Chapter 2

Environmental Education

The activities presented in the Educator's Guide are designed to teach various environmental concepts in fun and interactive ways. These activities are based on what can be seen at Steigerwald Lake National Wildlife Refuge. They are also based on the premise that you and your students have a vital interest in learning about the earth as a home for people and wildlife. With today's pressures on the quality and preservation of life on earth, there is a great need for people to become responsible members of the ecosystem. A concern for the land and its resources is basic to our survival since environmental quality and human health and well-being are all interdependent.

Environmental Education Goals

- Respect all life forms
- A basic understanding of the total environment
- A sense of belonging to a special human niche within the environment
- A feeling of responsibility towards life and accountability for human impacts on the environment
- The skills to identify and resolve environmental problems
- Participation in all levels of environmental stewardship

Environmental Education Objectives

Awareness

To help individuals and groups acquire an awareness of and sensitivity to the ecosystem— the total environment and its interactions.

Knowledge

To help individuals and social groups gain a variety of experiences in and acquire a basic understanding of the environment and its problems.

Attitudes

To help individuals and groups acquire a set of values and feelings of concern for the environment, and to help motivate them toward active participation in environmental improvement and protection.

Skills

To help individuals and social groups acquire the tools for identifying and solving environmental problems.

Participation

To provide individuals and groups with an opportunity to be actively involved in all levels of working toward the resolution of environmental problems.

Some Basic Ecological Concepts

A prior review of these concepts will enhance your group's understanding of what they see and do on the field trip.

Everything Has a Home
During your field trip, you will be walking in, around, and through several animals' living rooms, dining rooms, kitchens, bedrooms, and bathrooms. We call these homes habitats, ranges, and ecological niches. Ecology (from the Greek "oikus" which means house) is the study of the interactions of living organisms with each other and their common environment — the earth.

Everything is going through Changes
All plants and animals undergo evolutionary changes and adaptations. When things die, they are broken down, decomposed, recycled, and used by other living things.

Every Living Thing Consumes
Three categories of life forms are in the basic food cycle of life: plants, animals, and decomposers.

Everything is Interconnected
Interaction and interdependence occur among living and nonliving things and their environment. A change in one strand of the food cycle of life affects the entire web. Nothing exists in isolation.

There are Basic Necessities for Life
Food, water, shelter, and space are the basic necessities for life. These necessities are found in the atmosphere (air), the hydrosphere (water), and the earth's crust (soil). The biosphere is the thin skin of the planet where these zones collectively support life on earth.

Diversity is Essential for Life
Many similarities and differences occur among living and nonliving things. This variation is essential for maintaining a healthy community and ensuring that plants and animals survive and reproduce in spite of changing situations.

Humans are Capable of Changing the Balance of Nature
We are rational, thinking beings that have changed and continue to alter the environment of the earth in many profound ways. As such, we have a responsibility to all living things.

Refuge Assistance and Facilities

In order for students to have the most productive educational experience, and due to limited staff availability, teachers are expected to plan and co-lead their own field trips to the refuge. However, the following assistance is available.

Assistance

Field Notebook

A Field Notebook with field activities has been developed as a companion guide for educational visits. The Field Notebook is intended to support the concept of ecosystem functions including energy transfer through the ecosystem via producers, consumers, and decomposers. When used as a companion document to a field trip, the Field Notebook, supports Washington State curriculum for 5th grade science.

Field Activities

Within the Field Notebook are field Activities allowing students to collect actual data on the Refuge relating to either plant survival in restoration areas or a survey of nesting birds. Collection of this data will help refuge managers better understand the refuge resources over time.

Nature Walk Note Card

Also included in the Field Notebook will be two note cards that will provide the field trip leader with memory triggers to help them remember more detailed information described in this Educator's Guide as they guide their students along the trail. These note cards will be laminated and supplied in the Environmental Education Backpacks available for school visits. One of these note cards will include memory triggers for a history of the refuge on one side and natural resource memory triggers on the flip side. Another card will describe various wildlife/vegetation food web examples that can be found on the refuge.

