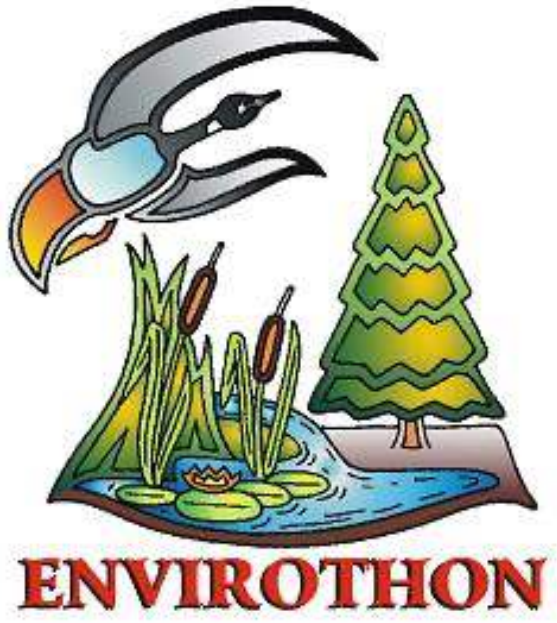
Nova Scotia Envirothon 2024
Learning Objectives



Aquatics

Abiotic

Identify the processes and phases of the water cycle.

Understand the concept of watersheds. Know the features of a healthy and unhealthy watershed.

Be able to asses the quality of a wetland based on abiotic water quality parameters such as pH, dissolved oxygen, total dissolved solids.

Biotic

Identify aquatic species common to Nova Scotia and understand their dependence on one another. Know which aquatic species are considered ‘at risk’ and what their status is. Know how to use a dichotomous key to identify micro- and macro-invertebrates. Habitat: Understand habitat needs of aquatic species.

Understand the concept of migratory fish and give local examples.

Understand the impact invasive and introduced species can have on an ecosystem and give local examples.

Identify culturally important wetland species that are important to Mi’kmaq culture.

Aquatic Environments

Identify types of wetlands according to the Canadian Wetland Classification System as well as their characteristics that differentiate the types of wetlands as well as from other types of ecosystems.

Understand the functions and values of wetlands.

Watercourse Protection & Conservation

Understand ways the Province manages, conserves and protects aquatic resources. Give examples of local regulations which are in place to protect aquatic resources, such as the NS Wetland Policy. How can you protect aquatic resources?

Know various methods of conserving water and why they are important. How can you conserve water?

Understand water quality testing and monitoring and why these tests are used to assess and manage aquatic environments. Understand point and non-point source pollution and ways to reduce them. Explain how water quality can be improved.

Wildlife

Wildlife Identification
Identify wildlife species common to Nova Scotia and the Maritimes using field guides, mounted specimens, skins/pelts, skulls, silhouettes, decoys, wings, scats, tracks, sounds or other common signs.

Identify specialized anatomical parts and describe their function using skull morphology and/or teeth.

Identify the different life stages between major taxonomic groups (mammals, birds, reptiles, amphibians, and insects).

Identify general food habits (herbivore, omnivore, carnivore), habitats (terrestrial, aquatic) and habits (diurnal, nocturnal) of common local wildlife species.

Identify basic needs required by common wildlife species.

Identify local species at risk and be familiar with the factors causing their decline.

Wildlife Ecology
Describe wildlife adaptations and their significance (hibernation, migration, colouration, etc.). Identify and explain the advantages of physiological and/or behavioural adaptations of wildlife to their survival.

Define habitat and its essential components. Know the habitat requirements for common local wildlife species. Be familiar with associated terminology such as limited factor, territory, home range, fragmentation, degradation, edge effect, etc. Explain major causes of habitat loss and degradation in Nova Scotia.

Know the difference between an ecosystem, community, and population. Understand the impact of limiting factors and carrying capacity on common wildlife species. Be familiar with different biotic and abiotic factors at play in local ecosystems.

Define biodiversity and explain why biodiversity is important to people and wildlife. Understand the importance of the three levels of biodiversity (genetic, species and ecosystem/community) and the implications of loss at each level. Explain the major causes of biodiversity loss in Nova Scotia.

Describe food chains, food webs and trophic levels with examples from Nova Scotia. Be able to diagram a food web.

Name and describe some local examples of symbiotic relationships, predator-prey relationships, ecological niches, keystone species and indicator species.

Conservation and Wildlife Management

Understand the concept of carrying capacity and why it is the main factor affecting population size. Relate the concept of carrying capacity to a wildlife species native to Nova Scotia. Understand the difference between biological carrying capacity and cultural carrying capacity.

