

# Alaska Wildlife Learning Objectives

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- 1) Identify Alaskan wildlife species using mounted specimens, skins/pelts, picture, skulls, silhouettes, decoys, wings (waterfowl), scat, tracks, animal sounds, or other common signs. Animal tracks may be original or molds made of the prints. Wildlife signs may be real or reproduced.
  
- 2) Use a key or field guide to identify Alaskan wildlife species or signs. Wildlife species or signs may be presented in any form as described above.
  
- 3) Identify general food habits (herbivore, omnivore, carnivore), habitats (terrestrial, aquatic, fossorial), and habits (diurnal, nocturnal) using skull morphology and/or teeth.
  
- 4) Understand the concepts of habitats, biodiversity and adaptation, and give examples of each.
  
- 5) Understand the concepts of wildlife population dynamics, such as carrying capacity, birth, mortality, age-structure and mating systems.
  
- 6) Understand how non-native (exotic), invasive species in Alaska threaten the environment and the biodiversity of many wildlife species.
  
- 7) Understand the terminology and factors that affect threatened and endangered Alaskan wildlife species. Know the meaning of extinct, extirpated, endangered, threatened, candidate species and reintroduction.

# Alaska Aquatic Ecology Learning Objectives

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1) Know the processes and phases for each part of the water cycle and understand the water cycles role in soil nutrient erosion, climate influences, and natural hazards.

2) Understand the concept and components of watersheds and be able to identify stream orders and watershed boundaries. Know the factors of a healthy watershed and an unhealthy watershed.

3) Know how to perform and interpret chemical water quality tests, including pH, dissolved oxygen, and suspended sediment. Understand why and how aquatic organisms and water quality is affected by the physical, chemical and biological conditions of the water.

4) Understand the concept of water conservation and explain ways Alaskans can reduce their water usage.

5) Identify common aquatic macroinvertebrate species and explain how they contribute to the overall picture of a stream's health.

6) Understand how soil is impacted by point and non-point source pollution and the importance of soil management to agriculture and clean water.

# Alaska Forestry Learning Objectives

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- 1) Know the parts and tissues of a tree and be able to explain the growth cycle and life cycle of a tree.
  
- 2) Understand the process of photosynthesis and respiration and how they are important to the growth and reproduction of trees.
  
- 3) Identify common Alaskan tree species, such as white and black spruce, cottonwood and paper birch without a key, and identify specific or unusual Alaskan trees and shrubs through the use of a key.
  
- 4) Know the typical forest structure: canopy, understory and ground layers and crown classes. Understand the stages of succession for Alaska's two forest types: Boreal and Rainforest.
  
- 5) Identify the abiotic and biotic factors in a forest ecosystem, and understand how these factors affect tree growth and forest development. Consider factors such as climate, insects, microorganisms and wildlife. Use a cross-section of a tree to determine the age of the tree and describe how the annual life cycle affects the appearance of its annual rings.
  
- 6) Know how to use forestry tools and equipment including D-tape and an inclinometer in order to measure tree diameter, height, basal area and volume of wood.
  
- 7) Explain the "Ecosystem Services" provided by trees, and understand why trees and forests are important to human health, recreation, wildlife and watershed quality.

# Alaska Soils/Land Use Learning Objectives

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1) Understand the importance of soils and appreciate the relatively small amount of usable soils that exists on Earth.

2) Understand the origin and types of soil parent material.

3) Understand basic soil forming processes: addition, losses, translocations and transformations.

4) Recognize and understand features of Soil Profiles, and be able to use this information to determine basic soil properties and limitations.

5) Identify and describe soil characteristics (texture, structure and color, using Munsell color charts).

6) Recognize that biological diversity is important for soil health and hence plant, human, and environmental health.

7) Understand the procedure for taking a soil sample and conducting nutrient analysis.

8) Understand how soil is impacted by point and non-point source pollution and the importance of soil management to agriculture and clean water.

# Alaska Nonpoint Source Pollution and Low Impact Development Learning Objectives

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- 1) Identify point and nonpoint source pollutants.
  
- 2) Demonstrate the cumulative effects of nonpoint source pollution.
  
- 3) Learn to read and interpret a contour map while identifying important map clues about watersheds and water quality.
  
- 4) Compare local household and community nonpoint source pollution to surface water quality standards.
  
- 5) Identify ways to reduce or eliminate nonpoint source pollution.
  
- 6) Understand the concept of eutrophication and what human actions cause an excess of phosphorous and nitrogen into surface waters.
  
- 7) Describe how green infrastructure works as a strategy for managing storm water.
  
- 8) Understand the function of Low Impact Development practices, including bioretention, grass, swales, vegetated roof covers, and permeable pavements.
  
- 9) Understand how soil is impacted by point and nonpoint source pollution and the importance of soil management to agriculture and clean water.