Migratory Crossroads Power Point Presentation

Review the power point presentation about the refuge. It will provide an excellent lead in to the discussion you have with the students described in the next section, Student Suggestions.

Environmental Education Backpacks

Backpacks are available for loan to teachers for visits to the refuge. The backpacks contain simplified field guides for refuge plants and animals, binoculars, pencils, and clipboards.

Lesson Planning Assistance

Refuge staff and/or volunteers may be available to meet with teachers and group leaders to help plan field trips. They can recommend activities and places to go on the refuge that will help you achieve learning objectives.

Volunteer Assistance

Volunteers may be available to assist with your environmental education visit. Volunteers will be trained in the lessons of the Field Notebook and its Field Activities. Along with EE backpacks, class chaperones and teachers; these volunteers may be available to assist in facilitating class activities on the refuge. Volunteer support is limited and will be subject to volunteer availability on any given day. Volunteer support is reserved for teachers that have attended an educator's workshop for Steigerwald Lake Refuge. Teachers that have not attended an educator's workshop at Steigerwald Lake are welcome to arrange a refuge visit but should not anticipate additional support from refuge staff or volunteers.

Educator's Workshops
Refuge staff will host educator's workshops at least annually to provide teachers and volunteer field trip assistants with information needed to provide students with an interesting and informative field trip. Information provided will include an introduction to the refuge and its facilities, natural history along the Gibbons Creek Art Trail, and science-based activities designed to assist students meet State-mandated science tests.

Bird Identification Field Trips
Refuge staff may be coordinating bird identification field trips for attendees to the workshops. This will provide educators with additional information to share with their students. The field trips will include information about "tools of the trade", basic bird biology, bird identification techniques, and actual species identification discussions during a bird walk on the refuge trail. These will be announced at the same time as the teacher workshops are announced.

Transportation
Depending upon funding, the refuge may be able to assist with bus transportation costs. We feel it appropriate, however, to ask each school to share in the transportation expense for each field trip scheduled. Please call the Refuge Manager for details.

Facilities
Parking
There is a parking lot at the entrance to Steigerwald Lake Refuge at the Gibbons Creek Wildlife Art Trailhead. There is more parking available at the Captain William Clark Park, but the walk will be considerably longer.
Restrooms
Restrooms are located at the parking lot near the trailhead. The restrooms consist of only two stalls, so please use the restroom facilities at your school prior to arriving on the refuge.
Drinking Water
There is no drinking water on the refuge. Please bring your own.
Garbage
There are no garbage cans on the refuge. Groups should remove (and recycle!) their garbage.

Study Areas on the Refuge

The Gibbons Creek Wildlife Art Trail on the Steigerwald Lake Refuge has a diverse assemblage of habitats in close proximity to each other, and therefore, has been designated the primary environmental education site for groups visiting the refuge. Groups will have a great opportunity to observe and compare differences and similarities of habitats including bottomland forests, grasslands, shallow wetlands, ponds, and streams.

The Gibbons Creek Art Trail is a 2.75-mile loop that takes you along wetlands and through woodlands. If you choose to walk the entire loop, you should allow at least two hours

to complete this trip. The east end of the trail loops onto a section that is open to the public from May 1 through September 30. During the remainder of the year the area is closed to reduce disturbance to wildlife. Please model stewardship to your students, by respecting the seasonal trail closures and other refuge regulations.

Although you may choose to walk the entire loop with your students, the Steigerwald Wildlife Refuge Field Notebook has been designed to be used with a nature walk leading from the trailhead to the Red-tailed Lake Overlook. That will allow your classes to have time to participate in the environmental education activities presented.

Making Reservations

In order to accommodate as many groups as possible, advanced registration is strongly recommended for all school groups visiting Steigerwald Lake National Wildlife Refuge.

To Register You Will Need to:

- Call the refuge (360/835/8767) and ask to schedule a field trip and let the refuge staff know you will be coming. Refuge staff will e-mail you a registration form for completion prior at least two weeks prior to arrival. If you desire volunteer assistance, they should be submitted at least a month prior to arrival.
- Reservations will be made on a "first-come-first-served" basis.

Why is Registration Recommended?

