

THE COASTAL CONNECTION: Migratory Birds of Virginia

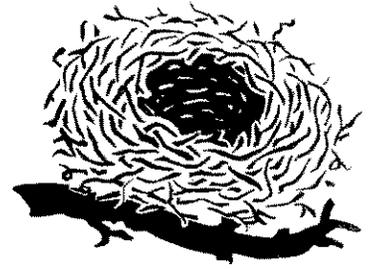
A Curriculum Supplement for Virginia Educators

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LESSON 1:

Migration Connection: The Atlantic's Finest Reststop



Purpose:

To map the fall migratory path of neotropical migratory birds.

Concepts:

- ◆ Neotropical migratory birds spend breeding months in the forests of North America and winter months in tropical communities.
- ◆ Neotropical migratory birds follow and depend on specific routes during migration.
- ◆ Coastal Virginia is a key staging area and stopover site for neotropical migratory birds of northeastern United States and Canada.

Background Information:

It all begins when the days get shorter and the nights get cooler. Something signals millions of birds in the cooler climates of North America that it is time to leave their summer breeding grounds and head to warmer latitudes. Late July to mid-August signals the beginning of the fall migration for the neotropical migratory birds. Birds follow the East Coast south until they begin to bottleneck at the southern tip of the Delmarva Peninsula in Virginia. The Eastern Shore at the mouth of the Chesapeake Bay becomes a staging area for this great event.

Neotropical migratory birds are those birds which breed and nest in North America and spend winter months in the tropical communities of the Caribbean, Mexico, Central America, and South America. During the spring and summer months, birds fill the North American forests with their songs, and shore birds flock to the coastal areas of the far north. All of these species spend the summer months busily nesting and raising young. About 75% of the birds nesting in North American forests are neotropical migrants.

As summer draws to a close, these birds begin to eat ravenously to increase their fat stores, by as much as 50%. This is necessary for the long flight they face in the coming weeks. However, it will not be enough to sustain the birds. They must make stop-overs along the way. The Delmarva Peninsula in Virginia offers food and shelter for the travelers.

The migrants will follow the Atlantic coastline and inland mountain ranges to their tropical destinations. The hawks will follow their prey, the songbirds, to the tropical forests. (Note: Some migratory birds, such as ospreys, travel only as far as the coastal wetlands of Virginia and the temperate southern United States.)

As warm weather returns to North America and Virginia, the migratory birds return to their summer homes where they will rear their young until it is time again to head south. The migration connection thus continues as it has for thousands of years.

Getting Ready:

- ☞ Discuss how we get ready for a trip. What types of needs must we consider in order to reach our destination?
- ☞ Make copies of the map worksheet and copies of the migration directions to distribute to each student or student group.
- ☞ Locate and mark the Delmarva Peninsula, the Eastern Shore of Virginia, Mexico, Central America, and South America on a map.
- ☞ Ask students, "What do the rainforests of Central America and the coast of Virginia

Materials Needed:

- N. & S. America Map
- Migration Directions
- World Atlases
- Bird Field Guides

Evaluation:

Have students use a bird field guide to locate the summer and winter range on an atlas of at least three neotropical migratory birds of Virginia.

have in common?" [Both offer habitats for many of the same birds. They have the resources necessary to support the needs of neotropical migrants.]

Procedure:

1. Give each student a map worksheet and ruler. Give each student or group the migration directions and an atlas.
2. Instruct each student to follow the migration directions and track the migratory paths of all four birds. Students should mark points on the map worksheet and connect the dots, using a different color for each bird.
3. Choose one of the migratory routes and measure its total distance. Where is Virginia in the trip? [Consider the fact that the routes begin further north and run through Virginia; emphasize that Virginia is critical to the overall migratory corridor.]
4. Discuss the migratory routes and tropical destinations of these birds. Consider the impact of habitat destruction along key stop-over points and in winter homes in the tropical forests.
 - ◆ What happens if a bird finds no food or resting places at a needed stop-over like the Eastern Shore of Virginia? [Birds who cannot find enough food may perish or reach their destinations too weak to thrive or reproduce.]
 - ◆ What happens when birds who are used to specific areas return to find them cut down or disturbed? [They have no where to live because other areas are already occupied by birds.]

Extensions:

Calculate the number of miles per night a bird may fly during migration. Use the measurement taken above from Virginia's Eastern Shore to the tropics to determine student calculations. Birds fly at an average 20 miles per hour and may take up to three weeks to complete migration. Remember that this average is somewhat misleading because birds will sometimes rest for a night, stop for longer than a day to feed, or fly non-stop over water.

Migration Directions

1. Scarlet Tanager -

The Scarlet Tanager eats during the day and migrates at night. Head from northern New Jersey along the Delaware River (A) toward Wilmington, Delaware. Fly over the northern Delmarva Peninsula to Kent Island (B), just east of the Maryland capital. Continue south along the Eastern Shore of the Chesapeake Bay to Cape Charles, Virginia (C). Fly over the southern Chesapeake Bay southwest to Greensboro, North Carolina (D). Stay west of Savannah, Georgia and cross the Okefenokee Swamp (E). Continue south over Florida to the Gulf of Mexico and pass to the west of St. Petersburg, Florida (F). Head south past the capital of Cuba (G) and rest on the Isla de la Juventud (H). Cross the Caribbean Sea to Panama (I). Go the final leg to Columbia and spend the winter months in the jungles west of the Cauca River (J).

2. Yellow-billed Cuckoo -

The Yellow-billed Cuckoo eats during the day and migrates at night. Head south over the Delaware Bay toward the capital of Delaware (A). Follow the Delmarva Peninsula (B) south and cross the southern Chesapeake Bay to the capital of Virginia (C). Continue south to Cape Fear, North Carolina (D). Follow the coastline to Savannah, Georgia (E), and on to Jacksonville, Florida (F). Follow the Florida coastline to Miami (G) and over the Florida Straits to Guantánamo, Cuba (H). Cross the Caribbean Sea to the coast of Venezuela (I). Spend the winter in the rainforest north of the Negro River in the Venezuelan state of Amazonas (J).

3. Broad-winged Hawk -

The Broad-winged Hawk is common to woodlands and migrates in soaring flocks on warm air thermals, or kettles. It migrates during the day, feeding on large insects, mice, and small reptiles, and rests during the night. Fly south from the woodlands near Philadelphia, Pennsylvania (A) down the edge of the Delaware River and on to the wooded areas northwest of Chincoteague Bay (B). Follow the Delmarva Peninsula south to Kiptopeke, Virginia (C). Follow the James River past Richmond, Virginia to the Allegheny Mountains (D). Then continue south along the Cumberland Plateau (E) through Tennessee and Alabama. Pass by the capital of Mississippi (F) and cross the Mississippi River into Louisiana. Fly over Alexandria, Louisiana (G), on the Red River and into Texas. Follow the Sierra Mountains southward toward Monterrey, Mexico (H). Fly past Puebla (I) and southeast toward the capital of Nicaragua (J). Winter west of the Central American mountain chain where prey is plentiful in the seasonal dry forest of the northwestern Nicaragua.

