Baltimore County Public Schools
Outdoor Science

Maryland Green Schools
Best Management Practice – Habitat Restoration
Grade Level – 4
BCPS Unit – Eco-Scouts

Voluntary State Curriculum
Standard
3.0 Life Science – The students will use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.

Topic
D. Evolution
Indicator
1. Explain that individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing.
Objectives
1. Describe ways in which organisms in one habitat differ from those in another habitat and consider how these differences help them survive and reproduce.

Topic
F. Ecology
Indicator
1. Explain ways that individuals and groups of organisms interact with each other and their environment.
Objectives
1. Identify and describe the interactions of organisms present in a habitat.
   a. Competition for space, food, and water.
   b. Beneficial interactions: nesting, pollination, seed dispersal, oysters filtering as in the Chesapeake Bay, etc.
   c. Roles within food chains and webs: scavengers, decomposers, producers, consumers.
2. Explain that changes in an organism's habitat are sometimes beneficial to it and sometimes harmful.

Introduction
There are seven BMP's offered as choices for the Green School application. As a school, you are required to select four different BMP's to obtain Maryland Green School status. This document provides three possible projects for the Habitat Restoration BMP. The projects are given for a specific grade level and are based on the BCPS curriculum and the VSC indicators. They execute the *Extension* piece of the 5E format for science curriculum fulfilling the Green School criteria for Best Management Practices through instruction as they broaden the existing science units.

Time will need to be allotted for implementation of these projects. The amount of time will vary with the complexity of the project. Your project might be defined as on-going activities (e.g., curbside recycling) or an annual event (e.g., Earth Day Celebration or a unit specific project). Teacher discretion will determine how to facilitate the project. Factors including student needs, time management, and available resources will need to be taken into consideration.

The three projects described below are only a few of the many possible projects that could be used to fulfill your school's BMP requirement. Please do not feel that you are limited by these suggestions.

BMP – Habitat Restoration

Habitat restoration creates a healthy place for plants and animals. Natural habitat is often disturbed by school construction. Schoolyard habitat restoration projects may be simple or complex. Mowed grass areas could be allowed to return to natural meadows or a small butterfly garden could be created in a mowed area. Elaborate projects might involve the participation of business or community partners.

BMP Project 1 – Planting Native Plants

Background

Maryland plants include native species and species that have been introduced from other areas. When the non-native plants take over an environment many native species can no longer survive, these plants are considered invasive. Replacing exotic/non-native species with native species or planting a native species garden can benefit the habitat. They are more resistant to pests, disease, and drought. Native plants are more nutritionally beneficial to wildlife. This results in a healthier habitat for all organisms.

Resources

- Chesapeake Bay Foundation
  Philip Merrill Environmental Center
  6 Herndon Avenue
  Annapolis, MD 21403

- Chesapeake Bay Foundation: *Steps for Creating a Schoolyard Habitat Plan*
  http://www.cbf.org/site/DocServer/steps_syh.pdf?docID=3288

- Chesapeake Bay Program: *Invasive Species*
  http://www.chesapeakebay.net/baybio.htm

- Maryland Department of Natural Resources Natural Heritage Program: *Non-Native Plant Species*
  http://www.dnr.state.md.us/wildlife/iepintro.asp

- MAEOE: *How to Choose and Find Native Plants*
  http://maeoe.org/habitat/how/plants.php

- Home and Garden Information Center: *Order Free Publications* http://www.hgic.umd.edu/content/orderfreepublications.cfm

- Home and Garden Information Center: *How to Measure Your Yard* http://www.hgic.umd.edu/_media/documents/hg306.pdf

Cross Curriculum Connections

- Language Arts: Students could write a letter to a local nursery asking for a reduced price or donation of native plants.

- Language Arts: Students could read about the value of native plants, how non-native plants are introduced, and what species of non-native plants are prevalent in our community.

- Language Arts/Art: Students could design and illustrate a field guide describing the native plants.

- Math: Students could tally the number of native and non-native species on the grounds surrounding the school and remove the non-native plants and replace them with native plants. The students could re-tally the number of plants. A graph could be completed to compare the results.

- Math: Students could determine the area of the planting location prior to planting and calculate the number of plants needed.

- Social Studies: Students could inform the school population of the laws that address the introduction of non-native plants into our area.

- Social Studies: Students could research how native plants were used by Native Americans.

Tips for Implementation

- Be sure to work with local agencies as a means of support. Local nurseries might be interested in providing native plants at little or no cost. Media coverage and newsletter acknowledgement can be motivating and encourage community involvement and business partnerships.

