

NATURAL HISTORY

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**SPIRIT
BEAR**

Spirits of the Great Bear Coast

Rare white bears may be vestiges of the Ice Age.

By Cheryl Lyn Dybas
Photographs by Andrew Wright

The sea is the color of old silver; its surface is as smooth as a wave-worn shell. Just after dawn on a cool August day in remote Kl-
emtū, British Columbia, I'm with a group of biologists and naturalists milling around on a dock, waiting for the motor vessel *KX Spirit*. The boat will ferry us to the only place on Earth where, with luck, we can glimpse an almost mythical creature: a spirit bear. Scientists know the bear as *Ursus americanus kermodei*, or the Kermode bear, named in honor of biologist Francis Kermode (1874–1919), the first director of the Royal British Columbia Museum. Kermode was among the first to research this salmon-eating subspecies of the black bear, *Ursus americanus*.

To biologists, the spirit bear is what's called a color polymorphism of the black bear; it has white rather than black fur. "Spirit bears have one of the most distinctive and conspicuous such polymorphisms of any mammal," says biologist Thomas Reimchen of the University of Victoria. Reimchen has spent much of his career studying the bears. "A white bear," he says, "comes from a mutation at the melanocortin 1 receptor gene," which is also responsible for coat color variation in other mammals. The trait is recessive; both parents must carry a copy of the mutated gene for their offspring to be white, geneticist Kermit Ritland of the University of British Columbia discovered.

Spirit bears are throwbacks to the last Ice Age, a time when being white conferred an advantage to animals living near ice-white glaciers. Some scientists believe that black bears along what is now the British Columbia coast could have been separated from the mainland by ice, then inbreeding increased the mutation's frequency. As glaciers melt-



ed, some of the bears may have become stranded on newly formed islands. However spirit bears came to be, no more than a few hundred are likely alive today and are found only along the north coast of the province, primarily on Princess Royal and Gribbell Islands. About one of every ten black bears on the two islands is a white bear. That estimate is based on genetic studies of bear hair and scat samples.

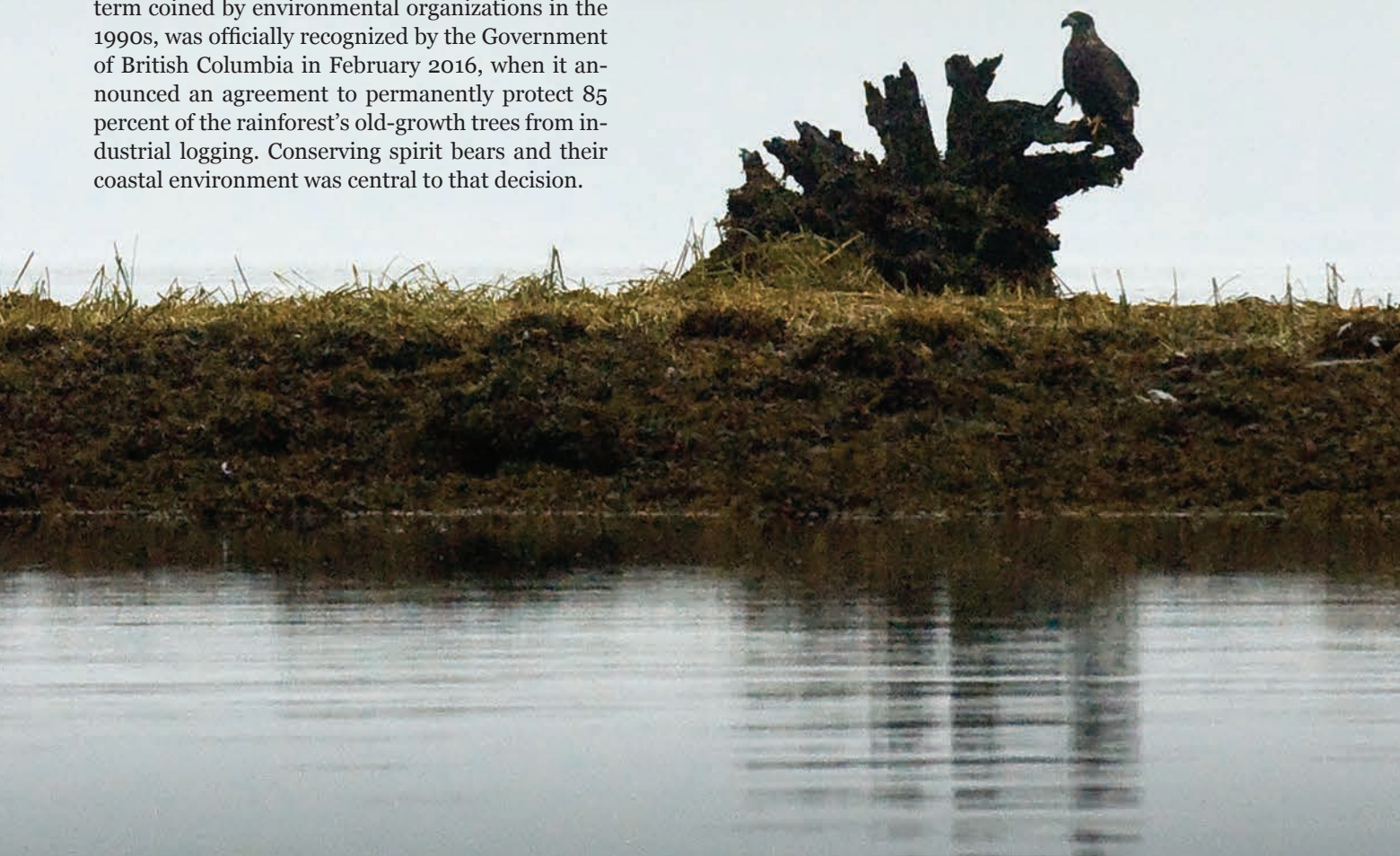
“No one knows exactly how many spirit bears are on Princess Royal or Gribbell,” says interdisciplinary conservation scientist Chris Darimont of the University of Victoria, “nor how many bears, spirit or otherwise, are in the region. But it’s an incredibly special place—for the bears, for the unusual coastal wolves that also depend on salmon for their meals, and for the many other species that directly or indirectly need salmon to survive.”

