Crab Meadow Watershed Wildlife Environmental Education Manual

by Christian Granelli

Introduction

The Crab Meadow Watershed is an area of 680 acres located north of Route 25A in Northport, New York. The watershed includes Henry Ingraham Nature Preserve, Fuchs Pond Preserve, Makamah County Park, Crab Meadow Golf Course, Jerome A. Ambro Memorial Wetlands Preserve, Crab Meadow Beach and Kirschbaum Park. A majority of the water from the forests, ponds, marshes and beaches of the Crab Meadow Watershed drains into the Long Island Sound.

The watershed is a resource that is extremely valuable to humans and local wildlife. People rely on the watershed as a buffer from storms, a filter of water, a nursery for fish and crustaceans, and for recreational activities and the aesthetic beauty it provides. Animals depend on the watershed for their food, water and shelter. The purpose of this manual is to introduce the idea of a watershed to students while connecting them to their local environment and wildlife in an attempt to create an understanding of the importance of the watershed.

This manual is designed for use by environmental educators and teachers and is appropriate for educating students from kindergarten through fifth grade. The manual consists of four programs, each with a classroom and a field component. The classroom component introduces students to the watershed, a specific habitat found in the watershed, and wildlife likely to be found in that habitat. After learning about the watershed, habitat and wildlife in the classroom the students will take an expedition into the watershed and into the specific habitat discussed to explore and search for the wildlife species focused on during the classroom portion of the program. Students will be immersed in the habitat while viewing native wildlife, sketching local species and noting physical and behavioral characteristics of the species in their field notebooks.

Procedure

Instructor introduction

Program introduction

- Has anyone heard the word watershed before?
    - Does anyone recognize any parts of the word watershed?
        - The first part of the word is water. Water is all around us. We depend on water for our survival.
        - The second part of the word is shed. Shed means to pour forth or pour off.
        - A watershed is an area where all of the water pours off or flows into the same place. In the case of the Crab Meadow Watershed the water pours into the Long Island Sound.

Importance of the Crab Meadow Watershed

- Can anyone think of any reasons why the Crab Meadow Watershed is important to people?
    - The Crab Meadow watershed serves as a buffer between the Long Island Sound and residential areas. The beach, saltwater and freshwater wetlands, and wooded areas contain much of the flooding that occurs during large storms, thereby protecting residential areas from damage.
    - The wetlands and woodlands of the Crab Meadow watershed act as filters removing contaminants from water, especially runoff that enters the woods and wetlands. The filtration of this water reduces the contamination of the water that enters the Long Island Sound.
    - The wetlands of the Crab Meadow Watershed provide a nursery for young fish and crustaceans. The calm sheltered waters of the wetlands allow for fish and crustaceans to grow in a safe environment and eventually become big enough to move into the Long Island Sound and to be harvested and eaten by people and other predators.

- The habitats within the Crab Meadow Watershed provide recreational opportunities like fishing, going to the beach, birding, canoeing/kayaking and hiking.
- The aesthetic beauty of the habitats and wildlife within the Crab Meadow Watershed is highly valued by residents of the area.

• Now that we know why the watershed is important to people does anyone know why it is also important to wildlife?

- The watershed provides animals with food, water and shelter/cover.
    - Like people, animals require a healthy diet, a supply of clean water, and a safe place to live in order to survive.

• There are a number of different habitats in the Crab Meadow Watershed.

- Does anyone know what a habitat is?
    - A habitat is the natural environment of an organism or the area where an animal lives.
- Can anyone tell me any habitats within the Crab Meadow Watershed?
    - In the Crab Meadow Watershed we can find a variety of habitats including forest, pond, marsh and beach habitats.

Today we will focus on the (subject habitat), why it specifically is important, examples of wildlife that can be found there and how we can protect the habitat and the Crab Meadow Watershed.

Protection of the Crab Meadow Watershed

• Now that we know that the watershed is important to people and also to animals what can we do to protect this area?

• Some examples of what we can do to protect the watershed are:

- Don't litter. Litter contaminates the watershed environment and can be harmful to wildlife, particularly birds.

- Do not take wildlife from its natural habitat. Taking wildlife from its natural habitat is in most cases illegal. Attempting to capture wildlife can also be

dangerous. It is wonderful to observe wildlife but it should be left in its natural habitat.

- Do not release any non-native species or pets into the wild. Releasing household pets into the wild can have harmful affects on native species. Non-native species can bring disease into the wild populations or out-compete native species for resources.

- If we see someone dumping in the watershed we should report it immediately to the Town. If you see someone dumping anything into any areas of the Crab Meadow Watershed let your parents know as soon as you can. Your parents should then call the Town and the proper authorities will be contacted to be sure that no illegal dumping is occurring.

- Make sure parents know that the watershed is important to us and that we don't want them to pollute it. Ask students to talk about the watershed and wildlife with their parents when they return home. Their parents will see that their children care about the valuable habitats and animals and if they do not already value them they will be more likely to after the discussion with their children.

Forest

Classroom Component

Materials and Preparation

Projector

Laptop

Screen

Extension cord and power strip

PowerPoint presentation

Props including red-tailed hawk feathers, snake skin, a box turtle shell, and southern flying squirrel fur

Objectives:

After taking part in the program students will:

- Be aware of what a watershed is and where the Crab Meadow Watershed is
- Know what wildlife is
- Be aware of why a watershed is important to people and animals
- Know what a habitat is and general characteristics of the forest habitat
- Know pieces of information about local wildlife found in the forest habitat including the red-tailed hawk, eastern milk snake, eastern box turtle and southern flying squirrel
- Have an idea of what they can do to help to protect the Crab Meadow Watershed and the forest habitat

Key Terms

Watershed, wildlife, habitat, forest, red-tailed hawk, eastern milk snake, eastern box turtle, southern flying squirrel

Summary

The Crab Meadow Watershed Wildlife Forest program will be presented to students in a lecture format, with PowerPoint slides containing pictures, videos and sounds of the topics being discussed. As each species of wildlife is discussed a physical prop including

a red-tailed hawk feather, snake skin, a box turtle shell and southern flying squirrel fur will be passed to students.

Background

A watershed is an area from which all of the water drains into the same place. In the case of the Crab Meadow Watershed the water from the area drains into the Long Island Sound. The watershed is extremely important to both people and animals. Within the Crab Meadow Watershed there are a variety of habitats including the forest habitat. Local wildlife species found in the forest habitat that depend on the watershed for their survival include the red-tailed hawk, eastern milk snake, eastern box turtle and southern flying squirrel. With responsible behaviors we will be able to protect the watershed and the wildlife species that live there long into the future.

