Student BaySavers Projects

Fix Your Schoolyard Bare Spots

CHESAPEAKE BAY FOUNDATION
Save the Bay

What Are Bare Spots?

Bare spots are places where vegetation (such as plants, shrubs, grasses, flowers) no longer exists in the soil. Bare spots come in all shapes and sizes. The outcome of having any type of bare spot is the same: stormwater hits the ground and is not able to soak into the land. Think about your school grounds. Where do you think you would find bare spots? The following are some common problem areas:

- heavily traveled foot paths
- underneath dense canopies
- drainage areas
- play grounds, playing fields
- slopes
- entrances/exits

You may not have the funds or permission to revamp your whole schoolyard, but this Chesapeake Bay Foundation step-by-step guide will help you identify problem areas and find solutions in order to slow, decrease, and improve the quality of stormwater runoff. The plans to fix bare spots in this guide are inexpensive and easy enough for most students to complete with minimal help from adults. Although this guide is specifically written with the schoolyard in mind, the projects would work just as well at a home, community center, religious center, or any other private property.

Why Fix Bare Spots?

Did you know that during an average rainstorm (1 inch in 24 hours) more than 700 gallons of water run off the roof of a typical home? That's enough water to take 17 baths or 58 showers! Just imagine how much water might be running off the roof of your school on a rainy day. Virtually every school ground has a substantial amount of impervious surface (area that rainwater cannot soak into) that affects the quality of stormwater runoff. When rain runs off the roof or directly falls onto an impervious surface, it cannot soak into the ground and will eventually enter a storm drain or a nearby creek. This excess water (called runoff) causes the soil in its path to erode more rapidly than it would naturally. Gravity then causes this runoff to flow downhill and into the closest stream or other waterway, carrying with it nutrients, sediment, pesticides, fertilizers, and other pollutants it encounters along the way. *By intercepting stormwater with plants, trees, rocks, or mulch you can stop it from rapidly pushing the land into rivers and streams.* You just might make your school more attractive too!

Scientists have found that nutrient and sediment pollution are the largest threats to water quality in the Chesapeake Bay watershed. Here is something you can do about it!

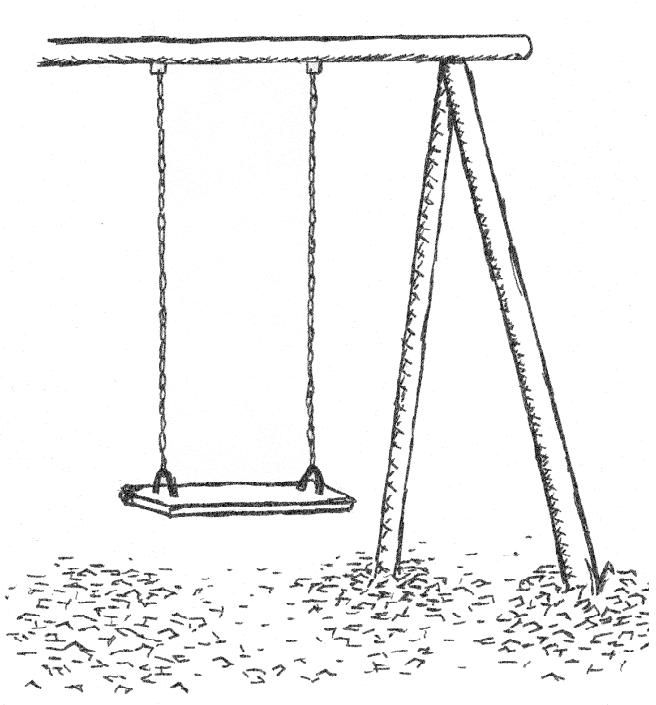
Getting Started

Getting started isn't as difficult as you might think. Just follow these steps:

- First, get a teacher or adult leader involved. Ask if he or she would be interested in helping you and your fellow students with the project by providing advice, supervision, and support.
- Before you plant or place anything in your schoolyard, you will need to get the approval of the school administrators, such as your principal. It is also important to discuss your plans with the custodial staff at your school—they may even be able to help you and will probably want to approve the location of the project. Some schools have PTA members that are involved in making decisions about the schoolyard; if any such groups exist at your school, it would be a good idea to speak with them as well.
- Next, you will need to determine where your bare spots are located.