- Ask members of the school community to lend their planting supplies (e.g., shovels, gloves, rakes). Be sure that they label the equipment for easy return.

BMP Project 2 – Creating a Water Supply in Winter

Background

Water is vital for the survival of organisms. The natural supply of water is affected by the varying level of precipitation, the terrain of the schoolyard, and the changing seasons. Unlike hotter months, the need for water is not often recognized in colder months. The greatest benefit of creating a water supply for your schoolyard habitat is animal survival. Frozen water, limited water supply, and unhealthy, unclean water does not provide the resources necessary for animal survival.

Resources

- Department of Natural Resources
  580 Taylor Avenue
  Annapolis, Maryland 21401
  1-877-620-8DNR (8367)
- Maryland Department of Natural Resources Wildlife and Heritage: *Water in Winter*
  http://www.dnr.state.md.us/wildlife/habichat4.html#wiw

- Pennsylvania Wildlife: *Water for Wildlife: Bird Baths and Ponds*
  http://pubs.cas.psu.edu/FreePubs/pdfs/uh160.pdf

Cross Curriculum Connections

- Language Arts: Students could write directions for how to make a simple water container for a backyard habitat. They should include materials and step-by-step directions with good use of text features.

- Math: Students could collect and record real-time data of the water and air temperature over time.

- Technology: Students could use digital photography to collect evidence of the animals visiting the water supply. A photo journal could be created using the photos and student-generated text.

- Technology: Students could create an acrostic poem using *Microsoft Word* or *Kidspirations.*

Tips for Implementation

- Locate a spot in the schoolyard that is close enough to the school (easy access) for regular water replenishment yet in a spot where animals could quickly escape from predators.

- Use a shallow plastic or metal container to hold the outside water. These can safely and easily be turned over to remove ice before adding new water.

- Portable heaters are available for keeping water from freezing. These should only be used in a protected area such as a school courtyard to prevent vandalism, theft or injury.

BMP Project 3 –Plant Identification Signs

Background

Signs for identifying plants are made from a variety of materials and can be permanently posted in the ground. Plant identification signs can be used by the entire community. Walkers can use them to familiarize themselves with the names of plants, possibly increasing their appreciation of nature.

Resources

- Maryland Cooperative Extension
  Baltimore County Office
  1840 York Rd, Suite J.
  Timonium, MD 21093
  410-666-1022
  Home and Garden Hotline: 1-800-342-2507

- Tree/Plant/Wildlife ID Signs: *Signs by David Arthur*
  This site sells a variety of plant identification signs models. It can be used to get ideas for creating your own plant identification signs or as an actual vendor.
  http://www.peedeercd.org/

- Precision Signs: *Botanical Identification Products*
  This site sells materials for creating signs. It can be used to get ideas for creating your own plant identification signs or as an actual vendor.
  http://precisionsignsusa.com/botanical_signs.html

- Home and Garden Information Center: *Order Free Publications*
  http://www.hgic.umd.edu/content/orderfreepublications.cfm

Cross Curriculum Connections

- Art: Students could design signs for plant identification. The designs could possibly be used to create the plant identification signs on the school property.

- Language Arts/Art: Students could design and illustrate a field guide describing the labeled plants.

- Social Studies: Students could research how native plants were used by Native Americans and include this information on the signs.

Tips for Implementation

- Choose to identify plants that are native to the area. Identify the plant as native on the sign. This provides an additional education piece as it brings further awareness of plants that are native to the area.

- It is recommended that the signs be made of materials that can withstand inclement weather and change in seasons. These signs are more costly to make but their durability justifies the expense.
- Have a celebratory grounds walk with each grade level to point out the plants identified with signage.

- Contact your local home improvement center for a possible donation of materials to build signs (e.g., metal stakes, wood, acrylic glass).

Additional Project Ideas for the Habitat Restoration BMP

- The *Eco-Scouts* unit provides a plethora of ideas for habitat restoration in Activity 11. Your school could select one of the projects not completed during the unit as a BMP project for Green School status.

- If your school has a nearby stream, plan a stream clean-up day. Pre and post evaluations of the stream quality could also be completed using aquatic insects as indicators.

- Rebuild an eroded area by filling it in with soil and planting trees or shrubs to prevent future erosion. Coordinate this project with your BCPS Grounds Crew Supervisor.

- Build a rain garden to help slow the runoff caused by storm water flowing from the school building and other impervious surfaces. See the Grade 5 Water Conservation and Pollution Prevention BMP for more details about rain gardens.