



## EASTERN SHORE OF VIRGINIA NATIONAL WILDLIFE REFUGE



This booklet is the combination of the original Junior Refuge Manager Booklet donated by the Chincoteague Natural History Association, new pages created by 2012 intern Matt Kneitel, and the 2009 edition created by: Eastern Shore of Virginia NWR interns Mary McClellan and Lindsay Abiouness and Girl Scout Troop 692:

|                |                 |
|----------------|-----------------|
| Alyssa Albert  | Ione Martin     |
| Emma Hemingway | Morgan Prothero |
| Hannah Berk    | Vienna Harvey   |

This 2012 edition was organized and created by Matt Kneitel, the 2012 Visitor Services summer intern.

All clip art pictures, tiger beetle, piping plover chick, and The Chesapeake Bay page pictures are from the 2009 edition.

Non-native invasive pictures were taken by Matt Kneitel.

Remaining animals and salt marsh picture are from: <http://digitalmedia.fws.gov/>  
Welcome page aerial picture credited to Ray Gefken.

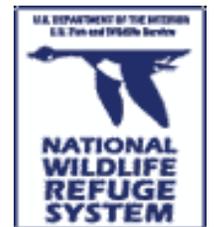
# JUNIOR REFUGE MANAGER ACTIVITY BOOKLET



Be a part of the real-world outdoor treasure hunting game on the Refuge by going to [www.geocaching.com](http://www.geocaching.com)

5003 Hallett Circle  
Cape Charles, VA 23310  
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[https://www.fws.gov/refuge/Eastern\\_Shore\\_of\\_Virginia/](https://www.fws.gov/refuge/Eastern_Shore_of_Virginia/)



## EASTERN SHORE OF VIRGINIA NATIONAL WILDLIFE REFUGE

# Welcome

Welcome to the Eastern Shore of Virginia National Wildlife Refuge. The Refuge is part of a national system of lands managed to ensure the future of wildlife and their habitats. We serve as one of the country's most valuable stopovers for migratory birds. If the refuge hadn't bought this land in 1984, you might be seeing a bunch of houses here, and many birds and butterflies would never make it to their wintering homes. Enjoy the non-human world surrounding you as you begin your journey toward becoming a Junior Refuge Manager.



This certifies that

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has successfully completed the  
**JUNIOR REFUGE MANAGER PROGRAM**  
at the  
**EASTERN SHORE OF VIRGINIA  
NATIONAL WILDLIFE REFUGE**



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Signed

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Date

# Native Americans

The natural resources of the Eastern Shore of Virginia filled many of the basic needs of daily life. The salty waters of the Chesapeake Bay were full of oysters, crabs, and fish. The Accomacks took aim with bows and arrows to hunt turkeys, deer, and other animals in the forest. They sharpened bones into fishing hooks and spear tips, and used grasses and weeds to weave nets.

The Accomacks grew things including beans, squash, and *maize* (corn). The most common way they used corn was to make bread. Women pounded the corn between two rocks breaking the kernels into small bits. This was how cornmeal was made.

**Circle all of the things you think the Native Americans used here: *\*\*Circle four of the pictures.\*\****



# Introduction

The Eastern Shore of Virginia National Wildlife Refuge manages 3,392 acres of forests, grasslands, salt marsh and beaches. The Refuge is home to a number of shorebirds, songbirds and other animals.

In the fall, the Refuge is a “truck-stop” for migrating birds and butterflies. They rest until wind and weather conditions are right and the birds are ready to cross the Chesapeake Bay.



**How  
a Jun-**

**to Become  
ior Ref-**

**uge Manager**

So, you want to become a Junior Refuge Manager? Well, it is not too hard. First of all, complete the activities in this book while you explore the visitor center and the nature trails. Then turn it in at the desk in the visitor center. The staff person will sign your book and give you a patch!

***\*\*If you are 6 or younger, then follow the directions and answer the questions in \*\* - \*\* only. Older kids should complete all of the questions to the best of their ability.\*\****

# What Is a Habitat?

A habitat is a place where an animal lives, finds food, defends itself from predators, finds a mate and reproduces. There are four main components to a habitat: food, water, shelter and space. A plant or animal needs all four of these things in order to remain healthy and to survive.

The Eastern Shore of Virginia is composed of four main types of habitat: the barrier islands along the Atlantic coast, salt marsh estuaries, wooded uplands and the open water of the Chesapeake Bay. Each of these habitats is important and provides a home or a temporary sanctuary for many birds and animals.

What things must an animal (including you!) have to survive? A healthy habitat provides all these things.

