



NORTHERN TRAIL

SELF-GUIDED TOUR FOR TEACHERS AND CHAPERONES

This tour provides questions and suggested answers to help teachers and chaperones guide their students through Woodland Park Zoo's award-winning Northern Trail bioclimatic zone. The text, keyed to the numbers on the map, includes questions (in *italics*) to share with students. Some of these questions have no right or wrong answer, but allow students to express a variety of responses, including sensory impressions as well as factual knowledge and observations. Chaperones should encourage students to think, to feel, and to observe as they progress through the exhibit from the tundra to the montane.



EXHIBIT OVERVIEW

Your journey will take you through three different biomes: taiga, tundra and montane. First is the taiga—moist, subarctic forest dominated by conifers. The tundra is a level or rolling treeless plain characteristic of arctic and subarctic regions. The last part of your tour is in the montane—a zone of relatively moist, cool upland slopes below timberline dominated by large coniferous trees.

1. ENTRANCE TO NORTHERN TRAIL

As you begin your journey through the Northern Trail, think about what the climate is like in Alaska. Winters are long, cold and harsh, and summers are short. Daylight in the summer may last all night long, and in the winter, there are days when the sun never comes up above the horizon.

Look at the trees around the pathway. *Why do you think these trees might have grown taller than trees in Alaska?* Here in Seattle, these trees have a longer growing season, and do not have to cope with the harsh conditions found in Alaska. In Alaska, growth is limited by cold weather, nutrient-poor soils and short growing seasons.

2. WOLF OVERLOOK

Your first stop on the trail is the overlook into the wolf exhibit. *Do you see the wolves?* Sometimes you will have to really use your observation skills since wolves are rather shy, and may be hiding behind the trees. Wolves generally hunt in packs and are important northern predators. Hunting large ungulates such as moose and caribou, wolves test their prey to find a weakness such as sickness or age.



3. TREES

As you travel along the Northern Trail, observe the plants as well as the animals. *How are the plants you see adapted for this cold, harsh environment?* Plants in Alaska often grow low to the ground, where wind speeds are lower and less harsh. The flexible branches of spruce trees keep the branches from breaking under heavy loads of snow. Gently feel the leaves of one of the evergreen trees (be careful not to remove or break the leaves). *How do they feel? How do you think they might help the tree survive the cold?* Evergreen leaves often have a waxy feel. Liquid water can be hard to find, since most water in this region is frozen, and waxy leaves help many plants retain valuable water.



4. GREAT GREY OWLS AND SNOWY OWLS

With their fluffy feathers and large heads, great grey owls live up to their name and are the largest owls in North America in length from head to tail (about 32 inches or 81 cm). *Look at the great grey owls' eyes in comparison to their heads – do the eyes look small or large to you?* In their large head and facial disk of feathers, great grey owls' eyes appear small. For hunting their prey of voles and rodents, often hidden beneath the snow, great grey owls rely much more on their sense of hearing than their vision to hunt (but their ear openings are hidden within their feathers). They will listen for the sounds of rodents under the snow – once they pinpoint the location of their prey by sound, they will plunge their talons into the snow to seize their prey.

Just beyond the porcupine exhibit, you may have to look hard to find the snowy owls – they are frequently in the back of their exhibit. *Can you tell if you are seeing a male owl or a female owl?* Yes, you can! The male is snowy white to blend in with the snow, while the female, who will spend more time sitting on her nest on the ground, is speckled to help her blend in with the rocky soil.

Why do these birds nest on the ground? They nest in the tundra, where there are no trees. *Can you see some adaptations to help them stay warm in the winter?* That large body helps to retain heat. What you might not be able to see is that their legs are covered with a thick layer of feathers to protect them from the wind and cold. *If you can see both species of owls, compare the sizes of the great grey owls to the snowy owls. Which species looks the largest? Which species do you think is heaviest?* Though they may appear larger, an average great grey owl weighs less than an average snowy owl (up to 2.5 pounds or 1.13 kg for a great grey owl and up to 6.5 pounds or 2.95 kg for a snowy owl).

5. PORCUPINES

Look carefully for the porcupines – they may be up in the trees or moving around on the ground in their exhibit. *Are they larger or smaller than you thought they would be?* Porcupines are rodents, like mice and rats, but they are the second largest of the rodents native to North America (only beavers are larger). *Can you see their quills?* *Can you see any other hairs on the porcupines?* Porcupines can have 30,000 or more quills, which cover all its body except the snout, throat, belly and feet pads. Quills are modified hairs with hollow, spongy centers, but porcupines also have regular hair to help keep them warm. Porcupines use their quills for defense; the loosely attached quills easily embed into the skin of the animal trying to attach the porcupine. While the porcupine cannot throw quills, the flailing muscular tail and powerful body may help impel quills more deeply into attackers.



6. ATHABASKAN DRYING RACK

As you rejoin the main pathway, look at the large wooden rack outside the Tundra Center building.

What do you think this rack is used for and why? This is a drying rack used by Athabaskan Indians in rural areas of Alaska to preserve fish they have caught or other meat they have hunted. Meat that is hunted in the summer can be dried and stored for use in winter when hunting is more difficult. In Athabaskan coastal or river villages, you would find these racks hung with salmon, whitefish, walrus, caribou or seal meat drying in the sun. If you were an Athabaskan child, one of your chores might be to keep animals away from your family's meat so that you would have food to eat in the winter.

7. TUNDRA CENTER

The Tundra Center is the large, sod-covered building which has been designed to resemble the structures that Athabaskan Indians historically built for shelter along rivers. *Do you think this building would keep the people warm during the winter? Why?* The thick sod walls would provide excellent insulation against the cold wind. *Would you be comfortable in this building in the summer?* Yes, it would be nice and cool – the thick walls would also insulate against the heat!

