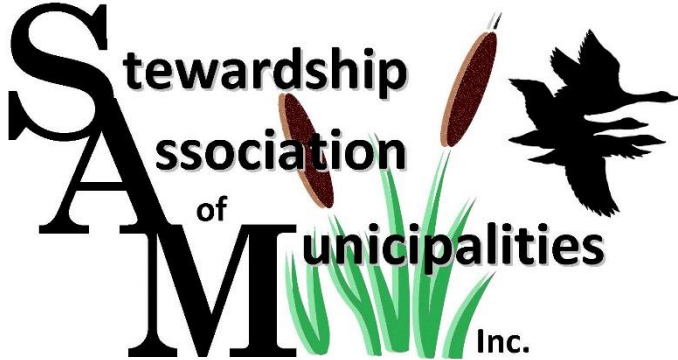


Developing & delivering outdoor interpretive hikes in Newfoundland and Labrador



SAM geocaching event in the Town of Come By Chance



Contents

Contents.....	2
Introduction.....	3
Stewardship Association of Municipalities	3
How to use this guide	3
Acknowledgements	3
Planning.....	4
Site.....	4
Prepare Participants	4
Preparation.....	4
Interpretation Ideas	5
Keep it Interactive	5
Be Flexible	5
Use All Senses	5
Bring Teaching Tools.....	6
Ask Questions	6
Activity Ideas	6
Clean-up	6
Scavenger Hunt	6
Birding.....	7
Action Projects	7
Biological Background.....	7
Plant Basics.....	9
Fungi.....	12
Invertebrates.....	13
Amphibians	14
Mammals	14
Birds	14
Additional Resources.....	16
Field Guides	16
Websites	17
Newfoundland and Labrador Environmental Organizations	17

Introduction

Stewardship Association of Municipalities

SAM (Stewardship Association of Municipalities) is an organization comprised of municipalities in Newfoundland and Labrador (NL) who conserve wildlife habitat by signing municipal stewardship agreements. SAM works with the Eastern Habitat Joint Venture in NL to secure, enhance and restore important wildlife habitat. As a network of communities who practice environmental stewardship across NL, SAM contributes to conserving biodiversity in our Province.

How to use this guide

This guide is divided into several sections:

- a) **Planning**
- b) **Interpretation**
- c) **Activity Ideas**
- d) **Biological Background -**
- e) **Additional Resources -** field guides, websites, and lists of environmental resources.

If the species mentioned are found in the guide section of the Newfoundland and Labrador chapter, the species name is coloured according to habitat type: **forest**, **wetland**, and **coastal**.

Acknowledgements

This project was made possible in part due to grants from Environment Canada's EcoAction Community Funding Program with support from the NL Wildlife Division.

I would like to thank Danielle Fequet (Ducks Unlimited Canada) and Jonathan Sharpe (NL Wildlife division) for their guidance throughout this project. The following people should be recognized for their contribution and feedback for various parts of the text, species selection and design; Andrus Votik, André Arsenault, Claudia Hanel, Ducks Unlimited Canada, Mac Pitcher, Robert Leblanc and all of the materials listed under Additional Resources.

This document would not be as useful or colourful without the pictures from Andrus Votik, Brad James, Beth Hoar, Charlotte Morgan, Claudia Hanel, Ducks Unlimited Canada, Kelligrews Ecological Enhancement Program, ET (Natural History Museum, University of Oslo), Jim Cornish, John Maunder, Mac Pitcher, Mardon Erbland, Roxanne Ryland, Vanessa Hussey, NL Wildlife Division staff, and the addition guide material from Ducks Unlimited Canada Project Webfoot program (Aquatic Invertebrates) and the Canada Wildlife Service (Common shorebirds of Newfoundland and Labrador).

Planning

Site

Make sure you have permission to use the area, and to lead a group there. Make the land owner or land manager aware of the activities that will happen on their land. Walk the entire area and scan the vicinity for actual risks (e.g. broken boardwalk boards) and perceived risks (e.g. falling into water). Note the time it takes to walk the trail or the area the event will be covering and note the terrain. Make the necessary changes to account for a particular demographic, such as young children or seniors. Note nearby facilities such as parking spaces, garbage bins, gazebos, and washrooms.

