A Loonie For Your Thoughts!

Learning About Nova Scotia's Lakes and Loons

TEACHER'S GUIDE

BIRD STUDIES CANADA
ÉTUDES D'OISEAUX

Imperial Oil Foundation
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This document has been developed by Bird Studies Canada, a non-profit organization dedicated to advancing the understanding, appreciation and conservation of wild birds and their habitats.

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Introduction

Most students have been interacting with living organisms since an early age, but they may not be aware of the important roles these organisms play in ecosystems, or of the impact of human disturbance on living things. In this education guide we use loons and lakes to teach students about the dependence of living organisms on their surrounding environment, focussing on maintaining healthy ecosystems. This guide concentrates on factors that threaten aquatic systems and wildlife, how to reduce human impact on lakes and loons, and general bird biology, such as development and flight.

This guide can be used for grades 4 to 7. Students will learn about the different life requirements of the Common Loon, and will be introduced to the general concepts behind "sustainability of an ecosystem."
This guide will be useful in emphasizing concepts such as habitat, communities and diversity of life. Students will use concepts previously learned, like the food web, to understand the impact of external factors (e.g. human impact) on a lake ecosystem.

Goal:

This program was developed to help students expand skills in identifying and finding solutions to local and global environmental problems as well as in understanding the requirements and complexity of living organisms. Students will be made more aware of their surroundings and will be able to apply what they learn at home, in their community and in recreational areas. The loon is the main focus of this program because loons are good environmental indicators as well as a national symbol of wilderness.

We hope you use this guide in the classroom to teach students about loons and the environmental challenges they face. This guide contains three main lessons containing information for you to present to your students. Each lesson is followed by an activity. Also included is a PowerPoint presentation with text that you can show to your class as an introduction to the concepts contained in this guide.

CURRICULUM LINKS

Grades 4-5

Lesson 1: Loon Biology

- ✓ Exploring the world of living things
- ✓ Animal appearances
- ✓ Animal behaviour
- ✓ Vocabulary

Lesson 2: Loon Conservation

- ✓ Stewardship
- ✓ Vocabulary

Lesson 3: Legends

- ✓ Writing skills
- ✓ Culture
- ✓ Oral language

Grades 6-7

Lesson 1 : Loon Biology

- ✓ Classification keys
- ✓ Habitat
- ✓ Populations

Lesson 2: Loon Conservation

- ✓ Interactions within Ecosystems
- ✓ Social issues and science
- ✓ Technology affecting ecosystems

Lesson 3: Legends

- ✓ Writing skills
- ✓ Culture
- ✓ Oral language

Lesson 1
Loon Biology
What is so special about the loon?

Are loons ducks?

Because they live in the water, have webbed feet and act like a diving duck, many people incorrectly assume that loons are ducks. In fact, they belong to a different family (Figure 1).

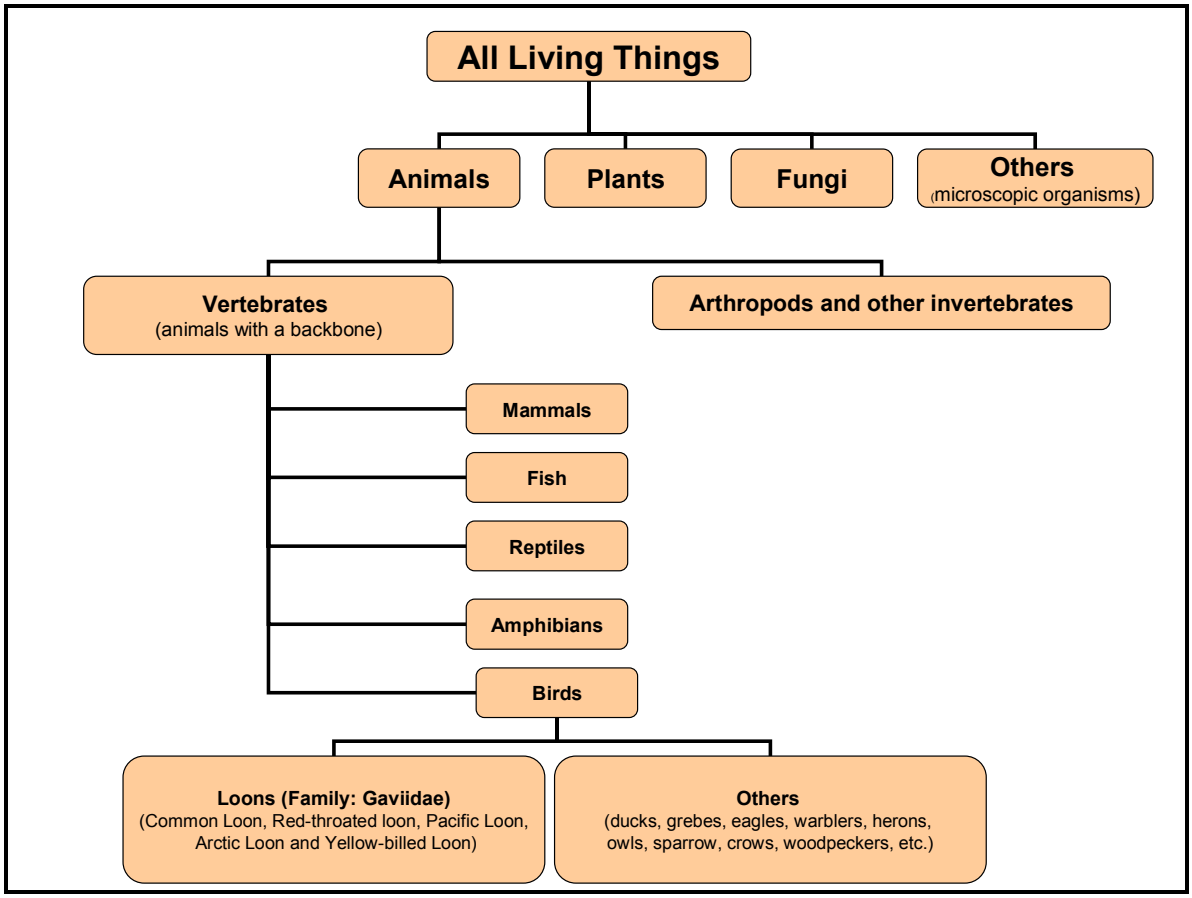


Figure 1: Taxonomic classification of the loon

The loon's body is actually quite different from that of a duck. Their feet are placed far back on their bodies and they have a heavier bone structure than ducks.

Where do we find loons in North America?

There are several types of loons found in Canada, including Red-throated Loon, Pacific Loon, Arctic Loon and Yellow-billed Loon. However, the easily recognizable black and white Common Loon is the most abundant and widespread loon species in Canada.

Common Loons can be found on summer nesting grounds throughout most of Canada and the northernmost regions of the United States. They winter on the ocean up and down the east and west coasts of North America, as well as on the Great Lakes (Figure 2).

Figure 2: Map of the breeding and wintering range of the Common Loon.
(From: McIntyre, J. W., and J. F. Barr. 1997. Common Loon [*Gavia immer*]. *In* The Birds of North America, No. 313 [A. Poole and F. Gill, eds.]. The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.)

What does the Common Loon look like?

The Common Loon has a striking black and white summer plumage, with a black head and a characteristic white necklace around its slender neck (Figure 3).

The belly and inner part of the wings are white year-round, but the other feathers are grey in their winter plumage. An immature loon resembles the adult in winter plumage.

Loons have bright red eyes in the summer; in the winter, the eyes fade to a brownish red colour, and the plumage fades to grey.

Figure 3: A Common Loon in breeding plumage ***(courtesy of USFWS)***

How does the loon dive?

Loons have special adaptations that allow them to dive under the water to catch food. Loon bones are solid, rather than air-filled like other birds. The weight of their bones is about equal to that of the much larger Bald Eagle. These heavy bones make loons less buoyant and help loons to dive.

As you can see in Figure 4 the most striking feature of the loon is its enormous feet which are placed far back on its body. The size and position of the feet make the loon look clumsy as it shuffles on land, but in the water the loon's strong legs and large webbed feet make it an excellent diver. In fact, in Europe, the loon is called the Great Northern Diver.

While diving, loons propel themselves forward with their feet (like flippers used in scuba diving) while holding their wings close to their bodies. Loons will compress their feathers and force air out which allows them to dive quietly below the surface of the water.