4. Eastern Kingbird -

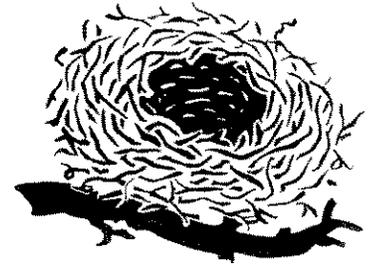
The eastern Kingbird, like other songbirds, feeds and rests during the day and migrates at night. Follow the Hudson River south out of the state of New York along the Atlantic coast to Cape May, New Jersey (A). Fly over Delaware Bay to Salisbury, Maryland (B) and on to Accomac, Virginia (B). Continue south and rest at Kiptopeke State Park (C). Cross over the southern Chesapeake Bay and continue south along the coast to West Palm Beach, Florida (D). Fly across southern Florida over Florida Bay (E) to the capital of Cuba (F). Continue over the Yucatan Channel (G) to Ciudad Chetumal (H) and down through Central America to the capital of Colombia (I). Fly to Iquitos (J) in the state of Loreto in northern Peru. Spend winter in the forests and fields west of the Amazon River.

Geography Is for the Birds

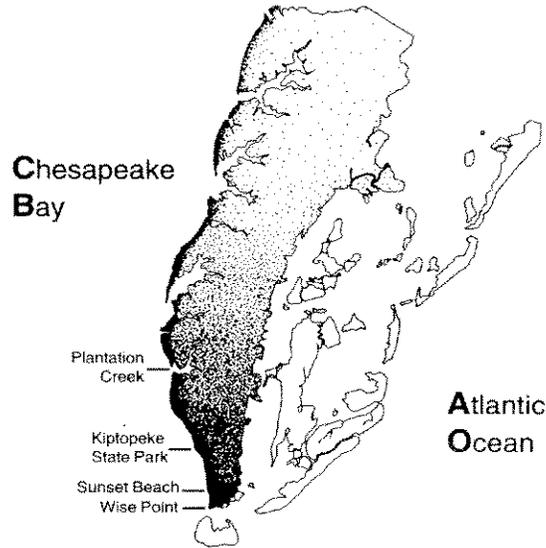
MAP WORKSHEET



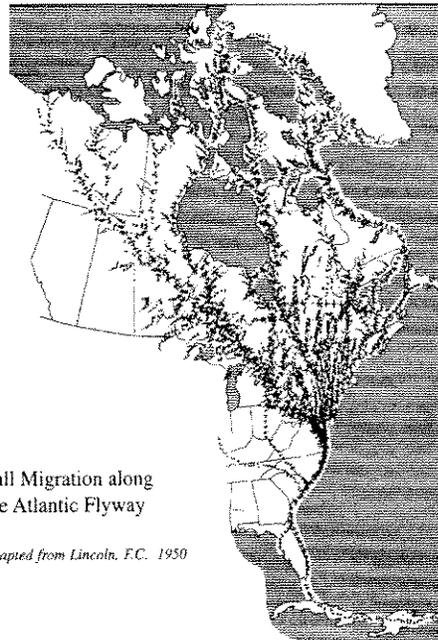
Migration Routes



Northampton County



On the mainland, the funneling effect of migration was documented in a two-year study a part of the Special Area Management Plan funded by the Virginia Coastal Program. Migratory birds were found to be most concentrated within the lower 6 miles of the peninsula and within approximately 200 yards of the Bay shoreline. Note: Although not depicted in the illustration, birds do use the eastern shoreline also. Illustration by Marian Urbi Watts.



Northampton County supports one of the largest concentrations of landbirds along the Atlantic Coast and is an important link in a much longer chain of habitats stretching from Canada to South America.

LESSON 2:

Coastal Corridor Habitat Dash

Purpose:

To examine the importance of habitat to Virginia's migratory birds.

Concepts:

- ◆ Good habitat in summer and winter areas, as well as along migratory pathways, is critical to the existence of neotropical migratory birds.
- ◆ Coastal Virginia has a variety of habitats desirable to many species of neotropical migratory birds during fall migration.
- ◆ Migratory birds have special habitat needs, and species vary with specific habitats in the coastal corridor of Virginia.

Background Information:

It never fails. Migratory birds come to Virginia every fall. The marshes that dot the edge of the Chesapeake Bay fill with shore birds migrating from the far north. Temperate migrants come here from the northern forests of the U.S. and Canada to remain for the winter, some replacing the same species in Virginia that headed to the warmer areas of the southern United States. Then there are the long distance travelers, the neotropical migratory birds that pass through the Eastern Shore of Virginia on their journey to winter feeding areas in Mexico, the Caribbean, and Central and South America. All of these migrants take advantage of the rich supply of insects and native fruits found on the Eastern Shore. Good habitat in both the summer and winter areas and along the migratory pathways is what makes migration possible.

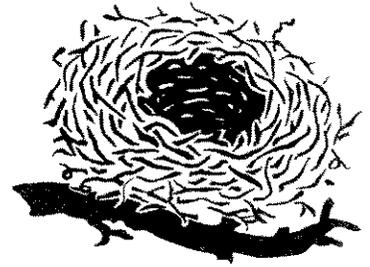
Why do birds come to Virginia? What causes the birds to concentrate along the Virginia coastline, especially at the southern tip of the Eastern Shore? Barriers like large bodies of water act as obstacles for birds migrating down the coast. The Chesapeake Bay is one of these obstacles as is the Atlantic Ocean. Birds follow the Delmarva Peninsula south, like a coastal corridor, surrounded by water. It is here, along the Eastern Shore and its barrier islands that they rest and restore the body fat that was lost during the first leg of their migration. Thus, autumn brings the birds in huge concentrations to the southern tip of Virginia's Eastern Shore where they find a rich abundance of food and shelter.

Coastal forests and scrub, along with the barrier islands, provide habitat for the greatest abundance and variety of birds. As early as late July and through mid-October, neotropical migrants pass through the "coastal corridor" of Virginia in search of insects and native fruits. Eastern Kingbirds and, later, Gray Catbirds are only two of the species that abound in the highly preferred coastal scrub habitat. The flashy American Redstart is an abundant species that uses pine, oak, and mixed hardwood forests. Warbler species literally fill the forests along with the bird watchers who come to witness the spectacle.

By the time the neotropical migrants leave, the temperate migrants such as American Robin and Kinglets arrive on the Eastern Shore in time to enjoy dogwood, wax myrtle, and poison ivy berries. Sparrows and finches gorge themselves on the grass and weed seeds.

