How to Deliver a Wetland Field Trip

Ducks Unlimited Canada

education.ducks.ca

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Learning Resources

Duck Unlimited Canada provides lots of resources to introduce your students to wetlands before your trip. Visit us on-line at education.ducks.ca or, in French, at education.canards.ca.

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DUC staff; also, thanks to East Elgin Secondary School (page 11 lower left), Toronto Region Conservation (back cover, photos 1, 3, 4) and Credit Valley Conservation (back cover, photo 6)

Ducks Unlimited Canada

Reasons to take your teaching Outdoors!

A wetland field trip offers the chance for students to apply what they learn in the classroom to real-world, hands-on learning experiences.

Here are just a few examples:

- Apply organizational and problem solving skills while preparing for an actual field trip.
- Explore firsthand the ways in which animals and plants are adapted for specific habitat— in this case, a wetland.
- Observe aquatic invertebrates and analyze their different forms of locomotion and the different ways they obtain oxygen
- Observe animals at different stages in their lifecycle (tadpoles—frogs; dragonfly larva—adults, ducks—ducklings, etc.)
- Assess the different roles of plants and animals in the ecosystem (producer, herbivore, carnivore, etc.)
- Observe the diversity of life and the role each organism plays.
- Use scientific research skills (water testing, study transects, bioindicators, etc.) to investigate, analyze and interpret wetland health.
- Communicate observations and hypotheses to others and, back in the classroom, interpret their findings through graphs, reports, stories, drawings and other methods.

Outdoor learning has added benefits.

Studies in education, medicine, public health, sociology and other disciplines document a range of benefits relating to the time children spend learning outdoors in nature including:

- increased enthusiasm for learning
- heightened proficiency in developing & applying language skills
- improved academic achievement
- enhanced social skills— cooperation, shared decision-making, problem-solving, leadership, social competence
- a greater sense of pride and ownership in their accomplishments
- a reduction in discipline & classroom management issues
- increased critical thinking skills including the ability to synthesize information, understand complex relationships and connections between individuals and communities

Studies show that outdoor education enhances a sense of ownership and stewardship. Children love to be part of the solution – especially when they are able to see results of their interactions firsthand.

> *"Evidence suggests that children and adults benefit so much from contact with nature that land conservation can now be viewed as a public health strategy."*
>
> Dr. Howard Frumkin
> *Centres for Disease Control and Prevention, and,* Richard Louv
> *Author, Last Child in the Woods*

Field Trips are Inspiring!

Letter from a BC parent

"Joel has been talking non-stop about everything he saw and learned. He has been reading the Marsh World Book and is truly excited about it.

Our family is planning a trip to Serpentine Marsh next weekend. Joel is eager to share with us everything he learned. He said it was the best field trip he has ever been on.

Thank you so much for inspiring Joel..."

1. *Check out the Children and Nature Network website at www.childrenandnature.org and Canada's Child and Nature Alliance at www.childnature.ca for further information and research reports.*

Why Wetlands?

Nothing can compare to the rubber-boots approach of wetland education programs. All senses are engaged from the moment the students step off the bus. They take the message of wetland conservation home to parents, siblings, grandparents and friends. It is hard to number those who are reached by one visit. It is a field trip they will remember the rest of their lives.

- A New Brunswick teacher

Wetlands are one of the earth's most productive ecosystems and an essential part of the water cycle upon which all life depends.

Wetlands rank with tropical rainforests in the diversity and productivity of plants and animals that they support. They are found in every part of the world—except Antarctica.

Canada has more than 1,270,000 square kilometres (127 million hectares) of wetlands. That's nearly 25 per cent of all the wetlands on Earth!

Over 600 species of plants and animals live in Canadian wetlands —including more than one-third of Canada's species at risk.

Mammals, birds, amphibians, reptiles, fish and invertebrates use wetlands for food, water, breeding and nesting grounds, resting areas and shelter.

Wetlands are nature's water filters. Many wetland plants and animals, including microorganisms, remove harmful impurities from our water and keep it clean naturally. Some communities and businesses even use managed wetlands to purify their wastewater.

Spring runoff and heavy rains can create too much water for the land to absorb. Wetlands can store excess water and slow its flow, reducing the risk and severity of flooding.

Wetlands release stored water slowly back into the ground—filtering it and purifying. This creates a clean groundwater supply for humans.

Wetlands are an important source of water for wildlife, plants including crops, and people during droughts or dry spells.

Wetland plants stabilize the soil, holding it in place and preventing erosion. And they trap sediments helping to create a rich fertile habitat for plants and animals.

Wetlands on the coasts of lakes and oceans can minimize the impact of waves, currents and even storms that can cause erosion and flooding.

Wetlands store carbon and other greenhouse gases and reduce their impact on climate change.

Wetland plants create oxygen.

Wetlands provide important economic benefits through the Ecological Goods and Services (EG&S) they provide. For fact sheets about EG&S and to find out more visit http://www.ducks.ca/conserve/wetland_values/conserve.html

Wetlands support biodiversity and are full of life. They make great places to learn about biology and the environment!

Despite these benefits, wetlands are also one of the Earth's most vulnerable and threatened ecosystems. Even in "wetland rich" Canada, wetlands are disappearing at an alarming rate. Seventy per cent or more of wetlands have been lost in settled areas of Canada and more have been damaged. This trend continues across Canada but Ducks Unlimited Canada and others are working to reverse this. Conservation work, based on science, and encouraging governments to implement strong policies for wetland protection are making a difference.

When we try to pick out anything by itself we find it hitched to everything else in the universe.

John Muir (1838 - 1914)

Choosing a Site

Your choice of site will depend on several considerations and some may be beyond your control (cost, distance, etc.). No matter what, involving your students in a wetland learning adventure will be well-worth the effort.