Steigerwald Lake National Wildlife Refuge is a popular place with limited facilities. By having teachers register their classes we can:

- Distribute classes so they do not use the same refuge unit at the same time. This reduces overcrowding of refuge facilities, minimizes wildlife disturbance, and provides a better opportunity for wildlife observation.
- Coordinate volunteers who provide orientations to groups.
- Provide better interpretive and educational programs to a greater number of people.
- Determine the number of people participating in various activities on the refuge. This information may be used to obtain funding for future improvements to our public use programs.

How Many Groups May Visit Daily?

The number of groups may vary, but we usually try to schedule only one group per day on the refuge. Extra groups can sometimes be scheduled for early morning or evening visits.

Does Registration Guarantee a Visiting Date?

Yes, if you have obtained a confirmation over the telephone or in writing.

Planning a Field Trip

The difference between your field trip being just another fun day outside the classroom or

being a powerful learning experience in the field depends on how well you and your students are prepared.

Be Familiar with the Site
Take advantage of annual Educator Workshops. You, and as many of your adult leaders as possible, should visit and explore the site prior to the field trip. Remember, places change over time and with the seasons; therefore you should visit during the season of your scheduled field trip. The refuge trail is open during daylight hours.

Field Trip Themes and Goals — Plan Ahead
Know the concepts you want to teach, and select or design field trip activities, as well as pre- and post-trip activities, to teach those ideas. (Washington Sate EALR correlations have been identified for many of the activity in this guide.) It may not be so important that you follow your schedule exactly, but do have a conceptual map of the goals and objectives of your field trip. Be flexible to deal with, or take advantage of, unpredictable events or changes.

If you plan on using the Field Notebook (strongly suggested, and the emphasis of the Educator's Workshop), review it and share some of the basic concepts with your students during the week before you come out.

Student Suggestions
Involve your students in the planning process. This is their field trip, and if they help design it and have an investment in it, their visit to the refuge will be more memorable. Follow up on any sparks of interest you noticed during pre-trip activities or as you explained the upcoming trip. Ask your students to answer the following questions in writing. Use their responses in your planning.

What do you know about the wildlife refuge?

What do you expect to see at the wildlife refuge?

What do you expect to do at the wildlife refuge?

What do you think you learn about at a wildlife refuge?

Adult Leaders and Group Size
A ratio of one adult to five students is optimum for a field trip, although up to one to 15 can be manageable with well behaved students

Class Groups
Your students should be divided into small groups of 10-15, depending on how many field trip leaders you will have. We strongly recommend you divide your class into these groups before coming to the refuge, and including boys and girls into each group. Plant-, animal-, or color-coded name tags are successful examples of grouping techniques.

After the Trip
Continue the field trip experience in your classroom. Summarize the events and conduct follow-up activities. Complete the data collection, conduct the calculations, and have the groups discuss their findings with each other. Relate back to the field trip throughout the school year. Consider returning to see the refuge in a different season, or to follow up on past activities.

Checklist for a Successful Field Trip

- ✓ Be familiar with the site and background information.
- ✓ Review the information in the Educator's Guide. Be especially familiar with the Field Notebook.
- ✓ Share the information in the Field Notebook with your students during the week before the field trip.
- ✓ Sign up for a bird identification class if you are interested and one is scheduled.
- ✓ Arrange transportation.
- ✓ Develop lesson plans and activities that fit into your curriculum and take advantage of students' interests. Design worksheets for your students to use during their field trip to enhance learning (optional, if not using the Field Notebook).
- ✓ Have your schedule well thought out and coordinated with refuge staff. Consider small group divisions, distribution of equipment, travel time, timing of activities, and rainy day alternative activities.
- ✓ Working with refuge staff, recruit adult leaders who can assist with your field trip. A 1:5 to 1-15 ratio of adults to students is recommended. Emphasize this is to be a fun-filled learning experience. In addition to the volunteer field trip leaders, you should see if you can get some additional parents to help with keeping the groups together. Let parents know that they have the authority to keep the students' behavior appropriate.
- ✓ Have students' parents visit the refuge or arrange an informational meeting at your school. Make sure they know they have authority to assist you in keeping the students' behavior appropriate on the field trip.
- ✓ Proper dress is important. Ask students to bring a warm jacket or rain gear (if necessary) and to wear clothes they won't mind getting dirty. Students should wear sturdy walking shoes. If they need to bring a bag, a backpack frees hands to write, point out interesting animals, and use binoculars.
- ✓ Don't forget lunches. Bring several plastic bags for collecting lunch garbage and

recyclable containers. There are no trash cans at the refuge.

