



To the Teacher

Thank you for your interest in holding your Meaningful Watershed Educational Experience at Dyke Marsh Wildlife Preserve. This program has been designed to provide students with the kind of field experience described in the Chesapeake 2000 agreement signed by the District of Columbia, Maryland, Pennsylvania, and Virginia. It is designed for students in grades 4-6. This booklet will function as your guide to preparing students for their visit to the marsh. It provides background information and activities that can be used in the classroom.

The guide contains the following sections:

- An **Overview** of what the students will experience on their visit to the marsh, **Program Logistics** and a **Sample Itinerary**
- A statement of the program's **Theme and Objectives**
- **Background Information** and **Resources** that will help you with pre- and post-visit activities
- **Pre-visit** and **Post-visit** activities that provide students with the information necessary for a positive and meaningful experience on the marsh
- **Guidelines** that addressing safety issues, chaperones, and items to bring on the day of your visit
- An **Evaluation** form (Your feedback is greatly appreciated and will help us to upgrade and further develop this Parks as Classrooms program.)

Again, thank you for your interest in this program. To make reservations or ask for additional information contact a ranger at 703-289-2553.

See you in the marsh!

Overview

This Meaningful Watershed Educational Experience is a three hour program that gives students hands-on experience exploring the biotic and abiotic components that make up a freshwater marsh biome. Dyke Marsh Wildlife Preserve provides an ideal setting for examining such concepts as watersheds, water quality monitoring, plant communities, erosion and sedimentation, and environmental conservation. This program is designed to provide students with the kind of field experience described in the Chesapeake 2000 agreement signed by the District of Columbia, Maryland, Pennsylvania, and Virginia.

Students will be divided into four groups that will rotate among four stations:

Testing the Waters

Students will test water for temperature, conductivity, dissolved oxygen, nitrite content, and pH to create a snapshot of water quality in the marsh. They will consider what the water in Dyke Marsh is like, how it came to be this way, and how its quality might affect the kinds of life that can grow in the marsh.

Invasive Species

Students will learn the life histories of common native and invasive species in the marsh. They will consider what kinds of plants grow in this freshwater marsh biome, how exotic plants arrive, why some exotic plants are so successful that they are considered invasive, and how invasive plants change the marsh. Volunteers will show students how to remove invasive species.

Moving a Marsh

Students will investigate the layers of sediment that lie at the bottom of Dyke Marsh. They will compare the marsh's current shape to what has it looked like in the past and consider how water and energy change the shape of the marsh over time.

People in the Marsh

Students will search for evidence of historical uses of the marsh. They will consider how each type of use has changed Dyke Marsh and influenced the type of use that came after it.

There will be a lunch break halfway through the program.

Program Logistics

National Park Service rangers will greet your group at the Haul Road trailhead in Dyke Marsh. Bus drivers can drive straight toward the marina, drop students off at the trailhead, then proceed to the marina to turn around.

Group size is limited to 120 students. Prior to arriving at the marsh divide your class into four groups of equal size.

Teachers must bring their own water quality test kits. For each group the teacher can conduct one set of tests while students observe or subgroups can conduct one test each and share their results. You will need at least one full set of tests for each large group.

Students will eat a picnic lunch on the Haul Road Trail. Bring bag lunches as food is not sold in the park. Rangers will provide tarps to sit on, hand sanitizer, water and cups, and trash bags.

While restroom facilities are available near the marina, the location is not convenient to the activity area. Encourage students to use the restroom prior to walking down the trail or during their lunch break.

Portions of the Haul Road Trail can be muddy. Advise students to wear closed-toe shoes that can be washed after the field trip.

Sample Schedule

This is a sample schedule of a typical class visit to Dyke Marsh Wildlife Preserve. This schedule can be modified based on your school district's regulations. We will try to work within your constraints.

9:45 - 10:00

Students arrive at the trailhead and divide into groups. Brief chaperones on the day's schedule.

10:00 - 10:15

Each group will get an overview of the day's activities, agree on a set of rules, then walk to its first station.