Check out your neighbourhood first!
Children need to know that nature exists all around us. A local site connects students to their own community. There are other advantages too—you may be able to walk there—a cost saving and a chance for multiple visits. And, it may be a catalyst for you and your students to develop an environmental action project close to home.

Farther afield . . .
Nature centres, conservation areas and parks often have wetlands associated with them. Check with your municipality or local conservation organizations. Ducks Unlimited Canada (DUC) works with numerous groups across Canada to provide field trips and offers connections to wetland sites through its education.ducks.ca website.

Whatever you choose, here are some questions you should ask:

- ☐ Is the site open to school groups? Make sure you have permission to visit – especially if it is on private property!
- ☐ Do they offer an educational program or interpreter? Will you be using these services or, if you wish, can you do it on your own?
- ☐ Let them know your goals for the field trip or the topic you are trying to teach. They can advise you if their site is suitable and suggest the best spot to visit.
- ☐ If you are conducting your own program, are there any restrictions to the activities you can undertake? *Most public sites will **not** allow you to collect plants or take away samples, but many will allow you to conduct a pond study—as long as it is done with respect for wildlife and the natural area you are visiting (see page 6). Even if there are restrictions, your students can still sketch and record their observations.*
- ☐ Practical details include:
  - Costs— For admission? Do they charge for supervisors? Volunteers? For parking (bus or car)?
  - hours of operation
  - directions *(especially for rural sites, since GPS and other tools are not always reliable)*
  - *parking (for a bus?)*
  - access to washrooms
  - picnic shelter or accommodations for lunch, rain, poor weather
  - any requirements that you might have for special needs students
- ☐ What are their safety and emergency procedures?

And, of course, you will want to know about the wetland itself! What type of wetland is it? Are there birds, plants, wildlife or other special features that you should look for?

What about Stormwater or Flood Ponds?

Many cities have Stormwater Management or Flood Retention Ponds, especially in newer housing developments. These specially-built depressions act as "safety valves" to absorb water and release it slowly after a storm. Many are planted with native shrubs, grasses and wetland plants and soon become "naturalized" attracting local wildlife.

If these are publicly accessible, they may be an easy place to visit with your class. However, if you are planning to use them for activities such as water testing or a pond study, check with your local municipality first.

You may be able to visit a DUC conservation project

DUC has over 7,000 landowner partners who are conserving wetlands on their properties. You may know someone who would be pleased to offer your students the chance to explore their wetland.

Make sure the owner is willing to do this and check out the site first to make sure it is safe, accessible and will work for your students.

Planning Your Trip

Field trips are exciting for students and involving them from the very beginning will make it a more enjoyable time for all of you. They will take ownership of the event and are likely to take on more responsibility for their behaviour.

With your class:
Use this activity to introduce the planning of your field trip.

Ask the students how they think a team of researchers would prepare to go out to work in an isolated wetland. Your students might suggest that the researchers would need:

- a plan *(including what equipment to take, who will do what tasks, etc.)*
- a map of the site
- proper clothing, an emergency first aid kit, water and food, directions to the site and plans to make sure someone knows where they were going and when they would return, a way to communicate in case they become lost or injured, etc.

Other ideas:

_____
_____
_____
_____
_____
_____

You might want to discuss what might happen if the researchers weren't prepared. For example:

- Without the right equipment, they couldn't do their research properly and their results might be wrong.
- If they didn't dress properly they might get sunburned or be too cold to complete their tasks.
- They could run into problems if they didn't plan for emergencies, or let people know when to expect them back.

For your field trip, this might mean you and your students need to:

- ☐ plan the activities you want to do at the wetland and identify the equipment you will need
- ☐ plan your field trip teams; teams can then work together to prepare for the trip
- ☐ decide the proper clothing to wear for the weather and activities you have planned
- ☐ decide if they need to bring drinks *(important to prevent dehydration!)*, and snacks or lunch depending on how long they will be there
- ☐ **plan a safe trip—** The teacher will, of course, be responsible for safety or for speaking to the staff at the site about it but the class should discuss the rules for your trip as you plan.

There are Many Ways to Conduct a Wetland Field Trip

Let the students take the lead! What would they like to see firsthand during their trip? What questions do they have about the wetland or the animals that live there? Why is this wetland, and others like it, important? Is the wetland damaged or protected? Are there theories they want to test—about biodiversity, water quality, etc.? They can do research or hypothesize what they might or might not be able to see or answer during their visit.

Project-based Approach. There are numerous ways to incorporate a student-focused, project-based activity into your wetland visit. For example students could work, alone or in groups, to research individual plants, animals, special wetland features, human uses or other aspects of wetlands. If you are using testing equipment, some of them can research how to use it properly. In the field the students become the "expert" resource person.

Give each student a chance to share their expertise. There are plenty of tasks - some can prepare brief naturalist-style presentations about the creatures and features you might see, others can be in charge of the equipment and provide instructions on its use, others may take the lead around safety or proper handling of animal specimens and so on.

Use work sheets or journals to guide your students' activities. These may help to focus your students' attention and they can provide guidelines for conducting their own science-based observations.

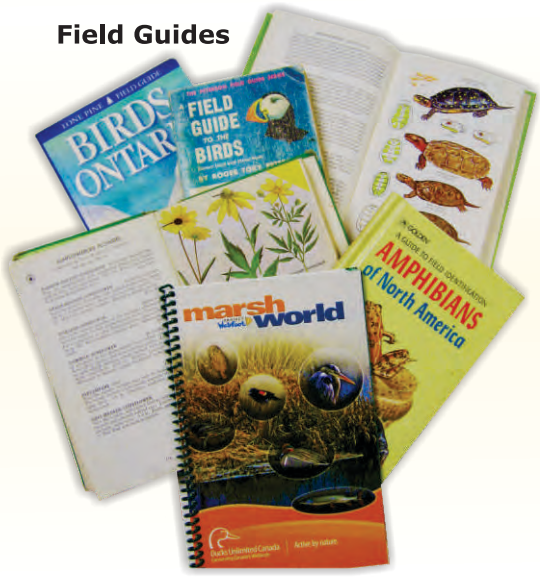
Focus through art or a camera lens. Sketching nature or capturing it with a camera can enhance observation skills. Or students could work alone or in groups to create a photo journal or video of their trip or to tell the story of the wetland.