Prepare Participants

Before the event, provide the audience with the following information:

- Event location details (meeting location, end location, terrain, difficulty, etc.)
- Items to bring (water bottle, binoculars)
- Duration of the event (start and end time)
- Appropriate clothing (dress for the weather)
- Target age (if your event is targeted to minors make sure you have parental permission and make sure there are enough adults to help)
- Potential risks and hazards (rough terrain, loose boards, etc.)

Preparation

Each SAM community has a **Habitat Conservation Plan** that outlines the policy put in place to protect the town's wildlife habitat and provides an understanding of what exactly SAM is trying to protect under its municipal stewardship agreement. This material can help you develop the interpretive hike.

For instance, if one goal of the conservation plan is to protect a species of bird, it would be important to mention on the walk reasons to protect the bird, the habitat type, and life history of the bird. From that conversation, discussing habitat enhancements taken would be a logical topic to elaborate on measures conducted to protect the bird. Such actions could include putting up nesting boxes, boardwalks and other physical structures, development plans, and so forth.

Becoming familiar with local wildlife area is a great first step. Local naturalists and environmental organizations in the area may be able to partner with you. Online resources can help you learn about wildlife near you (See the **Additional Resources** section).

Interpretation Ideas

Keep it Interactive

Ask the participants questions to gauge their level of knowledge and let them feel involved during the activity. Compare and contrast species and habitats to practice identifying, classifying, teaching naming systems, and key characteristics. Stories and jokes can help convey concepts.

Sample Compare and Contrast Topics

- balsam fir (*Abies balsamea*) and black spruce (*Picea mariana*)
- chipmunk and squirrel
- caribou and moose
- butterfly and moth
- damselfly and dragonfly
- coniferous and deciduous forests
- diver and dabbling (ducks)

Be Flexible

During the tour it may become apparent that the original plan is not going to work. Ask the participants what they want to learn and incorporate their questions into the activity to make it interesting to them. Weather can change quickly; have a back-up plan in case of bad weather.

Use All Senses

Instead of directly telling participants the facts you want to convey, make use of all five senses to demonstrate your concepts.

Sight: Show the group what you are talking about. Take them to specific sites if possible.

Touch: Let the audience feel objects in their environment such as moisture in the soil, and plant texture. However, don't disturb species at risk, and their habitat. If at a park check the rules before removing or picking anything.

Smell: Let participants smell the various fragrances of the flowers, bark, and so on.

Taste: Become familiar and confident with the edible and poisonous plants in the area. Show the group a few examples and let them taste the different berries if it not a species at risk. Be very careful with edibles; do not encourage a group of children to eat anything unless their parents are there.

Hear: Get the participants to listen to different sounds of birds and other animals in the area. When the group hears a bird or squirrel, let them listen and see if they can pick out the calls later.

Bring Teaching Tools

Useful **pictures** could include a species you may not get to see on your trip but lives in that particular habitat or a different stage of its life cycle that the participants may see when they visit another time. Having **audio files** on your phone can help demonstrate bird sounds. **Field guides** can show the audience how to identify species and the tour guide can learn new ones as well. A **hand lens or magnifying glass** could be used to show the group smaller details on plants or fungi. To recognize features or animals at a distance, use **binoculars** or a **scope**.

Ask Questions

Suggested questions to help engage your participants:

What is a wetland?

What are the different types of wetlands?

What type of wetland is this?

What animals live here? - mammals? - amphibians? - invertebrates? - birds? - plants?

Why do we want to protect wetlands / other ecosystems?

What services does this ecosystem provide for us?

What does the word stewardship mean?

What can we do to protect this ecosystem?

What can you do to protect this area?

Who should we get involved?

Should we keep snags (dead standing trees)?

Should we take _____ (species name) home? Why not?

What are the different types of bird habitats?

How can we identify different birds?

What is a species at risk? How can we protect them?

Activity Ideas

There are many different activities you could include during your interpretive walk. Below are some suggestions that may work in your community.

