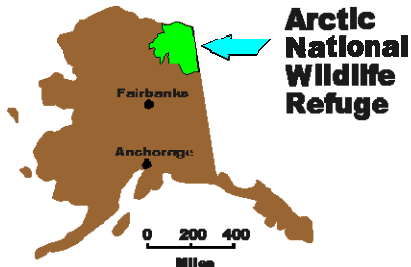


Animals of the Arctic National Wildlife Refuge

The Arctic National Wildlife Refuge is located in the Northeast corner of Alaska and with a range of nearly twenty million acres is the largest wildlife refuge in our country's public lands system.



Map Courtesy of Fish & Wildlife Service

Home to an amazing diversity of animals, the Arctic Refuge provides a unique learning opportunity to study animal adaptations, unique and rare species, as well as migration. These animals must be able to handle quite a range of weather conditions and temperatures during their life on the arctic plain. While summer days are relatively mild with weeks of continuous sunlight and average temperatures in the 40's, the winter months average a temperature of -10 degrees Fahrenheit and when the sun sets in mid-November, it does not reappear until late January. The materials below will help you share the stories and lessons of these animals with your students by exploring some of the Refuge's unique species, discussing the special adaptations some of the Arctic's animal residents have to live in this intense environment, and finally migrations which are supported by the Refuge.

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The Bears of the Arctic Refuge

The Arctic National Wildlife Refuge is our nation's largest wildlife refuge and contains the greatest variety of plant and animal life of any protected area within the Arctic Circle. The remoteness of the Refuge has also helped to protect its beauty and keeps it one of the most wild and undisturbed areas within the United States. The animals of the Refuge also contribute to the uniqueness of the area. All three species of bear—brown,, black and polar can be found within the Refuge.



Images courtesy of U.S. Fish & Wildlife Service

By the Numbers

- Polar bears can smell a seal that is under 3ft of ice from up to a mile away! **CLASSROOM ACTION:** select a variety of different scents and see how many your students can identify.
- More than **250** animal species rely on the Refuge's diverse habitats. **CLASSROOM ACTION:** once the students have located where the Refuge is, see how many animals they can name that call this area home.
- Members of the Porcupine Caribou herd, which give birth on the Coastal Plain of the Refuge, can travel over **3,000** miles during their annual migration. **CLASSROOM ACTION:** students can plan trips to see how far 3,000 miles will get them.
- The average temperature at the Refuge during July is **41 degrees F** and **-4 degrees F** during February. **CLASSROOM ACTION:** what are the average temperatures for these months where you live?

One of the most loved of these three species, polar bears, are also the world's largest terrestrial carnivore. Male polar bears can weigh between 770 and 1500 pounds with female bears weighing up to 550 pounds. Polar bears are equally adept at walking on ice as they are swimming in the chilly Arctic Ocean. Their paws have fur on the underside pads and short claws which give them a better grip on the ice. Additionally, nearly 4 inches of blubber keeps the polar bear warm during the winter months and their frequent swims. While the first thing people think of may be their white fur, the polar bears actually have black skin under the fur allowing them to absorb more heat from the sun's rays. Unlike the other two species of bears found in the Refuge, the polar bear is active year round, the exception being pregnant females who den, but they do not hibernate. During the denning process, females will create a burrow under the snow where she will have her cubs and nurse them until the spring. The Arctic Refuge is home to the highest concentration of onland polar bear dens in Alaska.

Brown bears are the next largest species of bear found in the Refuge and are sometimes referred to as grizzly bears. The brown bears of the Arctic Refuge represent the most northern population of the species in North America. Because of the harsh winter conditions in the Refuge, these bears may hibernate for up to 8 months out of the year. This explains why the brown bears of the Refuge are often smaller in size than those found in out parts of the country. Brown bears are omnivores and will eat meat, roots, greens, or berries depending on what is available and what season it is.

Black bears, the most common bear species in North America, are the smallest of the Refuge's three bears. Solitary and secretive, the black bears reside in the forests which are found in the southern part of the Refuge, where they often avoid their brown bear counterparts who have been known to kill black bears who encroach on their territory.

Other Arctic Refuge Residents

In addition to the bears, many other mammals call the refuge home, including the ancient musk ox. Around during the time of the woolly mammoths, musk oxen survived the last ice age and can still be found north of the Arctic Circle. Once extinct from Alaska due to over-hunting, the



musk ox was reintroduced to the Arctic Refuge in 1969 where they now maintain a healthy population around 300 individuals. Musk oxen are herbivores and feed on the grasses and plants which grow in the Refuge. With heavy insulated wool coats, musk oxen are able to brave the frigid winter temperatures and are the only large mammal to live year round in the

Refuge. In addition to their thick coats, the musk oxen's short legs and square body help to reduce heat loss and in severe cold the musk oxen reduce their movement to a minimum to preserve heat and energy. Musk oxen are social animals that travel together in a herd. During the cold windy months, herds will circle together blocking the cold wind and conserving body heat while warding off potential predators.