Bring in technology. If you have access to GPS you can use this technology to record and map key features of the wetlands. Some sites offer the opportunity to explore them through geocaching.

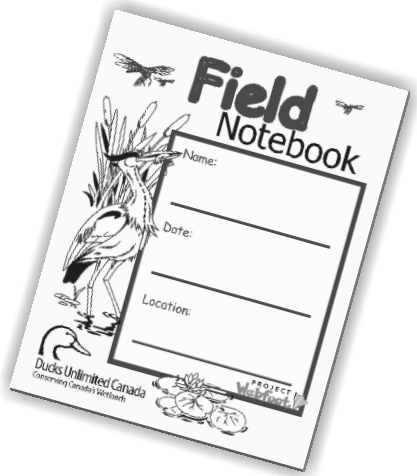
Leave pens and paper behind in the classroom. Let them immerse themselves in the experience and observe nature without distractions. Then reflect on their wetland adventure back in the classroom through stories, poems, posters or research projects.

As a change of pace, you or your guide may want to include one or two games (see page 16). Again, a group of students might prepare one beforehand to use on your trip. If you run out of time or there isn't a suitable place to do it—you can do later it in the school yard to reinforce their learning experience.

Field Guides



Field guides come in many forms including books, sound recordings or even guides that fit in your pocket. You can use them before your field trip to learn about things you might see in the wetlands, or during or after your field trip to learn more about what you have observed.



DUC's Project Webfoot kit includes many resources, including a field notebook to copy for your students. It provides useful information to guide their wetland exploration. Other resources are available from our website at education.ducks.ca.

Respect for Nature

Learning outdoors is an adventure and it is an opportunity for students to think about the natural world, the important role it plays in our lives and how we can help to care for it.

Before your Trip

Younger students – Set the scene for your discussion.

A noisy giant stomps into their home (or into your classroom) with great big muddy feet. The giant makes a mess – breaks all the furniture and tosses everything around so you can't find your things. They make so much noise that you have to stop what you're doing. But they don't stop there. They steal your food – not just today's food but the food for all of your family for the rest of the week.

Ask your students "How they would feel?" How would they expect a visitor to treat their home or your classroom? Discuss your visit to the wetland and ask them to think about how they should behave in "someone else's home".

Older students –

Scientists respect nature but also, when they are doing outdoor research they want to make sure that their actions don't affect their results. Ask the students "What sort of things might go wrong?".

- ☐ noise – might disturb birds or other wildlife that you are trying to study
- ☐ stirring up the water too much – you won't be able to find invertebrates or it might affect your water testing results
- ☐ damaging the wetland, or taking away too many study samples might cause an imbalance or other problems with recovery

Teachers:

Demonstrate Your Own Respect for Nature

Be a good role model. Show interest, enthusiasm and respect for the site and its natural inhabitants.

- ☐ Ensure all creatures are handled with care and that they are gently placed back into their home.
- ☐ Is part of the wetland being impacted too much by your visit? Is one spot becoming eroded or the soil compacted? You may decide to make it "off limits" to reduce any further damage.

At the Wetland

- ☐ **Leave plants in place and undamaged.** They produce food and act as shelter for animals. Their flowers produce nectar, an important source of food for insects and other creatures.
- ☐ **Handle any animals with care!**
  - Invertebrates, tadpoles, small fish, etc.— need to be covered with water and protected from overheating (make sure water doesn't get too warm & limit observation time).
  - Amphibians (frogs, toads, salamanders) have delicate limbs that can be easily broken with rough handling. They are sensitive to chemicals, so if you have applied insect repellant, hand sanitizer or sunscreen, avoid touching them. The skin of many species needs to be kept moist to allow them to breathe properly so naturalists often dip their hands in water first.
  - Reptiles (snakes, turtles, lizards). Generally better to observe but if you do handle them, make sure everyone washes their hands afterwards (a good practice anyway!) Although uncommon, you may encounter venomous snakes in some areas, so it is good to know if this is a concern where you live.
- ☐ **Respect the Cycle of Life.** Many field trips take place in the spring, an important breeding and nesting time. Turtles and other animals may be on their way to lay their eggs and nests should not be disturbed. Baby animals should be left alone. Dead animals should be left in place and not handled. They nourish many plants & animals, and fertilize the soil.

Teachers' Checklist

Before the Trip:

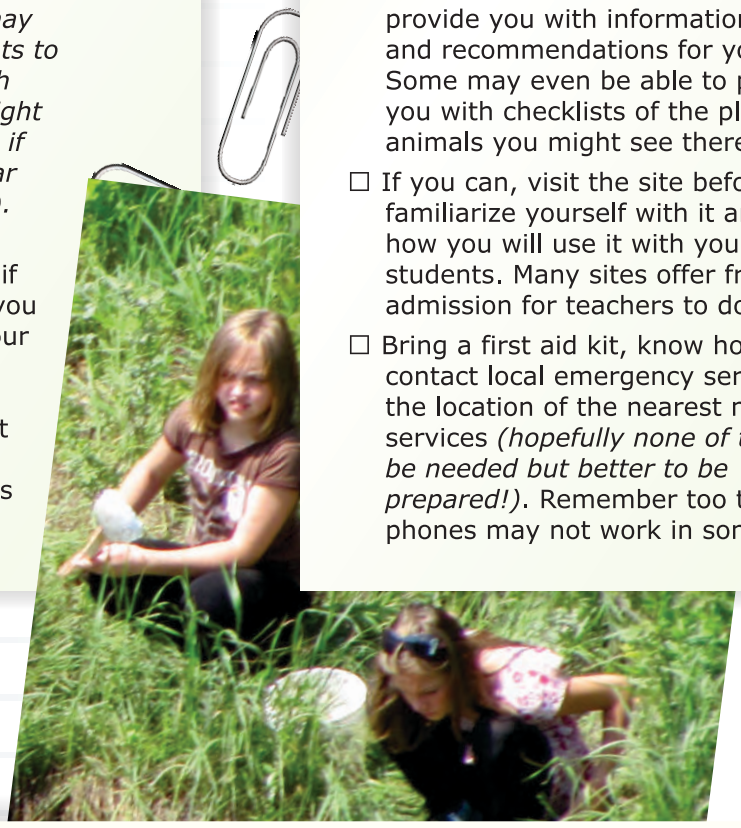
- ☐ Confirm time & date of trip with the site.
- ☐ Arrange the bus or other transportation well in advance—especially for spring field trips. A few days before your trip call to confirm your bus and pick up time.
- ☐ Make sure parents receive the trip information and that all permission forms have been returned.
- ☐ Arrange extra volunteer supervisors according to your school policy. Make sure they know what's expected of them, including the day's schedule. You may want to provide them with a few simple ideas on how to assist the students in meeting your anticipated learning outcomes.

For a guided tour:

- ☐ Advise them of any special needs *(for example, some sites may require special arrangements to accommodate students with mobility limitations. You might also want to let them know if any students have particular allergies or other concerns).*
- ☐ Tell the guide or interpreter what you are studying and if there are particular topics you want them to cover with your students. It is good to let them know if you class is starting or finishing the unit or if they completed it several months ago and this is a review.

On your own:

- ☐ Outdoor education sites will usually provide you with information, maps and recommendations for your visit. Some may even be able to provide you with checklists of the plants and animals you might see there!
- ☐ If you can, visit the site beforehand to familiarize yourself with it and plan how you will use it with your students. Many sites offer free admission for teachers to do this.
- ☐ Bring a first aid kit, know how to contact local emergency services and the location of the nearest medical services *(hopefully none of these will be needed but better to be prepared!)*. Remember too that cell phones may not work in some places.



On the day of your trip:

- ☐ Make sure your students are on time for the bus pick up.
- ☐ Make sure you have the tools and equipment you need - but if you have delegated the responsibility to students allow them to be accountable for this *(however it doesn't hurt to make sure you have a few "backup" items for key activities)*.
- ☐ 1 clipboard/student *(if needed)* and pencils *(no pens please, they run if paper gets wet!)*. Bring a few extras too.
- ☐ Not everyone comes prepared. Check the weather forecast. Extra jackets, hats, mitts, rain gear, boots, etc. can make the day more enjoyable for everyone. Check out your "lost & found" or stock up on extras from a recycled clothing shop.

Parent/Guardian Consent

Most schools have their own form for field trips but it is important that parents are properly informed about the trip and the activities their child will be taking part in. Many school districts/boards provide translation of these forms for parents or guardians whose first language is not English.

Your form/letter should include:

- ☐ Where you are going
- ☐ An agenda/itinerary including: educational objectives, departure date/time, expected return time
- ☐ Who is sponsoring the field trip, whether fundraising is needed and if there are any costs for the parents.
- ☐ Planned activities— make sure parents are aware of your planned activities, especially ones near water such as invertebrate sampling, canoeing, etc.
- ☐ Supervision and Safety—who will be supervising, type of transportation (bus, parent driven cars, etc), any safety concerns and how they will be addressed
- ☐ You should include some sort of declaration by the parent showing that they understand and approve their child taking part in this field trip.
- ☐ Many schools address the taking of photos with a blanket permission at the beginning of the school year. If not, and if you are taking photos or making videos, make sure to include a section about this.
- ☐ Do not forget a place for the student's name and the parent/guardian's name, signature and date.

Plan for a Safe Trip:

Set boundaries and identify "off-limit" areas. At some sites you may need to identify boundaries with brightly coloured flagging tape or some other simple method. REMINDER: Remember to remove these when you leave!

Are students allowed to enter the water? If so, they should wear rubber boots. We suggest they wade in only to ankle depth. Some suggest the top of their boots, but this often results in plenty of wet feet!

Agree on a signal to call the group together. This is helpful if you want to share a great discovery or need to deal with an emergency. Make sure your supervisors know about this too!

Make sure students wash their hands - after exploring the wetland and especially before eating lunch or any snacks. Cover any open cuts with a waterproof bandage.

Student Checklist

Before the Trip:

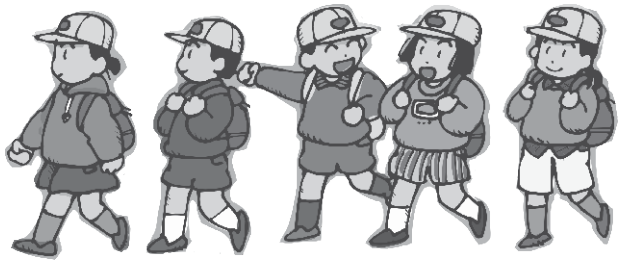
☐ Return your signed permission forms by _____.