- ✓ Name tags help students to identify their groups, and leaders and staff to identify the students.

Prepare students for their field trip. Let them know where they are going and the behavior expected of them. See refuge field trip behavior guide lines .
Have the students use the restrooms before coming to the refuge, as we have limited facilities at the refuge.

Group Management Hints

A Great Handout for Parent Chaperones and Adult Group Leaders
If you have apprehensions about leading a group of children away from the four-walled constraints of a classroom, relax! There are several techniques you can use to help keep the group's attention and maintain the feeling of freedom and open exploration. Try the following:

Be Prepared
Read over the activities and visit the refuge yourself before bringing your class. The more comfortable you are, the more comfortable the students will be.

Wildlife First
Remind the students that they are on a national wildlife refuge, and that while they are on the refuge, to remember that they are in the home of the wild creatures they are about to encounter, and to treat it kindly and with respect. Be quiet and walk softly so they will be able to see the animals, and don't disturb the vegetation

Be Enthusiastic
Enthusiasm is a greater catalyst than knowing a bunch of names. Whatever you are doing, do it with gusto! Get down on your hands and knees to look at the plants. Study an animal by "being" it (move as it does, sound like it, etc.), especially if you don't get to see the animal. You are the leader and you set the tone for the experience.

Have a Focus
When you stop to look at something, focus on something concrete. Gather the group in a semicircle with everyone facing toward the object of attention.

Speak With the Group
Speak loudly and clearly, facing the group. Talk with the group, not at it.

Make Eye Contact
Make eye contact with your students. If necessary, you should face the sun, rather than having the students look into the sun.

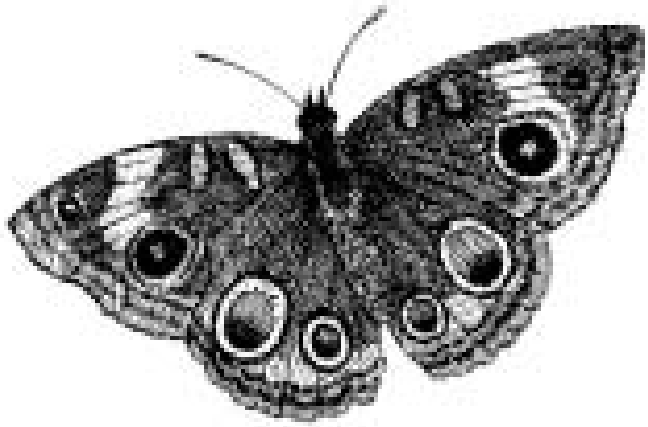
Ask Questions

Encourage thinking and group interaction by asking questions. For example, “Why is there a hole in the ground here?” “How did it get here?” “What would you need to live here if you were a _____?” Whenever possible, ask questions instead of giving information.

Be Patient with Answers
Give students time to think and answer questions. Count to 10 before revealing the answer.

Stimulate Imagination
Stimulate imagination and excitement while you are delivering factual information or asking questions about the plant or animal.

Be Versatile
Recognize the magic of the moment. If you are talking about plants and a northern harrier swoops by, watch the harrier. The harrier will probably leave within a couple of minutes; the plants will still be there.



Demonstrate
Keep it simple. Demonstrate an activity as you explain it.

Encourage Curiosity
Encourage your students to pursue their natural curiosity. Any observation they make is a good one. If they come up with questions you cannot answer, have them write them down; they can look up the answer or ask a staff member later.

Emergency Bathroom Breaks
For the safety of the student, if a student has to use the facilties in the wild, send two students with one adult.