**\*\*Answer all four.\*\***

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_



# What you can do to help the Bay and Marsh!

1. Recycle.
  2. Don't litter.
  3. Conserve electricity and water.
  4. Carpool, take a bus, or bike to your destination.
  5. Try not to overwater, over-fertilize, or mow your lawn frequently.
  6. Plant trees and shrubs.
  7. Avoid using face washes with plastic beads
- in them. Not all of them dissolve and they can suffocate critters in the bay.



What are some other things you can do?

1. \*\* \_\_\_\_\_
2. \*\* \_\_\_\_\_
3. \_\_\_\_\_

**Ask someone at the front desk to share with you some of the ways the visitor center is "going green." Have them initial below. **\*\*Younger kids do not need to do this.\*\*****

\_\_\_\_\_

# Threats to the Bay and Marsh and Other Natural Areas

Match the threat to the picture.

**\*\*Match all four\*\***

- Overdevelopment
- Pollution
- Overfishing
- Global Warming



# Non-native Invasive Species

A non-native species is a species that does not naturally occur in a given area. Another term for a non-native species is “exotic.” An invasive species is a species that rapidly colonizes a habitat and grows fast or large enough to out-compete other species. This can lead to local extinctions or lower species diversity.



Some non-native plant species are considered invasive. Honeysuckle (above) and sweet fennel (right) can be found along the butterfly trail.

**Look for these species and circle the picture if you find them!**

**\*\*Younger children do not need to look for invasive species.\*\***



# Adopt a Habitat

Choose one of the four Eastern Shore of Virginia habitats (Chesapeake Bay, uplands, salt marsh or barrier islands). Look at the display for your chosen habitat and watch the video on the small screen within the display. Answer the four questions below and decide what you can do to help protect your adopted habitat.

1. Name two physical features which define this area (ex: trees, deep water, sandy beaches, etc.). **\*\*Name one instead of two.\*\***
2. Name three animals you might find in this habitat. **\*\*Name two instead of three.\*\***
3. List two benefits that this habitat provides for the environment, wildlife and/or humans (ex: clean water, food, etc.). **\*\*List one instead of two.**
4. Name one threat to this area (ex: pollution, development, erosion). **\*\*Both age groups should name one.\*\***

# Chesapeake Bay



Great Blue Heron

The Chesapeake Bay is 200 miles long and 100 feet deep in places. However, its average depth is only 21 feet.

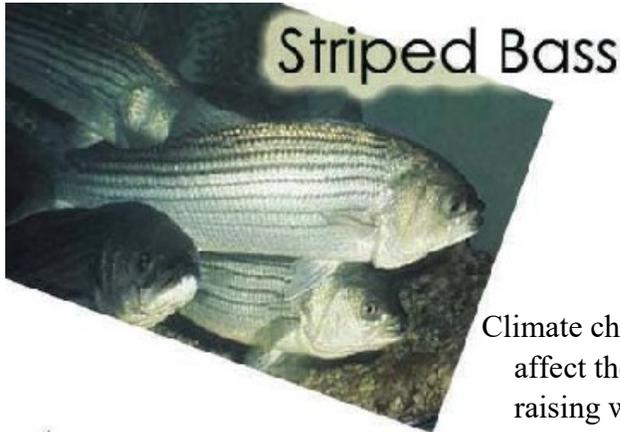
Dozens of species of crabs and shellfish and over 300 species of birds are found in or around the Chesapeake Bay. There are 350 species of fish and 16 species of underwater grass.



Osprey

# The Ches

# Habitat Connect Four

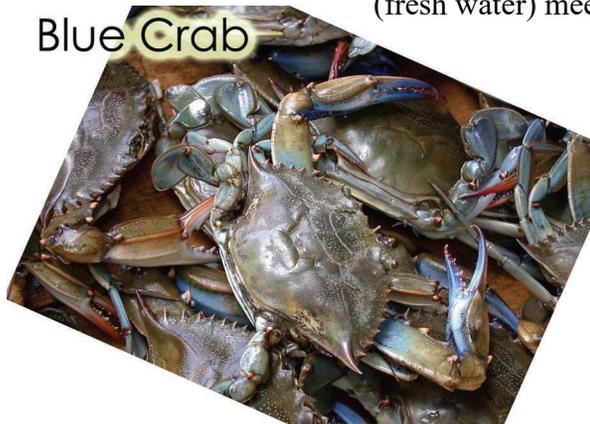


Climate change will affect the bay by raising water levels

that will cover marshes. Water will become warmer, and less dissolved oxygen is in warmer water. This means fewer fish will be able to live there. Combat climate change by reducing your carbon footprint. See this web site:

[www.zerofootprintkids.com/kids\\_home.aspx](http://www.zerofootprintkids.com/kids_home.aspx)

The Chesapeake Bay is the largest estuary in the United States. An estuary is where rivers (fresh water) meet the ocean (salt water).