By “region,” Darimont is referring to the Great Bear Rainforest (GBR), also known as the Central and North Coast forest, a temperate rainforest on the Pacific Coast of British Columbia. It’s a 6.4 million-hectare area that’s part of the Pacific temperate rainforest ecoregion, the largest coastal temperate rainforest in the world. Black, spirit, and grizzly bears all carve out space in the GBR.

Spirit bear influence, however, extends beyond the two islands they’re known to inhabit. Called the pandas of Canada, spirit bears are critical to temperate rainforests like the GBR. The GBR, a term coined by environmental organizations in the 1990s, was officially recognized by the Government of British Columbia in February 2016, when it announced an agreement to permanently protect 85 percent of the rainforest’s old-growth trees from industrial logging. Conserving spirit bears and their coastal environment was central to that decision.



Above: Before allowing her cubs to come down from a tree, a female spirit bear checks a route to the river. Below: A grizzly bear stares down a bald eagle on a misty October morning in the heart of British Columbia’s Great Bear Rainforest.





“In the world of bears and people, seldom is the ocean recognized as a support system for the great monarchs and icons of North America’s wilderness,” writes Ian McAllister in the 2013 book *Bear: Spirit of the Wild*. “Yet along the wet, rainforest-covered archipelago of Canada’s west coast, a diverse population of bears looks to the ocean for its survival. There’s an elegant relationship between these coastal bears and their ocean home. And each year, the defining line between these two worlds becomes less clear.”

In autumn, spirit bears live on steep slopes along fast-running, boulder-lined streams brimming with salmon returning from the sea to spawn. In spring and summer, the bears wade in lowland estuaries amid sedges, which they feed on along with barnacles, mussels, and other invertebrates they wrest from rocks in the intertidal zone. “They’re always waiting for salmon, the most protein-rich food in their diet, to come back in the fall,” says Reimchen.

At any time of year, what’s the likelihood of glimpsing a spirit bear? “The chance of finding a white bear on any given day is almost non-existent,” Reimchen

says. “If it happened, it would be a ‘once-in-a-lifetime.’”