Clean-up

A clean-up day in the area is a simple activity to organize. The basic materials you need are gloves; garbage bags and a plan for what to do with the garbage that gets collected. Following the walk and clean-up, a BBQ is a good idea to thank the community for coming out and cleaning up.

Scavenger Hunt

This event could consist of hidden clues about wildlife habitat along the trail. It could be a contest where the team who finds all the clues first wins or could be delivered as an interpretive hike where the guide reads the clue and the participants discuss the topic in a group. A **geocache hunt** is

a variation of a scavenger hunt where participants use a GPS (geographic positioning system) to track down the clues (caches) during the activity.

A **geocache event** was held in Come By Chance. GPS units were provided to participants with instructions. The groups used the GPS to find the cache (clues/treasures) that were hidden along the walking trail. Each cache had a letter and the participants had to unscramble the letters at the end to complete the activity.

Birding

Provide participants with binoculars and or let them bring their own. Ensure that each person knows how to focus their binoculars and when a bird is spotted, make notes as a group of its physical and behavioural characteristics. These could include bird songs, calls, colours, size, or nesting habitat. Show the group how to use a field guide to help identify a bird. If possible, invite an expert to lead this event or set up a scope to view areas that are frequently visited by birds. Participants could log their observations on ebird.org.

Action Projects

Participants could work together and enhance the habitat for wildlife and visitors. Activities could include building nest shelters/boxes, boardwalks, gazebos, native tree planting, and invasive species removal.

Biological Background

The biological information you provide to your audience depends on many factors such as participants' ages, interests, location, time of year, and so forth. Here are some pointers to help you with your nature tour.

Naming

Scientists give every different species a **scientific name**. This name helps reduce confusion across the globe. For instance, what people recognize as a **Blue Jay** in Newfoundland would be the same in British Columbia. However, most people in Canada call *Cornus canadensis*, **Bunchberry** while many people in the province call it **Crackerberry**.

One of the broadest ways to categorize living species is by kingdom. Scientists are constantly changing the groupings, but there are commonly 6 different recognized kingdoms: Animalia, Plantae, Fungi, Protista, Archaea, and Bacteria.

Activity Idea: Help the group to learn one or two new scientific names.

Biomes, Ecosystems, and Habitats

Biomes are regional groups of specific plant and animals that are best adapted to that particular environment. The environmental factors that define a biome are usually climate, geology, vegetation, and soils. There are terrestrial (land) and aquatic biomes. Terrestrial biome examples are rainforests, temperate deciduous forests, boreal or Taiga forests, grasslands, savannas, deserts, and tundras.

Newfoundland and Labrador has two biomes: **taiga (Boreal forest)** and **tundra**. The **tundra** biome covers Arctic areas including Northern Labrador. About one metre below the soil, there is a permanent frozen layer called permafrost, preventing water to easily drain through the rest of the soil, creating shallow water pools and restricting plant root growth.

The **boreal forest biome** is found south of the tundra, and is distributed across North America, Europe and Asia including Newfoundland and southern parts of Labrador. Soils are usually acidic, nutrient poor usually lacking nitrogen and phosphorous. This biome is dominated by coniferous forests, with **balsam fir**, and **black spruce** and wetland habitats particularly bogs. Coastal areas contain intertidal, pelagic, and marine benthic zones.

Ecosystems refer to abiotic (non-living) components such as rocks, air, soil and biotic (living) components such as fungi, animals, plants that are interconnected in a system. The term habitat refers more specifically to where species live.

Biodiversity

Biodiversity has many definitions. Most people only think of this term as meaning having lots of different species in a given area. However, it includes populations of each species as well and the variation of life at a smaller scale (genetic) or larger scale (ecosystem). Biodiversity can be negatively affected by species loss or invasive exotic species.

Activity Idea: Discuss food web examples. Ask the group what a species eats and what eats it. Then elaborate on the implications of what would happen if it were removed from this ecosystem. (The predators would not have any food and the prey populations would go up.) Discuss why it is necessary for an ecosystem to contain a variety of species in case this did happen.