10:15 - 10:35

First station

10:35 - 10:45

Walk to second station

10:45 - 11:05

Second station

11:05 - 11:45

Walk to lunch, eat lunch, then walk to third station.*

11:45 - 12:05

Third station

12:05 - 12:15

Walk to fourth station

12:15 - 12:35

Fourth station

12:35 - 12:45

Walk to buses

12:45 - 1:00

Conclusion and load buses

*Note: Opportunities for restroom breaks will be limited due to the location of restroom facilities in the park. Between 11:05 and 11:45 chaperones can assist with escorting students to the restroom with minimal interference to the flow of the program and the experience of the student.

Program Theme and Objectives

Essential Question

How are the water and energy of the Potomac watershed used in Dyke Marsh?

Objectives

- Identify common pollutants from nonpoint sources and explain the impact of each on a wetland.
- Assess the quality of Dyke Marsh's water based on "snapshot" tests.
- Describe the characteristics of exotic plants that make them potentially invasive.
- Predict the extent of an exotic species based on its current location and characteristics.
- Summarize the geologic events that created Dyke Marsh.
- Explain how geologists know what they do about Dyke Marsh's past.
- Describe ways that humans have changed Dyke Marsh to make it meet their needs.
- Propose human uses for Dyke Marsh that might restore it to a relatively stable state.

Standards of Learning Addressed

District of Columbia SOLs: Science 4.3, 4.4, 4.7

Maryland SOLs: Science 2A, 3A, 3D, 3E, 3F, 6A, 6B

Virginia SOLs: Science 5.7, 6.2, 6.3, 6.7, 6.9

Background Information

Located along the west bank of the Potomac River approximately 95 miles from the Chesapeake Bay, Dyke Marsh Wildlife Preserve consists of approximately 485 acres of tidal marsh, floodplain, and swamp forest. Dyke Marsh, which is believed to have formed 500 years ago, is one of the largest remaining freshwater tidal wetlands in the Washington Metropolitan area.

Dyke Marsh provides a habitat for a diverse array of plants and animals. The Haul Road Trail is a favorite of area birdwatchers, hikers, photographers, and nature lovers. In addition, the waters in and around the marsh are popular fishing areas. People who explore the marsh by canoe may be rewarded with up-close encounters with the resident wildlife.

What's in a Name?

Dyke Marsh was indeed "diked" at one time. In the early 1800s, earthen walls were built around the perimeter of the marsh in order to create more "fast land" or land not flooded by high tides. These areas were used to graze livestock or grow crops.

Animals of the Marsh

Dyke Marsh provides supports a diverse array of animals. Beavers and muskrat live and play in the marsh. At dusk, little brown bats and red fox begin their nightly forays. Other mammal species observed in the marsh include: cottontail rabbit, gray squirrel, shrews and field mice.

Several species of reptiles and amphibians also inhabit Dyke Marsh. Bullfrogs and leopard frogs are on the lookout for northern water snakes and snapping turtles. During the summer months, painted turtles may be seen on logs absorbing the sun's warmth and a box turtle might be seen roaming the floodplain in search of food.

Perhaps the most common sound heard in Dyke Marsh is the trill of the red-winged blackbird. Commonly associated with wetlands, red-winged blackbirds nest among the cattails and feed on insects and seeds.

Nearly 300 species of birds have been observed in Dyke Marsh Wildlife Preserve. As a result, Dyke Marsh Wildlife Preserve is one of the premier birdwatching spots in the Metropolitan Washington D.C. Area.

Plants, Plants, and More Plants

To date, more than 360 species of plants have been recorded in Dyke Marsh. The dominant species of the marsh itself is the narrow-leafed cattail, which typically develops its characteristic flower spike by June. Other species associated with the tidal marsh include: arrowhead (a.k.a. duck potato), a plant whose starchy tubers are favored by waterfowl; arrow arum, a distinctive plant with large triangular leaf blades; pickerelweed; sweetflag; spatter-pond lily; and northern wild rice, the grains of which are enjoyed by red-winged blackbirds, waterfowl, and people.

The Human Factor

Today, Dyke Marsh is much different than just 50 years ago. Originally, it is believed that the marsh once consisted of 650 acres. Dredging done during the 1950s and 60s led to the current size and configuration of the marsh. Dredging along the outer fringes of the southern part of the marsh resulted in the removal of approximately one-third of the emergent marsh, which was replaced with deep water that reaches 30 feet (9 m) below mean tide level. Even today, visitors can see the impacts of dredging, including shoreline erosion, trash from dredging operations, and deep holes in the marsh which are most visible at low tide.