The Forest Habitat

- Can anyone tell me what a forest is?
    - A forest is a large area of land covered with trees and underbrush. The forest of the CMW is deciduous. In a deciduous forest the trees drop their leaves each fall. Some of the trees found in the forest of the CMW include American beech, red maple, chestnut oak and tulip poplar.
- Can anyone tell me why the forest is important to people?
    - Recreation
    - Aesthetics
    - Raw Materials
    - Hunting
- Can anyone tell me why the forest is important to animals?
    - Food
    - Shelter/Cover

Wildlife in the forest of the Crab Meadow Watershed

- Can anyone think of any species of wildlife that live here in the forest habitat of the Crab Meadow Watershed?
- Today we will talk about four species of wildlife that live right here in the forest habitat of the Crab Meadow Watershed.

Red-tailed Hawk

Red-tailed hawks (RTH) are birds with a brown head and back, a white chest with brown streaking, and reddish colored tail feathers. (Pass RTH feather to students) They are active during the day, which makes them diurnal. (Play RTH Call) They live in tall trees in large nests. RTHs are birds of prey, which means they hunt, capture and kill their own food. They feed on mice, rats, squirrels, rabbits, snakes, amphibians and smaller birds. RTHs help to control rodent populations. They can be seen soaring high in the sky using their excellent eyesight to search for food. RTH's eyesight is about 10 times better than humans, and they can see more colors than humans can including ultraviolet light. The ability to see ultraviolet light allows RTHs to see a trail of urine left by prey species helping the hawk to find its prey. RTH's have a special adaptation to help them to hunt successfully during the day called a super orbital ridge. The super orbital ridge is a bone that protrudes above each of the RTH's eyes and acts as a visor to block the sun from the hawk's eyes. When RTH's spot their prey they dive at over 100 mph and attempt to grab it with their sharp talons. Red-tailed hawks use their sharp hooked beak to rip apart their prey. They lay up to three eggs each year. RTH's live approximately 12 years in the wild and up to 30 years in captivity.

Eastern Milk Snake

The Eastern milk snake (EMS) is a reptile that is tan in color with reddish-brown blotches outlined in black extending down its body. The milk snake gets its name from a myth that EMSs entered farmer's barns and sucked milk from cows. They live in wooded areas of the Crab Meadow Watershed. EMSs are mostly nocturnal. They can be found hiding under logs and rocks and also in mammal burrows. Like most reptiles EMSs have scales to help protect their bodies and they shed their skin as they grow. (Pass shedded snake skin to students) Also like other reptiles the EMS is cold blooded, meaning its body temperature is dependant on the air temperature around it, and because of the cold seasonal temperatures in the CMW it hibernates from the late fall through the early spring. EMSs eat frogs, toads, salamanders, mice, eggs and small snakes. EMSs help to control rodent populations and are prey for higher-level predators. They use their forked tongues to taste the air in order to locate their prey. After finding their prey EMSs constrict their prey and swallow it whole. Snakes have extremely flexible jaws which allow them to open their mouths wide enough to eat prey more than twice the size of the snakes head. The bottom part of the snake's jaw is separated into two halves that move independently and allow the snake to pull the prey into the snake's throat. Eastern milk snakes lay up to 20 eggs each year under a log or rock or in a rotted log. EMSs reach three feet in length and live up to 12 years. They depend on the food and shelter provided by the forest of the Crab Meadow Watershed for their survival.

Eastern Box Turtle

The Eastern Box Turtle (EBT) is a reptile with a domed shell or carapace that is olive to brown in color with orange or yellow markings on it. Male box turtles have orange or red eyes while females have gray or brown eyes. EBTs get their name because of their ability to pull their entire body into their shell and close their shell completely like a box. The bottom of the turtle's shell or the plastron is hinged which allows the shell to close completely. The EBT is found in the forest of the Crab Meadow Watershed. Like most turtles the EBTs shell helps to protect it. (Pass box turtle shell to students) EBTs eat plants, berries, mushrooms, insects, snails and worms. Every spring female box turtles dig a hole in sandy or loose soil and bury up to 8 eggs. (Play video of EBT) The eggs hatch between September and October. EBTs grow to a maximum length of 8 inches. They can live over 100 years but generally live for about 40 years. Though tolerant of human development the population of EBTs has decreased due to the destruction and fragmentation of their habitat. Many turtles are killed each year while attempting to cross heavily trafficked roads. EBTs have a homing instinct and when they are removed from their home range they will attempt to return to that area. The EBT depends on the food and shelter provided by the forest of the Crab Meadow Watershed for its survival.

Southern Flying Squirrel

The Southern Flying Squirrel (SFS) is a mammal with grayish brown fur on its back, white fur on its stomach, a flattened tail and large black eyes. (Pass squirrel fur to students) The SFS is the smallest tree squirrel and is about the size of a chipmunk. SFSs have flaps of skin between their front and rear legs that allow them to glide through the air. While gliding they use their flat tails as rudders to steer their flight and to help them slow down before they land. They can glide up to 250 feet from the top of one tree to the trunk of another. (Play video of SFS gliding) They are the only nocturnal tree squirrels. SFSs live in holes in trees in the forest of the Crab Meadow Watershed. They eat fruit, nuts, insects and eggs. SFSs can store up to 15,000 nuts in one season. SFSs are important prey animals for owls, raccoons, and snakes. SFSs produce up to two litters each year with up to seven young in each litter. They grow to 8 inches in length to the tip of their tail and live up to 6 years in the wild. Like other mammals SFSs are warm blooded. They do not hibernate in the winter, but can go into a state of torpor in which the squirrel lowers its body temperature and slows its metabolism allowing it to survive during times of difficult environmental conditions and decreased food.

Field Component

Materials and Preparation

Field Notebooks

Pencils

Binoculars

Boards for snakes

Props including visuals of each animal discussed, a box turtle shell, a flying squirrel fur, a red-tailed hawk feather, and a portable stereo to play the red-tailed hawk call

Objectives:

The field component of the program will:

- Reinforce the importance of the watershed
- Remind students what a habitat is
- Remind students what a forest is and why it is important
- Allow students to explore their local forest habitat
- Allow students to use their observation skills when sketching the animals discussed
- Allow students to use their listening and writing skills when recording information about the animals discussed
- Teach students how to properly use binoculars
- Develop a connection between students, their local environment and the animals that live there

Key Terms

Crab Meadow Watershed, habitat, forest, red-tailed hawk, eastern milk snake, eastern box turtle, southern flying squirrel

Summary

The purpose of the field component of the forest program is to reinforce the importance of the Crab Meadow Watershed and the forest habitat in the watershed. Students will

explore the forest habitat, discuss animals that can be found their, use their observation and drawing skills to sketch the animals, and their listening and writing skills to record information about the animals. Students will also be taught the proper way to use binoculars. The goal of the program is to connect students with their local environment and the animals found there in order for the students to better understand, value and protect their environment in the future.

