

# Endangered and Threatened Species of Alaska

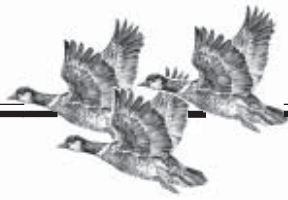


# Activity Guide



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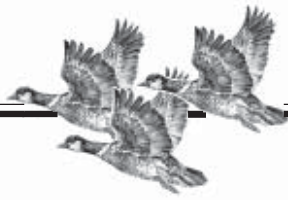
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# Introduction

These curriculum materials are focused on Alaskan species that are managed by the U.S. Fish and Wildlife Service with particular emphasis on those found on islands and shorelines included in the Alaska Maritime Wildlife Refuge. Some of the information and activities also appear in the Alaska Wildlife Curriculum unit "Wildlife for the Future." The "Wildlife for the Future" unit was developed by the Alaska Department of Fish and Game and encompasses principles of Alaska wildlife management and conservation.

A multi-media teaching kit will be available at the Alaska Islands and Ocean Visitor Center in Homer. You will be able to arrange for instructors to lead your class in activities included in this curriculum. (More information about the Visitor Center education programs is available at <http://www.islandsandocan.org>.)

This teaching packet is designed to help you introduce the concepts of "biodiversity" and "endangered" to your students in a hands-on interactive way. It is divided into five sections.

- ❖ Section 1 introduces the concept of biodiversity and habitats - key elements in the survival of plants and animals in ecosystems around the world.
- ❖ Section 2 introduces you and your students to the Endangered and Threatened species of Alaska, with a few key species selected as focal points.
- ❖ Section 3 provides activities to help you and your students explore some of the factors that contribute to changes in population size and population dynamics. Activities focus on extinction, carrying capacity and counting populations.
- ❖ Section 4 includes activities that look at human and natural events that can have a catastrophic impact on species and human interventions that have had both positive and negative effects on local populations.
- ❖ Section 5 is focused on special stories about endangered species and on successful recovery efforts by wildlife management agencies. Here you will have an opportunity to do a fun puppet show about extinction and lead your students through two flannel board stories about recovery efforts for the Aleutian Canada Goose and the Short-tailed Albatross.

At the end of the Activity Guide you will find appendices with information on the Endangered Species Act, and Coloring Pages for younger students.

Species covered in this activity guide:  
Endangered and Threatened Species

Short-tailed Albatross  
Aleutian Shield Fern  
Aleutian Canada Goose (recovered species)

Threatened Species NOT covered in this activity guide:

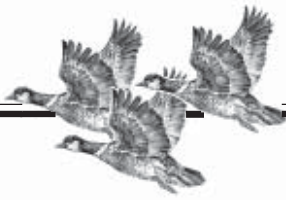
Steller's Eider  
Spectacled Eider

Species Vulnerable to Becoming Endangered

Kittlitz's Murrelet  
Pribilof Rock Sandpiper  
Northern Sea Otter

*Information and activities about these sea ducks can be found in the Sea Duck Activity Guide put out by the Center for Alaskan Coastal Studies*





# Background

Alaska is unique in that we have many healthy populations of species of plants and animals that, in other parts of the country, are considered threatened or endangered. Alaska's size, percent of undisturbed habitat and small population contribute to this phenomenon. Still, even in Alaska we have plant and animal species that have become extinct, are listed on the endangered species list, are considered a threatened population or have been listed as a species of concern. Although there are differences between those plants and animals listed at the federal and state level, the reasons for their listing and their need for protection remain important.

There are many factors that can contribute to a species becoming threatened or endangered.

❖ Declining Populations

If a species' population reaches a level where the recruitment of young does not replace the mortality rate of the adult population, then the total population begins to see a decline. Once the population gets below a critical point, recovery is very difficult, sometimes impossible. There are many reasons why a population may experience a decline, for example, a natural or human disaster wipes out a large number of plants or animals, an over harvest of the species occurs, there is a significant reduction of the animal's food source, or the animals may face high stress from predation.

