

Survival in the arctic and subarctic is a challenge. The main problem is the extreme cold. But there are others; herbivores must also deal with limited food for browsing and grazing, efficient predators, and summer hordes of insects. Carnivores must deal with cyclical decreases in the game they depend on. Both herbivores and predators compete within their own species for mates, and sometimes for food. All animals must protect themselves from human hunters, and many are threatened by loss of habitat as people erect buildings on the land. Alaskan animals have adapted to the challenges of the natural world in a number of unique ways.

CAMOUFLAGE

In many animal species, babies are born with dappled brown coats so they can blend into the brush or forest. In Alaska, the arctic fox and Sitka black-tailed deer follow this pattern. Other Alaskan animals change color as the seasons turn. Several species have adapted to both summer and winter by shedding mottled brown coats in the fall and growing snowy white ones in their place. Examples include snowshoe hares, arctic hares, ptarmigan, and weasels (called ermine in their winter white phase).

FUR AND FEATHERS

Both land and sea mammals of the north develop heavy winter fur to protect them from cold temperatures. The fur grows in two layers: a soft, dense underfur insulates the body from heat loss, while long, slick outer hairs (called guard hairs) shed water, snow, and wind. Beavers, muskrats, minks, sea otters, and land otters have adapted to cold climates in this way. The fur of some animals has unique characteristics to deal with Alaska's weather. For instance, wolverine fur is resistant to frost. For this reason, use it to make fur ruffs for parka hoods, since the wearer's breath will not condense on the fur. Caribou hairs are hollow, providing both buoyancy for swimming and extra insulation for arctic winters. Because of this property, caribou skins are used as sleeping bags and parkas. The underwool of the muskox is so soft it is knitted into luxurious scarves and hats. Seal fur is stick and sheds water and so is often used in arctic areas to make boots, called mukluks. The porcupine's quills are actually modified hairs that are filled with a spongy material and tipped with tiny barbs. These quills protect the rodent from predators. Mammals are not the only Alaskan animals that have adapted to the cold climate with protective covering. The ptarmigan, Alaska's state bird, grows feathers all the way down its legs and on its toes.

BODY SHAPE AND SIZE

Many Alaskan animals have a compact body type that conserves heat. For instance, the lynx has short, furry ears unusual in the cat family. Snowshoe hares and arctic foxes have similarly short ears. Sea mammals are protected by a thick layer of fat, or blubber, that insulates them from cold waters. Other mammals are adapted for specialized travel requirements. Lynx and snowshoe hares have large feet that spread their body weight, keeping them from sinking into deep snow. Caribou hooves are flexible, making quick travel over uneven tundra or in deep snow possible, and useful for swimming across rivers and lakes. The long legs of moose allow them to step over fallen trees and dense bushes as they browse in the forest.

HIBERNATION AND FREEZING

During hibernation, the animal's body functions decrease almost to nothing. This allows hibernating animals to survive without food or water during the lean winter season. Alaskan hibernators include black bears, brown bears, mice, and marmots. Other animals actually freeze during the winter and then revive when they thaw out in the spring. Normally, freezing would kill an animal, since ice crystals would form inside cells and burst the cell membranes. But some animals, including certain caterpillars, fish, and houseflies, produce a chemical like antifreeze in their cells that either prevents freezing or retards the formation of ice crystals within cells.

ANTLERS, HORNS, AND TEETH

Although antlers, horns, and specialized teeth are not unique adaptations to cold climates, they are important survival tools for many Alaskan animals. Antlers are different from horns in one important way: they are shed each year, growing back in the summer and fall, while horns are not shed. Moose, caribou, deer, and elk grow antlers, which they use in mating displays, as protection from predators, and in foraging for food. Muskoxen, Dall sheep, and mountain goats grow horns, used in mating displays and defense from predators.

Animal teeth have evolved according to diet. For instance, grazers' molars are large and flat, perfect for grinding up grass before it is swallowed. Browsers' molars are large, but have ridges, since they must grind up woody branches and bark. The beaver's front incisors never stop growing, but are worn away by constant gnawing on wood. Toothed whales such as killer whales and belugas have carnivores' teeth, sharp for biting and chewing meat. Baleen whales such as humpbacks and bow-head whales have long flexible strips of baleen instead of teeth, perfect for filtering tons of tiny plankton, krill, and small fish for food. Walrus tusks are used in defense of life or mates and as tools for digging clams on the bottom of the sea.

BEHAVIOR

Each animal species has unique behaviors that allows it to survive in its habitat. Examples include different social organizations, such as flocks or herds (geese, cranes, caribou, sheep, goats, elk, muskoxen, fur seals, walrus), family groups (eagles, wolves, whales, land otters, foxes, beavers), solitary life (moose, lynx, wolverines, porcupines), and colonies (many rodents).

Other adaptive behaviors are defensive strategies. For instance, muskoxen form a tight circle around the herd's young when threatened by predators. The adults face the outside of the circle, showing only their horny brows and front hooves.

Still other adaptive behaviors include hunting methods, such as wolves' pack hunting, killer whales' and humpback whales' circles of bubbles that trap fish, and bears' use of their long claws to swipe salmon from streams.

Diet itself is an adaptive strategy: Grizzly bears can thank their varied diet of fish, small and large game, berries, and roots for their survival after the Ice Age. Their larger cousins, the short-faced bears, owe their extinction to the fact that they ate only meat, and when their prey became scarce the bears starved.