Background

The field component begins with a brief review of the Crab Meadow Watershed. What do students remember about the watershed? Why is it important?

Then there will be an introduction to the habitat we will be exploring. What is the role of the forest in the Crab Meadow Watershed? Describe the forest.

What animals did we discuss that are found in the forest habitat?

Start the walk. Look under boards placed along the trail for snakes. Discuss any snakes found. If no snakes are found by the last board discuss what we know about snakes. Tell students what snakes could be found in this area. Provide visuals of each snake that may be found. What do the snakes depend on the forest for? What do snakes eat? Allow students to sketch one of the snakes in their field notebooks. Ask them to draw the snake as best they can and include any physical details they notice. Ask them to write down any notes that they remember about the snake they drew and snakes in general.

After the snake discussion continue along the trail. Reach an area where a box turtle may be found. Discuss what we know about the box turtle. Show students the shell of the box turtle. Ask them to sketch the box turtle shell in their field notebooks. Ask them to include details of what they remember about the turtle. (May want to show visuals of other land turtles)

Walk further along the trail and stop to discuss the flying squirrel. Provide a visual of the flying squirrel. Ask students why they don't see it? And when would they expect to see it? Ask students to sketch the flying squirrel in their field notebooks including any notes about physical characteristics and behaviors that they remember.

Continue along the trail to the wildlife viewing location. Distribute binoculars to pairs of students. Discuss any wildlife we see at this location. Play the red-tailed hawk call and listen for a response. Show the students a red-tailed hawk feather. Ask the students to use their binoculars to observe their surroundings and any wildlife they may see. Ask them to sketch an organism they see that interests them including any characteristics of the organism that they observe. Assign the students the activity of identifying what it is they sketched. If they don't know in the field ask them to do some research when they return to the classroom to identify their sketched organism.

Henry Ingraham Nature Preserve
Site of Forest Program Field Component

POND

Classroom Component

Materials and Preparation

Projector

Laptop

Screen

Extension cord and power strip

PowerPoint presentation

Props including a snapping turtle shell, snake skin, bullfrog skeleton, raccoon fur, raccoon skull

Objectives:

After taking part in the program students will:

- Be aware of what a watershed is and where the Crab Meadow Watershed is
- Know what wildlife is
- Know what a habitat is and general characteristics of the pond habitat
- Be aware of why a watershed is important to people and animals
- Know pieces of information about local wildlife found in the pond habitat including the American snapping turtle, northern water snake, bullfrog and raccoon
- Have an idea of what they can do to help to protect the Crab Meadow Watershed and the pond habitat

Key Terms

Watershed, wildlife, habitat, pond, American snapping turtle, northern water snake, bullfrog, raccoon

Summary

The Crab Meadow Watershed Wildlife Pond program will be presented to students in a lecture format, with PowerPoint slides containing pictures, videos and sounds of the topics being discussed. As each species of wildlife is discussed a physical prop including

a snapping turtle shell, snake skin, bullfrog skeleton and raccoon fur will be passed to students.

Background

A watershed is an area from which all of the water drains into the same place. In the case of the Crab Meadow Watershed the water from the area drains into the Long Island Sound. The watershed is extremely important to both people and animals. Within the Crab Meadow Watershed there are a variety of habitats including the pond habitat. Local wildlife species found in the pond habitat that depend on the watershed for their survival include the American snapping turtle, northern water snake, bullfrog and raccoon. With responsible behaviors we will be able to protect the watershed and the wildlife species that live there long into the future.

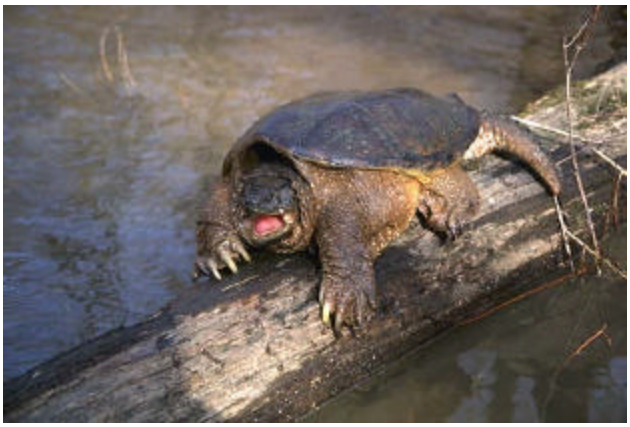
The Pond Habitat

- Can anyone tell me what a pond is?
    - A pond is a small body of water. Fuchs Pond is a man-made pond that was constructed in the early 1900's and was at one time a cranberry bog. The ground fed pond is now home to many different types of plants and wildlife in the CMW. Some of the plants that can be found in and around the pond include duckweed, common cattail and skunk cabbage.
- Can anyone tell me why the pond is important to people?
    - Recreation
    - Aesthetics
    - Fishing
- Can anyone tell me why the pond is important to animals?
    - Food
    - Shelter/Cover
    - Water

Wildlife in the ponds of the Crab Meadow Watershed

- Can anyone think of any species of wildlife that live here in the pond habitat of the Crab Meadow Watershed?
- Today we will talk about four species of wildlife that live right here in the pond habitat of the Crab Meadow Watershed.

Common Snapping Turtle



The American snapping turtle is a reptile with a dark green/brown shell with small projections at the rear of the shell, a long tail with scales and spikes on the top portion, and scaled legs. It is found in the freshwater ponds of the Crab Meadow Watershed. Like most turtles the snapping turtle's shell helps to protect it. (Pass turtle shell to students) Snapping turtles eat fish, dead plant and animal matter and occasionally small ducklings. The scavenging done by snapping turtles helps to keep their underwater environment clean. Every spring they climb on the shore and dig a hole in sandy or loose soil and bury up to 80 eggs. (Play video of Snapping Turtle) The eggs hatch between September and October. After hatching the young turtles make their way back to the water. Snapping turtles spend the late fall through the early spring dug into a mud bank or in a muskrat lodge hibernating. They are excellent swimmers and are able to swim two miles within a few hours. Snapping turtles live between 30 and 40 years in the wild but can live upwards of 60 years in captivity and can weigh more than 80 pounds. Though tolerant of humans, development has decreased the number of snapping turtles due to the destruction and fragmentation of their habitat. Many turtles are killed each year while attempting to cross heavily trafficked roads when on their way to lay their eggs.