Identify Your Bare Spots

INVESTIGATE! Identifying bare spots can be almost as much fun as fixing them. Don't forget, the trouble with bare spots is that they can't soak up water. This means it is best to investigate where your bare spots are when it is raining. Don't forget your raincoat! There are some great activities in the Chesapeake Bay Foundation's curriculum materials that can help you with your investigation—copies of two activities, *Schoolyard Report Card* and *Down the Drain*, are included in your packet. You might find it useful to complete one of these before you begin.



As you survey your school grounds, pay attention to where the water runs and where it is collecting. Any place that you can see fast-running water, puddles, or hard, bare soil with no vegetation is an indicator that you have a bare spot.

It is important to do detective work before you purchase any materials so that you can determine what you need. Each project in this guide is very different and so are the materials needed for each.

Diagnose Why the Spot Is Bare

THINK! Once you have identified a bare spot, you then need to figure out why it is bare. This way you can solve your problem appropriately. For example, you wouldn't want to plant trees where people are trying to walk! Think about the following possible causes for a bare spot:

1. A lot of activity in this area causes the ground to be compact and bare (example: a walking trail or playground).

2. The area is susceptible to erosion (example: a slope).

3. The area is not exposed to enough sun for vegetation to grow.

4. Water constantly runs, falls, or collects in this area.

Which one fits best with the problem site you have found? There may be more than one reason you have a bare spot.

Determine Your Solution

SOLVE! Now that you have decided the cause of your bare spot, you are ready to solve the problem. Look through this packet to determine which solution will work best for your schoolyard.

Bare Spots Projects

Project: Mulch Your Bare Spots

Problem 1:	A lot of activity in this area causes the ground to be compact and bare.
Example:	Walking trail, playground.
Solution:	Loosen the ground and add a layer of mulch.

What is mulch?

Mulch is a material, such as bark, woodchips, and/or hay, used to cover the soil in order to suppress weeds, retain moisture, prevent soil erosion, and most importantly improve drainage!

Budget Worksheet

Materials	Quantity	Price Each	Total Price	Source
1. Mulch				
2. Shovels, Rakes				
3. Measuring tape				

Materials List:

- Bagged mulch or woodchips from a local gardening center or local town/city municipality—donated or buy ($0-3 per bag)
- Rakes—borrow or buy ($0-15 each)
- Shovels—borrow or buy ($0-20)

Mulching Your Bare Spot

1. To determine the amount of mulch you need, measure the length and width of the bare spot.

2. Typically, mulch is measured in cubic feet and works best when applied at least three inches thick. To determine how much mulch you need, use this formula: *length x width x height*. Don't forget, all your units of measurement need to be the same. Here's an example:

> A plot that needs to be mulched has a length and width each of 10 feet. The mulch (height) needs to be spread 3 inches over the entire plot. Here's the right calculation:
>
> 10 ft x 10 ft x 3 inches/12 inches = 100 x $^1/_4$ = 25 cubic feet of mulch (3/12 comes from converting inches into feet: 12 inches in 1 foot)

3. With the help of an adult, buy your mulch—or you may even be able to have it delivered for free.

4. Using your shovels, turn over the top layer of soil that will be covered with mulch. Doing this will bring air to the soil and help rain to permeate the ground.

5. Now you can use your shovels to thickly spread the mulch (about 3 inches) over the entire area.

6. Rake the mulch so that it is evenly distributed and easy to walk on, especially if it is a highly used area. Be careful not to cover or harm nearby plants or trees.

Maintaining Your Mulched Area

Bark and woodchip mulch will last for quite some time. You may want to check on it every four months to see if it needs to be refreshed with a new layer.

Bare Spots Projects

Project: Create a No-Mow Zone

Problem 2: The area is susceptible to erosion.

Example: A grass slope or edges of a parking lot, road, or stream bank.

Solution: Create a "no-mow" zone.

What is a "No-mow" Zone?

A no-mow zone is an area of your schoolyard that is left to grow rather than be mowed.

Letting vegetation grow rather than cutting it down encourages the plants' roots to grow deep into the ground. This helps keep soil in place instead of letting it erode into a storm drain. A no-mow area can also attract wildlife and important pollinators for nearby plants and/or gardens.