Traveling coincidentally with both waves of migrants are raptors, the birds of prey. These include the Bald Eagle, Peregrine Falcon, Merlin, and the hawks who migrate through the coastal corridor throughout the fall. The American Kestrel arrives in the early part of the season to feed on large grasshoppers along open roadways. Merlins, Peregrine Falcons, and Sharp-shinned, and Cooper's hawks come next, feeding on the smaller migratory birds in the forests and scrub of the peninsula. Red-tailed hawks are the last to arrive, taking advantage of the small mammals left vulnerable from the die back of summer plants.

The Eastern Shore is the ideal coastal corridor between summering and wintering areas for migratory birds. Here exist a variety of forested and scrub areas, dotted with marshes and filled with native foods and plenty of shelter — ideal conditions for literally millions of birds.



Materials Needed:

- Paper plates representing: 1. coastal corridor habitat - deciduous forests (D), coniferous forests (C), mixed forests (M), and scrub (S); 2. summer habitat; 3. winter habitat. Use one plate for every three students.
- Bird name tag for every student, representing the Virginia migratory birds. See "copycat" sheet. Include 1 Sharp-shinned Hawk, 1 Peregrine Falcon, and one or more of the remaining birds.
- One or two baggies per songbird filled with food (e.g. peanuts). Fill some 1/4 full, half-full, mostly full, and leave some empty or sparsely filled.
- Coastal habitat posters. (These need to be created: Photo quality of a coniferous forest, deciduous forest, a mixed forest, scrub, and a salt marsh.)
- Bird field guide, such as *Peterson's Field Guide to the Birds of Eastern North America*.

Evaluation:

Create a project to share information about one species of migratory bird and its year-round habitat needs. Possible project ideas include: a display board, an oral report, a written report, a poster, a fictional story, a painting or poem.

Getting Ready:

- ☞ Set up a large playing area or “coastal corridor” designating North, South, East, and West. Place the “habitats” (paper plates) in the “coastal corridor” as described in Materials Needed.
- ☞ Have students discuss the factors that may influence birds during migration.
- ☞ Make a list of these influences. Classify them as positive factors (those that help the birds) and negative factors (those that harm or stress the birds).
- ☞ Discuss the basic components of habitat: food, water, shelter, and space. Do all species have the same basic needs?
- ☞ Use the habitat posters to discuss how these four components might be provided in each of the coastal corridor of Virginia habitats. ♦ What types of food are available? ♦ What kind of shelter is available? ♦ Is water available? ♦ Why are these things important to migratory birds? Let’s find out.

Procedure:

1. The day before (or several days ahead) have each student choose a bird name tag. Have them research the habitat needs of their bird to be prepared for their Coastal Corridor Dash. Identify the habitat below the bird’s name with letters that represent the type(s) of habitat best suited for that bird. For example, the Yellow-rumped Warbler would most likely find suitable habitat in a coastal scrub.
On the day of the “dash” have each student wear their bird name tag and line up on one end of the playing field (summer homes/ nesting areas). The goal is to “fly” through the coastal corridor along Virginia’s coast on their way to their winter feeding areas. The teacher must act as the director of the wind and use a flag to point in the direction that the wind is blowing. Students can “fly” only when the teacher is pointing South or Southeast. (Birds take advantage of the winds to save energy while migrating during their long journey.)
2. Explain to the students that they are birds preparing for migration. They are about to leave their summer homes and take a long journey south. In order to complete the trip they must eat lots of food for energy, they must rest, and they must not get eaten themselves. This means they must find suitable habitat that meets the specific needs of their bird. The paper plates represent coastal habitats. “Birds” can only rest and feed in habitats suitable for their species. Each student songbird can only pick up one bag per stop.
3. The leader calls “FLY!” and the “birds” begin their journey. Remind them that they can only fly in one direction to reach their winter home. At the same time, the two hawks are trying to “eat” the songbirds by tagging “flyers.” Flyers are safe only if they reach a suitable habitat at the winter feeding grounds. Students can only move to the next stop when the teacher points in the appropriate direction for favorable winds.
4. Students must have one foot on a paper plate in order to continue their journey. If they cannot get their foot on a paper plate, are tagged, or run out of food that means they have not found any suitable habitat. They “die” and move to the sidelines until the next round.
5. The round continues until all birds have either made their way to their winter grounds or have “died” on the journey. If there is no loss of habitat then the birds will have a successful migration to their winter homes. Here they will feed and return to their summer breeding habitats in the northern U.S. and Canada.
 - ♦ Record the number of birds who are able to return to their summer home.
6. Round 2 begins with students preparing to pass through the coastal corridor on their second journey to their winter feeding areas. Tell them that development and pollution have made certain habitats unsuitable for birds.
 - ♦ Remove some of the plates (habitat) from the coastal corridor and from the winter area.
7. Allow students to play at least three times.
 - ♦ Correlate the number of birds returning to their summer homes with the availability of habitat along the coastal corridor and in their winter areas. Graph the results.

Discussion: What important roles do coastal areas play in bird migration? What other factors contribute to successful bird migration?

Extensions:

- ♦ Use field guides to research food sources and winter habitat of the birds named in the Coastal Corridor Dash. Visit a local forest to explore in detail the habitat of the “coastal corridor.” Read and discuss the story, *Flute’s Journey: The Life of a Wood Thrush*, by Lynne Cherry.
- ♦ Visit Kiptopeke State Park, the Eastern Shore of Virginia’s National Wildlife Refuge, or Chincoteague National Wildlife Refuge. Explore the habitat at these places and visit their excellent educational interpretive displays.

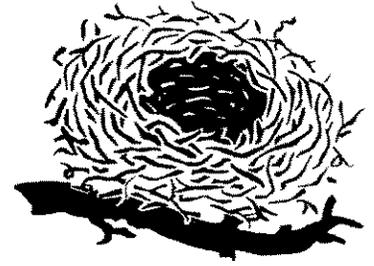
Note: Adapted from the activity MIGRATION HEADACHE in the Project WILD Aquatic Education Activity Guide.

sharp-shinned hawk (all)	peregrine falcon (all)
black and white warbler (c, d, m)	pine warbler (c)
yellow-rumped warbler (s)	gray catbird (s)
eastern kingbird (s)	eastern wood- peewee (d)

white-eyed vireo (s)	red-eyed vireo (d,m)
yellow-billed cuckoo (d,m)	American redstart (c, d, m)
ruby crowned kinglet (c)	scarlet tanager (s, c, d, m)

LESSON 3:

Magnificent Migrants



Purpose:

To demonstrate how different beaks are adapted for getting different foods and to evaluate the importance of adaptations to migration.

Concepts:

◆ Neotropical migratory birds are specially adapted for their unique lifestyle. Adaptations enable birds to survive in their individual habitats as they move from one place to another.

Background Information:

Visit the Eastern Shore of Virginia in the fall and you will witness millions of birds of all colors, shapes and sizes. You might see the yellow breast of the Pine Warbler flitting through the pine trees; or hear the “meow” of the Grey Catbird in the scrub. You might even see a sparrow perched delicately on the tip of a blade of marsh grass or an Osprey diving for a fish dinner.