Northern Water Snake

The northern water snake is a reptile with a dark brown back with bands from its neck to the base of its tail, and a cream colored stomach with black crescent shaped markings. The northern water snake can be found in and around the ponds of the Crab Meadow Watershed. Like many other snakes the northern water snake is able to swim. The snake is able to float because of the surface tension provided by the water. The snake moves in an s-shaped motion to glide across the surface of the water. (Play video of northern water snake swimming) The water snake hunts around the edges and in the shallows of ponds. The northern water snake eats small fish, frogs, salamanders, worms, birds and mammals. They help to control small rodent populations and also serve as a prey species for raptors, raccoons, foxes, opossums, snapping turtles and bullfrogs. They are able to project their bodies out of the water up to six feet to attack prey like birds and insects. Northern water snakes are constrictors meaning they wrap their bodies around their prey and squeeze the prey until it can no longer breath and eventually dies. The water snake then eats its prey whole. The water snake is active during the day and at night. They can reach up to 4.5 feet in length and shed their skin as they grow. (Pass snake skin to students)

Bullfrog

The bullfrog is an amphibian with a greenish brown back and a tan belly. The bullfrog gets its name from its deep croaks. (Play bullfrog call) The bullfrog can be found in the ponds of the Crab Meadow Watershed. As an amphibian the bullfrog goes through a metamorphosis, or change in the form of its body, from when its a young frog to when it becomes an adult. Female bullfrogs lay up to 20,000 eggs in the spring on the surface of the water. The eggs hatch in the late summer into tadpoles. During the tadpole stage of its life the frog has gills and a long tail. As the tadpole develops into an adult frog its gills are replaced by lungs, it grows four legs and its tail shrinks until it no longer exists. Bullfrog tadpoles take at least two years to transform into adult frogs. Bullfrogs are mostly active at night and hunt insects, fish, small rodents, snakes and frogs. Bullfrogs are prey species for birds, snakes, raccoons and foxes. Frogs are a good indicator of the health of the water body in which they live. A polluted body of water can lead to deformities, death and decreased populations. Bullfrogs can grow from three to eight inches in length. A male bullfrog's eardrum is twice as large as its eye while a female's eardrum is the same size as its eye. Bullfrogs can survive in the wild from eight to ten years. (Pass bullfrog skeleton to students)

Raccoon

Raccoons are mammals with dark gray fur, with rings of black and white extending down their tails and a black mask on their face surrounded by a white border. (Pass raccoon fur to students) They live in hollow trees near the ponds of the Crab Meadow Watershed. Raccoons are excellent climbers and swimmers and can run up to 15 miles per hour when on the ground. Raccoons can be seen prowling along the edges of ponds in the watershed or swimming in the ponds hunting for fish and frogs. Raccoons also eat birds, mice, insects, worms, fruits and nuts. Raccoons help to control pest populations and also eat carrion thereby helping to clean up decaying animals. They are known to dig through people's garbage when given the opportunity. Raccoons are primarily nocturnal though they can occasionally be seen foraging for food during the day. Raccoons have excellent vision for seeing at night and also have excellent hearing. (Pass raccoon skull to students) Raccoons do not hibernate but spend most of the winter sleeping. Female raccoons give birth to three to six baby raccoons or kits in the early spring. Raccoons generally live for approximately five years in the wild but can live up to 15 years and can weigh up to 40 pounds.

Field Component

The field component begins with a brief review of the Crab Meadow Watershed. What do students remember about the watershed? Why is it important? Then there will be an introduction to the habitat we will be exploring. What is the role of the pond in the Crab Meadow Watershed? Describe the pond. What animals did we discuss that are found in and around the pond habitat?

Begin the walk to the pond. Tell students what turtles can be found in this area. Provide visuals of each turtle that may be found. Show the students a snapping turtle shell. What do the turtles depend on the pond for? What do turtles eat? Allow students to sketch one of the turtles in their field notebooks. Ask them to draw the turtle as best they can and include any physical details they notice. Ask them to write down any notes that they remember about the turtle they drew and turtles in general.

Walk to the side of the freshwater wetland to the north of the pond. Search for snakes under the boards placed near the edge of the wetland. Discuss the northern water snake. Show a visual of the snake. Ask the students to draw the snake paying attention to the details of its body. Ask students to include descriptions of any physical and behavioral characteristics of the snake that they remember.

Walk to the pond. Play a bullfrog call. Listen for any responses and look for frogs. Show a visual of a bullfrog. Discuss the frog. Ask students to draw the frog and note any physical or behavioral characteristics that they remember.

Continue to walk along the edge of the pond stopping where raccoon tracks can be found in the mud. (Make paw prints) Show students a visual of a raccoon. Discuss why the raccoon tracks might be found on the edge of the pond. Ask students to sketch the paw print of the raccoon and the visual of the raccoon noting any physical or behavioral characteristics that they remember.

Distribute binoculars to pairs of students. Ask them to observe their surroundings and any wildlife that they may see. Ask students to sketch to the best of their ability a plant or wildlife that they see around them noting any characteristics of the organism that they see. Discuss with students the organisms they drew. Ask students to identify the organism if they can or if not to research and identify the organism upon their return to the classroom.

Fuchs Pond
Site of Pond Program Field Component

Marsh

Classroom Component

Materials and Preparation

Projector

Laptop

Screen

Extension cord and power strip

PowerPoint presentation

Props including osprey feather, diamondback terrapin shell, fiddler crab skeleton, snake skin, red fox fur, red fox skull

Objectives:

After taking part in the program students will:

- Be aware of what a watershed is and where the Crab Meadow Watershed is
- Know what wildlife is
- Know what a habitat is and general characteristics of the marsh habitat
- Be aware of why a watershed is important to people and animals
- Know pieces of information about local wildlife found in the marsh habitat including the osprey, diamondback terrapin, marsh fiddler crab and eastern garter snake
- Have an idea of what they can do to help to protect the Crab Meadow Watershed and the marsh habitat

Key Terms

Watershed, wildlife, habitat, marsh, osprey, diamondback terrapin, marsh fiddler crab, eastern garter snake

Summary

The Crab Meadow Watershed Wildlife Marsh program will be presented to students in a lecture format, with PowerPoint slides containing pictures, videos and sounds of the topics being discussed. As each species of wildlife is discussed a physical prop including

an osprey feather, a diamondback terrapin shell, a fiddler crab skeleton, and shedded snake skin will be passed to students.

Background

A watershed is an area from which all of the water drains into the same place. In the case of the Crab Meadow Watershed the water from the area eventually drains into the Long Island Sound. The watershed is extremely important to both people and animals. Within the Crab Meadow Watershed there are a variety of habitats including the marsh habitat. Local wildlife species found in the marsh habitat that depend on the watershed for their survival include the osprey, diamondback terrapin, marsh fiddler crab and eastern garter snake. With responsible behaviors we will be able to protect the watershed and the wildlife species that live there long into the future.