Caribou are the most numerous large mammal which can be found in the Refuge. The majority of the Refuge's caribou are members of the Porcupine Caribou herd, named such because their migration route follows the Porcupine River from Canada all the way to the Coastal Plain of the Arctic Refuge. Fun fact for your students--reindeer and caribou are actually the same animal. Females generally weigh between 180-250 pounds with males weighing up to 400 pounds.



Unique to the animal kingdom, caribou are the only species where both the males and the females grow sets of antlers. The Porcupine Caribou herd travels every spring from the Yukon Territory of Canada, nearly 800 miles one way to reach the Coastal Plain of the Refuge where they give birth to their calves. This area is

ideal for giving birth for a number of reasons—the coastal plain is a narrow strip of land between the Brooks Range mountains and the Arctic Ocean limiting predator access to the newly born calves, continuous ocean breezes keep the mosquitoes away, and food and water is plentiful.

Adaptations of Arctic Animals

The Arctic ecosystem presents many survival challenges to its animal residents—such as extreme cold, months without sunlight and a short summer season to feed and raise young. In order to live in the Arctic Refuge, species have adapted to survive the difficult climate and landscape. Some of the better known adaptations have already been discussed including hibernation during the cold winter months and the thick fur coats found on many of the large mammal residents. For many animals, their thick insulating fur also changes color depending on the season, white in the winter and brown or taupe or red in the spring and summer months. While a white coat helps the animals camouflage with their surrounds to avoid

detection by predators, their white coats also radiate less heat back into the air keeping them warmer. In addition to their coats, Arctic animals have other physical characteristics which allow them to live and thrive in this ecosystem; caribou have large concave hooves that spread wide and act like a snowshoe; polar bears have fur on the underside of their feet to give them more traction on the ice; and most Arctic animals are shorter and stockier maximizing their heat retention. While these more general adaptations are shared by many residents of the Arctic, there are a few unique ones that really stand out.

The tundra bumble bee is a cold-blooded insect which lives in the Arctic. While the cold winter temperatures make it too cold for cold-blooded insects to even move, this bumble bee is still able to fly. Covered in dense hair, the tundra bumble bee loses less body heat than other Arctic Insects. When retaining its own body heat isn't enough, they have the ability to make their flying muscles "shiver" thereby generating body heat.

The woolly caterpillar, another Arctic insect, takes a very different approach to making it through the long winter. These caterpillars hatch in the fall and when the temperatures drop below freezing, they actually freeze solid for the entire winter. Once spring arrives, the caterpillars thaw and spend the spring feeding on the lush vegetation. After they have fed for a few weeks, they will form a cocoon and molt into a butterfly.

Supplemental Activities

Please look for the following activities on our educator page to bring the animals of the arctic into your classroom.

- **Skull Boxes:** Few classrooms have skulls available for student study, so the staff at the Arctic National Wildlife Refuge has created life-size, cut-and-fold boxes for the skulls of 10 mammals living in the Refuge: caribou, grizzly bear, wolf, wolverine, red fox, lynx, weasel (ermine), snowshoe hare, arctic ground squirrel, and collared lemming. These would be a great resource for middle school and high school science teachers. The skulls allow students to compare similarities and differences between species.
- **Adaptations in the Arctic:** The harsh environment of the Arctic requires many of its residents to utilize special adaptations. For example, the skin of a polar bear is actually black, allowing it to absorb more sun and stay warm in the cold temperatures. The hair of a polar bear is also hollow making its fur an even better insulator. The arctic fox changes the color of its coat in spring (reddish brown) and winter (white) to better blend in with its surroundings. This activity is probably best for elementary students and will allow them to learn about habitat, ecology, and adaptation

- **Stained Glass Art:** “Stained glass” art is a popular activity created by the Arctic National Wildlife Refuge staff. This art project was specifically produced for early elementary students, but it has proved of interest to all ages. We’ve had babes-in-arms, youngsters, teenagers and adults all drawing with focused concentration, and everyone’s results look great. There are 14 different species for artists to choose from and learn about.

About Alaska in the Classroom

The history of the Refuge is about its unique wildlife, wilderness and recreational values. These features provide many fantastic learning opportunities for you and your class. The supplemental materials which will be available in the following months will explore Arctic migration, the people of the Arctic, and the ecosystem of the Arctic more in depth. Each of these learning series includes background information on the topic, a vocabulary sheet with words from the lesson, as well as activities you can share with your class.