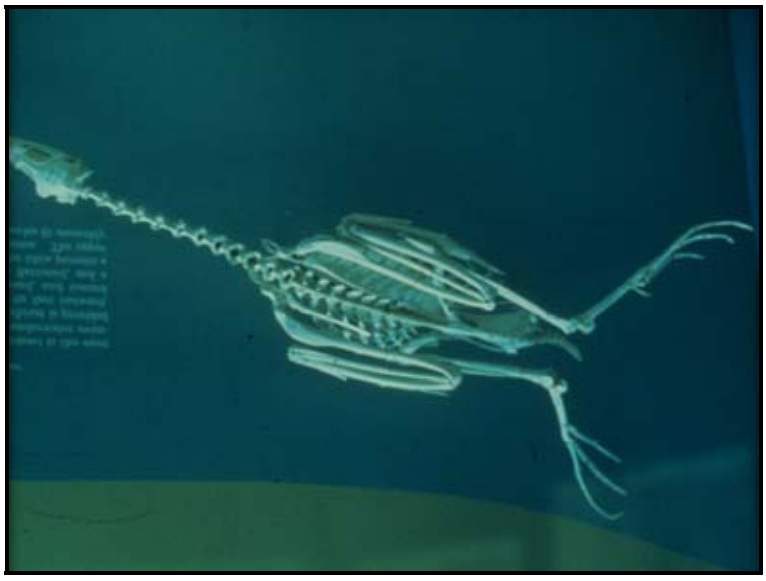


Figure 4: A loon skeleton
(courtesy of North American Loon Fund)

How does the loon fly?

Some diving birds, like penguins, have traded aerial flight for underwater flight using their wings as flippers to navigate through the water. Loons are capable of both aerial and underwater flight.

Birds in general are well adapted for flight. Compared to the bone structure of other animals, the skeleton is light, the bones of most birds (but not loons!) are air-filled and the heavy jawbone with teeth has been replaced by a light toothless bill. The biggest muscles in the body of a bird are the flight muscles that account for 15% of the total body mass.

Mechanism of Flight – To stay airborne, birds must overcome the force of gravity with forces that are equal to it and opposite. These forces are: weight, lift, drag and thrust. All four forces must be in balance to maintain flight.

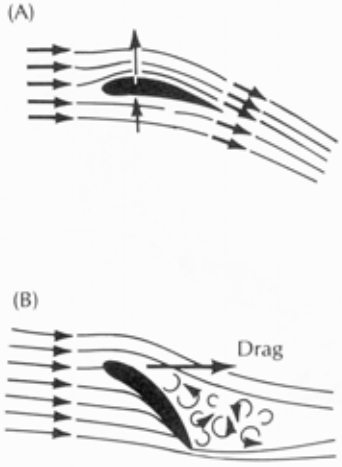


Figure 5–3 (A) The streamlined asymmetrical shape of an airfoil deflects air downward, thereby producing an opposite, upward-directed force called lift. (B) Lowering the rear edge of the airfoil to a more vertical position relative to the airstream increases its so-called angle of attack. Large angles of attack can cause the airstream to separate from the upper surface of the airfoil, thereby increasing turbulent airflow—or drag—and reducing lift to the point of stalling. (After Rüppell 1977)

Lift – Upward lift is needed to counter the downward effect of the bird's weight. Lift is the aerodynamic force produced by the flow of air past the surfaces of an airfoil. The wings of birds are shaped like airfoils, like the wings of an airplane. The shape of an airfoil deflects passing air downward. Newton's first law tells us that for every action there is an equal but opposite reaction. Therefore the downward deflection of air causes an upward force called lift.
Lift counteracts the pull of gravity and the weight of the bird.

Thrust vs. Drag – Thrust counters the slowing influence of the frictional forces of the bird moving through the air. Negative forces that oppose a bird's movement through the air are called drag. Turbulence through the air and friction between the air and the body of the bird can produce drag. The power of thrust (flapping of the wings) can overcome the slowing effect of drag.

Take off – Because of its small wings and heavy bones (both adaptations for diving), the loon has a hard time taking off. For the loon, it takes a water runway of about 10 to 50m. Loons can only take off by running over the water and flapping their wings; they can not take off from land.

In Flight – Once airborne, loons are fast fliers. They have short stubby wings that are excellent for navigating through the water but loons must beat their wings fast to stay in the air. Loons can reach up to 120km/hr, while beating their wings 4 times a second. (Can you flap your arms that fast?)

From: Gill, F.B., 1994. Ornithology. W.H. Freeman and Company, USA.

How does the loon produce chicks?

The breeding season of the loon is during the spring and summer. Because loons can't walk, they build their nests close to the water; the best site is an area that is completely surrounded by water, like an island. In May and June, the loon builds its nest in masses of aquatic vegetation in a small pile near a lakeshore or island.

An adult female loon will lay between one and three eggs (usually two) per year.

The chicks, at hatching in June or July, are not covered with feathers but with fuzzy down. Down is a type of feather that is an excellent insulator.

During the first week or two, both parents will carry the chicks on their back and will even dive briefly with the chicks tucked under their wing. Parents carry chicks on their back to provide them a safe place to rest, to conserve heat, and to avoid predators such as large carnivorous fish, snapping turtles, crows, gulls and eagles (Figure 5).

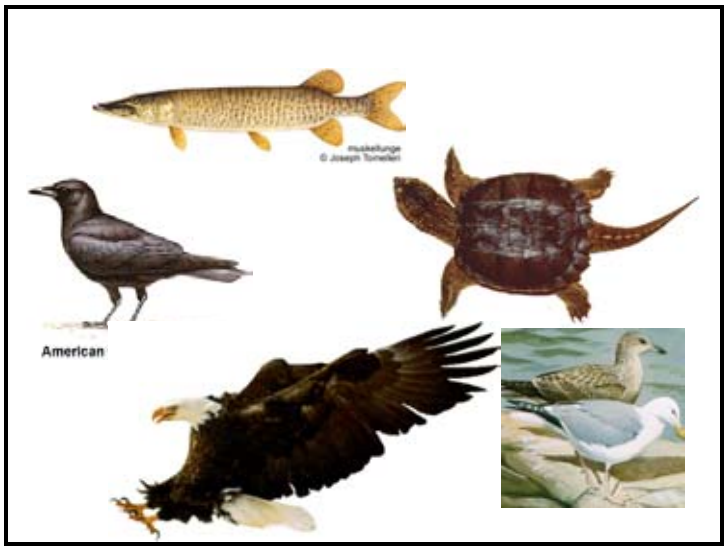


Figure 5: Predators of loon chicks

Loon chicks can swim within 24 hours of hatching, but they still depend on their parents for food and protection. For the first 8 to 12 weeks after hatching, the chicks are fed mainly fish by their parents. During this time

the parents are almost always with the chicks. After this time, the chicks can find most of their own food and are able to fly.

Loons are able to fly at about 10 weeks old. By the time of migration the young loon is capable of taking care of itself. The adults begin their migration in the late fall, leaving the young to fend for themselves. The young follow a few days later and will remain in coastal waters for up to 7 years before they return to the north to breed (see Figure 2 for wintering range).

Did you know?

Loons are reported to be among the oldest groups of birds still living today; their origin is thought to have occurred more than 50 million years ago.

Loons sleep on the water, with their head tucked into their feathers. Loons prefer to sleep over the deepest part of the lake.

Loon chicks are dark grey to brown in colour, allowing them to be camouflaged on the water and therefore less visible to predators. Another reason for this colour is that it absorbs the sun's heat and therefore keeps the chicks warm.

The incubation period (the length of time from when the eggs are laid to when they hatch) is about 28 days; both parents take turns sitting on the eggs.

The major predators of loon eggs and chicks are: gulls, raccoons, large fish such as pike and muskellunge, snapping turtles and other loons. Adult loons, with sharp beaks to defend themselves, have few predators except people.

The main diet of the loon consists of fish. They will also feed on crayfish, frogs, snails, salamanders and leeches.

Lesson 1

ACTIVITY

Loonie Days!

On the next few pages are some fun facts and information about loons. Ask your students the questions and see if they can explain why loons do certain things. Have them fill in the story sheet for each fact. Then go through the correct answers with them (page 20). Students will have fun coming up with explanations for some of the more interesting facts about loons.

Foot waggle!

The Common Loon has a behaviour where it sticks its foot out of the water and wiggles it! Why do you think the loon does this? Do you think it is tired? Or maybe its feet get cold?