Inside this building you will find a 7-foot mural depicting the vastness of the tundra. As you follow the mural from right to left, notice that the seasons change from late winter, through spring, summer and fall, then back to early winter. Some animals, such as snowshoe hares and ptarmigan, change the color of their fur or feathers from brown in summer to white in winter. *Why would that help them survive?* These colors provide camouflage; white blends with the snow in the winter, and brown blends in with the grass in the summer.

8. BEAR OVERLOOK

Just beyond the entrance to the Tundra Center is the exhibit for brown bears. All brown bears are the same species, *Ursus arctos*, but there are two subspecies of brown bears—grizzly bears and Kodiak bears, the main difference being relative size. Grizzly bears, such as the bears you see here, live in the interior of North America, and are the smallest subspecies of brown bear. Brown bears living in coastal areas of Alaska have access to migrating salmon and so are considerably larger in size. Kodiak bears that live in the Kodiak archipelago are the largest brown bear subspecies.

What do you notice about these bears that would help them during a cold winter? How about a hot summer? Their large body and thick fur will retain heat well, and their small ears will not lose much heat. What you can't see is the thick layer of fat that the bears put on under their skin during the summer—fat provides very effective insulation. During the winter, when they are sleeping in their den and not eating, the bears convert that fat to nutrients, and burn it off by spring. Over the course of the summer they shed that thick winter coat to help keep cool.

9. BEAR CAVE

As you continue along the pathway, notice the dark cave on your left. Enter the cave to discover a unique view of the bear exhibit. *Did you find any signs, like footprints, perhaps, that bears might have been in the cave?* The adult and cub prints in the cave floor were made using models of tracks made by Alaskan bears—not by real bears walking through the cave!

10. TAIGA VIEWING SHELTER

Next to the cave is the Taiga Viewing Shelter. Inside you will have an expansive view of the bear exhibit on one side and of the otter and mountain goat exhibits on the other side.

Where do you think the bears spend their time in the winter? They are frequently asleep in the cave. *What about the summer?* Look for the bears walking around looking for food, or swimming in the pool. *What do you see in the exhibit that the bears might want to eat?* Lots of fish! But the bears don't catch very many of them. Wild bears fish in shallow rivers, not in deep pools like this one, and more than 90% of their diet consists of plants. There is a list of some of their favorites on the panel to the left of the window.

What animals do you see from the other side of the building? River otters, with their sleek shape, webbed feet and muscular tail, are ideally suited for their aquatic life. *How do they stay warm in the cold?* They have very thick fur and a layer of fat, just as the bears do. Before they dive in after fish, they groom their fur backwards to let an insulating layer of air into their fur. See if you can see the air bubbles escaping as the otters swim.



11. MOUNTAIN GOATS

As you leave the building and walk down the pathway, you enter a montane environment complete with dramatic rocks covered with lichens, both real and artificial. *How do you think these animals climb these rocks?* The goat's hooves are shaped to act like suction cups and help the animals move easily across the difficult terrain. They are able to find food in places in the mountains that might be too high and too inaccessible for other animals. *How else might animals use these rocks?* Look for mountain goat hair. They also need to shed their heavy winter coats, and often use the rough surfaces of the rocks and small trees as brushes to help them shed. Zookeepers collect the shed goat hair and give it to members of the Skokomish tribe of western Washington. They are reviving an ancient tradition of weaving a ceremonial blanket of mountain goat hair, and the contribution of the zoo's goats is very important.

Can you see signs of another animal that might be using these rocks? Look closely on the far left side of the exhibit, near the Taiga Viewing Shelter, and you'll see a simulated peregrine falcon nest complete with eggs.

12. STELLER'S SEA EAGLES

The last building you will encounter on your Northern Trail walk is the Steller's sea eagle viewing enclosure. These eagles can tolerate extreme cold. Some, especially juveniles, migrate further south during the cold winter months. This increases their chances of survival due to higher temperatures and greater access to food.

Which eagle do you think is the male and which is the female? Why? If the birds are sitting close to one another, you can tell by their size. For raptors (birds that catch and kill their food with their feet, such as hawks, eagles, owls and falcons) the female is the larger bird. A male eagle would weigh about 11-13 pounds (approximately 5 to 6 kg), while a female would weigh between 15 and 20 pounds (approximately 7 to 9 kg).

The eagles at Woodland Park Zoo are wild birds that were brought here because of injuries and cannot be released. Woodland Park Zoo works in cooperation with wildlife agencies to assist the recovery of bald eagles.

13. ELK OVERLOOK

Follow the boardwalk to its end. *What animals do you see? Can you tell which of the elk is a male?* Male elk are larger than female, and grow a set of antlers every year, dropping them at the end of the fall mating season, or rut. *How do think these elk might adapt to changing weather?* They migrate, both in latitude and in elevation. In winter, elk migrate farther south, and they also move farther down the mountain to places where the snow is not so deep, and the temperature is not quite so cold.

Can you see the wolves from here? Look back up the hill and you might see the wolves on the far side of their hill.



14. THE END

This completes your tour of the Northern Trail. Take some time to think about how the plants and animals you have seen have adapted to survive the rigors of a northern environment. Also think about how animals and plants depend on one another and their environment for survival.

As you make your way back up the hill and to the rest of the zoo, think about ways that you adapt to changing weather. *What do you do differently in the winter than in the summer? How do you depend on your environment?*

Additional background information on this bioclimatic zone is provided in Woodland Park Zoo's Northern Trail Teacher Packet, available on the zoo's website at www.zoo.org or call 206.548.2500.