Prompts & Quick Activities

Use these ideas for quick activities to fill time while waiting for the other group to finish or whenever you have a few extra minutes. This is also good information to provide to parent chaperones.

Short Observations
• Find a bird and watch it as you count to 25. Describe what you noticed about the bird’s color, flight, size, or other characteristics
• Stop! Close your eyes and listen. Try to block out the sounds of the cars going by. Describe the nature sounds that you hear in 30 seconds.

• Do you see tracks in the mud? Can you guess who made them? Which way were they traveling?
• Find an insect and watch it as you count to 25. Describe what you noticed about the insect: Can it fly? Is it eating? What is it eating? Anything else?

Find Something
• Find three human-made things around you. What are the positive and negative aspects for each object?
• Find two to five things that have been changed by an animal. Find two to five things that have been changed by humans. Explain these to a partner.
• Find two animals or an animal and a plant that have a relationship with one another (heron-fish, duck-plant, minnow-algae, etc.). Explain the relationship.
• Find the largest and the smallest animal, plant, flower, bird, stone, etc. Find different things that are the same size. Find a bird that:
  • walks on edge of the wetland
  • dives to get its food
  • soars as it flies
  • sits in a tree

Do Something
• Do you see any litter? If it is safe to do so, pick it up and put it in the class garbage bag
• Move the way an animal moves.
• Write two descriptive sentences about something you see right now. Use as many adjectives and adverbs as possible.
• Compare the colors of animals with their surroundings. What do you notice?
• Push a pencil point into the soil with the open palm of your hand. Measure the distance it has gone into the soil when your hand begins to hurt. Try the measurement in different areas. If you were a burrowing animal, where would you like to live? Why?
•Draw a scene of the perfect wildlife habitat; a place you would want to spend time at. Now draw a candy wrapper or dog waste in it. How you do you feel? How does it ruin you perfect spot?

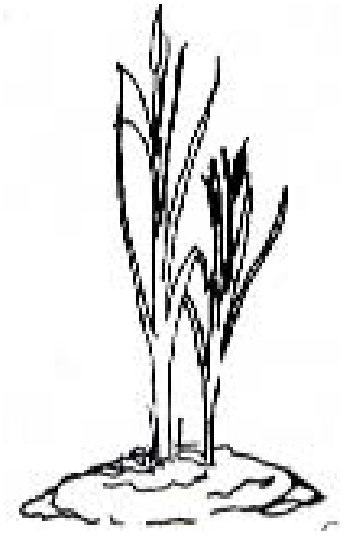
Pretend / Imagine
• Pretend you are 1 inch tall and live in the wetland. What would you like to eat? Who would like to eat you? Where would you hide?
• Let's pretend it suddenly started to rain hard right now. Where would you go if you were a (rabbit, squirrel, bird, fish, butterfly, etc.)
• Pretend it is 500 years ago. What do you think this land looked like? What lived here? Did people live here? What do you imagine was the same? What do you imagine was different? Imagine what this looked like as the Native Americans started a controlled burn of the oak savannah. The low grassy area would burn but the large oak trees would be protected.
• Pretend it is 500 years in the future. What do you think the land will look like? What will live here? Will people live here? What do you imagine will be the same? What do you imagine will be different?

Guidelines for Refuge Field Trips

Certain rules are necessary to help protect the wildlife and facilities at Steigerwald Lake National Wildlife Refuge. Please make up rules with your group before the field trip. Have your students describe what behavior they think will be appropriate, then fill in the points they miss. This way, they will be "coming up with" the rules and will be more likely to follow them. Help them understand this is a protected area and a special place for plants and animals; it is different from a park or playground. Emphasize they are visitors and should act as if they were in someone else's home. Be sure to include these rules:

Take Away Only Memories
All plants (including edible ones), animals, and artifacts are protected. Students can only take drawings, pictures, rubbings, and memories.

Replace What You Pick Up
If you move any rocks, sticks, or logs, please put them back as you found them. Otherwise, you would be rearranging the "furniture" of many animals' and plants' homes. While the underside of fallen branch may not seem important, this moist microclimates may be the perfect home to many bugs.