Write your answer below:

The foot waggle

Red eyes

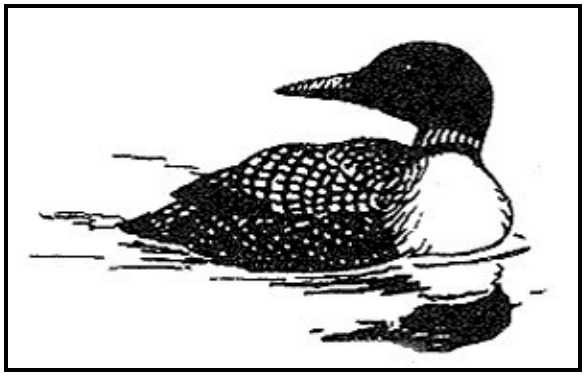
Why do you think loons have bright red eyes? Do you think it is so they look attractive? Or maybe they are trying to scare other animals?

Write your answer below:

Are loons vain?

Loons spend a great deal of time preening which means that they are always straightening out their feathers and grooming themselves. Do you think they do this because they are vain and just want to look nice all the time or is there a better reason?

Write your answer below:



How long can I live?

Loons lay 1-3 eggs each year. Biologists know that birds that lay only a few eggs, like loons, live for a long time. On the other hand, birds such as ducks can lay 8-14 eggs each year but they only have an average life span (the length of time that they live) of 8-10 years. Based on this information, how long do you think an adult loon lives on average?

Write your answer below:

What is my favourite meal?

Loons dive underneath the water to feed. What do you think they might like to eat? Do you think the young loon chicks can eat the same things as their parents? How much food do you think a loon can eat in one day?

Write your answers below:

Loonie Days!
Teacher's Answers

1. Why does the loon stick its foot out of the water and wiggle it (Foot waggle)?

Biologists have a hard time explaining this behaviour. One theory is that the loon could be stretching its foot. Another theory is that the loon waggles its foot for temperature control. The water is cold and it might be bringing the foot out to warm it up. The foot waggle could also aid in blood circulation. Whatever the reason, the loons do the foot waggle so often that biologists use this behaviour to identify coloured bands placed on loons' legs for identification purposes.

2. Red eyes

Loons only have bright red eyes in the summer; in the winter the eyes turn a darker brownish red colour. One theory is that loon eyes are brilliant red to be attractive to the opposite sex and to be seen across a lake by other loons, helping them to defend their territories. Another theory suggests that the colour red is the first to be filtered out under water; thus, by having red eyes, the whole head appears black underwater, thereby "hiding" the loon's head from the fish it preys upon.

3. Are loons vain?

Loons keep their feathers waterproof by preening. They squeeze oil from an oil gland near the base of the tail with their beaks and then rub it over their feathers. Loons also use their beaks to realign the feathers to make them waterproof. Loons can spend many hours preening.

4. How long can I live?

Loons have a long life expectancy; they can live up to 25-30 years.

5. What is my favourite meal?

The loon's favourite meal is fish. Chicks are fed small food items early in life such as snails and minnows. It is estimated that an adult loon can eat up to 2 lbs (approx. 1kg.) of fish per day.

Lesson 2
Conservation
How can we help?

What is threatening the loon in Nova Scotia?

Although Common Loons still nest in large numbers across Canada, recent studies have shown a concern for their low breeding success (low nesting success and survival of young). The Common Loon nests in populated areas all over Canada, which is why it is susceptible to the effects of pollution, development and human disturbance. In this section of the education kit we will discuss the top threats that loons face in Atlantic Canada. The activity is designed to illustrate some of these threats. Additional information is available in the last section of the guide.

Because loons can't walk, they must build nests close to the water in areas protected by wind and wave action, such as islands and shorelines. Loons usually use the same nest site year after year. When proper nesting habitat is not available loons will build their nest on poor habitat with little protection from predators, waves, and other threats. Under these conditions, the chances of maintaining a nest and raising young are lowered.

Types of Threats

Development – The development, on lake shores and islands, of cottages, marinas and campsites destroys nesting habitat for loons (Figure 6). Loons need quiet backwaters to nest and raise their young. Development near the edge of the lake destroys crucial habitat for loons.

Figure 6: Shoreline development

Healthy Side

- ✓ Natural shoreline – good wildlife habitat
- ✓ Floating dock
- ✓ Natural buffer to filter pollutants
- ✓ Secluded cottage – low disturbance

Unhealthy Side

- × Hardened shoreline
- × Permanent cement dock
- × Mowed lawn – fertilizer runoff
- × Cottage easily visible leading to higher disturbance

Dams – Fluctuations of water levels in lakes controlled by dams for the purpose of generating power can harm the nests of loons. Habitat destruction occurs when the water level is raised and nests are drowned, or when the water level is lowered and nests dry up and become inaccessible to the parent loons (loons need water for take-off and landing).

Boats – Motor boats and personal watercraft are a big problem for loons with nests. Operators of speedboats traveling fast through the water may not be aware of the presence of loons. Personal watercraft and powerboats can wash out the nests or knock the eggs from nests by the creation of

wakes. These boats run fast and loud through the water disturbing loons without noticing; they often cannot hear or see the birds in the water.

When humans or domestic pets approach, either on foot or in a boat (motorized or not), loons tend to leave their nest, and eggs are left unprotected from predators, and may become cold. Boats can also cause the separation of loon chicks from their parents, leading to an increased chance of predation and a decrease in parental care activities like feeding and brooding. In addition, many loon chicks are killed by injuries from boat propellers.

Solutions: Know the signs! A loon shows levels of distress by raising its wings while sitting in the water. Another sign is the "penguin dance" where the loon raises out of the water with the wings held tightly in and the bill low and held tight to the chest. The penguin dance demonstrates a very high level of distress (Figure 7).

Figure 7: The "Penguin Dance" (Photo: Kevin C. Loughlin)

Fishing nets and traps – loons entangled in fishing nets and traps drown (Figure 8). Loons that get fishing lines caught around their beaks can starve.

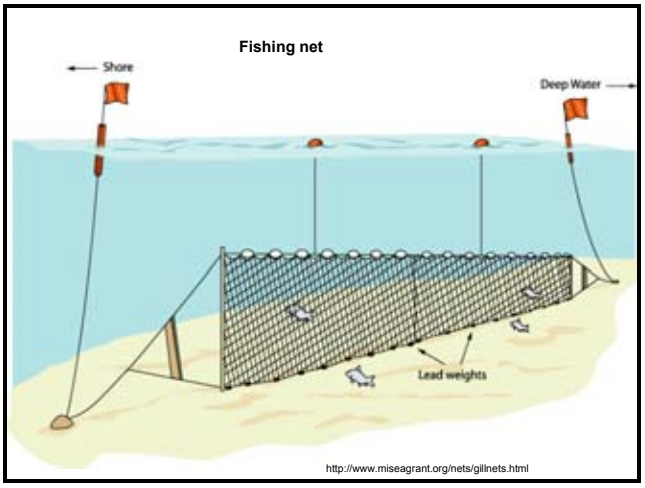


Figure 8: Fishing net

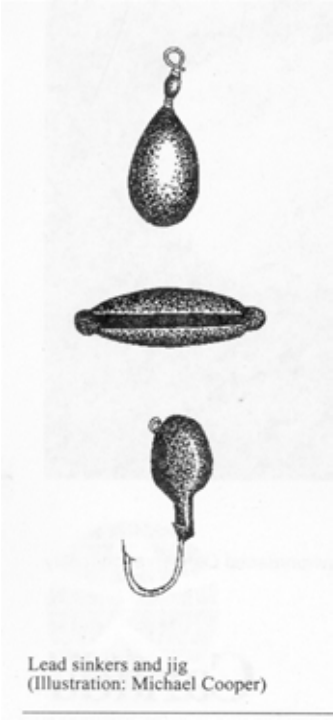
Lead Poisoning – Lead poisoning is not only a problem for loons but for many other birds. Every year in Canada thousands of ducks and other birds die from lead poisoning.

Water birds like the loon can get lead poisoning by eating lead shotgun pellets and lead fishing sinkers and jigs that accumulate or are discarded near lakes. Since loons have no teeth, they ingest small pebbles from the lake bottom which are held in their stomachs to help to grind up food. Pieces of lead can also be swallowed with these stones. Lead is absorbed into the blood and tissues of loons, where it causes lead poisoning. Ingesting a single lead sinker will kill a loon.