Nonetheless, our crew presses onward. The quest for the spirit bear has taken us by plane from the United States to Vancouver, then again by air to Bella Bella, a 1,450-resident community perched on a rocky ledge of tiny Campbell Island north of Vancouver Island. From Bella Bella, a ferry boat, the *Eagle*, zooms us to an even tinier island, Swindle, and the unincorporated community of Klemtu, 329 straight line miles from Vancouver. But nothing is “straight line” in the fog-shrouded, fjord-cut GBR. Least of all finding a spirit bear.

An hour slips by, and the Sun is up on the horizon. The *Spirit* backs out of its berth at the Spirit Bear Lodge dock and threads north through narrow straits. A fierce wind begins to blow, whipping the once-calm ocean into froth. Waterfalls carrying last night’s rain cascade down towering cliffs, blowing their spray onto *Spirit*’s windshield. A point of land emerges from the mist, the tip of Princess Royal Island. The tough going is about to get tougher.

Spirit’s captain, who’s known simply as “Moose,” a



member of the Kitasoo/Xai'xais First Nation, drops the boat's anchor off Princess Royal Island and lowers a Zodiac inflatable boat over the side. Crew members Mercy Georgia Starr Mason, also a Kitasoo/Xai'xais member, and Elissa Crouse climb aboard, followed by everyone but Moose, who remains with the boat. Mason and Crouse guide us to a shoreline where the boulders are taller than we are. For a slim chance of encountering a spirit bear, we will need to climb over the rocks, bushwhack through vine-choked rainforest, and crawl down a steep, moss-covered path to a creek. The track is a slippery forty-five-degree slope.

Mason and I perch on a wet, mossy log halfway down the last stretch. Ten minutes tick by, then twenty, then thirty. "We could easily be here for six or seven hours," Mason says, "and even then . . ." A note of hope: the creek is beginning to fill with early-running pink salmon, *Oncorhynchus gorbuscha*, making their journey upstream to spawn. The salmon are manna for spirit bears.

Reimchen and others have found that spirit bears have an advantage over black bears in catching salmon—the salmon can't see the white coats as clearly as they can black fur. During daylight hours, Reimchen exposed spawning salmon in a stream to white- and black-clothed human observers. The salmon were less likely to swim away from those dressed in white than the ones in black, "possibly, due to the reduced visual contrast of white against a background of skylight," Reimchen hypothesizes. Because salmon are the major source of protein for both spirit and black bears, greater salmon capture success by white bears could "facilitate their persistence," says Reimchen.

Above: A salmon-filled, satiated bear snoozes during the heat of the day just a few yards from a river. Right: A spirit bear mother and two black bear cubs slip out of the forest to forage along a river. This is the usual experience for people seeking an encounter with a spirit bear—a glimpse of an elusive bear.





Pink salmon are the core fall food source for spirit bears as winter approaches.

Whither go the salmon, he believes, so go the spirit bears.

On Gribbell Island, only two major salmon streams exist, leading to concentrations of bears at the two spots. Princess Royal Island has thirty salmon streams, reducing competition between white and black bears.

Reimchen and fellow biologist Dan R. Klinka, also at the University of Victoria, found that white bears are more likely to live near the sea and eat more salmon. Black bears are usually found along salmon streams running through deep forests, where the shadows of overhanging trees better disguise them from their prey.

From our spot on the trail, Mason and I hear waves breaking on a beach. We're a short distance from where the creek meets the sea. We've been waiting for what seems like an eternity but has been barely an hour. Mason slowly turns uphill, then raises her finger to her lips in the universal sign of "quiet." My spine tingles. A spirit bear, its white haunches lit by a ray of sun, soundlessly rounds a boulder and comes into full view.

Rooted in place, we watch as a bear that's almost as white as a polar bear makes its sure-footed way down a steep, rocky ledge to the creek below. There, it "snorkels" for salmon, dunking its head in the water and peering from left to right and back again in search of an unwary pink salmon. Fur on the bear's head and back is tinged light caramel, perhaps a result of contact with tannins in coastal cedar trees.

The bear gives up on one spot and pads to another after

another down the creek until it reaches the sea and fades from sight. Maybe, it's turning over rocks in the intertidal zone, making a meal of species such as blue mussels. By the time the bear ambles off, deciding to wait for a day with more salmon, it has shared the creek with us for more than thirty minutes.

