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A Claw Comparison: How Claw Shape Relates to the Livelihoods of Bears

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The anxious black bear cub fled up the trunk of this birch and soon was safely nestled 30 feet up, within its limbs. A cub's hurried ascent up a tree has been clocked at 3 feet per second. If we examine the claws of different North American bear species, we can see that the strongly incurved, sharp-pointed claws of black bear are similar in shape to the feline claw design - perfectly adapted for climbing. When a bear accelerates from a walking climb (described in Northern Woodlands' Summer 2023 issue) to a faster gait, paired hind and forefeet work together to push and pull upward with the hooked claws of all four feet pressing into the bark. Sharp claw tips insert into the tree's bark while the inward curving space on the underside of each claw helps secure a firmer grip.

Black bear claws are also well adapted for searching for food through rotting wood. A good site for trackers to find sign of this common black bear feeding behavior is a 15- to 25-yearold young forest opening where logging left behind a valuable bounty of stumps, slash, and other downed woody material. As this woody debris ages over a few years, it provides moist recesses of rotting wood. These structures become inhabited by ants, wood borers, and beetles - a boon to bears and multiple other wildlife species that seek them. I remember watching a large black bear using the claws of his front feet to forcefully dig into and pull apart the top surface of a rotten stump. Aggressive backward raking movements sent wood fragments flying. Minutes later, he had torn apart the top surfaces of the stump and a nearby rotten log.

Male polar bear feet. Record weight male polar bear from Alaska weighed 2,204 lbs!

To appreciate how specialized black bears' claws are to the bears' forest habitat, it's instructive to compare them to the claws of other North American bears. For example, the enormous feet of this mature male polar bear (photo next page) walking across the ocean's pack ice are uniquely adapted for locomotion and hunting success. Polar bear feet are massive (a foot or more wide for the largest males), and one could easily assume that they serve as snowshoes. However, polar bears' big foot size does not assist with flotation on top of deep snow. Instead, the extra-large feet work to spread out the bears' 500 to 1,700 pounds of weight so that the animals are less likely to break through thin ice. Large, paddlelike front feet with partially webbed toes propel polar bears while swimming up to 4 miles per hour and potentially dozens of miles in

Adult female polar bear tracks next to my boot imprint.

a day. Swimming, not walking, is their most energy-efficient means of travel and access to food.

Respected polar bear biologist Ian Stirling and colleagues discovered another unusual feature not found on the feet of any other North American bear. Using electron microscopy, the scientists learned that polar bear footpads are covered with minute, scaly papillae and "vacuoles;' tiny circular depressions that probably function like suction cups. Both of these features likely contribute to better traction on ice. As for the polar bear's claws, these resemble a black bear's short claws, but are less incurved. They are well adapted for several critical activities: climbing out of the ocean onto firm ice or onto land; scoring and opening frozen-over ice holes used for hunting seals; hooking and hauling slippery seals from the ocean; and fatally wounding occasional larger prey, including walrus, beluga, and narwhal whales.

Grizzly bears and their larger related subspecies, the Kodiak brown bear, have yet another, remarkably long, claw type. Although the claws are fearsome looking, they're not nearly as dangerous as the bears' feet. These bears often incapacitate or kill prey with a forepaw strike. The "smackdown" impact of a grizzly's striking paw exerts an estimated 7,000 to 25,200 pounds of force per square foot! Long claws make that experience even more devastating. But grizzly and brown bear claws - which are thicker, spade-like, and somewhat straighter

Left: A comparative view of North American bear claws, which have evolved to serve different purposes in different habitats. Right: The Kodiak brown bear claw, with its concave and grooved underside, resembles a gouge chisel. This shape enhances its use for digging.

These males appear to be fighting and perhaps seeking to "smack down" and wound one another with their claws. Not so. Actually, these bears are brothers and are playfully wrestling and practicing fighting skills they will need as adults.

than black bear claws - are actually designed for digging. Foraging bears excavate massive amounts of sod and soil and cast aside huge boulders while seeking to expose the burrows of a variety of prey, including lemmings, pocket gophers, ground squirrels, marmots, and voles. They also dig up subterranean plants in great quantities, including edible bulbs, tubers, and roots. As late summer and fall approach, these bears dig for the buried caches of pine nuts, roots, corms, and forbs that were hidden and stored by squirrels and other small mammals.

Grizzly and brown bear claws are perfect for digging, but they also have another use. I'll never forget the big brown bear sow I observed as she dug up dozens of Alaska's Katmai coast clams. To my amazement, she used a single claw from one front paw to surgically hold the clam while the other one went down the center of the valve, separating it.

Notice how the paws and claws of this enormous female Kodiak brown bear are being used with great dexterity and precision. She is seeking to expose and consume the most nutritious and delectable parts of the salmon. The salmon's delicious eggs are now exposed on the rocks and are also stuck to her lips.