Hunting of loons is illegal in Canada. However, duck hunting is a popular pastime. In the past duck hunters used lead pellets in their shotgun shells. For every bird a hunter hits he or she shoots an average of 5 or 6 shells. Over many years of hunting near lakes lead pellets have accumulated in high numbers. Loons can mistake lead shot for food or grit and become poisoned. Fortunately, government agencies recognized the problem with lead shotgun shells and all duck hunters in Canada are now required to use "non-toxic" shot or steel shot that will not cause any problems to the birds if they

ingest it. However, lead shot is still present at the bottom of many lakes and streams.

Lead sinkers and jigs are used by many recreational anglers. About 500,000 kilograms of lead sinkers and jigs are sold in Canada every year, a portion of which end up in lakes and rivers used by loons and other waterbirds.



Lead sinkers and jig
(Illustration: Michael Cooper)

The loon is not the only bird that can be affected by lead poisoning; dabbling ducks, sea ducks, grebes, cranes, herons, geese, swans, birds of prey and scavengers are also at risk. In Canada, the bird most commonly reported to be poisoned by lead is the Common Loon.

<u>Signs of Lead Poisoning</u>:

- Strange behaviour such as flying poorly or crash landings
- As the poisoning gets worse the bird cannot fly or walk at all
- Eats little and loses a lot of weight
- Susceptible to disease and predation
- Even if there are no visible signs of poisoning the bird may be impaired by: not being able to migrate, find food, mate, build a nest, lay eggs or care for chicks properly.

In addition to banning the use of lead shotgun shells in Canada, government agencies are now looking at ways to encourage anglers to use sinkers and jigs made out of other material such as steel, bismuth and tin, that is not harmful to loons and other birds.

Acid Rain - Acid Rain is a big problem for lakes in Atlantic Canada. Loons are fish-eating birds and so are susceptible to the acid rain that is reducing fish stocks in lakes. On severely affected lakes, loon chicks may die from starvation because of low fish numbers. Acid rain comes from the accumulation of air pollutants from industries and car emissions that makes the rain acidic. As you can see in Figure 9 the acid rain accumulates in the

lake which is a problem for loons. Acidification of the water in lakes causes the fish to die, so the loons have no food to feed their young.

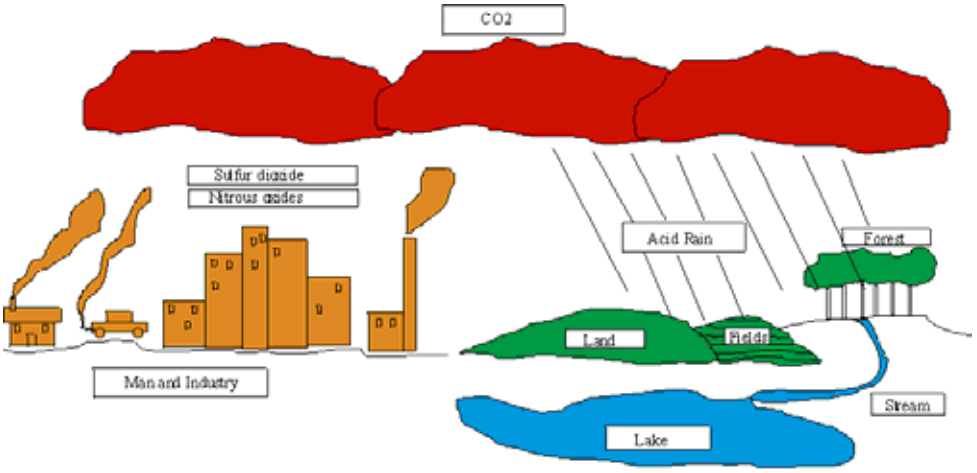


Figure 9: The acid rain cycle

Litter - Predation of eggs and chicks is a natural occurrence and something loons have lived with throughout their long history. However, populations of some egg and chick predators like raccoons, bears and gulls have increased because of the availability of human garbage. In addition, loons can become entangled in discarded plastic pop can rings and fishing line.

How can we help?

Keep it wild - Work to preserve the wild parts of a lake. Remember that loons require natural shorelines to build nests and quiet backwaters to raise chicks.

Watch your wake – Use sensible boating practices and steer clear of loons. Remember that loon nests are built close to the water's edge. Wakes can damage nests and cause erosion of the shoreline and alter the vegetation pattern. Slow down at the water's edge and in marshy areas.

Get the lead out – Use non-lead sinkers and jigs (and don't discard fishing line and hooks in the water).

Don't mess with the food chain – Don't feed or provide protection to nest predators like raccoons, foxes and gulls. Dispose of your garbage properly, don't be a litterbug!

Spread the word – If you see someone doing something that could eventually cause harm to a loon please inform them of what you learned. Encourage your friends and family members to exercise safe boating practices and to recognize the signs that mean you are too close to a loon.

Remember…

- "It is our responsibility to protect our environment and our loons!"
- "Practice safe boating practices, know the signs!"
- "Don't be a litterbug, keep our environment clean and our wildlife safe!"

Lesson 2

ACTIVITY

What Harm Can it Do?

This activity is designed to show students how daily activities can affect surrounding wildlife (in aquatic environments particularly) if caution is not exercised. Students will also reflect on what happens to garbage items when left near or in lakes.

Divide the class into 6 groups. Each group receives one of the fact sheets and the visuals associated with that sheet as described below. Each group has 5 minutes to read their sheet and to look at the visuals prior to presenting their information to the class. Provide each student with a copy of the activity sheet to fill in individually as the presentations are made. Each group then stands and describes their items and the "harm they can do". The last group describes the conservation measures that can offset the harmful impacts described. (Alternatively, use only 5 groups and the teacher can work through the last activity sheet with the class as a whole, asking them to describe ways in which they can conserve loons.)

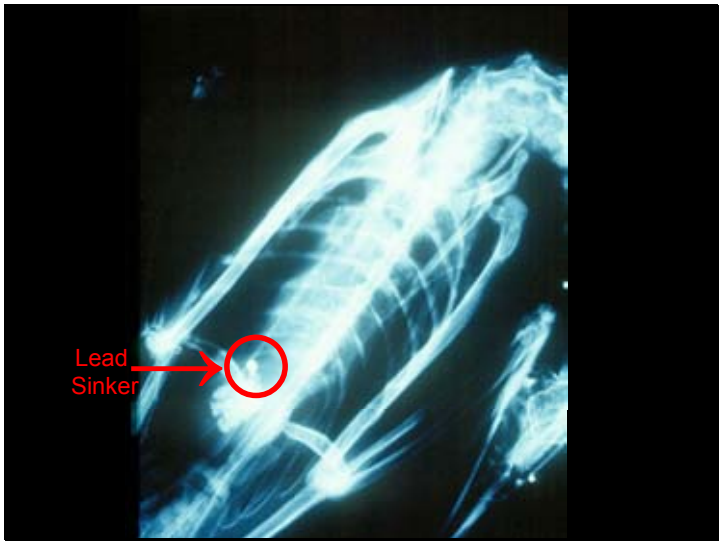
You will need the following items for each group:

1. Entanglement:
   Items: fishing line, plastic pop can rings, fact sheet # 1
2. Lead Poisoning:
   Items: Fishing sinkers and jigs, fact sheet # 2
3. Acid Rain and Mercury:
   Items: Some vinegar in a jar, fact sheet # 3
4. Boats and Wakes:
   Items: A toy boat, fact sheet # 4.
5. Shoreline Development:
   Items: Toy house, toy excavator or bulldozer, fact sheet # 5
6. Making Nova Scotia's Lakes Loon Friendly:
   Items: fact sheet # 6

What Harm Can it Do?
Fact Sheet 1

- Loons can become tangled in fishing line and nets.
- Even garbage like pop can rings can cause entanglement.
- If the loon is not freed quickly it will die of starvation or drown.
- Please pick up your garbage and do not leave broken fishing line in lakes.

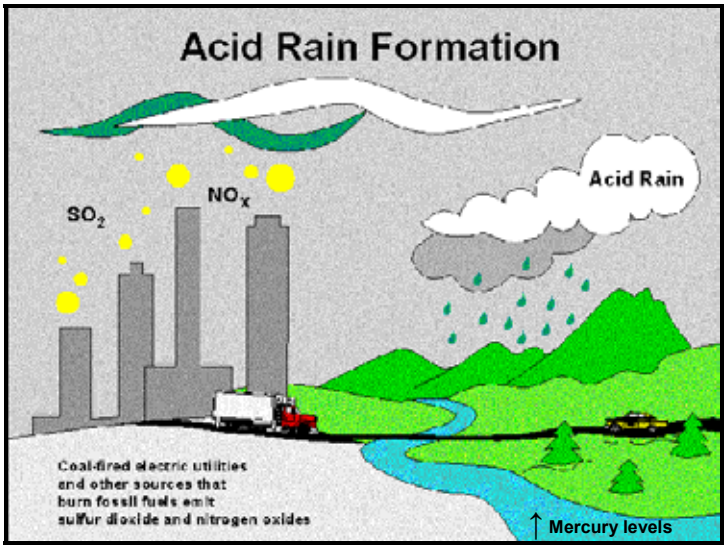
What Harm Can it Do?
Fact Sheet 2



X-ray of a loon showing lead sinker.