Materials List:

- Good detective skills
- A list of maintenance workers at your school
- Paper and pen or computer and printer
- Scrap wood (free at a local hardware store)

Budget Worksheet

Materials	Quantity	Price Each	Total Price	Source
1. Scrap wood				
2. Hammer				
3. Nails				
4. Acrylic paint				

- Hammer and nails (ask your maintenance workers at school)
- Acrylic, non-toxic paint ($5-$10 per can)

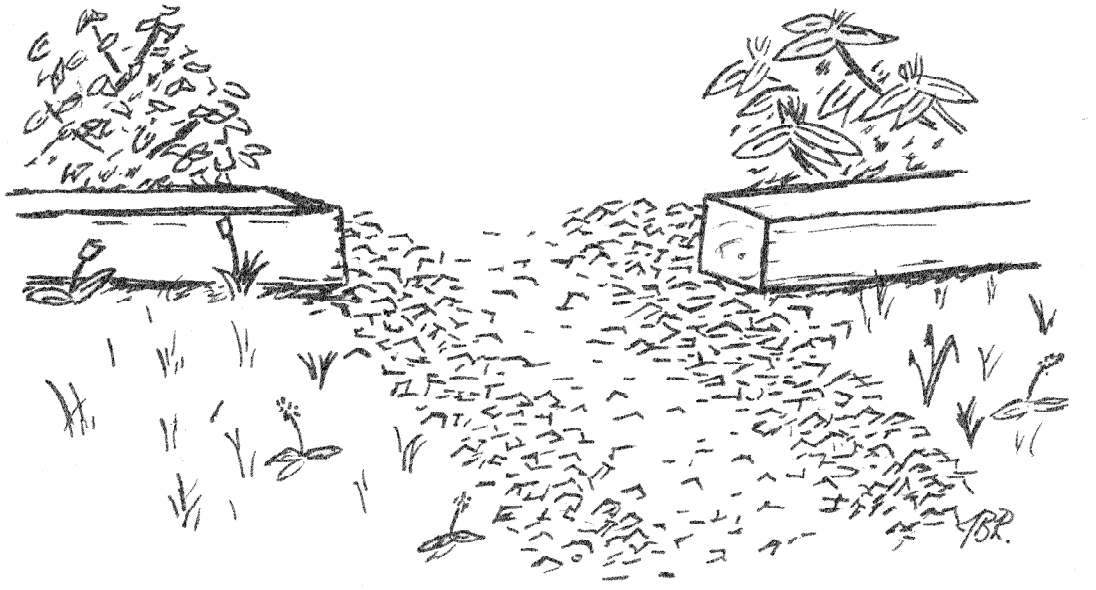
Creating Your "No-mow" Area

1. Find those areas in your schoolyard that are mowed but don't need to be. Examples might include: grassy areas that are not used for anything, slopes or other areas that are difficult to keep mowed. Notice where the most wear and tear has happened due to walking or playing.

2. Choose a potential no-mow area that is both needed and practical (where erosion is obvious, but where long grass won't get in the way of foot traffic).

3. Talk to or write a letter to your school maintenance staff regarding information on no-mow areas and set up a time to show them the potential sites for vegetation growth. Explaining why a no-mow zone is important and can help the school.

4. Once you have permission and have reached an agreement with the maintenance staff, make sturdy signs out of wood and paint them so that you can inform and remind your school where the no-mow areas are located. (It is best not to play in these areas so that vegetation has the best possible chance to grow!)



Bare Spots Projects

Project: Use Native Plants

Problem 3: The area is not exposed to enough sun for vegetation to grow.

Example: Underneath or near tall or dense vegetation.

Solution: Plant native, shade tolerant plants.

What Does Native Mean?

Native species are plants that evolved within a particular regional environment. For example, a coconut tree is native to the coast of Mexico, and an American Holly is native to the Chesapeake Bay watershed. Advantages of planting native species are that they need little maintenance, they support local pollinators and wildlife, and they will not compete aggressively with surrounding vegetation.

What Does Shade Tolerant Mean?

When a plant is shade tolerant it means that it grows best in an area with little direct sunlight. Ferns in a forest are shade tolerant; they grow well underneath the tall canopy of trees. Your group can research native, shade tolerant plants on the Internet using the Helpful Resources at the end of this guide.

Why Plant?

Planting vegetation in what was once bare soil can increase the quality of runoff coming from your schoolyard. Plants stop run-away soil from entering storm drains and help absorb excess nutrients.