Many species are designated as **species at risk** at either a federal or provincial level.

In Newfoundland and Labrador there is an “Endangered Species Act” to provide special protection for plants and animal species considered to be endangered, threatened or vulnerable (special concern) in the province. The provincial wildlife division enforces this act.

Activity Idea: Find out about the species at risk in your community. Learn how you can help populations recover.

In contrast to native species found in the province, there are **invasive exotic species** as well. Invasive exotic species can outcompete native species for resources. Japanese knotweed (*Fallopia japonica*) is considered one of the most invasive species in the world and is a native plant to parts of Asia. Japanese knotweed was introduced to North America and Europe, and is found growing

throughout this province. It grows in a variety of habitats, commonly in open areas, road sides, moist, and wetland regions. This plant resembles bamboo and is often transplanted due to aesthetic appeal and hardy characteristics. However, it can spread very rapidly through its underground stem system (rhizome) that sprouts roots. It can damage concrete foundations and roads.

Activity Idea: Plant native species, remove invasive ones, or monitor particular species. Consult a professional for guidance.

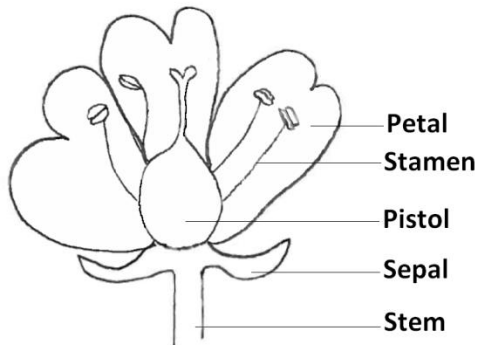
Activity Idea: Explain to the group the consequences of removing and relocating a species. The species may not survive or could take over their new habitat.

Plant Basics

Terrestrial plants are considered **vascular** plants if they have an extensive system of tubes that transport water and nutrients. Such plants include seedless vascular plants such as pterophytes, ferns, and their relatives; gymnosperms, conifers; and flowering plants known as angiosperms. Plants that lack these tubes are considered **nonvascular**, and include bryophytes such as mosses, liverworts, and hornworts.

Wildflowers

Wild flowers are angiosperms. The seeds of these plants develop in chambers called ovaries within a flower and then mature into a fruit such as a berry.



A flower is composed of many intricate parts.

Often the most obvious part of the flower is the petals. The petals often guide pollinators such as bees to the male parts (stamen) and to the female parts (pistol) of the flower. Attached to the flower stalk are modified leaves called sepals. Sepals protect the flower before flowering season.

Activity Idea: Often, sepals and petals are hard to differentiate when the flower is in bloom. Look at a flowering *Cornus canadensis* (commonly known as **crackerberry** in NL) plant and ask what colour and discuss how many the petals there are. It looks like four white petals, however those are the bracts, specialized leaves protecting reproductive flower parts. The petals are quite small and occur in between the bracts.

Grasses, Sedges, and Rushes

Grasses, sedges, and rushes are examples of monocots (see above for description). These plants can be very difficult to identify. Generally, sedges have triangular or square solid stems, rushes have round solid stem, and grasses have a cylindrical or slightly flattened hollow stem.

Trees and Shrubs

Each field guide suggests a different way to identify a plant. Todd Boland in his field guide, *Trees & Shrubs of Newfoundland and Labrador*, divides trees /shrubs into two categories, **coniferous** and **deciduous**. Deciduous trees are generally broad-leaf hardwood trees that lose their leaves in the fall and winter. Examples of deciduous trees are maples (*Acer* spp.), **birch** (*Betula* spp.) and trembling aspen. Coniferous trees, often referred to as evergreen or cone-bearing species, have needle like leaves that do not fall off during the winter. Cone-bearing species are gymnosperms (from the Greek *gymnos*, naked, and *sperm*, seed). Gymnosperms seeds are not enclosed in chambers like angiosperms (flowering plants). Examples of coniferous trees in Newfoundland are spruce (*Picea* spp.), pine (*Pinus* spp.) and **fir species** (*Abies* spp.). However some coniferous trees are deciduous trees. For example, **tamarack/larch** (*Larix laricina*) have needle shaped leaves that the fall off during the winter months.