Why are so many different types of birds found in basically the same habitat? If all the birds were the same, ate the same foods, found shelter in the same places, and did things the same way then they all would be competing for the same resources in a habitat. Instead, birds fill different **niches** or jobs in their habitat. Neotropical migratory songbirds feed mainly on insects or fruit, other migrant birds may eat seeds, and still others, including raptors or “birds of prey” may prey on small mammals. Birds like the Whip-poor-will and the Ovenbird live on the forest floor, other like the Common Yellow-throat live in the shrubs of the understory, and some, like the raptors, spend much of their time above the tree canopy. Owls, Nighthawks, and other nocturnal birds feed at night while others feed in the daylight hours. These birds have adapted to fill a specific niche within their habitat and consequently, in most cases, have increased the species chance for survival.

Adaptation by a species is their process of making physical or behavioral adjustments based on the demands or conditions of the environment. Adaptation takes places slowly, over many generations. One example is the feather design of owls. The edge of an owl's flight feathers are serrated, which scientists believe allow the bird to fly silently, an advantage when flying through the forest at night in search of small mammals. This adaptation may have occurred initially chance, when many years ago an owlet hatched with serrated feathers. Flying silently at night while hunting for food is an adaptation that helped the owl to survive in its habitat.

One of the best ways to determine how birds have adapted to their habitat is to look closely at their beaks. It would be extremely difficult for a hawk to eat insects from the bark of a tree, or for a woodpecker to catch and eat a mouse. Each bird has a specially designed beak adapted for obtaining and eating certain foods.

Migration is a behavioral adaptation some birds have made to their environment in order to assure the success of their species. For birds nesting in northern climates, the food supply decreases with winter dormancy and frigid temperatures. By flying south to the warmer climates of the tropics, birds increase the likelihood of finding enough food to eat and in turn increase their chances for survival.

Materials Needed:

- Assorted art materials and supplies
- “Copycat” page
- Tall, thin flower vase filled with water; eyedropper or straw; envelop or small fishnet
- Large sauce pan; dry oatmeal; Gummy worms; chopsticks; nutcracker and strainer
- Walnuts; tongs and chopsticks
- Popcorn or tiny marshmallows; envelope or small fishnet; forceps or tweezers
- Rice and a small log

Evaluation:

Create a portfolio that illustrates at least 5 bird adaptations and their advantages.

Note: Adapted from Ranger Rick's Nature Scope, BIRDS, BIRDS, BIRDS! activity: “Fill the Bill” and Project WILD's “Adaptation Artistry.”

Getting Ready:

Discuss adaptation and its advantages for migratory birds. Discuss and view pictures of some of the different beak styles and how they help birds to survive. Set up 5 stations, each with a different type of "food" that fits a different beak style and three different tools. Have available various art materials and supplies.

Station Set-up:

Station #1 Ruby-throated Hummingbird

Water in a tall, thin vase to represent nectar in a flower.

Tools: eyedropper or straw
envelope or small fishnet
large scoop or slotted spoon

Station 2# Clapper Rail

Large saucepan filled with dry oatmeal & Gummy worms, representing worms buried in mud.

Tools: chop sticks
nutcracker
strainer

Station #3 Northern Cardinal

Whole walnuts or other nuts to represent seeds with hard coverings.

Tools: nutcracker or pliers
tongs
chopsticks

Station #4 Nighthawks and Whip-poor-wills

Popcorn or tiny marshmallows tossed in the air (which must be caught in the air) to represent flying insects.

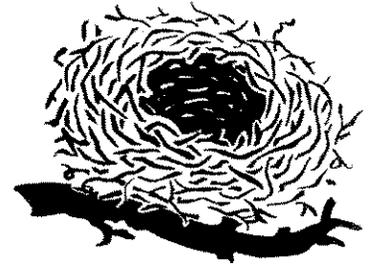
Tools: envelope or small fishnet
forceps or tweezers
tongs

Station #5 Warblers

Rice spread on a log to represent caterpillars and other insects.

Tools: forceps or tweezers
envelope or small fishnet
nutcracker or pliers

THE COASTAL CONNECTION: Migratory Birds of Virginia



This unit is designed to assist educators in Virginia, especially third through seventh grades, in teaching a unit on the migratory birds of coastal Virginia. The five lessons emphasize the unique situation migratory birds encounter when stopping in Virginia on their annual migration south. All activities address the Virginia Standards of Learning for Science and include ideas for evaluation and extension of learning. The basic concepts included in this unit are:

Lesson 1: Migration Connection

page 1

- ◆ Neotropical migratory birds spend breeding months in the forests of North America and winter months in tropical communities.
- ◆ Neotropical migratory birds follow and depend on specific routes during migration.
- ◆ Coastal Virginia is a key staging area and stop-over site for neotropical migratory birds of the northeastern United States and Canada.

Lesson 2: Coastal Corridor Habitat Dash

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- ◆ Coastal Virginia has a variety of habitats that provide food and shelter to many species of neotropical migratory birds as they begin their fall migration.
- ◆ Virginia migrants prefer coastal habitats to inland habitats.
- ◆ Neotropical migratory bird species have special needs and species vary with specific habitats in the coastal corridor of Virginia.

Lesson 3: Magnificent Migrants

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- ◆ Neotropical migratory birds are specifically adapted for their unique lifestyle.
- ◆ Adaptation enables the birds to survive in their individual habitats as they move from one place to another.

Lesson 4: Bird Watcher's Paradise

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- ◆ Migratory birds are important and unique members of Virginia's coastal ecosystem.
- ◆ Inventorying and mapping are important methods used to research migratory birds.
- ◆ The Eastern Shore of Virginia is a bird watcher's paradise.

Lesson 5: Creating a Refuge for Birds

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- ◆ Native habitat used by birds during migration is constantly under the threat of development.
- ◆ Virginians can help reverse the loss of migratory birds by creating, enhancing, and managing a variety of coastal native habitats. Individual actions make a difference in the conservation of migratory birds and their habitats.

Procedure:

Part 1

1. Divide the group into teams and pass out one copy of the “copycat” page to each group. Explain that there will be three different tools at each station, each of which represents a different type of bird beak function. At each station, each group must decide which tool would most efficiently get the food.
2. After they pick the best tool they should write the name of their tools on their “copycat” page under the food type. Then match the tool type to the correct beak and bird to determine what type of food is eaten by each pictured bird.
3. Discuss beak adaptations. Some beaks are very specialized and some are more versatile. What are the advantages and disadvantages of both?