Materials List:

- PH kit—borrow from school, pool owner, or buy from pet store ($0-20)
- Shovels—borrow or buy ($0-$20 each)
- Trowels—borrow or buy ($0-$5 each)
- Topsoil—donated or buy (approx. $3 per bag)
- Mulch or straw—donated by farm or buy (approx. $5 a bale)
- Native plants—donated or buy (costs will vary depending on quantity and variety)

Planting Your Shade Tolerant Natives

1. Read the instructions on your PH kit to determine how acidic your soil is. This will help you determine what kind of plants will best survive in this area.

2. After determining which plants would best suit your site, purchase your plants.

3. Dig holes for your new plants that are the depth of the root ball (the part of the plant that is in the pot) and at least twice as wide as the root ball. Most bought plants will have spacing instructions.

Budget Worksheet

Materials	Quantity	Price Each	Total Price	Source
1. PH kit				
2. Trowels				
3. Shovels				
4. Topsoil				
5. Mulch or straw				
6. Native plants				

(Be careful not to take the plant out of its pot until you are ready to put it into the ground—otherwise the roots can dry out and become damaged).

4. Place your plants in the holes that you dug and replace the soil around the roots, being careful not to cover the stem. Press firmly with your hands to make sure the plant is securely in the ground.

5. Water your new plants. A watering can works best for new plantings. If you use a hose, be sure to water your plants gently.

Maintaining and Caring For Your Plants

Because the native plants you chose can tolerate periods of dry weather, you won't need to water your plants unless it doesn't rain for a long time (two to three weeks). While your plants are still young and new to the area, it might be a good idea to check on their progress each week and make sure they are not getting stepped on. You could even paint a sign letting people know what the plants are and why they are important.

Bare Spots Projects

Project: Create a Gravel Trench

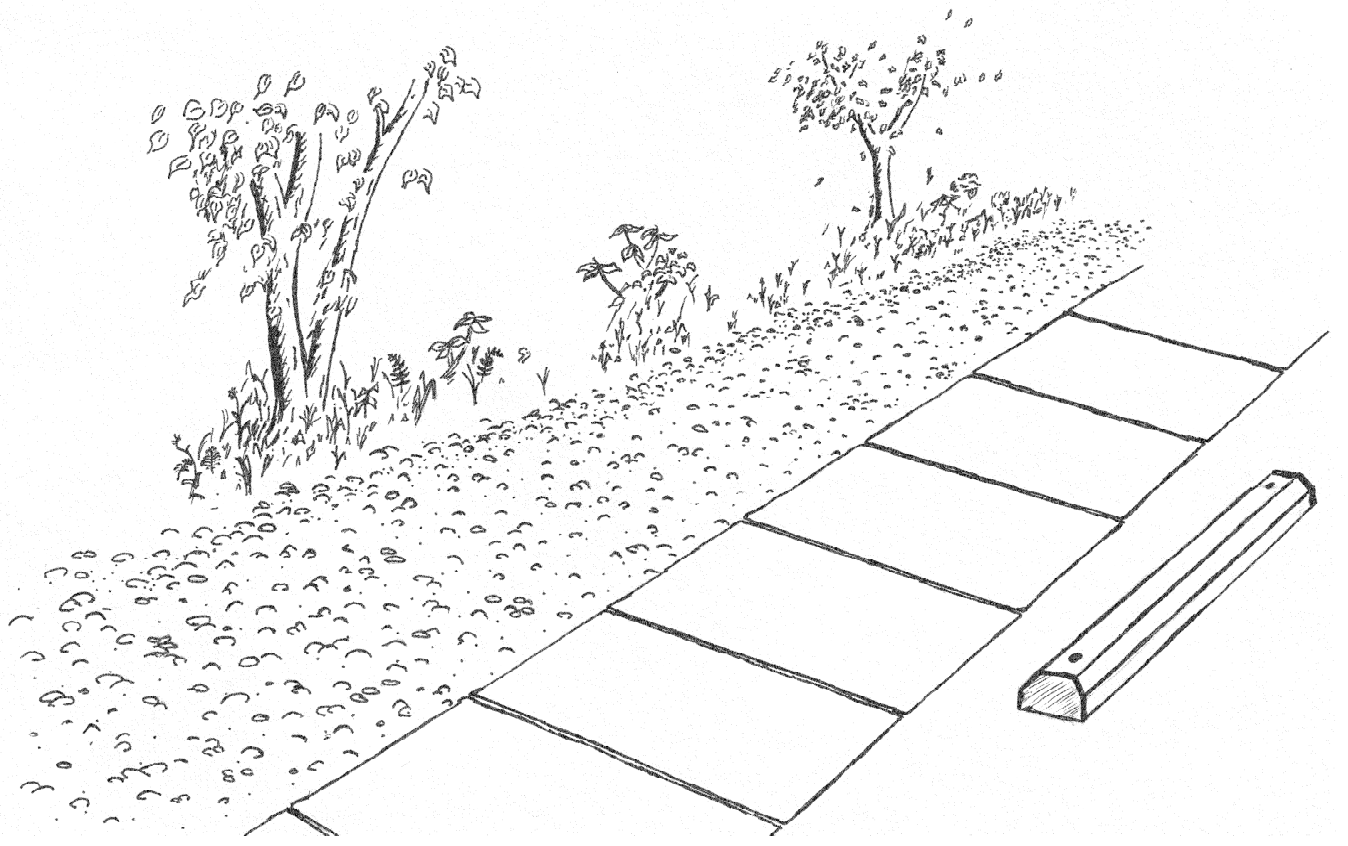
Problem 4: Water constantly runs, falls, or collects in this area.