Activity Idea: Compare **black spruce** and **balsam fir** trees. Show a twig from both species; let the participants roll the needles in their hand. Black spruce needles typically have edges while the balsam fir needles feel flat. Show the resin blister on a balsam fir trunk and pop one. Allow the participants to smell the plants such as twigs from yellow birch, or **dogberry** flowers.




Broad-leaf type

A deciduous tree/shrub (broad-leaved) can further divided by single/**simple** leaves (white birch, *Betula papyrifera*), on each stem, or **compound**, with small leaflets combined to form a larger leaf (e.g. **American mountain ash**, *Sorbus americana*):



Leaf arrangement

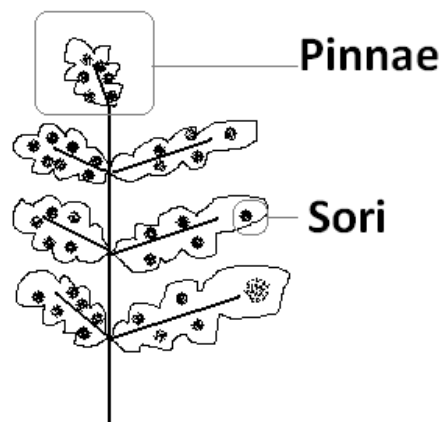
Leaf arrangements can be opposite, alternate, or whorled. Opposite arrangements are when a pair of leaves are divided by the branch in the middle such as maple species (*Acer* spp.). Alternate arrangement include **birch** species (*Betula* spp.), where the leaves alternate on either side of the branch. Whorled arrangements contain at least three leaves that grow around the stem at the same point, such as sheep laurel (*Kalmia angustifolia*).

Alternate arrangement	Opposite arrangement	Whorled arrangement
		

Fern and Fern Allies

These plants reproduce through spores rather than seeds. These plants undergo two different developmental stages before a new recognized fern is displayed. Ferns are recognized by their green leaves and stalk called a **frond**.

To identify a frond, look at how the frond is divided and the shape of the leaflets (pinnae). Often the spores are found in **sori** under the pinnae or as different looking long structures next to the sterile fronds (for example, **Cinnamon fern**).



Activity Idea: Use a hand lens to show the sori on the underside of the fern.

Fungi

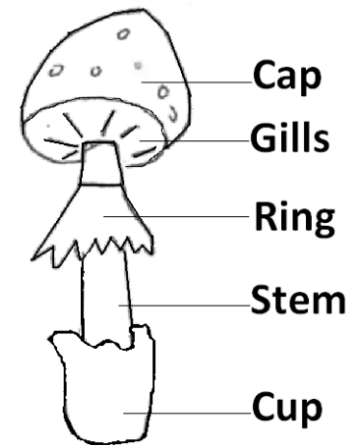
Fungi cannot make their own food. They absorb their nutrients using a network of tiny individual filaments. Fungi have different roles in ecosystems such as decomposers (saprophytes) that break down dead organic material, parasites that absorb nutrients from living hosts, or mutualists where the fungi and the host plant benefit by providing nutrients, minerals, and/or sugar to one another (a mycorrhizal relationship).

Mushrooms

Mushrooms are the reproductive part of some species of fungi and release spores instead of seeds. Identifying mushrooms can be a difficult task. Important mushroom characteristics to make note of during identification are the shape and colour of the cap, gills, stalk, ring (see below), spore print (described in most field guides), habitat, or substrate. Many mushrooms are poisonous, so do not eat unless you are certain of the species.

Developing mushrooms are covered by two veils; one that covers the entire mushroom and one that covers the gills. As the mushroom is growing the veils break and often disappear. Remaining veil tissues are useful in identification. For instance, remnants may be found as flakes or warts on the cap or tissue around the stalk, often called a ring.

Mushrooms are often grouped by the appearance of the structures found under its cap. Common groups are gilled-lined surface, boletes-spongy surface, and toothed-spiny surface.