Exotic or non-native plants are another result of human impacts at Dyke Marsh Wildlife Preserve. Exotic species are very opportunistic, growing in disturbed areas and often out-competing beneficial native species.

Several exotic vines smothering portions of the floodplain forest, including porcelain-berry, Japanese honeysuckle, and Asiatic bittersweet. The marsh is not immune to exotics either. Yellow iris and the common reed are present and efforts are being made to prevent the introduction of purple loosestrife.

Resources

<http://www.chesapeakebay.net/library>

http://www.dcr.virginia.gov/virginia_naturally/mwee.shtml

<http://water.epa.gov/lawsregs/guidance/wetlands/readlist.cfm>

<http://www.fcwa.org/education/kids.htm>

Anderson, Margare. Field, Nancy. Stephenson, Karen (1998). *Leapfrogging Through Wetlands*. Dog-Eared Publications. ISBN 0941042189.

Collard, Sneed B., III (2009). *Many Biomes, One Earth*. Charlesbridge Publishing. ISBN 1570916322.

Dobson, Clive and Beck, Gregor (1999). *Watersheds: A Practical Handbook for Healthy Water*. Firefly Books. ISBN 1552093301.

Kalman, Bobbie (1997). *What Is a Biome?* Crabtree Publishing Company. ISBN 0865058873.

Stille, Darlene R. (2000). *Wetlands*. Children's Press. ISBN 0516267914.

Program Guidelines

Chaperones

Chaperones are an essential part of a successful Parks as Classrooms program. We require at least one chaperone for every ten students. Secure the right amount of chaperones as early as possible; consider creating a back-up list in case of cancellations. Please review the following rules and suggestions with your chaperones, as well as the safety rules.

- Your primary responsibility is to the students and the students' safety. You should be actively involved in keeping the group together and quiet on the trails.
- Be prepared to participate in all activities with the group.
- Allow students to learn through trying and asking.
- Remember, providing information is not as important as stimulating thinking. If chaperones don't know something, that's okay.
- No smoking.
- Chaperones, as well as students, must wear long pants, shoes and socks. Please, no sandals, flip-flops, or river (raft) shoes.

School Regulations

Follow your school district's requirements for field trips (principal, parental approval, making bus arrangements, etc.).

Pre-Visit Activities

Pre-visit activities prepare students for a more meaningful and rewarding visit to Dyke Marsh Wildlife Preserve. Review the pre-visit activities and conduct those that your schedule allows. Also, review the list of terms included in this booklet with your students prior to their visit.

Clothing

Review what to bring and what to expect with students and chaperones. The trail used during this program may be muddy depending on recent weather patterns. Everyone should wear long pants and shoes that they don't mind getting muddy. Please, no dresses, shorts, heels, sandals, flip-flops, or river (raft) shoes.

Restrooms

While restroom facilities are available near the marina, the location is not convenient to the activity area. Encourage students to use the restroom prior to walking down the trail or during their lunch break.

Food and Drink

Students will eat a picnic lunch on the Haul Road Trail. Bring bag lunches as food is not sold in the park. Rangers will provide tarps to sit on, hand sanitizer, water and cups, and trash bags.

Nametags

To enable the Ranger to make the trip more personal for each student, please have students wear nametags on their outermost layer of clothing.

Group Size

Group size is limited to 120 students. Please divide your group into four smaller groups before arriving at the park. (They will be split into these groups at the beginning of the program.)

Safety Considerations and Park Guidelines

In order to ensure a safe and rewarding experience, please be sure to review the following guidelines with all participants prior to your visit:

- Respect the plants and wildlife. Remember that ALL plants and animals are protected in National Parks.
- Respect each other and other trail users. As other visitors will be enjoying the island during our visit, we will be as quiet and organized as possible. Yelling, running, and talking over others are examples of inappropriate behavior.
- Follow the ranger. Allow the ranger to lead the group while hiking in the marsh. A teacher or chaperone should follow the end of the line.

Post-Visit Activities and Evaluation

The post-visit activities are designed to reinforce and build upon the knowledge gained in the park. Review these activities and conduct those which you feel would best benefit your class. We encourage you to complete and return the Program Evaluation Form. Your comments will assist us in expanding and improving this program.