The Marsh Habitat

- Can anyone tell me what a marsh is?
    - A marsh is an area of low wetland that is periodically inundated, normally treeless and is characterized by certain grasses and sedges. The typical plants found in the Crab Meadow Marsh include saltmeadow cordgrass, smooth cordgrass, and bull rush.
- Can anyone tell me why the marsh is important to people?
    - Storm Buffer
    - Filters Water
    - Nursery
    - Aesthetics
    - Recreation
- Can anyone tell me why the marsh is important to animals?
    - Food
    - Shelter/Cover

Wildlife in the marsh of the Crab Meadow Watershed

- Can anyone think of any species of wildlife that live here in the marsh habitat of the Crab Meadow Watershed?
- Today we will talk about four species of wildlife that live right here in the marsh habitat of the Crab Meadow Watershed.

Osprey

Ospreys are birds with a white head and chest, and a brown back and wings. They are active during the day, which makes them diurnal. (Play osprey call) They live primarily on manmade osprey platforms, but can also be found nesting in large dead trees surrounding wetlands. They feed mainly on fish. They can be seen hovering between 30 and 100 feet above the surface of the water looking for fish. When ospreys spot their prey they dive into the water feet first and attempt to grab the fish with their long talons. Ospreys also have small spines on the bottom of their feet that help to hold slippery fish. After catching fish they fly with the fish's head facing forward to reduce air resistance. The fish is brought back to their nest or to a nearby perch before it is eaten. Ospreys lay approximately three eggs each year. They live up to 30 years in the wild. Like all other birds ospreys have feathers. Their feathers help to keep them warm and dry, and also help them to fly. (Pass feather to students) Ospreys became endangered in the 1950's due to DDT, a pesticide that they ingested through the fish they ate that caused the shell of the osprey's eggs to become fragile. The fragile eggs often broke, greatly reducing the number of ospreys being born. The banning of the use of DDT helped osprey populations to recover. A healthy clean watershed will support substantial fish populations that will provide food for the osprey.

Diamondback Terrapin

The diamondback terrapin is a reptile with a dark brown wedge shaped shell and white or gray head and feet with black spots. The diamondback terrapin gets its name from the distinctive circular rings on the top of its shell that resemble a diamond shape. Diamondback terrapins can be found in the saltwater marsh of the Crab Meadow Watershed. (Pass terrapin shell to students) They lay eight up to 18 eggs on land each spring. The eggs hatch after three to four months of being buried. Diamondback terrapins eat snails, crabs, plant shoots and occasionally fish. They are active during the day and bury themselves in the mud of the marsh at night. They can often be seen floating with just their nostrils above the surface of the water. Male terrapins grow to an average of 5 inches while females reach 7.5 inches. Diamondback terrapins live up to 40 years in the wild. During the late 1800's and the early 1900's diamondback terrapins were considered a delicacy by the upper class of society resulting in heavy terrapin harvesting and a great decrease of their population. When the demand for terrapin meat tapered off during the 1920's terrapin populations were able to recover. Diamondback terrapins are now listed as a vulnerable species in the State of New York, but are still harvested commercially and recreationally from August through April.

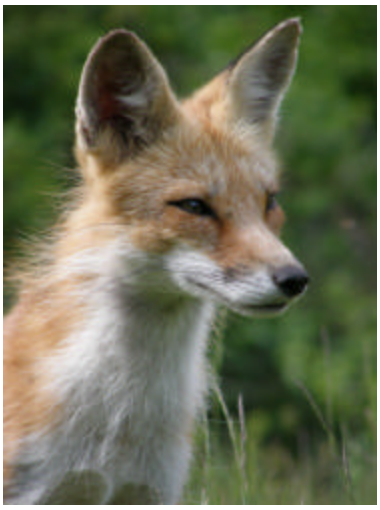
Marsh Fiddler Crab

Fiddler crabs are small crustaceans that are tan to brown in color. The color of their bodies' changes throughout the day getting darker as the tide goes out and lighter as the tide comes back in. (Pass fiddler crab skeleton to students) Fiddler crabs are found in the inlet to the Crab Meadow marsh. They get their name from the single large claw of the male, which resembles a fiddle. The claw of the marsh fiddler crab can grow up to one and a half inches in length. The large claw of the male is used to attract a mate and to defend his territory. (Play video of male fiddler crab) If a male fiddler loses his larger claw it will grow back during his next molt on the other side of his body and the lost claw will grow back as a smaller claw. Fiddler crabs dig burrows of three feet in length using their walking legs. The tunnels are slanted and have a small open area at the end of the tunnel where the crabs spend their time during high tide. At high tide the fiddler crab plugs the end of its tunnel with mud allowing the burrow to stay moist but not flood. Fiddler crabs are active during the day and the night depending on the tidal cycle. They eat algae, bacteria and decaying plant material. Like other crabs fiddlers have gills, but since they are primarily land crabs they are able to breathe air as long as their gills stay moist. When fiddler crabs mate females carry the eggs on their abdomen for two weeks until they are ready to hatch. When the eggs are ready to hatch the female travels to the water and releases several thousand of her babies into the water where they stay for a few weeks until they are large enough to return to the shore. Fiddler crabs live up to a year and a half in the wild.

Eastern Garter Snake

The eastern garter snake is a reptile that is dark brown to olive in color with three yellow stripes down its back and a yellow stomach. They live in wooded areas of the Crab Meadow Watershed near the edges of ponds and wetlands. They can be found hiding under logs and rocks and also in mammal burrows. Like most reptiles they have scales to protect their bodies and they shed their skin as they grow. (Pass shedded snake skin to students) Also like other reptiles the garter snake is cold blooded, meaning its body temperature is dependant on the air temperature around it, and because of the cold seasonal temperatures in our area it hibernates from the late fall through the early spring. The eastern garter snake is the first snake to come out of hibernation during the spring. Garter snakes are primarily active during the day but are also active during the night at times. Garter snakes eat frogs, toads, salamanders, fish, mice, insects, eggs, slugs and small snakes. They use their forked tongues to taste the air in order to locate their prey. They can release an unpleasant odor when they feel threatened. Garter snakes do not lay eggs like most snakes but instead give birth to up to 50 live baby snakes each 5 to 9 inches in length. Adult garter snakes reach four feet in length and live up to 10 years.

Red Fox



Red foxes are mammals with reddish brown fur, large pointed ears and black noses. Like other mammals they have fur, give birth to live young and are warm blooded. (Pass fur to students) They are nocturnal omnivores. Their chins and stomachs are white and they usually have a white tip at the point of their tail. Foxes use their tails for balance, to cover their bodies for warmth during cold weather and to communicate with other foxes. Adult red foxes have up to 12 different calls to communicate with other foxes. (Play fox call) Foxes are found in the wooded areas of the Crab Meadow Watershed and live underground in dens when raising young. Their diet consists of insects, rabbits, birds, rodents, amphibians, reptiles, berries and carrion. Foxes are important for the environment because they keep rodent and small mammal populations in check. Foxes reproduce once each year and have an average litter size of 5 kits or baby foxes each spring. They live an average of 3 years in the wild and up to 12 years in captivity. (Pass fox skull to students) Red Fox populations have decreased greatly due to development and destruction of their habitat. Red foxes make their presence known to other foxes through a scent left by urinating on trees and rocks.