As you explore the visitor center, find the plants and animals listed in the boxes below. Some are pictured, others are decoys or mounts, and some may be mentioned in writing. When you find one, jot down the letter which represents the habitat where that species can be found. You may stop when you connect four boxes across, down, or diagonally. You may also continue until you fill in the whole card if you want.

- C** Chesapeake Bay
- U** Uplands
- S** Salt marsh
- B** Barrier Islands



|                                    |                  |                   |                  |
|------------------------------------|------------------|-------------------|------------------|
| Green sea turtle                   | Woodcock         | Redhead duck      | Canada goose     |
| Submerged Aquatic Vegetation (SAV) | Hawksbill turtle | Flounder          | American kestrel |
| Oyster                             | Blue crab        | White-tailed deer | Striped bass     |
| Monarch butterfly                  | Piping plover    | Osprey            | Blue-winged teal |

# Endangered Species



Here on the Eastern Shore of Virginia National Wildlife Refuge we do our best to protect endangered species.

For instance, we set cages around Piping Plover (below) nests that keep the predators (like raccoons and gulls) out, and we close off beaches to humans for the benefit of the Northeastern Beach Tiger Beetle (above). These species became endangered because of people disturbing their nesting sites, crushing eggs with cars and scaring parents away from nests. It's up to us to make sure these species get the chance to flourish once again!



# The Big Gun

During World War II, when the Refuge was still used as an army base, the bunkers housed massive 16-inch guns. This means the opening of the barrel had a 16 inch diameter, which is almost 1.5 feet across! The gun was almost 70 feet long and weighed around 120 tons! The barrel shown here used to be on the USS Missouri, and is now on display here at the Refuge!



Walk under the bunker and notice the following changes:

**\*\*Answer all of these for both age groups\*\***

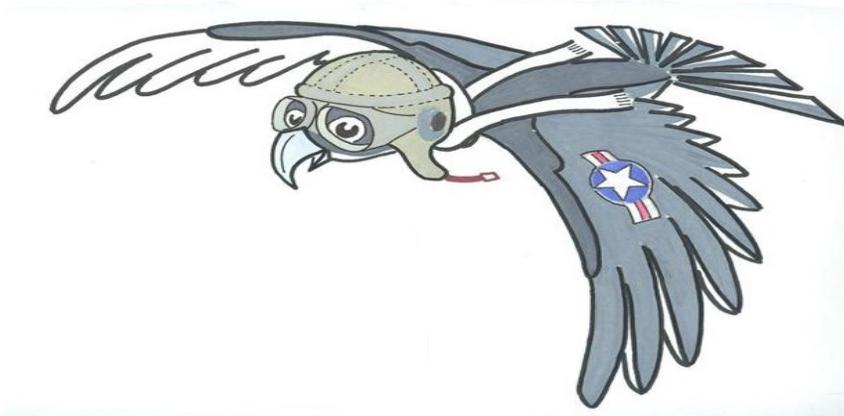
Did it get lighter or darker?

Did it get warmer or colder?

List any animals you see under the bunker:

# Life Before The Refuge

At the end of the Butterfly Trail, cross the road and begin on the Wildlife Trail. You will soon pass through a stone-like arch with dark mysterious rooms inside. The strategic location at the mouth of the Chesapeake Bay encouraged military uses of the area over the years. This is a bunker left over from World War II when, what is now Refuge land, was an army base called Fort John Custis, named after an important 18th century inhabitant of the area. The Fort was set up to protect naval bases and shipyards in Virginia Beach and Norfolk from attack. During that time, the bunker housed 16-inch guns and ammunition. If you want to find out what it holds now, just take a look. Keep your eyes open for birds and other cavernous-loving creatures! Fort John Custis became Cape Charles Air Force Station in 1950, and became a national wildlife refuge in 1984.



# Threatened and Endangered Species

When a species is extinct there are no more of them living anywhere on the planet. An endangered species is one that is in immediate danger of becoming extinct. A threatened species is one whose numbers are low or declining, but is not yet declared endangered. Almost all species of animals are protected to some degree by federal, state, or local laws.

Since the first settlers arrived in America, more than 500 species of plants and animals have become extinct. Today, nearly 800 plants and animals in the U.S. are listed as threatened or endangered. About 20 of those species are found at some sites in the Chesapeake Bay area.

The main threats to threatened and endangered species are: water, land and air pollution; poisons such as pesticides; and introduced species of plants and animals which compete with native species for food, water, shelter and space. However, loss of habitat is the major cause of plants and animals becoming extinct. As the human population increases, more natural resources are needed and more land is cleared for the building of homes, shopping centers, roads, and other artificial structures.