"To say that you were lucky is an understatement," Reimchen would later remark. "It was a surreal moment," remembers naturalist Karen Bouley, a member of the group. "Our hearts were pounding from the pure excitement of seeing such a beautiful and rare animal. It's easy to see why spirit bears play an important role in First Nations mythology." The Kitasoo/Xai'xais have lived on British Columbia's coastal islands for thousands of years. The sacred white bear is known to them as *Moksgm'ol*—the spirit, or ghost, bear. These indigenous people tell a story of the creator, Raven, who left a reminder of the time the world was covered with ice. Raven asked black bears to turn every tenth offspring white and promised that these white bears would have unique powers. They would lead chosen people to special places where they would find fish that come from deep in the ocean.

How long will these fabled spirit bears survive? "Despite the risks of small population size and the destabilizing effects of immigration [of black bears, without the recessive mutation, making their way to the islands], the long persistence of the white bears is a good sign for the future," says

Reimchen. Less hopeful is the number of salmon swimming in from the sea to spawn in western North American rivers—a drop of 90 percent over the last century. Logging that jams salmon spawning streams with debris is a major culprit. A warming ocean is also affecting such fish as salmon that have adapted to cold waters. Many cold-water species have begun shifting their ranges northward to regions with lower water temperatures. Other threats to wild Pacific salmon include dams that block access to upper river reaches, unregulated overharvesting, illegal harvesting (poaching), and habitat destruction by development and mining activities.

With salmon harder to find in mainland streams, grizzly bears have begun to make their way to Princess Royal Island and other places in the GBR where salmon runs are still relatively healthy. Grizzlies can easily out-compete spirit and black bears for piscine prey. “That’s already happening,” says Brian Collen, general manager of Knight Inlet Lodge. As the salmon swim, Knight Inlet is 205 miles south of Princess Royal Island. The inlet is a fjord, bordered by narrow, steep cliffs created by the passage of a massive glacier. It is one of the longest fjords on the British Columbia coast—it cuts inland some seventy-eight miles from the sea—and is fed by the Klinaklini River. The river ferries nutrient-rich meltwater from the Klinaklini Glacier to the inlet.

Knight Inlet is known for its abundant grizzly bears, which feast on salmon in fall and on sedges that form a floating carpet of green in spring and summer. No spirit bears dwell there, but “salmon tussles” between the inlet’s grizzly and black bears may foreshadow life for spirit bears on islands to the north. “The number of Knight Inlet bears throughout 2017 was in line with what we’ve seen in past years,” says Collen. “But low counts of pink salmon, brought challenges for the bears, especially for females with cubs. Pink salmon returns along the entire Pacific Coast are down, and the cause has yet to be determined.”

With fewer pink salmon, and more grizzlies outward bound from the interior, run-ins over salmon between black bears and grizzlies are bound to result. Chum salmon, *Oncorhynchus keta*, numbers in Knight Inlet, however, have been strong, says Collen, offering the fjord’s bears alternative prey.

Should the pink salmon downward trend extend to such places as Princess Royal and Gribbell Islands, “it may limit spirit bears’ long-term prospects,” says Darimont, especially

if the bears have to fend off grizzlies for the same few prize salmon. Despite these challenges, Darimont hopes spirit bears will grace the Great Bear Rainforest coast long into the future. He recalls the first spirit bear he ever encountered. “It was a female eating red elderberries. It had just stopped



A successful catch. In times of plenty, spirit bears only eat the eggs of female salmon. The bears have to put on as much weight as possible for the winter, and they can only eat so much food each day. Salmon eggs are the highest-fat food available.

raining. Everything, including the bear, was wet.” The scientist was about 100 feet away, aboard a research vessel motoring along the coast of Princess Royal Island. “It was almost dusk and not many birds were singing by then. We could hear every snap of a branch when the bear let go of the berry bush.” The spirit bear is an ambassador for the Pacific Northwest coast, Darimont believes. “Maybe she knew that,” he says. “She was a reminder to us all that her home should be treated with care if we want to stay in these bears’ stunning presence.”

Award-winning science journalist and ecologist **Cheryl Lyn Dybas**, a Fellow of the International League of Conservation Writers, has brought a passion for wildlife and conservation to *Natural History*, *National Geographic*, *National Wildlife*, *BBC Wildlife*, *Yankee*, *Scientific American*, and many other publications, and is a Field Editor at *Ocean Geographic*. Eye-to-eye with the wild is her favorite place to be.