Part 2

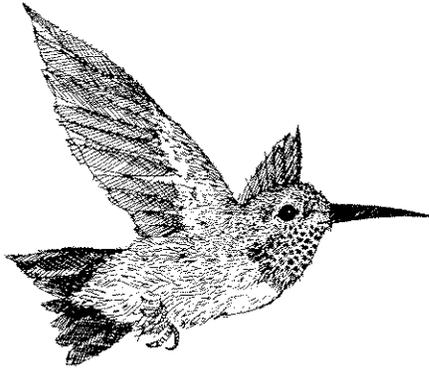
1. Tell students they will each have the chance to design their own original Eastern Shore migratory bird - one well-adapted to its habitat. Each student should decide where the bird will live, what it will eat, its type of mobility, and its sex.
2. Based on these choices, students should write down the adaptation necessary for their bird to survive. Remind them that these are migratory birds that will spend the year in two different places.
3. The students will each create an original bird using available art materials and supplies.
4. Students may report on their bird by telling its name, what it eats, its habitat and lifestyle and why these special adaptations were chosen.
5. Display birds in the classroom or media center.

Extension:

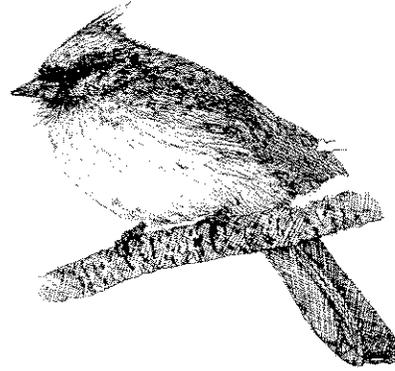
Create a collage of real life migratory birds from the Eastern Shore of Virginia. Identify their special adaptations. Discuss adaptation of wetland birds, including wading birds. Read *A Field Guide to Little-known and Seldom-seen Birds of North America* by Ben, Cathryn and John Sill.

MAGNIFICENT MIGRANTS COPYCAT PAGE

1 nectar from a flower	2 worms buried in the mud	3 seeds	4 flying insects	5 caterpillars & other insects
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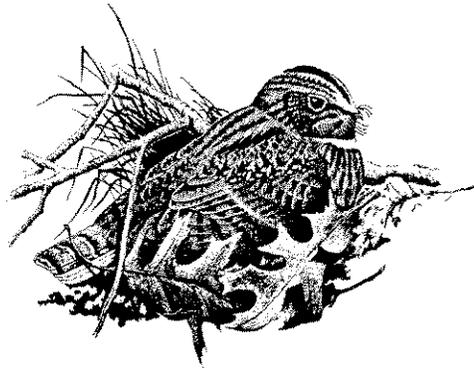
RUBY-THROATED HUMMINGBIRD _____



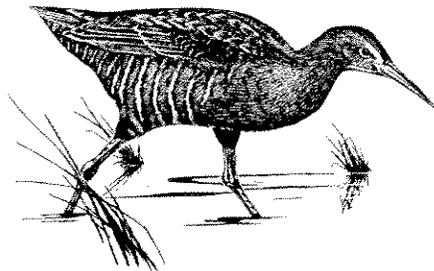
NORTHERN CARDINAL _____



PINE WARBLER _____



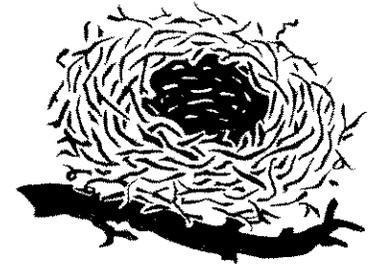
WHIP-POOR-WILL _____



CLAPPER RAIL _____

LESSON 4:

Bird Watcher's Paradise



Purpose:

To develop sensitivity toward migratory birds and demonstrate bird observation as a valuable tool in researching migratory birds.

Concepts:

- ◆ Neotropical migratory birds are a vital natural resource for Virginia
- ◆ Inventorying and mapping are important methods used to research migratory birds.
- ◆ The Eastern Shore of Virginia is a bird watcher's paradise.

Background Information:

Birds not only contribute to our pleasure, but they are also important members of Virginia's ecosystem and indicators of the health of the environment. Through the observation of birds, researchers are able to determine ecological weaknesses and conservation measures, necessary to remedy them. Research over the past few decades has revealed a dramatic decline in the number of certain migratory birds, partially due to the destruction of their habitat.

Scientists use various strategies for observing and collecting data on migratory birds. Under the Partners in Flight program, the Virginia Department of Game and Inland Fisheries (VDGIF) is coordinating a statewide breeding bird survey (BBS) focusing on neotropical migratory birds. The project is designed to initiate long-term monitoring of neotropical migratory birds with other state, federal and non-governmental agencies, like the Virginia Society of Ornithology. Volunteers or varying skill level conduct either BBS routes or monitor nest sites to assist in gathering research data.

Project FeederWatch, a bird monitoring program for students, teachers about birds and the scientific method. To an even greater extent, the project is a valuable research tool for bird scientists at the Cornell Lab of Ornithology at Cornell University. Students make observations of birds at their feeders and record bird numbers and species over several months. These observations help scientists determine population growth and distribution patterns.

Bird banding and wildlife mapping also add to the body of knowledge we have of migratory birds on the Eastern Shore. Volunteers man mist nets for capturing birds at the Kiptopeke state Park Banding Station. Once the birds are captured, identification bands are attached to them or data from previously banded birds is recorded. This information enables scientists to follow the route of migratory birds and better understand the behavior connected with migration and the habitat choices of the birds.

Wildlife mapping provides information on where particular wildlife species, including migratory birds, occur in Virginia. Volunteers collect data on which wildlife species they see in places like their backyard or schoolyard. This information is sent to the VDGIF where it becomes part of a larger database, the Fish and Wildlife Information System. Biologists use this information to make decisions concerning wildlife management, research, and education.

The Eastern Shore of Virginia offers scientists and individuals the opportunity to observe a broad range of migratory birds in their native habitat. Not only scientists, but also amateur birdwatchers flock by the scores to witness the drama of fall migration as songbirds, raptors, and shorebirds visit the Eastern Shore on their way to distant destinations.

Materials Needed

- Birdwatcher's Scavenger Hunt "copycat" page
- Field guide of eastern birds
- Binoculars (optional)
- Map of Virginia or the Eastern Shore

Evaluation:

Students compile a portfolio or scrapbook of birds they have observed at home or in the schoolyard.

Getting Ready:

Make copies of the scavenger hunt. Review briefly different adaptation in birds and discuss how these can be used as a means to identify birds.

Discuss how scientists use observation and strategies, such as mapping, to research migratory birds. Play an observation game by placing several natural objects on a table for part of the day and then covering the table with a sheet. Ask students to recall the items that are on the table.

Procedure:

1. Use the Bird Watcher's Scavenger Hunt with a partner, to become bird watchers in their schoolyard. Check off items as they are found.
2. Create a list, using the field guides, of birds that best match each descriptor found during the scavenger hunt. For example, match a bird with a short, stout bill for cracking seeds with a purple finch, chipping sparrow, northern cardinal or northern junco.
3. Use range maps found in the field guides to determine if the birds they have listed are found in their area and what time of year they are likely to occur there.
4. Glue pictures and names of birds from the final list onto a map to demonstrate the birds found in their region. Place an "M" next to the migratory birds.