- Since loons have no teeth, they pick up small pebbles from the lake bottom which they use to help grind up their food.
- Sometimes they will pick up lead pellets or sinkers with these stones.
- Lead from these sinkers or pellets is absorbed into the blood and tissues of the loons where it causes lead poisoning.
- Ingesting a single lead sinker or jig will kill a loon.
- In Canada the bird most commonly reported to be poisoned by lead is the loon.
- Each year approximately 500,000 kg of lead sinkers and jigs are purchased in Canada. A portion of this lead ends up in lakes used by loons.

What Harm Can it Do?
Fact Sheet 3



- Loons are fish-eating birds so when acid rain causes fish populations to decline they have less food.

- On lakes where acid rain is a real problem loon chicks may die because of low fish numbers.

- Acid water can also cause mercury and other toxic metals to dissolve from rock and soil.

- Since loons are at the top of the aquatic food chain these metals can build up to dangerous levels in loons.

What Harm Can it Do?
Fact Sheet 4

- This loon is doing the penguin dance which means that it is very distressed.

- Loons show this behaviour when they are disturbed by people.

- People in canoes, boats and on personal watercraft can disturb loons.

- Boats and personal watercraft can also flood loon nests when they are travelling too fast and leaving large wakes.

- Make sure you are careful not to disturb loons when you are out enjoying the lake in your boat or personal watercraft.

What Harm Can it Do?
Fact Sheet 5

- The development on lake shores of cottages, marinas and campsites destroys nesting habitat for loons.
- Loons need quiet backwaters to nest and raise their young.
- This picture shows the difference between healthy and unhealthy development – what are the problems with the unhealthy side?

What Harm Can it Do?
Fact Sheet 6

What harm can it do to try the following loon conservation practices next time you enjoy a visit to a lake?

Keep it wild - Work to preserve the wild parts of your lake. Remember that loons require natural shorelines to build nests and quiet backwaters to raise chicks.

Watch your wake – Use sensible boating practices and steer clear of loons. Remember that loon nests are built close to the water's edge. Wakes can damage nests and cause the erosion of the shoreline and alter the vegetation pattern. Slow down at the water's edge and in marshy areas.

Get the lead out – Use non-lead sinkers and jigs (and don't discard fishing line and hooks).

Don't mess with the food chain – Don't feed or provide shelter to nest predators like raccoons, foxes and gulls. Dispose of your garbage properly, don't be a litterbug!

Spread the word – If you see someone doing something that could eventually cause harm to a loon please inform them of what you learned. Encourage your friends and family members to exercise safe boating practices and to recognize the signs that mean you are too close to a loon.

What Harm Can it Do
Activity Sheet

Answer the following questions:

Give 5 examples of how human activity can harm loons

_____

_____

_____

_____

_____

How can we help conserve (protect) loons?

_____

_____

_____

_____

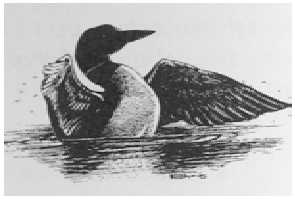
_____

Loons and their habitat are being threatened. There are simple steps you can take to help minimize your impact on loons and their habitat.

Please consider loons and their habitat next time you are out enjoying our beautiful wilderness

Lesson 3
Legends

The Common Loon is surrounded by an aura of myth and magic. It is a beautiful bird with a haunting call. The loon has inspired stories, legends and art work. In this lesson are two First Nation legends about loons followed by an activity at the end.



What is a legend?

A legend is an unverified, popular story handed down from earlier times. These stories entertain, explain or teach. Most importantly, legends make wilderness a familiar friend or become a significant part of the lives of the people. Legends teach appreciation of the animal and the environment.

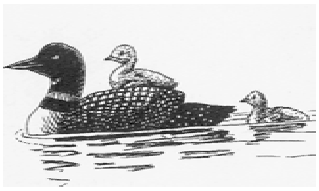
First Nations communities often use legends to tell stories about wildlife. Wildlife also plays a particularly important role in First Nations culture. Provided below are two First Nations legends about the loon. Read these legends to your students and then have them create their own legend based on some of the ideas we have provided.

How the Loon got its Necklace

Legend of the Ojibway

Once upon a time there was an old man who became blind. He felt badly because he could no longer see to catch fish and hunt for his family. A loon swam up to him and called to him asking, "Why are you crying, old man?" The old man said, "Oh loon, you are a wise bird and a wonderful fisherman; with your red eye you can see to great depths to catch fish for yourself and your family. I can no longer see to catch fish, so my family is hungry; that is why I am crying".

The loon called back to the old man, "Come and hold tight to my wings and bury your eyes in my feathers and I will take you through the pure waters to the very deepest part and then you will be able to see again." So the old man grabbed the loon's wings very tightly and buried his sightless eyes in the loon's feathers and the loon dove into the water. Down, down, down they went until the old man thought his lungs would burst. When they came back up the old man could see light, and could just make out the trees on the shoreline. They dove again deep into the water and the old man again thought his lungs would bust because they stayed under water so long. When they cam back to the surface the old man could see.



The old man was overjoyed. He said to the loon, whose feathers were all black at the time, "Oh loon, I am so grateful to you that I am going to give you my most precious possession: this beautiful necklace made of white shells." The old man took off his necklace and tossed it around the loon's neck. Everywhere the shells touched, the loon's black feathers turned to white marks. That is why the loon has a beautiful white necklace and a white pattern on its back.

The Loon

Legend of the Dena

Dale DeArmond

The man named loon had a cabin on a lake; he had a wife and two boys. One day, during the winter, they were out of fish, so the Loon went down to his fish camp to get some dried fish from the cache. He took his sled with him. He was getting fish from the cache when it fell down on top of him. He couldn't get out because it was on top of his back.

Finally, after many days, he got out, but his back was all rotted off. He could barely walk. He managed to drag himself back to his house. One of his boys ran out to meet him. The boy was glad to see him.

The Loon asked him, "What will we do if someone comes to this lake in a canoe?"

And the boy answered him, "Dive down and hide under the grass."

Then a hunter did come to the lake in a canoe. So they turned into loons and dove down under the water and came up in the grass, and hid under the grass.

That is why loons are heavy and can't walk, and why they have no tails. That is why they dive under the water and come up and hide under the edge of the grass.

Lesson 3

ACTIVITY

Write Your Own Legend about the Loon

Write a legend about the Common Loon. Some suggested topics are:

- Why do loons have red eyes?
- How did the loon really get its necklace (do you have another legend?)
- Why do loon chicks ride on their parents' backs?
- Why does the loon have such an eerie call (what is it trying to say?)
- Why are loons such good divers?
- Why do they only lay 2 eggs?
- Why do they have such big feet?
- Why do they have such a hard time moving on land?
- Where do loons go when they dive?

Remember that the last line of a legend almost always begins with: "That is why…"

Loon Quiz

1. How many eggs does the loon usually lay?

2. What does it mean when the loon does the "penguin dance"?

3. Do loons have red eyes all year?

4. How long do loons usually live?

5. What is one adaptation loons have for diving?

6. What are 2 types of human impacts on loons?

7. What are 2 ways to help protect loons?

8. What impact does acid rain have on loons?

9. Are loons ducks?

10. Why do loons carry their young on their backs?

Loon Quiz

Answers

1. How many eggs does the loon usually lay?
   1-3
2. What does it mean when the loon does the "penguin dance"?
   The loon is feeling threatened.
3. Do loons have red eyes all year?
   Yes, but the colour fades to brownish red in winter.
4. How long do loons usually live?
   Loons can live as long as 25-30 years.
5. What is one adaptation loons have for diving?
   Heavy bones, Large feet, Streamlined body.
6. What are 2 types of human impacts on loons?
   Development of cottages, disturbance, heavy wakes from boats and personal watercraft, fishing lines and nets, pollution and acid rain, lead sinkers and jigs.
7. What are 2 ways to help protect loons?
   Keep lake areas wild, avoid heavy wakes, don't use lead sinkers or jigs for fishing, don't litter.
8. What impact does acid rain have on loons?
   It reduces fish populations - the loon's food supply.
9. Are loons ducks?
   No they are in their own group, separate from the ducks.
10. Why do loons carry their young on their backs?
    Safety, avoid predation, conserve heat.