Walk and Talk Quietly
Walk and talk quietly. This increases your chances to observe the wildlife.

Stay With Your Group
Stay with your group. Each group must be accompanied by an adult at all times.

Be Aware of Trash
Avoid leaving any litter. Please bring litter and recycling bags, and, if you are willing, pick up any trash you find.

Help Protect Wildlife
Do not harass or scare the animals. Stay on trails to avoid trampling vegetation. Obey refuge signs. To prevent disturbing wildlife, buses and private vehicles are not allowed on refuge maintenance roads and trails.

Enjoy Yourselves!
Go exploring and use all of your senses.

Medical Considerations

Poisonous Plants
Most plants on the refuge are harmless; however, there are a few that can present problems to visitors. Teachers should know what these poisonous plants look like. Remind your

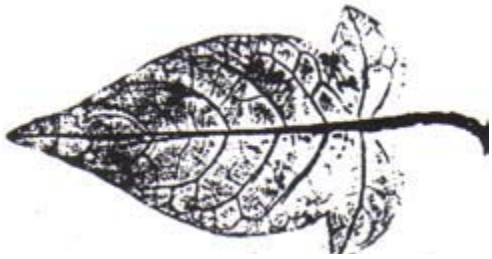
students: please leave the plants and berries for the animals and birds of the refuge.

Poison oak can be found in some areas, generally away from the Gibbons Creek Art Trail. However, this is a native plant that may be found around the Camas/Washougal area and is worth knowing. The leaves of this poison oak are in groups of three, shallowly lobed, and rounded at the tip. The flowers are small, green, and clustered. The fruits are shiny yellow or white. Remember, "leaflets three, let it be." Poison oak produces toxic oils that can cause a burning or itching rash on people who are allergic to it.

Nettles can be a nuisance to students if they touch the plant, resulting in an itching, burning sensation for several hours or longer. This plant grows in single stalks from the ground, 3 to 7 ft. tall, with long-stemmed leaves branching off the stalk in pairs. The leaves are saw-toothed, oval to lance-shaped, with prominent veins. Tiny green flowers hang in clusters from the base of leaf stems. This plant is common under the cottonwoods along the trail.

Poison hemlock is extremely deadly if eaten or chewed. This plant can grow to be more than 6 feet. The hollow, erect stem branches extensively and has purple-red splotches. The leaves look very similar to parsley or fern, and the flowers are very small, white, and numerous. If found, please notify the refuge office, as we are trying to eliminate this noxious weed. Any physical contact with this plant should be taken very seriously.

Bittersweet nightshade, a sprawling or climbing vine, can be found along some ponds and streams and is poisonous. The leaves of this plant vary in shape but have two ear-like lobes at the base of the blade. The blue-violet flowers grow on branches from a short stalk that extends out from the stem. The berries are bright red.



Insect Stings

Educators should be prepared to deal with insect stings and bites. Teachers and group leaders should be aware if any students are allergic to insect stings, and those with allergies should bring their own medications. Mosquitoes can be abundant during warmer months, so bring insect repellent. Take special care around the bridge over Gibbons Creek, as wasps frequently build nests in the pipe framework of the pedestrian bridge.

Avoiding Problems

One way to avoid contact with poisonous plants and insects is to wear long pants, long-

sleeved shirts, and closed toe footware.

Hay Fever and Asthma
Those with respiratory problems or allergies to pollens should bring medication. Seasonally tall grass brings pollen near eye level, potentially aggravating asthmatic students. Avoid hand contact with eyes and in some instances wearing a respiratory mask may be helpful.

Emergencies
Refuge office staff can be reached at (360) 835-8767. The refuge office, located across Highway 14, down the gravel road, is open Monday through Friday from 7:30 a.m. to 4:00 p.m. Washougal Police can be reached by dialing 911, or going to the office located at 1320 A Street. The fire station is located down the street from the police station, at 1400 A Street. There is no pay phone on the refuge. For emergencies, please bring at least on cell phone. Please inform the refuge manager of emergencies that occur on the refuge, but 911 should be your immediate action for emergencies.