Example: Drainage areas or alongside impervious surfaces.

Solution: Install gravel trenches along asphalt/impervious surfaces, such as walkways, roads, playgrounds.

Budget Worksheet

Materials	Quantity	Price Each	Total Price	Source
1. Gravel				
2. Shovels				
3. Gloves				
4. Rakes				
5. Wheelbarrow				



What Is a Gravel Trench?

A gravel trench is a long, dugout area filled with small stones or gravel. Ideally a gravel trench runs along an impervious surface such as a parking lot, sidewalk, or playground and also runs parallel to an area of vegetation on the opposite side. Together, the gravel trench and vegetation slow down and filter runoff from the impervious surfaces.

Materials List:

- Gravel/small stones—donated, buy (approx. $3/per bag or less at a bulk rate)
- Shovels—borrow or buy ($20 each)
- Gloves—buy ($3-5 a pair)
- Rakes—borrow or buy ($15 each)
- Wheelbarrow—borrow or buy ($40-70 each)

Dig Your Trench

1. Once you've located your problem area, measure to see how long your trench needs to be. Ideally it should run the length of your asphalt area.

2. You will need to determine how much gravel to buy using the formula for the volume of space your trench will take up (length x width x height = volume). Gravel is measured in cubic feet. Some schools have land use needs that will determine the width of your trench, but we recommend it be at least 12 inches wide and approximately 6 inches deep. You may want to talk to the maintenance staff at your school to discuss the width of your trench.

(12 ft x 1 ft) x (6 in x 1 ft/ 12 in) = 12 x $^1/_2$ = 6 cubic feet of gravel (length x width) x height = volume

3. Now it is time to dig the area for your gravel trench. The soil you dig up can be transferred to a garden or a well-vegetated area of your schoolyard (ideally you will be able to use it for a vegetated area that runs alongside your trench). It is best not to leave the soil in piles, as it will get washed down the storm drain in the next rainstorm.

4. Fill your trench with gravel using your hands, shovels, and/or wheelbarrow. Fill the trench so that you leave about $^1/_2$ inch below the edge so that rocks do not spill onto the nearby land and become a tripping hazard. Also, water can easily filter throughout the whole system this way.

5. A strip of vegetation, no less than 2 feet, should grow on the other side (the non-asphalt side) of the gravel trench to absorb any water that flows through the gravel. One option is to create a no-mow zone along this strip. If you want to get really creative, you could create a wild meadow area with native wildflower seed or plant native shrubs or trees in this area.

Maintaining and Caring for Your Gravel Trench

For the most part, your gravel trench will take care of itself. However, it is not a bad idea to check on the trench every couple of weeks to make sure it is evenly spread and that any stray rocks are put back into the trench. A rake might help you keep your trench in good condition.

Funding Your Project

There are many ways to get funding for all of the things you will need. For example, you could hold a fundraiser at your school, or you could ask your principal if there is money in the school's budget. You could also write a grant requesting money from a funding organization. Below is a list of organizations that offer grants to students, teachers, and school groups.

MARYLAND

Chesapeake Bay Trust
www.chesapeakebaytrust.org

WASHINGTON, D.C.