ADDITIONAL INFORMATION ABOUT LOONS FROM BIRD STUDIES CANADA AND THE CANADIAN LAKES LOON SURVEY

What's killing our loons?

Note: Since this article was written in 1996 other threats to loons have become more significant. In some areas of Canada, botulism is now the leading cause of loon mortality. A more recent article on botulism follows this article.

In 1993, the Ontario Ministry of Natural Resources (OMNR) and the Canadian Cooperative Wildlife Health Centre (CCWHC) began an investigation of disease and mortality of Common Loons in Ontario. The principal objectives were to document causes of mortality in adult loons, exposure of loons to lead and mercury, and to describe incidental disease conditions such as parasites. A request was made to all OMNR field staff to retrieve and submit as many loon carcasses as possible. The Canadian Lakes Loon Survey was also made aware of the study, as were wildlife rehabilitation centres. In 1994, the CCWHC was contacted by Tony Scheuhammer of the Canadian Wildlife Service, who was in the midst of a study of the toxicology of metals in loons, and was looking for tissues in order to measure lead, mercury and selenium levels. A collaborative effort was begun in which the CCWHC provided samples from all of the loons it received, and CWS conducted lead and mercury analyses on these tissues.

Since 1993, 62 adult loons (many of them submitted by CLLS volunteers) have been examined. In addition, necropsy reports were completed for 9 birds previously submitted to the Ontario Veterinary College. A protocol has been developed for the examination of each carcass. The location where the loon was found, and the circumstances surrounding its death are recorded. The birds are first measured and weighed. A standard necropsy is conducted, in which all body systems are examined in a search for significant abnormalities or evidence of disease processes. Samples of liver, kidney,

brain, pectoral muscle and a wing are sent to the CWS for toxicological testing. In most instances, samples of a wide range of tissues are collected for histological examination. Any parasites noted are saved for identification. From the gross examination of the carcass, microscopic examination of tissues, bacteriological culture and toxicological measurements, it is usually possible to determine cause of death.

The major causes of death in the Common Loons examined in this study are given below:

Cause of Death	Number of Birds	% of Total
Trauma	27	38.0
Lead intoxication	19	26.8
Aspergillosis	6	8.5
Gastric foreign body/entanglement	5	7.0
Intestinal parasitism	2	2.8
Other	6	8.5
Unknown	6	8.5
Total	71	100.0

Trauma

Trauma is the most important cause of death, accounting for 27 of 71 deaths. Seven individuals were shot; 9 died of injuries due to collisions with boats, cars or power lines; 6 died of drowning in fishing nets, and in 5 cases the source of the trauma was not determined.

Lead poisoning

Lead poisoning was the next most common cause of death. The source of lead was usually obvious; in 15 of 19 birds a fishing weight was present in the gizzard. Fishing weights of many kinds were found, but jig weights were the most common. Tissue levels of lead were very high in some of these birds. In waterfowl, tissue levels in excess of 20 parts per million (ppm) is taken to be evidence of lead poisoning. In these loons, liver levels ranged as high as 270 ppm and kidney levels were as high as 480 ppm. There was no evidence of

subclinical lead poisoning as is sometimes seen in waterfowl, indicating that when loons ingest lead, it is usually in sufficient quantity to be fatal.

Aspergillosis

Aspergillosis is a fungal infection that occurs in many species of birds, usually affecting lungs and air sacs. It is an organism that is widespread in the environment, and it is believed that most birds are resistant to its infection, unless they are weakened by some other disease, injury or stress. All but one of the six loons dying of aspergillosis had some other serious disease condition as well.

Gastric foreign body/entanglement

In five birds, the cause of death was attributed to the effects of having fishing line tangled around the bill, or of having swallowed a fish hook which subsequently became embedded in the digestive tract. In either case, the birds were unable to eat, and these loons died of starvation.

Parasitism

Two birds died due to the effects of extremely high burdens of intestinal parasites. Other birds were found to have substantial parasite burdens too, but also had more serious conditions which likely caused their deaths.

Other

Six birds died of a variety of unusual conditions such as rupture of a major blood vessel or impaction of the oviduct with eggs and subsequent rupture and release of eggs into the abdomen. In another six birds, no cause of death was determined.

One of the more obvious implications of these findings is the importance of human activities in causing the deaths of adult loons during the nesting season. At least 51 of 71 birds (72%) died as the result of trauma, entanglement or lead poisoning, all of which are consequences of human actions.

While these deaths may be representative of mortality during the nesting season, this may be a period when relatively few deaths occur compared with

migration and over-wintering. Commercial fishing nets likely claim a significant number of birds during migration and on the wintering grounds. Obviously, data collected over a longer term from a wider geographical area will be required in order to develop a more complete picture of the major causes of mortality in loons in Canada.

- Doug Campbell

BirdWatch Canada Fall 1996

What will waterbirds face on Lake Erie this fall?

By the time you read this, thousands of migrating waterbirds will already have made their way south to open water and nearshore staging areas on Lake Erie. The question is whether they are at risk of losing the gamble that thousands of other waterbirds have lost each fall in the last consecutive four years.

The relatively new hazard they have been facing is Type E botulism. Fortunately, no occurrences of bird deaths attributed to botulism were reported over the summer of 2003, but Lake Erie, and the other lower Great Lakes, will be tested again over the fall as fish-eating birds like loons, grebes, mergansers, and the deep-diving Long-tailed Duck migrate through these troubled waters.

Type E botulism is one of many potential natural pathogens to which wild birds can be exposed. Outbreaks of similar diseases, such as Type C botulism, are known to infect and kill tens to hundreds of thousands of migrating waterfowl in western North America. Periodic outbreaks of Type E botulism in the lower Great Lakes have caused major die-offs of fish and waterbirds in recent years. Since 1999, these events have occurred annually throughout the Lake Erie basin. Currently, little is known about what parts of Lake Erie harbour the bacterium *Clostridium botulinum* that produces the botulism-causing toxin, or which specific pathway(s) this pathogen follows to get into the food chain.

A multi-partner effort consisting of the Canadian Wildlife Service (CWS), Bird Studies Canada (BSC), the New York/Ohio/Pennsylvania Sea Grants, State Department of Environmental Conservation (DEC), and various other

groups and volunteers have been working to monitor these annual botulism outbreaks in Lake Erie. As a result, we now have a better understanding of probable causes and effects of this pathogen on Lake Erie's aquatic fauna.

An Exotic Connection

Non-native zebra mussels and quagga mussels first appeared in Lake St. Clair during the mid 1980s and 1990s, respectively, probably through release of foreign ballast water from ocean liners. In the absence of natural predators and with limited competition, both of these exotic species rapidly expanded their range throughout the Great Lakes. High densities of both species on Lake Erie's lake bottom are available to various species of mollusc-eating fish and birds.

Because they are filter feeders, the mussels may concentrate the botulism toxin and are believed to play a critical role in the toxin's transmission. Large numbers of these mussels are eaten by diving ducks, gobies, sheepshead, mudpuppies, and lake sturgeon. Lake Erie samples of mussels gathered from beaches and from bird digestive tracts have tested positive for Type E botulism. Further, mass die-offs of the mussels have occurred in Lake Erie, and decaying mussels may provide a major substrate to fuel growth of the botulism bacterium.

A species of non-native fish, the round goby, further adds to the invasive mix. It first turned up in 1990 in Lake St. Clair. It has since spread throughout the Great Lakes. Annual abundance of gobies has been monitored in Lake Erie since 1998 by the Lake Erie Forage Task Group's Inter-Agency Trawling Program. Their results show that Lake Erie goby populations have increased exponentially, probably due to a high abundance of their principle food (non-native mussels) and to the warm and shallow nature of the lake. Also, changes in the distribution of gobies appear to correlate with decreasing water levels, causing a west to east movement of gobies from the shallower western basin to the deeper eastern basin. This shift in goby density has corresponded with a west to east advancement and predominance of fish and bird die-offs caused by Type E botulism.