What to wear:

- ☐ old clothing (you may get wet and muddy!)
- ☐ hat and sunscreen to protect you from sun
- ☐ warm days - light weight and light coloured, long-sleeved shirts & pants (these will protect you from insect bites);
- ☐ cool or wet days— a jacket, rainwear or even a hat and mitts Hints: If you are working around water, keep your mitts dry and use them only to warm up your hands. Dress in layers—you can adjust for the weather.
- ☐ rubber boots— help in long grass or when there are damp spots and especially if you are allowed to wade in the water. Hint: At the end of the day an extra pair of dry socks and shoes are great to have, especially if you get your feet wet!

At the Wetland:

- ☐ listen to and obey your teacher's and/or the naturalist's instructions
- ☐ stay together as a group—with your field trip team or a buddy
- ☐ No —rough-housing - walk—don't run; don't splash or push people. Speak quietly so you can hear the animal sounds.
- ☐ tell an adult if something is wrong or if someone leaves the group



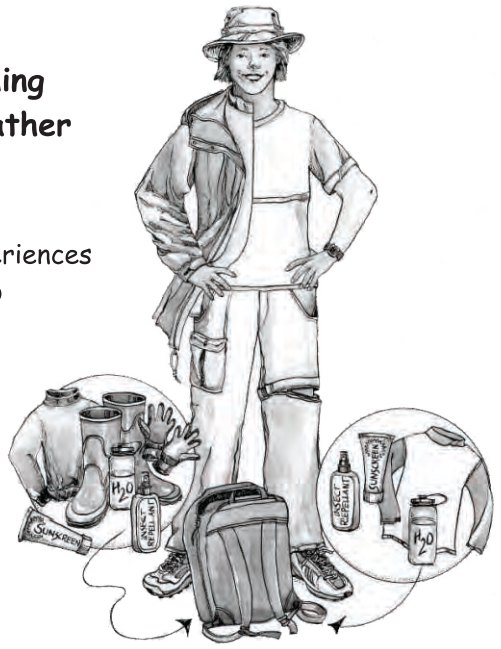
What to bring:

- ☐ any items that you or your group promised to bring for the trip —your classmates are depending on you!
- ☐ water/drinks (field work makes you very thirsty!)
- ☐ litterless lunch and/or snacks
- ☐ insect repellent, or the teacher may provide this—but keep it off your hands if you are studying invertebrates or if you may handle frogs or other small creatures
- ☐ Your teacher may ask you to bring other items (a camera, binoculars, etc.). Discuss these with your teacher first and make sure you have permission from home to take them on your trip.

Things to leave at home or on the bus:

- ☐ personal electronic devices (cell phones, IPods, etc.) unless your class plans to take photos or record video of your trip

No such thing as bad weather – only bad clothing!
Outdoor experiences can be fun, no matter what the weather, as long as you are prepared.



Share Your Discoveries

One never knows what you might see on an outdoor field trip and part of the excitement is discovering something unexpected and sharing it with others. And so this excitement doesn't become chaos, it is good to plan ahead. Here are some ideas to help -

Signaling a "find"
Agree on what to do if you spot something special *(a turtle laying its eggs, a deer, animal droppings, a nest or burrow, etc.).* It is generally best not to disturb this bit of nature but to share it with others by pointing it out or bringing the group closer *(this is a good practice too, in case some adult judgment is needed.)* One common signal is a hand raised by the "finder(s)" with others following as soon as they see it. Once you have everyone's attention the finder can point out his/her discovery to the group. Or, you or your students may already have your own signal that you can use.

Where Is It?
Pointing out a bird or something else at a distance can be a challenge. A technique used by bird watchers, is to use an imaginary clock to direct people's attention. The observer chooses an identifiable landmark *(tall tree, a large branch, a cluster of flowers)* and then describes the location relative to it. For example, the upright trunk of a tree could be 12 o'clock and a bird on a branch down and to the right might be located at "3 o'clock".

No Collecting— This is a good time to reinforce the "Respect for Nature" messages found on page 6 and to remind students that every find is part of the wetland habitat and should remain there.

Different Kinds Of Wetlands

"Wetlands" is a collective term for habitats that are covered by shallow water for all or part of a year. Wetlands have a source of water and they have specific kinds of soils that hold water at or near the surface. Wetland plants are specially adapted for their environment and they are able to withstand prolonged flooding.

There are different kinds of wetlands across Canada and different names are used depending on their individual characteristics. Some wetland types include: freshwater or saltwater marshes, swamps, bogs, fens, swales, sloughs, prairie potholes, etc.

It will help to know the kind of wetland you will be visiting and some of its characteristics before you arrive so your class can get the most from your visit.

Different Seasons

In spring wetlands are full of life, many with nesting birds, amphibians calling to attract a mate, and the eggs of invertebrates, frogs, fish and even turtles hatching. But it is worth visiting a wetland in other seasons too—especially if you have the chance to make repeated trips.

In fall, migratory birds may be passing through or gathering together to feed and prepare for a trip south. You may see evidence of beavers or muskrats reinforcing their dens for winter or the tracks of overnight visitors who have come down to water's edge to drink.

In winter other stories unfold — the trails of small mammals can be seen under or across the top of the snow. Or you may spot feathers and other signs of a bird of prey's successful hunt. This is a time to ask "Where do the animals go during winter?" Many birds fly south—but what about the insects, frogs, turtles, fish and other inhabitants? Hint—they are still there. This is a great chance for the children to research before their trip and then present their findings to their classmates!

The Field Trip!

Finally there!
This is an exciting time but before you begin you may want to take a few minutes with your captive audience. When they are still together on a bus or gathered at the entrance to the site, remind them of a few basic rules. We have suggested some key reminders here but you may have some of your own.

Consider a short washroom break— it could be a while before you get the chance again! If you are visiting a truly "rustic" site (one without washrooms or privies), you may need to consider having a washroom break en route.

Remind them too that the quieter they are, the more likely they are to see birds and other wildlife.