Extensions:

1. Project Feeder/Watch - Students collect data for the Cornell Lab of Ornithology at Cornell University to assist scientists in their research of bird populations. Use Project FeederWatch data forms to record the kinds and numbers of birds observed at feeders on the school grounds. Students collect data two days each week from November through April. For more information about Project FeederWatch call 1-800-843-BIRD.
2. Wildlife Mapping - Students combine nature study and technology to assist VDGIF biologists in determining where particular species occur in the state. Observe wildlife in the schoolyard and record data on a data recording form. Data is then sent via computer or mail VGDIF where it will become part of a database of wildlife species in the state. To learn more about Wildlife Mapping, call Wildlife Mapping Coordinator, at VDGIF, 804-367-8747.
3. Arrange a field trip to Kiptopeke State Park on the Eastern Shore or your closest coastal state park. For information contact Virginia Department of Conservation and Recreation, 203 Governor Street, Suite 213, Richmond, VA 23219; 804-786-1712.



Bird Watcher's Scavenger Hunt

Use the scavenger hunt below to help you develop bird watching skills. See how many items you can see or hear. Don't worry if you can not find all of the items. Just remember to be observant and have fun.

(INCLUDE ILLUSTRATIONS)

Shapes

- a bird that is plump
- a bird that is slender
- a bird with rounded wings
- a bird with sharply pointed wings
- a bird with a short, stout bill for cracking seeds
- a bird with a long bill for poking in the mud
- a bird with a tweezer-like bill for eating insects
- a bird with a hook-tipped bill for tearing meat
- a bird whose tail is deeply forked like a "V"
- a bird whose tail is square-tipped or slightly notched
- a bird whose tail is rounded
- a bird whose tail is pointed
- a bird with long legs and a long neck

Markings

- a bird with a spotted or streaked breast
- a bird with a plain breast
- a bird with white on its tail
- a bird with a stripe above its eye
- a bird with a ring around its eye
- a bird with light wing bars
- a bird with no wing bars
- a "red" bird
- a "blue" bird

Behavior

- a bird eating an insect
- a bird eating a berry
- a bird perching with its tail down

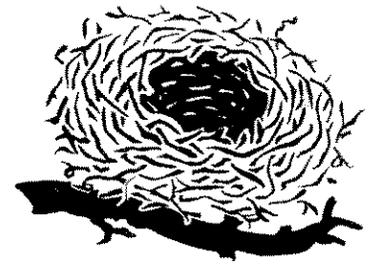
- a bird perching with its tail up
- a bird wagging its tail
- a bird climbing up the trunk of a tree
- a bird climbing headfirst down the trunk of a tree
- a bird flying straight and fast
- a bird soaring
- a bird wading in the water

Sounds

- a bird song that sounds like "what-cheer, cheer, cheer"
- a bird song that sounds like "zee, zee, zee, zee, zwee"
- a bird song that sounds like a kitten mewling
- a bird song that sounds like a loose trill

LESSON 5:

Creating a Refuge for Migratory Birds



Purpose:

To teach stewardship skills that benefit migratory birds by enhancing habitat on school grounds or in the community.

Concepts:

- ◆ Conservation of migratory birds must be made at all levels from international, to regional and state, down to local governments and private individuals.
- ◆ Virginia can help reverse the loss of migratory songbirds by creating, enhancing, and managing a variety of coastal native habitats.
- ◆ Individual actions make a difference in the conservation of migratory birds and their habitat.

Background Information:

Many governmental agencies and non-profit organizations in the Western Hemisphere are working diligently to protect neotropical migratory birds. Two major programs that work toward this effort are Partners in Flight and the Smithsonian Institution's Migratory Bird Center, both established in 1991. Partners in Flight, created to reverse the decline of migratory songbirds, is administered by the National Fish and Wildlife Foundation and currently has partners in thirteen federal agencies, every state government, several Latin American governments, and a host of nongovernmental organizations. Conservation efforts for Partners in Flight focuses in five major areas: population and habitat monitoring; management; research; education, outreach, and communication; and international partnerships.

The Smithsonian Migratory Bird Center was created by an act of Congress and works within the Partners in Flight network. The Center has strong international ties and produces quality educational materials. Efforts focus on research and policy analysis and development for the conservation of neotropical migrants.

Virginia state agencies are leaders in migratory bird conservation initiatives. Virginia's Department of Environmental Quality (DEQ) and Department of Game and Inland Fisheries (DGIF) have allocated resources for the conservation of migratory birds, their important coastal habitats, and environmental education initiatives. Virginia's DGIF nongame program has expanded monitoring programs and research initiatives in conjunction with Partner's in Flight. The Virginia Coastal Program of DEQ targets coastal natural resource research and education. Environmental education guides offered by the agencies, such as Project WET, Project WILD, and Aquatic WILD, include coastal topics important to migratory bird conservation.

Nongovernmental organizations are also involved in conservation efforts. The Nature Conservancy has an international scope with ecosystem and species conservation efforts on two continents. The National Wildlife Federation has focused its backyard habitat program on teaching individuals how to make their property migratory bird friendly. The Alliance for the Chesapeake Bay publishes the Bay Journal to keep individuals informed of research and happenings connected with the Chesapeake Bay and coastal resources. Their BayScapes program offers homeowners and educators practical information on landscaping to attract birds and wildlife and to conserve coastal resources.

Students and individuals can make a difference, in a variety of ways, in the conservation of migratory birds. One approach is to establish and maintain a migratory bird habitat in the community or schoolyard. *WILD School Sites* from Project WILD offers tips on establishing a schoolyard habitat. Students may also participate in migratory bird monitoring and mapping efforts as part of their conservation contribution.

Materials Needed:

- "Copycat" pages of Action Analysis Criteria and Action Plan Worksheet
- Class Log Book - gives a detailed, technical daily account of the project and provides guidelines for further jobs and research
- Student journals - give students an outlet for their emotional response to their education, linking cognitive and affective learning and developing writing skills
- Teacher journal - gives teacher a chance to respond to the project progress and educational process

Evaluation:

Students keep a class log book and individual journals to track the progress of their stewardship project and to reflect on their values and attitudes concerning the project.

Note: Adapted from the Action Research and Community Problem Solving Model by William Stapp and Arjen Wals.

Student leadership and direction are the most important criteria for success in a classroom stewardship project. The Action Research and Community Problem Solving Approach by William Stapp and Arjen Wals is based on the belief that students should play a role in planning their educational activities and should have the opportunity to take responsible action. Students learn about the problem, the action, and the process of problem solving. Students plan, implement, and evaluate projects in an ongoing spiral while using important elements of community problem solving.

Individual and community stewardship is the key to conserving migratory birds and their habitat. Whether it involves research, management, or education, action taken toward migratory bird conservation makes a difference.