Explain common wildlife management practices and methods that are being used to manage and improve wildlife habitat in Nova Scotia. Understand the role hunters and trappers play in wildlife management. How can you help in the protection, conservation, management and enhancing of Nova Scotia wildlife populations?

Describe some common methods of population sampling used to measure a wildlife population and how these data sets are useful to management practices.

Issues Involving Wildlife and Society

Understand how non-native, invasive species threaten our environment and the biodiversity of many wildlife species. Understand the impact that non-native, invasive plants can have on wildlife habitat and native wildlife species. Be familiar with species that are non-native and/or invasive to Nova Scotia.

Understand the impact that land-use decisions can have on wildlife populations. Understand that wildlife resources are under constant pressure caused by human population growth, environmental degradation, and habitat reduction.

Understand the impacts, both positive and negative, of people on biodiversity. Negative impacts could be fragmentation of habitat due to development (roads, buildings, etc.), disturbance of wildlife nesting seasons, destruction of habitat due to vehicles, motor vehicle collisions, trash interfering with wildlife health (food intake), pesticides in the environment. Positive impacts could be enhancement of wildlife habitat in order to attract wildlife viewing, increased knowledge through visiting wildlife and natural areas, funding for wildlife management.

Understand the various status of ‘at risk’ species (common, vulnerable, threatened, endangered, extirpated, extinct and special concern) and the factors that are affecting these species. Understand species reintroduction. Explain common causes that lead to depleted populations and describe measures being taken to help their recovery. Know the organization and agencies responsible for listing species as ‘at risk’ on global, national and provincial levels.

Describe white nose syndrome and how is it affecting bats. What measures are being taken to discover outbreaks and prevent spread? Describe brainworm and how is it affecting the mainland moose population.

Soils

Soil Conservation and Land Use Management

Understand why soils are a vital (and essentially non-renewable) natural resource that must be managed properly in order to sustain human society.

Compare different land uses and conservation practices and their impacts on soils, with particular emphasis on agriculture and food production.

Understand how soil management is integral to maintaining clean water and a healthy aquatic environment and identify ecosystems services provided by soil.

Chemical Properties of Soil and Soil Health

Understand how soil health reflects the overall chemical, physical, and biological conditions within a given soil.

Understand the concept of micronutrients and macronutrients as they relate to soils and plant nutrition.

Identify the importance and benefits of organic matter in soils.

Physical Properties of Soil and Soil Formation

Understand basic soil forming processes and the factors affecting them.

Understand the concept of soil parent material and how different parent materials can affect soil properties.

Be able to identify soil horizons and soil features and use this information to interpret soil properties and limitations for land use (e.g., texture, structure, colour, organic matter content, stoniness, drainage class).

Be able to use soil survey maps and related information to make interpretations about soil limitations, opportunities, and appropriate land use.

Forestry

Tree Physiology & Identification

Identify common tree species without a key, know how to use a key for unusual & less common species in the Acadian Forest Region.

Know the characteristics (shade tolerance, longevity, site, common uses) of the tree species native to Nova Scotia.

Know the parts and tissues of a tree and be able to explain the growth processes as they relate to the life cycle, including photosynthesis and respiration.

Forest Ecology

Understand the structure of a forest (canopy, understory, ground layer and crown classes).

Understand forest ecology concepts and abiotic and biotic factors affecting them including the relationship between soil and forest types, tree communities, forest succession and biodiversity.

Sustainably Managed Forests

Understand what silviculture is and the various treatments used, both in even-aged and uneven- aged management (thinning, clear cutting, shelter wood, selection cutting, pre-commercial thinning, site preparation and planting).

Know how to use forestry tools and equipment in order to measure tree diameter, height and basal area. Be able to examine growth rings to determine tree age and tree history (periods of drought, growth, scarring from fire).

Be able to interpret macro-features from an aerial photograph.

Understand how social, economic and environmental factors influence forest management decisions and be able to address current forestry issues from different perspectives (ie. Clear cutting vs old growth, prescribed burns in protected areas), and know the provincial regulations pertaining to wildlife habitat and watercourse protection.

Value of the Forests

Understand the importance and value of trees in an urban and community setting and what factors affect their health and survival.

Understand the economic value of forests and their importance to society including biodiversity, biomass, carbon sequestration, economic benefits, non-timber forests products, and why trees and forests are important to human health, recreation, wildlife and watershed quality.

Understand the economic importance of the forest industry to the provincial, national and international economies, and identify the main types of forest Products produced in the Maritimes.