Effects on Lake Erie Fish Communities

Since partners began monitoring Lake Erie fish die-offs in 1998, many thousands of dead fish have washed ashore between April and October, and some have been examined for occurrence of Type E botulism. More than 20 fish species have been included in these die-offs, the most common of these being: sheepshead, smallmouth bass, rock bass, lake sturgeon, carp, and mudpuppy (actually a fish-like salamander). Studies confirm that these species (most of which are nearshore bottom dwellers) are mainly feeding on known Type E botulism carriers (i.e., gobies and mussels).

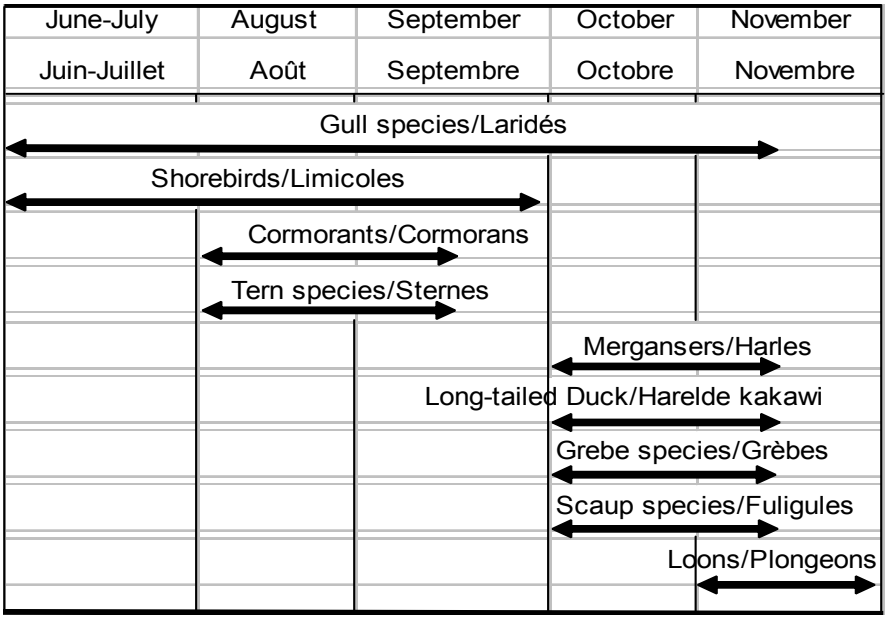
The New York State DEC - Lake Erie Fisheries Unit monitored fish mortalities in eastern Lake Erie along the New York shoreline in 2002. Proportional occurrence of dead sheepshead increased throughout the summer, while other fish species showed slight decreases. In 2002, sheepshead comprised 78% of the dead fish counted on the New York shoreline, yet they comprised only 4% of the total catch in the September gill net assessment, indicating a high susceptibility to Type E botulism poisoning. Despite this, annual offshore populations of sheepshead in Lake Erie are increasing, while other fish species are decreasing.

Effects on Lake Erie Waterbirds

Since monitoring began in 1998, numerous dead birds of several species have been found on the Lake Erie shoreline annually. At least 16 bird species have tested positive for Type E botulism. There have been particularly large numbers of Common Loons, Red-breasted Mergansers, Long-tailed Ducks, Ring-billed Gulls, Herring Gulls, Bonaparte's Gulls, Greater Black-backed Gulls, Horned Grebes, and Double-crested Cormorants. Stomach contents of affected birds often contain known Type E botulism carriers (i.e., gobies, mudpuppies, and mussels).

Three temporally distinct waterbird die-off events have been identified on Lake Erie. The first event occurs in late June and tends to involve gulls and shorebirds. The second event occurs in late August, with large numbers of gulls, terns, cormorants, and some shorebirds. The third event occurs in October through November, when thousands of migrant fish- and mollusc-eating diving birds, such as loons, grebes, mergansers, and Long-tailed Ducks,

arrive on Lake Erie. Gull die-offs extend across all three periods, while shorebird die-offs tend to mostly occur during the first two episodes. In general, these events correspond with peak migration periods of the species involved.



Preparing for Future Events

A concerted and standard research effort, coordinated among Canadian and U.S. jurisdictions, is needed to gain a better understanding of the causes and effects of Type E botulism on certain bird species (especially long-lived species such as Common Loons). Such an effort would also help answer many other questions about migratory birds that rely on Lake Erie's resources. Work should also focus on determining how climatic and hydrologic (e.g., low lake levels) factors relate to botulism die-offs in order to better predict potential future events. Bird Studies Canada will continue to play a role in helping to understand and address this important threat to migratory waterbirds.

- ***Steve Timmermans, Eoin Craigie, and Jeff Robinson***

BirdWatch Canada Fall 2003

Loon surveyors help shed light on mercury contamination

In addition to helping to determine annual productivity patterns of Common Loon chicks, many participants of the Canadian Lakes Loon Survey take some extra time to monitor the fate of loon nests after the hatching period has ended. In doing so, some volunteers have found that for one reason or another, certain eggs do not hatch. To better understand sources of such hatching failure, we have been advising interested volunteers to send any recovered eggs to the Canadian Wildlife Service's National Wildlife Research Centre (NWRC) for contaminant analysis.

These efforts paid off late in 2000, when Dr. Tony Scheuhammer and colleagues from the NWRC published a paper documenting concentrations of mercury and selenium found in Common Loon eggs - two elements known to occur in abnormally high levels in aquatic systems, and that can cause adverse effects in fish-eating birds, like loons. In this analysis, Canadian Lakes Loon Survey volunteers collected all of the loon eggs from the Maritimes and Québec, and most of those from Ontario. Loon eggs from the prairie provinces and from northwestern Ontario were in NWRC's tissue banks from previous studies.

The authors found that some loon eggs in samples from the Maritimes, Québec and Ontario (those collected by CLLS volunteers) contained the highest levels of mercury and selenium in the entire sample of eggs collected across Canada. Lakes in eastern Canada are generally believed to have the highest loadings of mercury and other contaminants due to this region's high industrial effluent and domestic air pollution. Scheuhammer et al. concluded that "*…loons in some environments in eastern Canada are experiencing mercury exposure sufficiently high to cause reproductive and behavioral impairment…*" CLLS data suggest that loon productivity is lower in eastern

Canada. Therefore, the presence of elevated mercury levels in some eggs does raise concern as to the effect on loon productivity over time.

Unfortunately, given the nature of the egg samples, the study could not determine if loon egg mercury levels are in fact higher in eastern Canada than in the west. The reasons for this are twofold. First, the eastern Canada (CLLS volunteer-derived) loon egg samples came entirely from failed nests, while eggs from other collections, representing other Canadian regions, came from mostly active nests, and some failed nests (i.e., an unknown proportion of the active nest egg samples would have been successful, perhaps due to lower mercury and/or selenium), preventing any across-region comparison. Second, and more simply, there were no regional differences in the median levels of loon egg mercury. Perhaps a future regional comparison of egg mercury from known failed eggs only (those collected by CLLS volunteers) will enable researchers to say for certain if mercury contamination in loons is higher in eastern Canada.

To those volunteers who helped collect failed loon eggs from abandoned nests and shipped them to the NWRC for contaminant analysis, and to all the volunteers who continue to monitor loon chick success in Canadian lakes, thanks for contributing to important scientific research on loons!

- Steve Timmermans

BirdWatch Canada Spring 2003

Can personal watercraft and loons co-exist?

The Loon Survey began 15 years ago, in part to assess threats to loons resulting from human activities. Comments from many surveyors over the past couple of years have revealed growing concerns about a new potential threat to loons — the increasingly popular personal motorized watercraft. Personal watercrafts have the potential to harm loons in several ways. On many lakes, extensive human use of small islands has increasingly driven loons to nest in quiet, shallow bays and marshes — areas which formerly excluded motorboats. Loons adapt as much as possible to human presence and can even do so quite well, providing that the level of disturbance is reasonable. But now even these small quiet backwaters are being invaded by high-speed personal watercraft. These machines have no propellers to get tangled in weeds and they float high in the water, so they can travel freely in these shallow bays. The presence of a personal watercraft can easily force a loon off its nest, leaving the eggs exposed to predation and the elements. Moreover, the wake from personal watercraft can wash eggs out of low-lying nests at the water's edge. Loon chicks are not safe either. Accidental deaths of baby loons can and do occur. Quite unlike adult loons, downy loon chicks (which are not very visible to begin with) are very buoyant, cannot dive well and cannot get out of the way of fast-moving watercraft. Not only can chicks be run over, the too-close presence of a careless boater near a loon family can impede the parental care and feeding of chicks. Repeated or prolonged interruptions can have dire consequences for chicks already stressed by scarce food resources. Anecdotal accounts of loons being disturbed or harassed make it clear that personal watercraft are having an effect on loons on some lakes. However, it is quite a different

thing to determine whether there is a measurable effect at a population level. To do this, we need to be able to determine whether loon reproductive success differs on lakes with and without this type of activity. This is why we began specifically asking whether CLLS volunteers had observed personal watercraft on their lakes in 1996. If we are certain of which lakes have these machines and which lakes don't, we can then make useful comparisons between them and see if personal watercrafts are having a significant, measurable effect on loon reproductive success. Once we know the extent of the problem, we can begin to look for cooperative solutions that leave both people and loons happy. In the meantime, perhaps we can help personal watercraft enthusiasts and/or manufacturers come up with an environmental code of ethics.