Reminders:

You want to keep the magic of your visit alive but some ground rules will help to ensure safety and enjoyment for everyone.

- Stay together—in your group, with your buddy and within the boundaries. And let your teacher or another grown-up know IMMEDIATELY if there are any problems or if anyone is missing from your group.
- Listen carefully to all instructions.
- Don't splash or push people.
- Treat all living specimens with respect and release them safely back where you found them.
- Wash your hands or use disinfectant after your wetland investigation, especially before eating.
- Use equipment and tools safely and responsibly. *NOTE: The tools you need for your field trip vary greatly depending on your teaching objectives, the age of your students and your planned activities. We have suggested some simple, easy-to-find items for the activities on the following pages. but if you are going on a guided tour or visiting an established outdoor centre they may provide them but check with them to make sure.*
- Don't litter and dispose of any water test samples, test strips or other items safely and as instructed by the teacher or guide.

Avoiding Biting Insects—some suggestions for before and during your trip

Wearing long-sleeved, light-coloured shirts and pants will help but also:

- Do not wear perfume or other scents including washing your hair with scented shampoo right before your trip
- Insect repellent—apply a small amount when you get to the site and are off the bus—but then, only if you need it. **If you use it, avoid contact with any marsh creatures, in the water or on land, since many insect repellents are harmful to them.**

Start with the Big Picture

It is very helpful to look at the wetland as a whole first.

As you look around the wetland, discuss what you see.

- Can your students identify features that help you recognize it as a wetland?
- Ask questions that will help them to think about how the habitat and wildlife interact.
- Watch for the teachable moments - a hawk flying overhead or tracks that tell a story of a night-time visitor.

DUC's student *Field Notebook* and *Marsh World* guide provide helpful information and ways to direct your students' attention. Field guides are great tools for identifying plants, wildlife and most other things found in nature.

Observe Insects and invertebrates — Look for them on plants, in flight, moving along the ground, skimming across the water. They provide food for birds and other animals. Some are predators or herbivores, while others are decomposers that eat dead plants and animals, converting them to nutrients for plants. Many insects pollinate plants so they can reproduce!

Where to look	What you might see!
Scan the trail or boardwalk, the shoreline	tracks, droppings ("scat"), webs, chewed plants, beaver-chewed logs or felled trees, nests, eggs, signs of digging (perhaps a turtle laying eggs, a raccoon digging them up or leading to a small animal's underground home), a beaver lodge or muskrat home
Scan the water surface —check out logs, little islands of vegetation, the water surface	a beaver lodge or dam, a muskrat home; turtles sunning on the log; a duck, goose or even crane's nest; frogs on a lily pad; water striders and other insects hunting or moving on the water surface
Look into the water	for fish, turtles, large invertebrates, eggs laid on plant stems or floating free; parts of plants or decaying fish, etc.

Look at the Plants! Remember - All green plants produce the oxygen we breathe and, through photosynthesis, they convert the sun's energy, water and nutrients from the soil into a usable form for animals. They are the foundation of the food chain. Without them no life could exist.

Things you might observe	Importance (their "function")
Cattails	Shelter; cover to hide from predators; a nesting spot (red-winged blackbirds, ducks, other birds); food (muskrats); muskrats use them to build their homes; filter water and lock up toxins – improving water quality
Wetland plants	Food; cover for invertebrates, fish and others; decay and nourish the wetland soils; their roots help suppress erosion
Shoreline plants, shrubs and small trees	Nesting materials; shelter; roots hold soil and reduce erosion; shade water, reducing its temperature
Berries, seeds, cones	Some of the ways that plants reproduce; food for animals
Dead trees standing in the water	Nesting sites (wood ducks, owls, etc.); shelter, food for decomposers

Wildlife Watching

Birds are an easy wildlife group to spot in wetlands and a great way to introduce children to the importance of wetlands as a home for animals. From songbirds to birds of prey, to waterfowl *(such as ducks and geese)*, to majestic herons and cranes, wetland birds come in all shapes and sizes. Birds rely on wetlands for food *(flying insects, plants, fish, frogs, aquatic insects)*; to make their nests and raise their young *(wrens, blackbirds (red-winged, yellow-headed and others), ducks, swallows, osprey)*; to rest during migration *(ducks, geese, swans and others)* and for other purposes. Without wetlands these birds could not survive.

Identifying birds or any wildlife and learning about their behaviour makes a wetland visit even more rewarding.

Identifying Birds

If you are on a guided tour your leader should be able to help you identify the birds and behaviours that you see. If you are on your own, and particularly interested in looking at birds, check with your students' parents, a local naturalist club or other staff members before the trip. Birding or bird watching is a popular hobby that is growing every year. You may find a local birder who is more than willing to come along as a resource for your group.

No luck? There are many excellent field guides available that can help you to identify birds or wildlife you see. You can find these at your local library, book store or on-line.

Even if you don't know the kind of bird, you can still watch for interesting bird behaviors—nesting, preening, feeding, caring for young, courting, protecting their territory or their young, diving underwater or other ways of escaping notice *(diving, camouflage, etc.)*.

Using Binoculars

If you have access to binoculars, they can help with bird watching or can bring parts of the wetland into closer view. With very little practice they are not that difficult to use.

1. Make sure the students place the strap around their neck. This prevents dropped and damaged binoculars. Hint: Binoculars may be set down in a moment of excitement—attach a bright piece of yarn or flagging tape to make them easy to spot.
2. Show them the binocular parts—
   - the small eyepiece end is the one they will look through
   - the binoculars' sides pivot in the centre to adjust to the width of their eyes
   - there are usually two adjustments to focus binoculars— the main one (a dial or curved bar) focuses both lenses, while a dial surrounding the right eye-piece can often be adjusted separately
3. Direct their attention to an easy-to-see stationary object (a post, a tree, a building). They can use this to practice focusing their binoculars. Make sure to help anyone who is having trouble.
4. A little practice—at school or at the beginning of the field trip—and they will soon master using binoculars.
5. When you're done, make sure everyone puts their binoculars away properly!