❖ Rarity

If the population of a plant or animal is naturally small, or the plant or animal is only found in a small area, then the rarity of the plant or animal may cause its listing since any one of the factors mentioned above could easily wipe out a population.

❖ Restricted Distribution

Restricted distribution is similar to the limitations of a rare species in that it means a species is not able to expand its habitat so as to adapt to changes it might encounter. Its unique location, such as an island habitat makes it vulnerable to disturbances and more difficult to increase its dispersal.

❖ Sensitivity to Environmental Disturbance

If a species is particularly sensitive to environmental disturbances then its population could suffer severe declines in the aftermath of a large scale human or natural disaster. Sea ducks are a good example of an animal that is sensitive to environmental disturbances because they congregate in such large numbers during the winter prior to breeding season and they molt flight feathers, so they would not be able to escape a disaster such as a large scale oil spill.

❖ Life History

A species' vulnerability to impacts to their population has a lot to do with their life history. Some animals that only produce one young, or small egg clutches, are at risk if too many breeding seasons go by and they are not able to successfully reproduce. Some animals that do not reproduce until they are four or five years old are at risk if disturbances to the young





## Background continued...

adults occur before they have been able to breed and reproduce. Unique adaptations of a plant or animal can sometimes play a role in their demise - a particularly beautiful feather, warm fur, large amounts of blubber, flightlessness, slow moving, etc. These factors can contribute to a population's drastic reduction in numbers and have in the past as humans expanded their explorations of new lands, had little controls or laws governing their actions and had a growing population extracting more natural resources.

The two concepts of biodiversity and island biogeography are important to understanding the health of ecosystems and the importance of working towards protecting species in trouble and preserving necessary habitats to ensure all ecological levels are functioning properly.

### ❖ Biodiversity

Biodiversity is a measure of the total amount of variety in terms of species or genetics. As we encounter a loss of plant and animals species through extinction the biggest consequence to the planet is a loss of biodiversity. Biodiversity is important to the health of the planet for many reasons. Biodiversity contributes to all of life's processes. Diversity helps with nutrient cycling in ecosystems, adaptations of species to different and changing habitats and human endeavors such as agriculture, and medical needs. Biodiversity helps the quality of the environment and health of all living things. People value biodiversity for many reasons, including aesthetic, moral, spiritual, educational, economic, and recreational reasons (World Wildlife Fund, 1999).

### ❖ Island Biogeography

Islands are typically too small or too isolated to support a variety of species. In the 1960s Robert MacArthur and Edward O. Wilson came up with the theory of island biogeography, based on studies that had been done on species of plants and animals inhabiting islands of different sizes. This theory states that more species will be able to live on islands that are larger and closer to a mainland or a larger body of land than on smaller islands that are spread further apart and are farther from the mainland. Islands, because of their isolation, are more ideal places for unique species of plants and animals to evolve. Unfortunately, islands can also be places of "concentrated extinction." Of 724 known animal extinctions in the last 400 years, about half were of island species, and of the bird species that have become extinct in that period, at least 90 percent were island dwellers (Kasnoff, 2000). In many ways, ecosystems on the Aleutian Islands can be looked at with the theory of island biogeography in mind. The Aleutian Shield Fern is an example of a plant species that has a very small population which is limited to only one specific place on an island. If anything were to happen to a significant portion of that plant population, it would easily become extinct. The Aleutian Canada Goose is another example of how species can easily succumb to an invasion of introduced species such





## *Background continued...*

as domesticated animals or pests (foxes and rats) for which they are unprepared to defend themselves against. Predation on their eggs and chicks almost decimated their population. In places where a loss of habitat is occurring at a rapid rate, fragmentation of habitats creates "islands" that mimic the same principles as those found on "real" islands and species of plants and animals are affected in the same way. In this way, the principles of island biogeography can be applied to many areas and lessons can be learned from the experience of conserving island plant and animal species.

### References:

Kasloff, Craig. In the Wild Spotlight: Island Biogeography (and fragmentation).  
[Http://www.bagheera.com](http://www.bagheera.com). 2000.

World Wildlife Fund. 1999. A Biodiversity Education Framework.