Getting Ready:

Planning the Process - Build support from other teachers and the administration for an environmental stewardship project and the Action Research and Community Problem Solving (AR&CPS) model. Demonstrate the connections to the curriculum and higher level thinking skills. Introduce students to the project and determine who is interested in participating. Inform and encourage participation from the parents of participating students. Create a tentative timeline and get support from the environmental and business community. Create a committee with advisors from local conservation agencies and organizations (such as Partners in Flight or Audubon), bird clubs, and the Native Plant Society. *Assessing Student Skills* - Assess the students' problem solving skills. Pay attention to skills that may need support during the project such as group process skills, and information gathering skills. Also important is the ability to work in a group; to recognize and state a problem; to generate, evaluate, and select alternative solutions; and to develop, implement, and evaluate a plan of action.

Procedure:

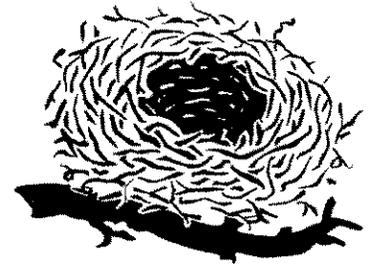
1. Conduct an inventory of the school grounds or a community area. Map and record the major natural and man-made features. You may want help in inventorying plants and birds or other wildlife found on your site. Record issues of concerns in a class log book.
2. Break into small groups to discuss and generate a list of topics that might be addressed through research and an action project. *"From your walk today, what did you see as some of the problems facing migratory birds in Virginia?"*
3. Narrow down choices by clustering and using the Action Analysis Criteria "copycat" page. The outcome may be one project for the entire class or several topics to be addressed in small groups. Use journals to respond to such questions as, "How does being involved in this project affect me?" "What things do I like about the project?" "What things do I dislike about it?" "How can we improve the project?"
4. Research the final topic in order to develop a problem statement that clearly defines the project. The teacher facilitates student research. Resources may include news articles; school and local library; the Internet; telephone directories; parents, teachers, administrators, and local agencies. Information is documented in the class log book and shared with other project members.
5. Once students feel they have enough information, a plan for action may be developed. While research continues, students brainstorm a list of strategies for addressing the problem and use the Action Analysis Criteria to help them narrow down alternatives to one plan. Remind students that it is important to state what they want the outcome of the project to be. Discuss with students what is possible to accomplish with the available time and resources. Use the Action Plan Worksheet to develop the action plan.
6. Implement student action plan and report progress to interested parties.
7. Evaluation of the project is an ongoing process. Students use the class log to record achievements and plan agendas, leaving them with a detailed record of the work accomplished. Students use their journals to express their feelings and reactions to the process, which can help the teacher to modify the project. As part of the AR&CPS model, students are constantly evaluating, researching, and modifying their project to achieve their criteria of success on the project.

Extensions:

1. Visit other school and community projects that create refuges for wildlife.
2. Participate in a student forum to share your environmental stewardship project with others.
3. Develop new stewardship projects.

ACTION ANALYSIS CRITERIA

Questions to ask before proceeding with an action project.



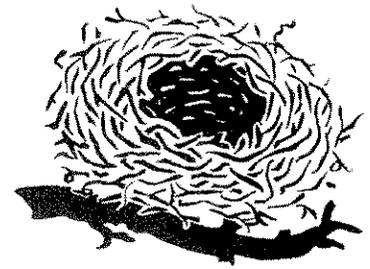
1. Is there sufficient evidence to warrant action on this issue?
2. Are there alternative actions available for use? What are they?
3. Is the action chosen the most effective one available?
4. Are there legal consequences of this action? If so, what?
5. Are there social consequences of this action? If so, what?
6. Will there be economic consequences of this action? If so, what?
7. What are the ecological consequences of this action?
8. Do my personal values support this action?
9. Do I understand the beliefs and values of others involved in this issue?
10. Do I understand the procedures necessary to take this action?
11. Do I have the skills needed to complete this action?
12. Do I have the courage to take this action?
13. Do I have the time needed to complete this action?
14. Do I have all the other resources needed to make this action effective?

ACTION PLAN WORKSHEET

Students keep a class log book and individual journals to track the progress of their stewardship project and to reflect on their values and attitudes concerning the project.

1. What is your project focus?
2. Describe the goal of your project.
3. What are the specific objectives that will help you reach your goal?
4. What jobs need to be accomplished to meet each objective? Who will do these jobs? Materials? Funding needed?
5. When will each task be completed?
6. Name people and organizations that might help? (partnerships)
7. List ideas for publicizing and generating support for your project.
8. Describe how you will determine the success of your project.

Virginia Migratory Bird Resources



General References

A Bird's Eye View of Coastal Wetlands, by Dana Bradshaw (Virginia Department of Game and Inland Fisheries, 1993)
Contact Virginia Department of Game and Inland Fisheries, 4010 West Broad Street, P.O. Box 11104, Richmond, VA 23230-1104.
An overview of coastal wetlands in Virginia and their importance to birds.

BayScapes - Video and Fact Sheets, developed by the Alliance for the Chesapeake Bay and the U.S. Fish & Wildlife Service (1994) Contact Alliance for the Chesapeake Bay, P.O. Box 1981, Richmond, VA 23216 or call 800-662-CRIS.
A program that focuses on landscaping in the Chesapeake Bay area to reduce the use of fertilizers, pesticides, and water; increase wildlife habitat; and save homeowners time and money.

Birds in Peril: The Plight of Neotropical Migratory Birds in Virginia, by Dana Bradshaw (Virginia Department of Game and Inland Fisheries, 1992) Contact Virginia Department of Game and Inland Fisheries, 4010 West Broad Street, P.O. Box 11104, Richmond, VA 23230-1104.
A publication that addresses the myriad of problems facing neotropical migratory birds in Virginia, as well as conservation measures being taken by the state.

Birds Over Troubled Forests, by Smithsonian Migratory Bird Center (1991) Order from the Smithsonian Migratory Bird Center, National Zoological Park, Washington, DC 20008.
A 32-page-color-illustrated booklet on the natural history and conservation of neotropical migrants.

Natural Heritage Technical Report 92-22, by T. Zebryk and T.J. Rawinski (Virginia Department of Conservation and Recreation, 1992) Contact Virginia Department of Conservation and Recreation, Division of Natural Heritage, 1500 E. Main Street, Suite 312, Richmond, VA 23219.
A preliminary survey of natural heritage resource sites in Northampton and Accomack Counties, Virginia.

The Ecology and Conservation of Neotropical Migrant Landbirds, "Habitat Suitability and Stopover Ecology of Neotropical Passerine Migrants," by F.R. Moore and T.R. Simons, edited by J.M. Hagan and D.W. Johnston (Smithsonian Institution Press, 1992) Contact Smithsonian Institution Press, Washington, DC.
An article on habitat suitability and stopover ecology of neotropical passerine migrants.

