
- Pool chemicals

**8 LITTER/TRASH**

Pick up and dispose of trash and litter properly:

Clean litter from the street and storm drains in front of your home to keep it out of our waters. Be aware of how, what, where, and when you put your garbage out for pickup. Blown items can quickly add up. Use a reusable bag when shopping to cut down on plastic bag usage.

**9 AUTO CARE**

Be conscious of where you are washing:

Washing your car and de-greasing auto parts at home can send detergents and other contaminants into the storm drain system. Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.

**Vehicle Upkeep:**

Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations (most auto parts stores will take used oil at no charge).

**10 PET WASTE**

Pick up and dispose of pet waste properly:

Pet waste can be a major source of bacteria and excess nutrients in local waters. Stormwater can easily move it from the road right-of-way down to the storm drain inlet and directly into your local stream.

Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain.
5 Things Your Community Can Do To Help

1 ORGANIZE A STREAMWATCH GROUP
Organize a streamwatch group that ‘adopts’ a stream, river, pond, or lake in your community (check the back of back of this booklet to see existing groups). An online list serve or ‘group’ with your friends and neighbors is also easy and useful, where you can exchange information about what you see in the streams and the community.

2 CONDUCT CLEANUPS
Conduct cleanups that remove trash and debris from waterways and streets.

3 STORM DRAIN STENCILING
Stencil storm drain inlets with messages to inform citizens that dumping pollutes local waters. All three jurisdictions in the Anacostia have existing programs that are looking for volunteers.

4 BE INVOLVED IN LOCAL AND STATE GOVERNMENT
Organize your group and learn the local regulations and support politicians who understand the importance of strong stormwater control. Make sure they push for strong stormwater regulations, better enforcement, construction of LID type projects, and use of proven stormwater control technologies.

5 EDUCATE
Organize school and public education programs and events on stormwater problems and solutions, or simply to teach about local streams, rivers, ponds, or lakes. Help develop or improve community programs that prevent soil erosion, and reduce runoff and stormwater pollution.

Get involved near your home!
Many of the Anacostia’s tributaries have active citizens’ groups that work to protect and restore their local stream. Check the map on the back of this guide to see if your local subwatershed has a citizens’ group, or go to www.anacostia.net/subwatershed.html for more information about your subwatershed.

If your subwatershed does not have an active citizens’ group there are still ways for you to get involved. You can contact a neighborhood civic association to see if they are involved in environmental issues. If you have the time and the drive to start your own group there are resources available to help. Begin by getting in touch with other members of your community, and contact the Metropolitan Washington Council of Governments at 202-962-3200 for general information. Also, anyone can become involved in one of the many groups that are focusing on the entire watershed, including the groups listed in the next section.

www.anacostia.net
Join Efforts Across Anacostia River Area!

Groups that work to protect and restore the Anacostia Watershed

Chesapeake Bay Foundation: 202-544-2232 www.cbf.org/anacostia
DC Appleseed Center: 202-289-8007 www.dcappleseed.org

Local Governments are also working hard

District Department of the Environment 202-535-2600 ddoe.dc.gov/ddoe/site/default.asp
Montgomery County Department of Environmental Protection: 240-777-7700 www.montgomerycountymd.gov
Prince George’s County Department of Environmental Resources (301) 883-5810 www.co.pg.md.us

Your Eyes Are Needed On The Street And In The Stream!

Report Illicit Discharges and Dumping

Report any sediment, chemical, grease, oil, or other spills to your local environmental protection agency. Developing a good relationship with your local environmental protection inspectors will help get them out when you see a big problem. You should also report any trash dumping ‘hot spots’ to local authorities.

District Of Columbia: 311 or 202-535-2600

Montgomery County: (240) 777-DUMP (6410) (Trash, only)
Prince George’s County: (301) 95-CLEAN (5326) or (301) 883-5045

“What is dumped in affects everything from the fish people eat to the kids that play in our rivers and streams”
This document was produced with funding provided by The Summit Fund of Washington.