Activity Idea: Newfoundland and Labrador has thousands of mushroom species. Thus, it is helpful to get someone experienced to teach you about mushrooms. Contact Foray NL for potential help.

Lichens

Lichens contain two species; a fungus and a photosynthetic microspecies (a species that obtains energy from the sun, such as a green algae or cyanobacteria). Lichens are usually named after the fungus. It is believed that lichens are an important indicator of air quality. Some lichens are more sensitive to air pollution than others. For instance, foliose lichens, (leafy appearance) have more surfaces exposed to the air than crustose lichens (paint-like appearance). Lichens do not disappear in the winter, thus they are exposed to the elements all year long which allow the species to easily accumulate toxins in their body called a thallus. In addition to the body (thallus) types previously discussed (foliose and crustose), lichens can be classified as filamentous (hair-like), fruticose (branched), and squamulose (scale-like). Sometimes, lichens reproduce asexually through soredia structures via wind dispersal or isidia, outgrowths of the thallus that break off. Many lichens reproduce sexually through spore-producing structures called apothecia, perithecia and pycnidia.

You can find a colourful printable guide to NL lichens at <https://cyanolichen-nl.weebly.com/lichen-poster.html> which you can take along on your hike.

Invertebrates

Invertebrates are animals (Kingdom Animalia) that do not have a backbone, while animals that have one are considered vertebrates (for example, amphibians, birds, and mammals). Examples of familiar invertebrates are dragonflies, mussels, beetles, worms, etc.

Lepidopterans - Butterflies, skippers, and moths. These species all have modified hairs called scales covering their bodies and wings, and a proboscis, an elongated mouthpart appendage for feeding through a suction mechanism. Butterflies and skippers are diurnal, active during the day, while butterflies hold their wings vertically at rest and have clubbed antennae, while skippers have hooked antennae and hold their forewings separate from their hindwings. Moths are nocturnal, and their antennae are threadlike, similar to feathers, and they keep their wings horizontal when resting.

These insects all undergo **metamorphosis**, a process where the animal transitions from one body structure to another. They begin their lives as eggs and hatch into larvae known as caterpillars. Larvae continue to develop through several stages called instars. After this phase, larvae develop into pupae (for moths: cocoon, for butterflies: chrysalis). During this stage, the species is maturing into its adult body. Depending on the weather conditions and species, they may go through multiple generations before the winter.

Odonates - Dragonflies and damselflies. Adult dragonfly eyes often touch, or nearly touch, and their wings are open or horizontally when resting, while adult damselfly eyes are fully separated and their wings are held together or vertical when resting.

They mate in flight and are often seen flying in tandem. After mating, the female lays her eggs in vegetation, over open water, and sometimes into the water itself. Unlike Lepidopterans, these species do not have a pupal or larval stage. The eggs develop into a nymph stage. They hatch from their eggs as nymphs which are just a small version of mature nymphs. The nymphs are characterized by a labium, a lower lip that is specialized to capture prey for food. Damselfly nymphs are longer and slender and have three long, tail-like gills, while dragonfly nymphs are smaller and broader, with no external gills. They molt several times, getting larger each time until they are mature nymphs. Dragonfly nymphs can grow to large sizes for an insect (up to 5 cm in length). Mature nymphs will crawl up the stem of a suitable water plant, out of the water and change from an aquatic immature insect into an adult insect. The body and wings of the dragonfly grow rapidly as it pumps fluids to them. After a while (it can be more than two hours) the adult will be ready to fly. It will hunt and often eat on the wing, and most importantly, it will look for a mate. The odonate life cycle may take between 1–5 years to complete depending on the species. However, the adult stage only lasts a few weeks.

Activity Idea: When examining dragonfly habitat, explain to the group that the vegetation around the wetland is used by the odonate nymphs to develop into an adult.

Hymenopterans - Ants, sawflies, bees, and wasps. They go through complete metamorphosis (egg, larvae, pupae, and adult stage). Many of these species are important pollinators.

Molluscs - Snails, clams, and squids. These species typically have one or more outer shells made of calcium carbonate and a muscular foot.