- **Harry Vogel**

BirdWatch Canada Winter 1997

From the Canadian Lakes Loon Survey mailbag…
CLLS surveyor observes loon pair raising 4 chicks!

Dear Canadian Lakes Loon Survey,

One day, not long ago, myself, my husband and a friend were out fishing on Lake Kasshabog, Ontario when we saw an unusual family grouping of birds. When I first spotted them, I thought they were ducks despite the loon-like profile. I dismissed them as ducks because there were four chicks in tow. But when they came closer, less than 20 meters from us, we all gasped in amazement. They were definitely loons! To our delight, one of the adults was catching fish and bringing them to the chicks.

When I got back home, I started thinking about it and I couldn't remember ever reading about loons having more than two chicks. I began to wonder about what I saw. I started checking the internet and my references and still couldn't find any mention of loons having any more than one or two young. Is four very unusual?

Cynthia Fiber, Loon Surveyor

Dear Cynthia,

Yes, what you saw is very unusual – so unusual that we are almost certain that it has never before been convincingly documented – at least not until now! Loons usually produce one or two young, and very rarely three. We are unaware of any documented evidence of four chicks being raised successfully by one pair.

So, what exactly are you seeing? There are three possible explanations. An extra large clutch could have been produced by one female. Or perhaps a second female "dumped" one or two eggs in another female's nest. Alternatively, some of the chicks may have been hatched by a neighbouring pair and were later adopted by the attending pair.

In Common Loons, large clutches of three and sometimes four eggs have been reported in the literature, but no four-egg clutches are known to have produced four chicks. Egg "dumping" by females in the nest of other females is a fairly common occurrence in some species of ducks, but to our knowledge has never been demonstrated for loons. What about chick adoption? It would be unusual for a species as territorial as the loon to adopt orphaned chicks, but during the chicks' first week of age (and maybe the second), loons have a very strong urge to care for young and, at the same time, individual recognition of chicks by the adults may be relatively weak. Thus, neighbouring pairs may be more prone to accept orphaned chicks early on (during brood rearing) than later (when parent-offspring bonds are more highly developed).

Is it a four eggs clutch or an adoption? We may never know. There is more evidence supporting chick adoption than there is for loons producing four chicks from one clutch, but the latter certainly cannot be discounted.

Are the chicks going to survive? Four chicks are a lot for one pair of loon parents to feed and protect. Luckily, Lake Kasshabog seems to be highly productive and the chicks seem to be doing well. Please keep an eye on them and keep us informed about their progress. And thanks for the great photo!

- Kathy Jones, Canadian Lakes Loon Survey

(Editor's Note: At the time of writing in August, all four chicks were still surviving.)

BirdWatch Canada, Fall 2001

Why did the baby loon cross the road?

If I've said it once, I've said it a thousand times – a Common Loon's legs are made for swimming, not walking, and you won't find one travelling any distance over land! You can understand my surprise, then, when I read a letter from Canadian Lakes Loon Surveyor Mary Walters, who described in detail the overland "migration" of a loon chick between two lakes.

On the morning of August 11th 1995, Mrs. Walters happened upon a young Common Loon chick plodding on its legs and wings along a gravel road towards Pass Lake, Ontario. The determined chick was coming from the direction of Anderson Lake, where Mrs. Walters had been watching a pair of loons with two young. The chick had had a rough time – its breast feathers were worn and its skin was abraded and bleeding. Because the area is home to martens, foxes, hawks and domestic cats, Mrs. Walters felt compelled to assist the chick and carried it to Pass Lake, where it was immediately joined by its parents (who were residents of Anderson Lake).

The less adventurous sibling decided to remain on Anderson Lake. The adults continued to feed both chicks throughout the summer. Mrs. Walters even observed one of the parents flying, with fish in bill, to feed the Anderson Lake chick. Both chicks were in good health at the end of the summer and both presumably migrated South at the end of the season.

Almost exactly a year later, this unlikely scenario was repeated on August 7th 1996. Mr and Mrs. Walters were alerted by a loon repeatedly calling and flying between Anderson and Pass Lakes while the other adult called from Pass Lake. Sure enough, they found and assisted the pair's single chick on its journey to Pass Lake. It turns out that Mrs. Walters and other local

residents recall seeing this overland movement on at least four other separate occasions since 1985!

I'd love to enlighten everyone with a carefully considered, scientific explanation of this behaviour, if I had one. The fact is that these events raise many more questions than they answer.

The conventional wisdom is that loon chicks live or die by the resources on their natal (where they hatched) lake. Unlike ducklings, which often travel overland to find better feeding areas, loon chicks are restricted to their natal lake, and its fishy menu, until they fledge. In fact, this dependence is what makes the survival of loon chicks such a good indicator of the impact of lake acidification on fish stocks. What motivated these loon chicks to cross 400 meters of black spruce forest, smooth rock, and a gravel road to a new lake? A comparison of the two lakes may provide a few clues. The nesting lake – Anderson Lake – is a small (12 hectares), shallow and turbid lake with mainly underdeveloped shoreline. The destination lake – Pass Lake – is a little larger (18 hectares) body of comparatively clear water and has an abundant supply of fish. Unlike Anderson Lake, it experiences considerable boat traffic during the summer, and about half of its shoreline is developed with cottages and other structures. If Pass Lake is a good spot to raise a loon family, why not just nest there? Perhaps it lacks the flat or gently sloping shoreline that loons need to nest. Even if suitable nest sites exist, the presence of people on a busy lake like Anderson can keep loons off nests. Abandonment of nests due to close proximity of boaters, flooding of nests by motorboat wakes, and booming populations of raccoons and other nest predators associated with human settlement have all been implicated in reduced nesting success of loons. Hence, nesting on quiet lakes like Anderson may be preferable to nesting on busy ones like Pass.

On the other hand, if Anderson Lake is a quiet place to nest, why not just stay there, instead of making the risky move to a lake that experiences more human use and boat traffic? Oddly enough, the number of boaters on a lake is often an indicator of its fish supply. Lakes with lots of boaters tend to be

those having high densities of fish, since fish naturally attract anglers and residents alike. Boaters are infrequent on Anderson Lake, indicating that fish populations there are not substantial. In addition, the small size and turbid waters of Anderson Lake might have made it difficult for the loons to find and catch enough fish to raise both their chicks.

When faced with limited food supplies on nesting lakes, we know that some loon parents will claim ownership of more than one lake. They effectively conserve the food supplies of the nesting lake for their chicks by foraging for themselves on adjacent lakes. So why didn't the adults feed themselves on Pass Lake, and feed their chicks from Anderson Lake, rather than go to these extremes? Or why not routinely carry fish from one lake to the other to feed the chicks, as one adult was seen to do on at least one occasion? Red-throated Loons are known to carry fish back to the nesting lake for their young. However, the heavy-bodied Common Loon requires a lot of effort to become airborne. In fact, Common Loons have the highest wing loading, or ratio of body weight to wing surface area, of any flying bird. It's simply not energy-efficient for Common Loons to carry food for chicks. Evidently, these loons decided it was easier to bring the chicks to the food!

For whatever reasons, the parents of these chicks have decided that the combination of these two lakes is the key to raising a family. I could find only one other published mention of an overland movement of loon chicks between lakes such as described here. We would like to know if other pairs of loons have adopted this strategy to raise chicks, and to look for common threads that might shed light on these occurrences. If anyone has similar stories, we'd love to hear the details!

Finally, and this is perhaps the greatest mystery of them all: how did the chicks "know" where to go and how to get there? Were they genetically programmed to leave? Did they just venture out by sheer accident? Had one (or both) of their parents long ago made a similar overland journey? If so, did they somehow pass this information on to their chicks? Using various calls, did they coax the chicks off one lake in the direction of the other? Just why did the baby loon cross the road?

-Harry Vogel

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