Garden Resources Of Washington (GROW)
1419 V St. NW
Washington, DC 20009
202.234.0591 fax: 202.234.0592

Dept. of Health-Watershed Protection Division
51 N. St. NE
Washington, DC
202.535.2239

PENNSYLVANIA

PA Bay Education Office
4999 Jones Town Rd. Suite 203
Harrisburg, PA 17109
717.545.8878

League of Women Voters, Water Resources Education Network
226 Forester St.
Harrisburg, PA 17102
800.692.7281
www.pa.lwv.org/wren

VIRGINIA

Virginia Environmental Endowment
1051 East Cary St. Suite 1400
PO Box 790
Richmond, Virginia 23218-0790
http://freenet.vcu.edu/vee/mini.htm

Helpful Resources

Alliance for the Chesapeake Bay
http://www.acb-online.org/bayscapes.htm
410.377.6270

BayScapes Program
US Fish and Wildlife Service
Annapolis, MD 21401
410.573.4581
www.fws.gov/r5cbfo/bayscapes.htm

Environmental Concern, Inc.
PO Box P, 210
W. Chew Ave.
St. Michaels, MD 21663
410.745.9620
www.wetland.org

Maryland Native Plant Society
www.mdflora.org

Native plants for Conservation, Restoration, and Landscaping
http://www.dcr.state.va.us/dnh/native.htm

Your Local Yellow Pages

Gardening Supply Centers

Town or City Works Department

Local Landscaper, Gardener, or Farmer

Congratulations! You are now ready to go out and rid your school grounds of bare spots! Because of your project, less nitrogen and sediment will enter the Chesapeake Bay. This has the direct effect of improving water quality. If you would like to write an article about your project, please submit one to the Chesapeake Bay Foundation's *Megalops* quarterly student newsletter.

The *Megalops* is a web-based newsletter that highlights student leadership and action around the Chesapeake Bay watershed.

To see the most recent edition of *Megalops*, go to **www.cbf.org/education.**

CHESAPEAKE BAY TRUST

This publication was funded in part by the Chesapeake Bay Trust, www.chesapeakebaytrust.org, a private, non-profit organization that seeks to promote public awareness and participation in the protection and restoration of the Chesapeake Bay and its Maryland tributaries.

Arlington Echo Outdoor School contributed technical knowledge to the publication of this guide.

Illustrations by Jeff Rogge.

Identifying Bare Spots Worksheet

Site Number	Investigation	Diagnose	Solve
Example	*Where is the problem area? Name the site*	*Why is there a problem? How is the area used?*	*What solutions would fix this problem?*
Site #1	Playground	A lot of activity here has caused the ground to be compacted and bare. When it rains, muddy puddles form in some areas, and a stream of mud drains into the nearby sewer.	By loosening the soil, water would be able to sink into the ground. Adding a layer of mulch on top of the soil would help stop the loosened soil from flowing into the sewer when it rains. Gravel would work too, but it would hurt if you fell on top. The sewer is far enough from the playground that we could put gravel around it.
Site #2			
Site #3			
Site #4			

Choosing and Completing Your Project Sheet

Project: (Example) Loosen the soil and add a layer of mulch to the playground.

Project:_____

Tasks	Who does this?	By when?	Date task was completed?
Get an adult leader and school staff approval			
Create a budget			
Find a source of money for your project			
Set a date or timeline for project completion			
Find people to help complete the project			
Get materials			
Do the project!			
Share the results (ex. *Megalops*, school newspaper, local newspaper, local TV)			

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Philip Merrill Environmental Center
6 Herndon Ave., Annapolis, MD 21403
410/268-8816
410/269-0481 (from Baltimore metro)
410/261-2350 (from D.C. metro)

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Philip Merrill Environmental Center
6 Herndon Ave., Annapolis, MD 21403
410/268-8833
410/269-1870 (from Baltimore metro)
301/261-1131(from D.C. metro)

Pennsylvania Office
The Old Water Works Building
614 North Front St., Suite G,
Harrisburg, PA 17101
717/234-5550

Virginia Office
Capitol Place, 1108 E. Main St.,
Suite 1600
Richmond, VA 23219
804/780-1392

Anacostia River Office (DC)
202/544-2232

Hampton Roads Office (VA)
757/622-1964

Salisbury Office (MD)
410/543-1999

Website: www.cbf.org
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1-888-SAVETHEBAY