Remind them of Bird and Wildlife Watching Etiquette

- Always stay quiet and approach slowly.
- Don't approach too closely. We don't want to chase them away or to disturb their natural behaviour.
- Do not shout or throw things to try to attract their attention.

Critter Dipping

Studying Wetland Invertebrates

Why study invertebrates?
There is more life in a wetland than first meets the eye! While people quickly spot a duck or frog, few realize the diversity of life that thrives beneath the water's surface. In fact many of the common insects that we associate with wetlands—dragonflies, damselflies and even mosquitoes start out life as aquatic invertebrates. These invertebrates are an essential link in wetland food chains as they are the food source for fish, frogs, songbirds and waterfowl, and even other invertebrates. Many are important scavengers helping to break down dead plant and animal materials. Without a healthy invertebrate population we would not see the many kinds of wildlife species we associate with wetlands.

Observing invertebrates gives us a miniature world where we can:

- observe adaptations, looking at how these creatures move, breathe and find prey in the water!
- discuss food chains and webs and the different roles within them (producer, consumer, decomposer)
- observe the biodiversity of life in a wetland
- discuss the interrelationships and niches that exist within an aquatic ecosystem.

Where to find invertebrates!
Just like larger animals, invertebrates will occupy different parts of their habitat. Some may be swimming on or near the surface. Others may be swimming farther below. While still others may be crawling amongst the decaying matter in the bottom of the pond or even be buried in the mud. Suggest your students "think like an invertebrate" - where might they be? Would they be hiding in the vegetation or under rocks? Would they be hunting other invertebrates near the surface? Many insects and other animals, such as frogs and fish, lay their eggs in the water, often attached to the underwater stems of wetland plants. Gently moving the plants may expose their resting place.

Invertebrates and vertebrates. Invertebrates are animals with backbones but you may find small vertebrate animals—tadpoles, minnows, etc. in your search as well.

Suggested equipment:

- white basins, small containers or your own Portable Pond (see next page)
- magnifying glasses or hand lens—to see small creatures
- nets (strainers or created from a piece of pantyhose stretched around a wire)
- turkey basters—helpful for sucking up and transferring small creatures
- paint brushes—to gently move vegetation or small animals
- pond scope (see next page)

Note: The number and kinds of small animals that you find during "critter dipping" will vary with the type of wetland, the health of the wetland and the season.

Handle with Care!

Wetlands creatures are delicate.

Tiny wetland creatures

Always pour water gently into the container from a low height.

Watch the temperature—small containers and shallow pans can heat up quickly in the sun. Temperature changes can be deadly to small animals. Provide some shade and only keep specimens for short periods of time.

A paintbrush is a handy tool to use when handling invertebrates. Use the brush to gently move aside debris and wetland plants or to move them to another container. You can also use the paint brush to make a final sweep, remove invertebrates clinging to the inside of any containers.

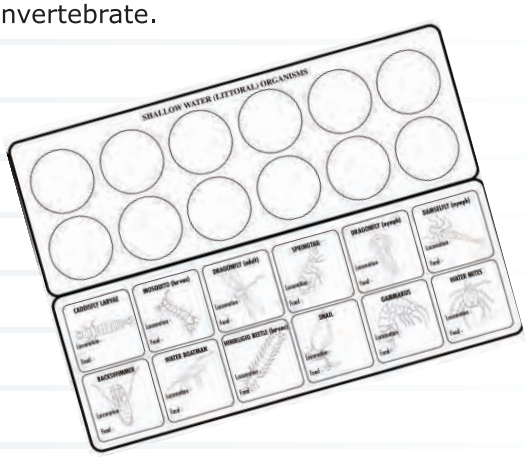
Flying insects, like dragonflies, moths, butterflies, etc. have delicate limbs, bodies and wings. Keep this in mind if you handle them.

Frogs, toads, snakes, turtles. Often it is best just to observe these in their natural setting rather than to risk injuring them accidentally *(tiny limbs break easily and amphibians are highly sensitive to chemicals)* or to have an unpleasant and often smelly experience as they defend themselves *(many secrete or expel unpleasant, but relatively harmless substances when handled!)*.

Critter Dipping!

Heighten their observation skills!

Ask the students to group each of the different species that they find together in different containers. Images of the different invertebrates can be found in resources provided by DUC, either in the Project Webfoot kit or available on-line. You can use a plastic egg carton, margarine or other small containers for each type of invertebrate.

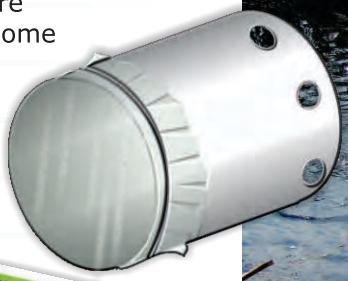


Pond Scope

Easy to make from a tin can or tube (minimum 20 cm diameter by 15 cm long), plastic wrap and waterproof tape.

Wrap the plastic wrap around the bottom of the "scope". This is the "lens" will allow you to view underwater. Secure the plastic firmly to the pipe with waterproof tape.

Your scope is ready to use! (A more complex version can be found in some of our teaching resources.)



Portable Observation Pond

A (2 m x 2 m) sheet of 6 ml white plastic from your local hardware or home improvement store makes an easy-to-carry, inexpensive, "do-it-yourself" observation pond where you can gather a group of students together. And it can be great fun for the students too!