Field Component

The field component begins at the gazebo with a review of the Crab Meadow Watershed followed by a brief discussion about the marsh habitat. What do the students remember about the watershed and the marsh in particular? Why are the watershed and marsh important?

What animals did we discuss that can be found in the marsh habitat?

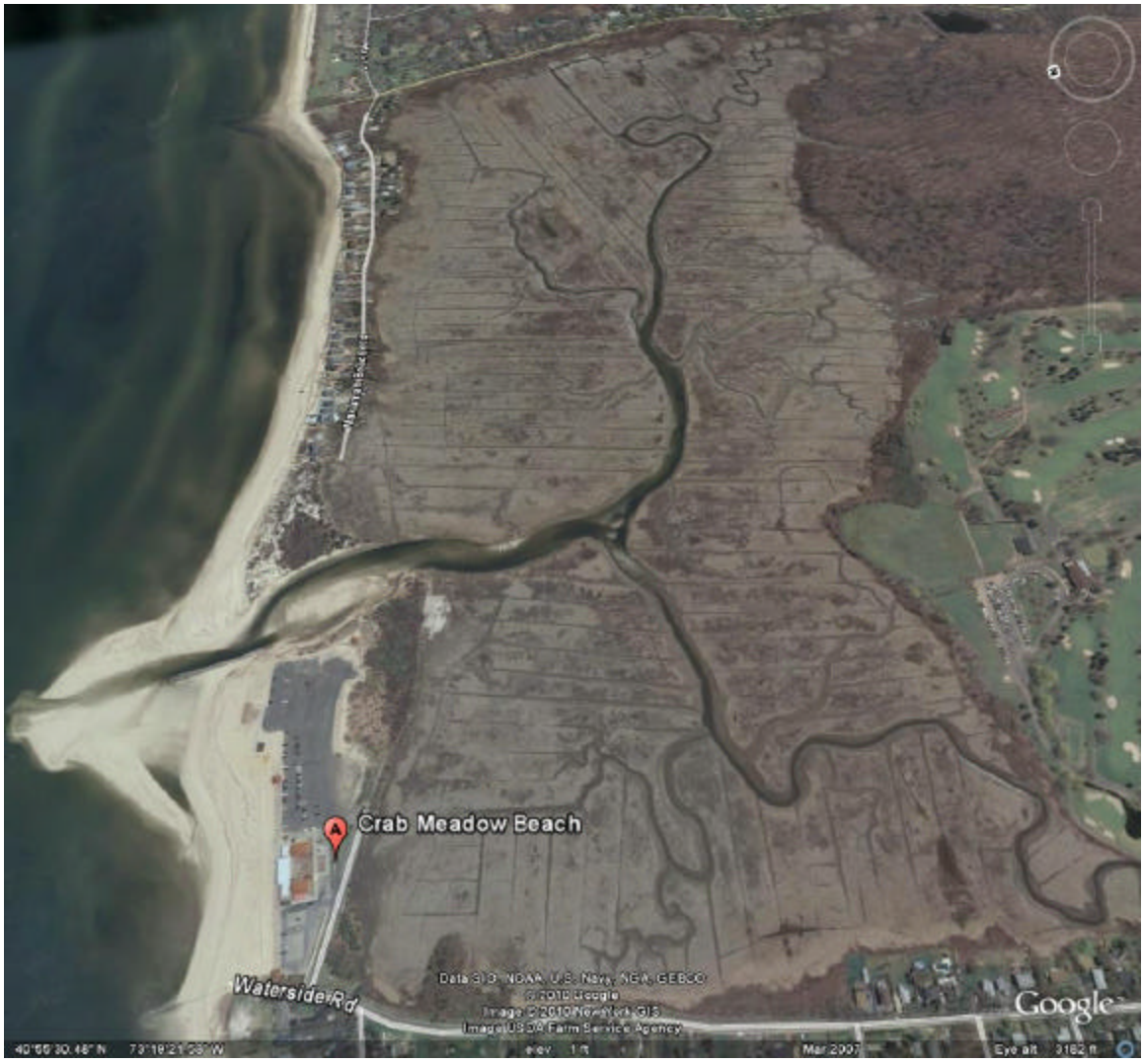
Begin the walk to the fiddler crab station. Stop near the fiddler crab holes and begin to discuss the crab. Catch a crab to show the students or have a dead crab as a prop. Describe the fiddler crabs life on the edge of the marsh. What do they eat? Allow the students to look closely at the fiddler crab and sketch the crab in their field notebooks noting any physical characteristics. Also ask the students to record any facts and behavioral characteristics that they remember about the crab.

Continue the walk to the second stop where the diamondback terrapin will be discussed. Provide a visual of the terrapin and a terrapin shell for the students to touch and view. Discuss the terrapin, what it eats and its life in the marsh. Ask the students to sketch the terrapin in their field notebooks noting any physical or behavioral characteristics.

Continue the walk to the area where the snake boards are located. Lift the boards to look for any snakes. If any snakes are found capture the snake and allow the students to observe it. Discuss with students what snakes may be found in this area. Provide visuals of each of the snakes. Ask the students to sketch the captured snake or any of the snakes shown to them in the pictures. Ask them to record and physical or behavioral characteristics in their field notebooks.

Walk to the next location and distribute binoculars for viewing of wildlife. Point out the osprey platforms located in the marsh. Discuss the osprey and its life in the marsh. If the ospreys are located nearby ask the students to observe them with their binoculars and

sketch them in their field notebooks. If the ospreys aren't visible ask the students to view other wildlife on the marsh and sketch an organism that they find interesting. Also ask the students to note physical and behavioral characteristics of the sketched organism that they notice or remember. If students are unable to identify the organism in the field ask them to research and identify it after returning to their classroom.



Jerome Ambro Wetlands Preserve
Site of Marsh Program Field Component

Beach

Classroom Component

Materials and Preparation

Projector

Laptop

Screen

Extension cord and power strip

PowerPoint presentation

Props including a plover feather, a horseshoe crab shell, a dried sea star and a lobster shell

Objectives:

After taking part in the program students will:

- Be aware of what a watershed is and where the Crab Meadow Watershed is
- Know what wildlife is
- Know what a habitat is and general characteristics of the beach habitat
- Be aware of why a watershed is important to people and animals
- Know pieces of information about local wildlife found in the beach habitat including the piping plover, horseshoe crab, common sea star and American lobster
- Have an idea of what they can do to help to protect the Crab Meadow Watershed and the beach habitat

Key Terms

Watershed, wildlife, habitat, beach, piping plover, horseshoe crab, common sea star, American lobster

Summary

The Crab Meadow Watershed Wildlife Beach program will be presented to students in a lecture format, with PowerPoint slides containing pictures, videos and sounds of the topics being discussed. As each species of wildlife is discussed a physical prop including

a piping plover feather, a horseshoe crab skeleton, a dried common sea star, and an American lobster skeleton will be passed to students.