Leatherback Sea Turtle



Delmarva Peninsula Fox Squirrel

# Monarch Butterflies

Based on what you have learned, where do you think the monarchs are right now? **\*\*Both age groups should answer this question.\*\***

What are the four stages of a monarch's life? **\*\*List #2 and #4\*\***

Name two plants that monarchs depend on for nutrition.  
**\*\*Name just one.\*\***

On the map below, draw arrows to show the movement of each of the four generations of monarchs.



**\*\*You do not need to do the map drawing\*\***

# Scavenger Hunt

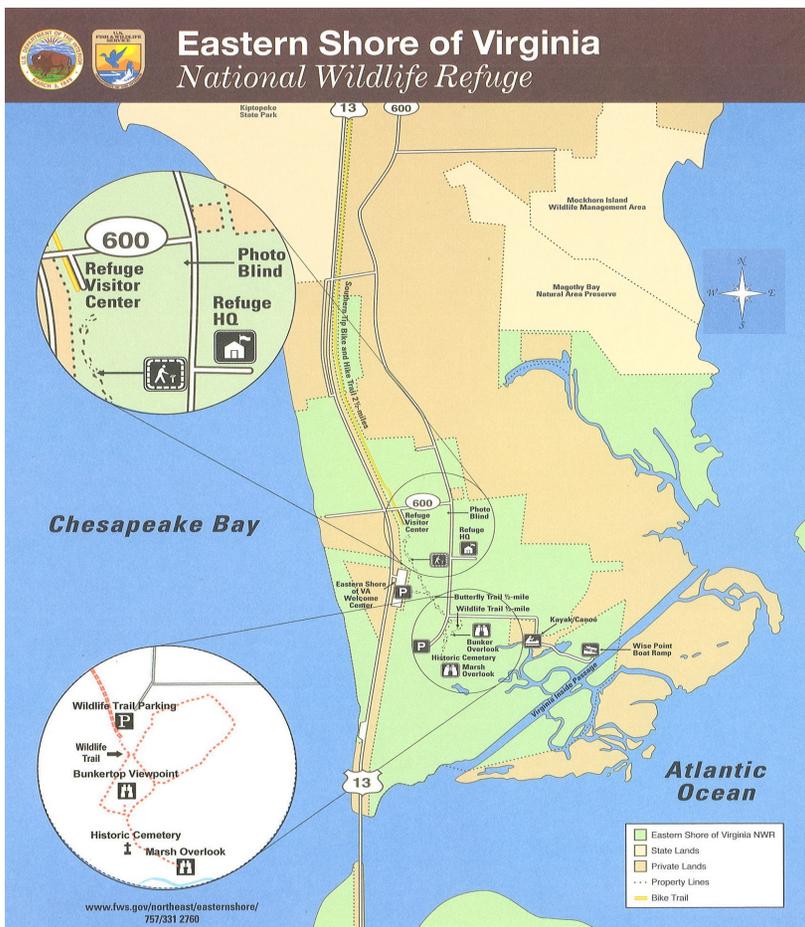
|            |
|------------|
| Sounds     |
| Salt marsh |
| Insects    |

# Take a Hike

When you are done exploring the visitor center, go out and enjoy the Refuge nature trails. There are three walking trails, including the butterfly trail and the wildlife trail.

The butterfly trail is a 1/2-mile long mowed-grass trail. Along this trail you will see a wide variety of native plants, as well as butterflies, insects, birds and possibly a rabbit or deer.

The wildlife trail is 1/2-mile long and loops through mixed hardwood forest and past an old grave site to a salt marsh overlook. You can also walk under or to the top of a World War II bunker. From the top you get a nice view of the Refuge, the barrier islands and the Atlantic Ocean.



You can get a full sized map at the front desk.



## Rules for the Trails



1. Don't bother the wildlife and the wildlife won't bother you. Except ticks - watch out for them! Check your body and hair afterwards.
2. Do not pick the flowers or other plants.
3. Take only pictures leave only footprints!
4. Stay on the trails; no bushwhacking.
5. All pets must be on a leash.
6. No littering. Carry out your own trash



# Scavenger Hunt

As you walk along the trails and the marsh overlook, look or listen for the following categories. Describe or draw 3 of the observations in the boxes below. **\*\*Instead of three, do 1 or 2.**

Birds

Plants

# How Many?

Walk around the visitor center. Look at the walls, the displays and the touch tables. See how many pictures, models or specimens you can find of the following species found in Virginia. **\*\*Look for two species instead of all three.\*\***



Brown pelican \_\_\_\_\_



Piping plover \_\_\_\_\_



Turtles \_\_\_\_\_