- Lay it out on the ground near a wetland. (Or lay it out on a portable table or other flat surface at waist height if you have students in wheelchairs or simply want to save your back!)
- Roll-up the edges on all sides to create a "pool" (1m x 1 m)
- Fill it with water from the wetland!

You now have a place to observe invertebrates and other treasures. When you're done, gently return your wetland study subjects to the pond and empty the water. Dry, fold and put away the plastic to use another day.

You can make a fancier "Port-A-Pond" version of this, especially handy for multiple classes and repeat use, by following the directions in the "Wetland Habitats and Communities" teachers' guide or contact us for instructions.

Identification sheets for fresh and salt marsh invertebrates.

Ducks Unlimited Canada provides a variety of resources to download from our website which can help with identification of wetland wildlife and provide interesting facts for your students. Additional resources are available to help with more in-depth studies such as water quality testing, population dynamics and so on.

Games can make a nice change of pace or be used to reinforce some of your learning objectives. These are just two suggestions but others may be found in teaching resources such as Project Wild and Project WET, or other on-line resources.

Water Cycle Game

(a wet but handy game on a hot day!)

You need:

- 1 large bucket filled with water (representing the ocean)
- 3 shallow pans (representing wetlands) and 3 sponges (clouds).

Place the 3 pans on the ground at one end and the water-filled bucket 20 metres away.

Quickly review the water cycle *(water evaporates from oceans, lakes, etc—condenses to become clouds—falls to earth (precipitation) - is absorbed and runs off into streams, rivers, lakes and wetlands).*

Divide into 3 relay teams. Each team receives a sponge (a "cloud")

On the start signal a member from each group races to the ocean, fills their sponge with water and returns to their wetland to fill it up with "rain" from their "cloud". They then pass the cloud to the next person in the group who repeats this task. The first group to finish filling their wetland wins.

Wetland Webs

To show the interdependence of plants, animals and the wetland habitat.

You need: a large ball of wool or string; large cards labeled separately with the following: sun, water, soil, oxygen, wetland, wetland edge, cattail, arrowhead (a plant), duckweed, hawk, frog, duck, dragonfly, mosquito, red-winged blackbird, marsh wren, beaver, heron, minnow, bass, muskrat OR create your own "on the spot" cards based on your visit (you'll need cards & a marker). Every student needs a card so you can create duplicates. With a smaller group, you can try it without cards as a "memory" game.

To play: The string/wool traces the relationships and eventually creates a "web." For example - starting with the sun. The sun looks for something to link to and states how this works. "I provide energy to the cattails so they can grow." (or I cause the water in the wetland to evaporate, etc.) The sun holds one end of the string and tosses the ball to the cattails. The cattails might then say "Muskrats eat me (or use me to build their homes) or "Red-winged blackbirds (or wrens or ducks) use me as shelter and build their nests amongst me, etc"—and then holds on to the piece of string leading from the sun while tossing the rest of the ball to the person they have identified. The ball may be tossed to a person more than once since there are many relationships to identify.

Once the web is created, ask "What happens if the wetland is drained?" Tell the wetland person to move away while everyone holds their string(s). Students should see their interconnectedness as the strings vibrate, and tighten or even break. Wetland loss impacts them all!

After your trip

A few hours in a wetland is not enough time to fully appreciate the natural beauty and diversity of these amazing ecosystems. Back in the classroom students should be given time to discuss and reflect on their experience. Poetry, artwork, journal writing or a scientific analysis of their field work exploration are all ways to reinforce the experience. Most importantly, we hope that it will inspire you to support or undertake your own conservation action projects in your community.

We want to hear from you!

Students all across Canada are becoming involved in helping to conserve wetlands. How do we know this? Because they write and tell us! Please let us know about your efforts—big or small. That way we can share your ideas with others and recognize your achievement. And, if you need ideas or hints on how to undertake a special project check out the back cover or visit our website at education.ducks.ca to learn about Taking Action! and how you too can become a Wetland Hero.

Email your stories to: project_webfoot@ducks.ca

Or mail them to:

Education Department
Ducks Unlimited Canada
P.O. Box 1160
Stonewall, MB R0C 2Z0

Make sure to include all of your contact information.

We look forward to hearing from you!

Ducks Unlimited Canada
Conserving Canada's Wetlands

Ducks Unlimited Canada's conservation efforts take many forms.

- ☐ DUC conducts research to guide its on-the-ground habitat conservation efforts.
- ☐ DUC works with governments and other groups to change policy in favour of wetland and habitat conservation.
- ☐ DUC has programs to encourage landowners to manage their lands in ways that benefit them while conserving wetlands and creating habitats more favourable to wildlife.
- ☐ DUC delivers wetland and environmental education programs to teach Canadians about wetlands and ways to conserve them.

We encourage you and your students to get involved in our conservation efforts.

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Take Action!
Become a "Wetland Hero"

We hope your wetland visit inspires you to take action to conserve these amazing places and to support or undertake your own conservation action projects in your own community. Here are some ideas to get you started -

Students test the waters of wetlands conservation

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1. Grow wetland plants in your classroom and transplant them to restore a local wetland or shoreline.
2. Write letters or attend public meetings to let decision-makers know you value wetlands and want them protected.
3. Build a boardwalk to protect sensitive wetland soils and plants.
4. Build, install and monitor nest boxes for ducks or other birds.
5. Teach others about wetlands
6. Older students can help with scientific research.
7. Share your love of wetland through art, music or drama.
8. Restore a nearby wetland to use as an outdoor classroom.

Visit our website at education.ducks.ca to learn more and to find out how you and your students can **Take Action** and become **Wetland Heroes**. Wetland Heroes receive a certificate and special token of our appreciation. With permission, selected Wetland Heroes may be featured on our Ducks Unlimited Canada website or in our publications.

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Visit our website at:
education.ducks.ca