Activity Idea: Critter dipping is a great activity to show a group about aquatic invertebrates. Use a small net to stir up some sediments from the bottom of a pond, then put the contents of the net into a small bowl of water. Eventually you should be able to see small aquatic animals such as juvenile dragonflies, water bugs, etc.

Amphibians

There are 8 amphibian species in NL. The amphibians found on the island (Newfoundland) are all introduced; **American toad**, mink frog, **green frog**, and wood frog. In Labrador, two-lined salamander, blue-spotted salamander, American toad, mink frog, wood frog, Northern leopard frog, and spring peeper.

Mammals

Mammals are animals that do not lay eggs, such as moose, rabbits and bats. Many of the mammals found in Newfoundland have been introduced for fur farming and food.

Finding mammals in action can be difficult. Have a look on the ground for evidence of wildlife such as animal tracks or scat.

Birds

Birding (birdwatching) is a recreational hobby enjoyed by naturalists of all skill levels. Most birders recommend a good pair of binoculars, a bird field guide, a camera, and/or a notebook and pencil to record the findings.

Questions to ask when identifying the bird:

- **What habitat is the bird in?**

Identifying the habitat of the bird will eliminate many possibilities. Consider wetlands, forests, urban, coastal, barrens, and arctic. When using a field guide, look at the range map for any potential species, which will show where the bird spends each season.

- **What size is the bird?**

A common question that most birders ask when identifying an unknown bird is: "Does the bird look as big as **robin** or as small as a **sparrow**?" (or another familiar bird). This simple question can be answered by the most basic birder.

- **What are the distinguishing features of the bird?**

Does the bird have a crest on the top of its head like a **cedar waxwing** or **blue jay**? or a colour pattern such a cap or stripes?

- **How is the bird behaving?** Is it soaring, perching, or hopping in the undergrowth?

- **What is the bird eating?**

Flies, seeds, plants in the water, or invertebrates in mud?

Ducks are often put into two feeding categories: divers or dabblers. **Divers** are heavier, thus require a longer running time to take off and dive deep in the water for food such as the **Common Goldeneye**. **Dabblers** tend to feed at the water's surface, dabbling for insects or plants and often stick their tails in the air when searching food, called tipping, such as Mallards or American Black Ducks.

Activity Idea: If you spot a duck, try to figure out if it is a diver or a dabbler. If it is a diver, count the number of seconds the duck stays under water.

- **What colour is the bird?**

Look for field marks and flash marks on the birds. Field marks include the colour of the feathers around the birds' eyes, wings, tail, chest, and rump. Flash marks are markings that are only shown when the bird is in flight such as the yellow under wings of a **Northern Flicker**.

Birds of the same species may be different colours depending on the birds' age, sex or the season.

For example, male ducks (drakes) are often more colourful than the female ducks (hens). Drakes are more brightly coloured to attract a mate while the females are generally less colourful to camouflage with their habitat to protect their young or eggs. Often, male plumage is different during the non-breeding season, called **eclipse**.

Activity Idea: Show a picture of a pair of ducks and ask which one is the male and female and why they think that.

- **What shape is the bird?**

Body: Birds are often put into categories based on their shape. This characteristic is important when identifying birds are flying and you can only see their silhouette. For instance, hawks and eagles have a large wing span, while woodpeckers have long chisel-like bills, large heads, and long tail feathers.

Tail: Is the tail forked, rounded, fan-shaped, wedge-shaped, pointed, notched, square, short, etc.

Bills and Beaks: Is the bill cone-shaped, needle-like or hooked? Bills are shaped depending on what the bird eats. The American Crow has a generalized beak shape because they eat a variety of food while finches have a cone-shaped beak to open seeds.

- **What sound is the bird making?**

Listening to the bird songs, calls, and drumming can be the best or only way to identify some birds. Use rhythm, pitch, repetition, and tone when learning and identifying bird calls. You can use memory technique to recognize bird calls. For example:

Black-capped chickadee: "chickadee-dee-dee" or "cheeseburger"

Yellow warbler: "sweet, sweet, sweet, I'm so sweet"

Additional Resources

Field Guides

Birds

Burrows, R. (2002). *Birds of Atlantic Canada*. Edmonton, AB: Lone Pine Publishing.