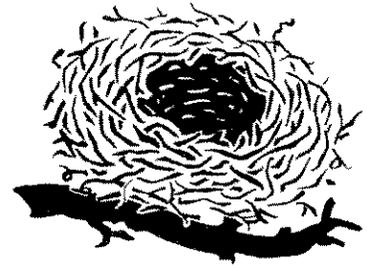
The Neotropical Migratory Songbird Coastal Corridor Study - Final Report, by Sarah E. Mabey, James McCann, Lawrence J. Niles, Charles Bartlett, and Paul Kerlinger (Virginia Department of Environmental Quality with funding from the National Oceanic and Atmospheric Administration, the National Fish and Wildlife Foundation, the U. S. Fish and Wildlife Service, and the Nature Conservancy, 1993) Contact Virginia Department of Environmental Quality, P.O. Box 10009, Richmond, VA 23240-0009. *A detailed report on the results of a study of neotropical migratory songbirds on the east coast, including the Delmarva Peninsula.*

Virginia Hospitality: Sharing the Natural Bounty of Virginia's Eastern Shore with hosts of fall migrants, by Bryan Watts (Center for Conservation Biology). Contact the Center for Conservation Biology, College of William & Mary, Williamsburg, Virginia 23185. *A colorful brochure that focuses on fall migratory bird visits to Virginia's Eastern Shore. Includes information on when specific migrant species are present and where you can find them. included in the packet.*

For More Activities and Lesson Plans.....

- A Guide to Bird Education Resources**, *Migratory Birds of the Americas: An Annotated Bibliography*, edited by Sarah B. Laughlin and Diane M. Pence (The National Fish and Wildlife Foundation, 1997) Write or call American Birding Association Sales, P.O. Box 6599, Colorado Springs, CO 80934. Phone: 800-850-2473.
A comprehensive, yet easy to read, assessment of migratory bird curricula. Includes ordering information for dozens of materials and programs.
- Aquatic WILD: Aquatic Education Activity Guide**, developed by the Council for Environmental Education (1995) Contact Suzie Gilley, Virginia Department of Game and Inland Fisheries, 4010 west Broad Street, Richmond, VA 23230. Phone: 804-367-0188.
An interdisciplinary, supplementary conservation and environmental education program emphasizing aquatic wildlife.
- Birds in Your Backyard**, by Cornell Cooperative Extension Service (1988) Write Cooperative Extension Service, Cornell University, 104 Fernow Hall, Ithaca, NY 14853. Phone: 607-255-2824.
A packet of descriptive materials on birds in your backyard, including how to make your own bird feeders and houses.
- Bring Back the Birds**, *A Community Action Guide to Migratory Songbird Conservation*, by Kenneth G. Towle (Conservation International - Canada, 1994) Write Conservation International - Canada, 1415 Bathurst Street, Suite 202, Toronto, ON M5R 3H8 Canada. Phone: 416-535-3052.
A compilation of background information about songbird decline and conservation action. Includes several pages of questions and activities for students.
- Highway to the Tropics**, World Wide Web Site, by Mike Kennedy (The Raptor Center, 1996) Write to the Education Coordinator, The Raptor Center, University of Minnesota, 1920 Fitch Ave., St. Paul, MN 55108. Phone: 612-624-1203. Web site: <http://www.raptor.cvm.umn.edu> (Then click on "Highway to the Tropics")
An educational program on the World Wide Web with lesson plans that give the basics on raptor migration and habitat, and makes scientific data available to the classroom.
- Migratory Birds Issue Pac**, by U.S. Fish and Wildlife Service (1995) Write Urban Wildlife Resources, 5130 West Running Brook Road, Columbia, MD 21044. Phone: 410-997-7161.
A packet that includes background information, several student activities, action-based education projects for birds, and a poster.
- Project FeederWatch**, by Cornell Laboratory of Ornithology (Cornell Laboratory of Ornithology, 1996) For information write Cornell Laboratory of Ornithology, P.O. Box 11, Ithaca, NY 14851-0011. Phone: 607-254-2440.
Instructional materials and data forms that classes may use to count the kinds and numbers of birds at their feeder.
- Project WET: Curriculum & Activity Guide**, developed by The Watercourse and the Council for Environmental Education (Council for Environmental Education, 1996) Contact Kelly Heimbach at the Virginia Department of Environmental Quality, P.O. Box 10009, Richmond, VA 23240-0009. Phone: 804-698-4049.
A collection of hands-on, easy to use, water-related activities for grades k-12. Includes topics on wetlands and conservation.
- Ranger Rick's NatureScope**, *Birds, Birds, Birds!*, edited by Judy Braus (National Wildlife Federation, 1992) Write National Wildlife Federation, 8925 Leesburg Pike, Vienna, VA 22184.
A booklet organized with information and activities formatted to offer background information, activities, and "copycat" pages that focus on the biology of birds, their natural history, and conservation.
- Ranger Rick's NatureScope**, *Wading Into Wetlands*, edited by Judy Braus (National Wildlife Federation, 1992) Write National Wildlife Federation, 8925 Leesburg Pike, Vienna, VA 22184.
A booklet organized along the same format as "Birds, Birds, Birds!" that focuses on wetlands, their ecology, and conservation.
- The Songbird Connection**, by Emile DeVito (New Jersey Conservation Foundation, 1994) Write New Jersey Conservation Foundation, Bamboo Brook, 170 Longview Road, Far Hills, NJ 07931. Phone: 908-234-1225.

A comprehensive curriculum for teaching about neotropical migratory birds. Includes a teachers guide, illustrated flashcards and posters of species in their summer and winter habitats.



WILD School Sites: A Guide to Preparing for Habitat Improvement Projects on School Grounds, developed by the Council for Environmental Education (1993) Contact Suzie Gilley, Virginia Department of Game and Inland Fisheries, 4010 west Broad Street, Richmond, VA 23230. Phone: 804-367-0188.

A guide for teachers that includes step-by-step guidelines and suggestions for establishing your own WILD School Site. Coordinates well with activities from the Project WILD Educator's Guide.

WOW! The Wonders of Wetlands (1995) Contact Environmental Concerns, Inc., P.O. Box P, St. Michaels, MD 21663-0480. Phone: 410-745-9620.

A comprehensive educator's guide with indoor and outdoor activities for K-12.

Internet

EE-Link

Maintained by the National Consortium for Environmental Education and Training.

www.nceet.snre.umich.edu/

Classroom resources, organizations, regional information, and an environmental education directory.

Highway to the Tropics

Maintained by The Raptor Center, University of Minnesota.

www.raptor.cvm.umn.edu (Then click on "Highway to the Tropics")

Lesson plans that give the basics on raptor migration and habitat, and makes scientific data available to the classroom.

National Wildlife Federation

www.nwf.org/

Topics: Issues and Actions, In the Classroom, Magazines and Publications, For Kids, Hot News, Action Alerts, and more.

U.S. Fish & Wildlife Service

www.fws.gov/

USFWS oversees the National Wildlife Refuge System. Information on wildlife conservation.

Virginia Department of Environmental Quality

www.deq.state.va.us

Information on programs related to coastal resources and conservation of natural resources.

Virginia Department of Game and Inland Fisheries

www.state.va.us/~dgif/index.htm

Information related to Virginia game and nongame wildlife.