Background

A watershed is an area from which all of the water drains into the same place. In the case of the Crab Meadow Watershed the water from the area eventually drains into the Long Island Sound. The watershed is extremely important to both people and animals. Within the Crab Meadow Watershed there are a variety of habitats including the beach habitat. Local wildlife species found in the beach habitat that depend on the watershed for their survival include the piping plover, horseshoe crab, common sea star and American lobster. With responsible behaviors we will be able to protect the watershed and the wildlife species that live there long into the future.

The Beach Habitat

- Can anyone tell me what a beach is?
    - A beach is an area of sand or pebbles extending along a shore. Beaches do not generally contain vegetation, thought the dunes found behind ocean beaches often contain plants.
- Can anyone tell me why the beach is important to people?
    - Storm Buffer
    - Recreation
    - Aesthetics
- Can anyone tell me why the beach is important to animals?
    - Food
    - Shelter/Cover

Wildlife in the beach of the Crab Meadow Watershed

- Can anyone think of any species of wildlife that live here in the beach habitat of the Crab Meadow Watershed?
- Today we will talk about four species of wildlife that live right here in the beach habitat of the Crab Meadow Watershed.

Piping Plover

The piping plover is a small shorebird with a sandy colored back, white belly and forehead, a black band on its chest, a black band between its eyes, yellow-orange legs, and an orange beak with a black tip. (Pass plover feather to students) The plover can be seen on the beach of the Crab Meadow Watershed. The piping plover arrives in March to nest and migrates south by September when the young are able to fly. The piping plover nests on the beach using shells, small stones and pieces of driftwood or grass to line its nest. Females lay up to four eggs each year. The piping plover is federally listed as a threatened species. Threatened means that the plover is likely to become endangered within the near future. Due to its status as threatened the United States Fish and Wildlife Service works with volunteers to build enclosures to protect the nests of the plovers to help to protect their eggs and young. (Play plover call) In order to protect their nests from predators piping plovers exhibit a broken wing display. If the plover feels threatened by a predator it will lead the predator away from its nest while pretending to have a broken wing, making it seem to be an easy target for the predator. Piping plovers can live between 10 to 15 years. Plovers run along the beach and eat beetles, crustaceans, worms and fly larvae.

Horseshoe Crab

Horseshoe Crabs have a dome shaped brown shell. Though crab is part of their name they are actually more closely related to spiders and scorpions. Horseshoe crabs get their name because their shell is shaped like the foot of a horse. (Pass horseshoe crab shell to students) Horseshoe crabs can be found in the Long Island Sound just off the shore of Crab Meadow Beach. In the spring horseshoe crabs come ashore to mate. The smaller males hold on to the back of the females as they come ashore. (Play video of crabs coming ashore) The female lays her eggs in the sand where they remain for two weeks until the tide reaches high enough to uncover the nest and carry the newly hatched horseshoe crabs into the water. When horseshoe crabs hatch they do not have a tail and spend their early days burrowed in the mud of the bottom of the Long Island Sound. They grow slowly and molt as they grow. Horseshoe crabs can live up to 20 years and can grow up to three feet in length from the front of their shell to the tip of their long pointed tail. The tail of the horseshoe crab is used to turn itself over if it finds itself on its back and not for defense. The horseshoe crab remains buried in the sand during the day and becomes active at night turning onto its back to swim. Horseshoe crabs have existed on the earth unchanged for approximately 450 million years. (Before dinosaurs) They eat worms and mollusks that they dig up from the floor of the Sound and occasionally fish and crustaceans. Horseshoe crab eggs are a valuable food source for shorebirds, sea turtles and fish.

Common Sea Star (Common Starfish)

The common sea star is orange or brown in color with five arms extending from a central disk. The sea star can be found in the shallow waters of the Long Island Sound around Crab Meadow Beach. (Pass dried sea star to students) The arms of the sea star are lined with rows of feet that have suckers on the end allowing the sea star to grip a surface tightly and also to wrestle its prey open. Sea stars usually eat mollusks like mussels, but also eat small crustaceans, and dead fish. When sea stars eat mussels and other shellfish they wrap their arms around the shell and use their suckers to open it just enough to insert their stomach inside the shell of their prey. Then they release digestive juices allowing the sea star to eat the prey within its own shell. Sea stars help to regulate shellfish populations and are a prey species of fish and birds. Sea stars can grow up to one foot in diameter and can live up to ten years. Sea star females can lay up to 2.5 million eggs. This is not the only way they regenerate though. If a portion of the sea star's body is separated from the rest, the sea star will not only grow that part of its body back, but as long as the piece that separated contains some of the central ring of the sea star, it will grow into an entire new sea star identical to the one that it was separated from.

American Lobster

The American lobster is a crustacean with a dark brown shell, two large claws, four pairs of walking legs and a long tail. The lobster can be found crawling and swimming along the floor of the Long Island Sound. The lobster's large claws are not identical. The smaller claw has small sharp teeth that are used to capture and cut up fish. The larger claw is used to crush shellfish. (Pass lobster skeleton to students) The lobster remains in a burrow in the sand or hidden under rocks during the day and walks along the Sound floor at night looking for food. The lobster will eat dead or live fish, eelgrass, seaweed, clams, mussels and other lobsters. The lobster molts its shell as it grows and stays hidden in its burrow while its new shell hardens. Lobsters normally weigh up to nine pounds and live up to 50 years. The largest lobster on record weighed 42 pounds and was estimated to be over 100 years old. (Show picture of largest lobster) Over the last decade the lobster population in the Long Island Sound has decreased drastically. Estimates put the decline in population at between 70 and 90 percent. A type of bacteria is thought to be the main culprit in the death of the lobsters, but pollution of the Sound is also thought to have played some role in the decrease.

Field Component

The beach field component begins under the picnic pavilion. There will be a review of the Crab Meadow Watershed, and why it is important. The beach habitat and its importance and characteristics will also be discussed. Students will be asked if they remember any of the animals that we discussed that can be found in the beach habitat and the Long Island Sound.

Begin with the discussion of the lobster. Talk about where it lives and what it eats. Describe to students the great drop in its population (70-90%) and that if we take better care of our watershed such a great population decrease would be less likely. Provide a lobster prop for students to observe and draw in their field notebooks. Also ask students to note any physical or behavioral characteristics of the lobster.