Warkentin, I. (2009). *Birds of Newfoundland*. Portugal Cove-St. Philip's, NL: Boulder Publications.

Fungi

Knopf, A.A. (2011). National *Audobon Society: Field guide to North American Mushrooms*. Toronto, ON: Random House of Canada Limited.

Voitk, A. (2007). *A little illustrated book of common mushrooms of Newfoundland and Labrador*. Rocky Harbour, NL: Gros Morne Co-operating Association.

Invertebrates

Erbland M. (2011). *Island insects: A photographic potpourri of Newfoundland 'Bugs'- Digital edition*. Retrieved from <http://www.justphotos.ca/islandinsects/>.

Morris, R.F. (1980). *Butterflies and moths of Newfoundland and Labrador: The Macrolepidoptera*. Hull, QC: Canada Government Publishing Centre.

Thorp, J.H. & Rogers, D. (2011). *Freshwater Invertebrates of North America*. Oxford, UK: Elsevier Inc.

Plants

Boland, T. (2011). *Trees and shrubs of Newfoundland and Labrador: Field guide*. Portugal Cove-St. Philip's, NL: Boulder Publications.

Scott, P.J. & Black, D. *Wildflowers of Newfoundland and Labrador*. Portugal Cove-St. Philip's, NL: Boulder Publications.

Marsh

Ducks Unlimited Canada. *Marsh world* (2nd ed.) Brandon, MB: Leech printing.

Coastal

Collins, M. (1993). *Life on the Newfoundland seashore: Seaweeds, invertebrates and fish*. St. John's NF: Jespersion Press Limited.

General

Kelligrews Ecological Enhancement Program (KEEP). *A collection of field guides for the environment of NL*. Conception Bay South, NL.

Mann, Henry. (2018). *Nature Guide for the Pasadena Nordic ski club trails*. Pasadena, NL: Pasadena Nordic Ski Club.

McCloskey, E., & Kennedy, G. (2012) *Nature guide to Atlantic Canada*. Edmonton, AB: Lone Pine Publishing.

Websites

ebird.org

Record the birds you see, keep track of your bird lists, explore dynamic maps and graphs, share sightings, contribute to science and conservation.

inaturalist.org

nlnature.com

Atlas of wildlife in Newfoundland and Labrador based on observations by residents and tourists.

naturewatch.com

Monitoring programs that encourage you to become a citizen scientist. (Frog, ice, plant, and worm Watch)

geocaching.com

Flora of Newfoundland and Labrador - newfoundland-labradorflora.ca

Newfoundland and Labrador Environmental Organizations

Provincial

Canadian Parks and Wilderness Society - Newfoundland and Labrador

cpawsnl.org

nlcoordinator@cpaws.org

NL Department of Fisheries and Land Resources

flr.gov.nl.ca

Ducks Unlimited Canada

ducks.ca

du_newfoundland@ducks.ca

Foray NL

info@nl.mushrooms.ca

Nature Conservancy

natureconservancy.ca

Newfoundland and Labrador Environment Network
nlen.ed@gmail.com

Nature Newfoundland and Labrador
naturenl.ca
naturenl@naturenl.ca

Regional

Environmental Education Commission - brotherbrennancentre.ca

K.E.E.P. Kelligrews Ecological Enhancement Program
www.envision.ca/members/templates/template6.asp?ID=6489
kelligrewseep@yahoo.ca

MUN Botanical Garden
mun.ca/botgarden

NAACAP
naacap.ca

Salmonier Nature Park
flr.gov.nl.ca/wildlife/snp

The Suncor Energy Fluvarium
fluvarium.ca

ACAP Humber Arm
facebook.com/ACAPHumberArm

Humber Natural History Society
facebook.com/Humber-Natural-History-Society-816633858388642

Western Environmental Center
facebook.com/wecnl

Grand Riverkeeper Labrador, Inc.
refbnfl@yahoo.ca
www.grandriverkeeperlabrador.ca