Next discuss the piping plover. Ask students where we expect to see the plover. Provide a visual of the plover for students to observe. Distribute binoculars to students for viewing of birds on the beach. If plovers are present ask students to focus on them. If not discuss whatever birds are present. If a variety of gulls are in the area tell students about the different types of gulls. Ask students to choose a bird on the beach and sketch it paying close attention to the details of its body. Ask students to record any notes about the physical or behavioral characteristics of the bird that they sketched and to identify it. Describe the methods that plovers use to protect their nests. Discuss the broken wing behavior but also the camouflage of their eggs. Lead students to a coned area where replica plover eggs are hidden. Ask the students to patrol the area and attempt to find the eggs.

After the egg hunt lead students onto the beach where the horseshoe crab will be discussed. Make sure to have a horseshoe crab shell available as a prop to be used when discussing the animal. Ask students to view it closely and sketch both an above and below view of the animal in their field notebooks. Ask students to record any additional behavioral or physical characteristics about the horseshoe crab that they found interesting.

Walk with the students to the waters edge and discuss the sea star. Provide the students with a dried sea star for viewing and handling. Ask students to closely sketch the sea star and record any physical or behavioral characteristics about it that they found interesting.

Tell students that we have only talked about a few of the many animals that can be found on the beach and in the Long Island Sound. Distribute nets to the students to explore the shallows and find what other animals are living near the beach. Any specimens collected should be placed in buckets filled with water located nearby on the beach. Discuss any specimens collected. Ask students to sketch and identify one of the collected organisms including a description of its physical and behavioral characteristics. If students are unable to identify the organism ask them to research and identify it upon return to the classroom. After the searching period is over and all specimens are discussed return whatever has been collected back into the water.

Finish by making clear that the Long Island Sound is the ending point for a majority of the water from the Crab Meadow Watershed and that it is crucial to protect the other habitats in the watershed in order to protect the Long Island Sound.

Crab Meadow Beach

Site of Beach Program Field Component

References:

Alsop, F.J. III. (2001). Birds of North America Eastern region. New York: D.K. Publishing, Inc.

American lobster. [Photograph]. Retrieved from http://latimesblogs.latimes.com/photos/uncategorized/2009/01/13/lobster.jpg

Behler, J., King F. (1979). National Audubon Society field guide to North American reptiles and amphibians. New York: Alfred A. Knopf, Inc.

Burke, R., Feinberg, J.A. (2006). *Amphibians and reptiles of Long Island, Staten Island and Manhattan.* Retrieved from http://people.hofstra.edu/Russell_L_Burke/HerpKey/

Chesapeake Bay Program. (2008). *Bay field guide*. Retrieved Nove,ber 15, 2010 from http://www.chesapeakebay.net/fiddler_crab.htm

Christopher, T., Farrand Jr., J., Limburg, P.R., Pistorius, A., Rice, J. (1991). *Nature in America You're a-to-z guide to our country's animals, plants, landforms and other natural features.* New York: The Reader's Digest Association, Inc.

Cogger, H. (Ed.). (1999). *The little guides reptiles & amphibians.* San Francisco: Fog City Press.

Common Sea Star. [Photograph]. Retrieved from http://www.scaquarium.org/Upload/animals/seastar.jpg

Davis, T. (2004). *Osprey*. [Photograph]. Retrieved from http://www.geometer.org/TT2004/Photos/images/Osprey.jpg

Diamondback terrapin. (1998). [Photograph]. Retrieved from http://pelotes.jea.com/AnimalFact/Reptile/Terrapin.jpg

E. Dale Joyner Nature Preserve at Pelotes Island. (2008). *Atlantic marsh fiddler crab*. Retrieved November 15, 2010 from http://pelotes.jea.com/fidcrab.htm

Eastern box turtle. Personal photograph by Derek Rogers. 2010.

Fairfax County Public Schools. (2010). *Study of Northern Virginia ecology.* Retrieved November 15, 2010 from http://www.fcps.edu/islandcreekes/ecology/eastern_garter_snake.htm

Flying squirrel. [Photograph]. Retrieved from http://extension.unh.edu/FHGEC/docs/Flysquir.htm

Garter snake. Personal photograph by Derek Rogers. 2010.

Horseshoe crab. [Photograph]. Retrieved from http://1.bp.blogspot.com/_aEwQL8PcsH0/SwwmRX_1UgI/AAAAAAAAAnM/gN6NXJuh7l0/s1600/070912180732_Horseshoe_Crab_Limulus_polpyhemus_LG.jpg

LeClere, J. *Milk snake*. [Photograph]. (2005). Retreived from http://www.herpnet.net/Iowa-Herpetology/images/stories/reptiles/snakes/Lampropeltis_milksnake/lampropeltis_eastern_milksnake.jpg

Michaels, P.A. (2005). *Bullfrog*. [Photograph]. Retrieved from http://greennature.com/gallery/frog-pictures/bullfrog.jpg

Minnesota. Department of Natural Resources. (2010). *Nature fact sheets brook trout.* Retrieved from http://www.dnr.state.mn.us/snapshots/fish/brooktrout.html

Northern water snake. Personal photograph by Chase Cammarota. 2010.

Piping plover. [Photograph]. Retrieved from http://mri.usd.edu/watertrail/FieldGuide/images/Birds/piping_plover_lrg.jpg

Pugh, D.E. (2006). *Brackish-water fiddler crab.* [Photograph]. Retrieved from http://www.dpughphoto.com/images/brackish-water%20fiddler%20crab%20ocracoke%2051106.JPG

Red fox. Personal photograph by Derek Rogers. 2010.

Red-tailed hawk. Personal photograph by Derek Rogers. 2010.

Snapping turtle. [Photograph]. Retrieved from http://mayo.personcounty.net/Wildlife%20Page/Snapping%20Turtle.htm

State University of New York College of Environmental Science and Forestry. (2003). *Snakes of New York*. Retrieved November 15, 2010 from http://www.esf.edu/pubprog/brochure/snakes/snakes.htm

Sterling, D. (1978). *The outer lands: A natural history guide to Cape Cod, Martha's Vineyard, Nantucket, Block Island and Long Island*. New York: W.W. Norton & Company Inc.

Sutton, A., Sutton, M. (1988). *The Audubon Society nature guides Eastern forests.* New York: Alfred A. Knopf, Inc.

U.S. Environmental Protection Agency. Watersheds. (2008). *What is a watershed?.* Retrieved from http://www.epa.gov/owow/watershed/what.html

United States Fish and Wildlife Service. (2000) *Piping plover critical habitat*. Retrieved November 15, 2010 from http://www.fws.gov/plover/q&a.html

University of Michigan Museum of Zoology. (2001). *Animal diversity web*. Retrieved November 25, 2010 from http://animaldiversity.ummz.umich.edu/site/accounts/information/Procyon_lotor.html