**Spirit Bear**

**In a moss-draped rain forest in British Columbia, towering red cedars live a thousand years, and black bears are born with white fur.**

By Bruce Barcott

Photograph by Paul Nicklen

**On a drizzly autumn morning on the coast of British Columbia,** a shadowy figure lumbers down to shore. A black bear has come to eat. It's spawning season. Egg-heavy fish glut the streams of Gribbell Island, a small piece of Canada's Great Bear Rainforest, one of the largest coastal temperate rain forests in the world. The bear pauses on a patch of rockweed algae to sniff the air. The rain and mist can't mask the funky rot. Pink and chum salmon carcasses lie tangled in linguine strands of tidal sedge. The bear moves like a silhouette across the landscape, its black fur blending in with the dark rocks and dusky woods.

 Marven Robinson spots the bear but turns away, uninterested. "We might have better luck upstream," he says. Robinson, 43, stocky and swathed in rain gear, is a wildlife guide and member of the Gitga'at First Nation, whose traditional territory includes Gribbell Island. This bear isn't what he's looking for. He's after a more revered and rare creature: what the Gitga'at call *mooksgm'ol,* the spirit bear, a walking contradiction—a white black bear.

Neither albino nor polar bear, the spirit bear (also known as the Kermode bear) is a white variant of the North American black bear, and it's found almost exclusively here in the Great Bear Rainforest. At 25,000 square miles—one and a half times as big as Switzerland—the region runs 250 miles down Canada's western coast and encompasses a vast network of mist-shrouded fjords, densely forested islands, and glacier-capped mountains. Grizzlies, black bears, wolves, wolverines, humpback whales, and orcas thrive along a coast that has been home to First Nations like the Gitga'at for hundreds of generations. It's a spooky, wild, mysterious place: There are wolves here that fish. Deer that swim. Western red cedar trees that have stood a thousand years or more. And a black bear that is white.

As his boots slosh up a soggy trail fringed with ferns and devil's club, Robinson scans for movement. No bears. He spots a tuft of white fur snagged on an alder branch. "They're around here, for sure," he says. He points to the chewed bark. "They like to stand and bite the tree just to say to other bears, I'm here using this river."

An hour passes. Robinson waits patiently on top of a moss-patched boulder. Then he sees a rustling in the bush. "There he is," he says.

A white bear steps out of the tree cover onto a streamside rock. Set against the dark palette of the rain forest, the bear's fur appears shabbily radiant. Not pure white, exactly. More like a vanilla-colored carpet in need of a steam cleaning. The bear swings its head from side to side, peering into an eddy for salmon. Before it can lunge for one, a black bear suddenly comes out of the forest and runs the white bear off its perch—though "runs" might be a bit strong. Everything the bears do seems to unfold in slow motion, as if they're trying to conserve every last calorie for the coming winter. The white bear lumbers into a thicket and disappears.

Robinson watches. He's spent 15 years among the spirit bears. Still, he's transfixed. "This particular white bear is very submissive," he says. "Sometimes that gets to me. I'm protective. I once saw an old white bear attacked by a younger black bear. I was about to jump in and pepper spray the black one. The instinct was strong in me. But then the white one reared up and threw him off." Robinson smiles, as if to admit the absurdity of a man jumping into a bear fight. But in his eyes there's a hint that he might have done it.

**Robinson isn't alone.** That same protective instinct runs strong throughout the Great Bear Rainforest. It's one of the factors that have kept the spirit bear alive." Our people never hunted the white bear," says Helen Clifton, sitting in her kitchen in Hartley Bay, a small fishing village marked by tendrils of wood smoke and the echoing calls of ravens. Strong in voice and spirit, the 86-year-old Clifton is a clan matriarch of the Gitga'at, one of 14 bands that make up the Tsimshian people of British Columbia's northwest coast. Bear meat was rarely a main food, she says. But First Nations hunters went after black bear in greater numbers when European merchants established the British Columbian fur trade in the late 18th century. Even in those days, though, taking a white bear was taboo, a tradition that has continued through many generations. "We never even spoke of the spirit bear at the dinner table," Clifton says.

That tight-lipped custom might have been an early form of environmental protection. By not speaking of the bear, much less hunting it, the Gitga'at and neighboring bands never let word of the creature reach the ears of fur traders. Even today the Gitga'at and Kitasoo/Xai'xais people keep a watchful eye on their bears during hunting season. "It's not a good idea to come after black bear in our territory," says Robinson. "You never know. Our bears might shoot back."

 That attitude makes a difference. For decades the presence of poachers and trophy hunters—as well as mills and a cannery—made grizzlies in the Great Bear scarce and skittish. The industries are now gone, as is the grizzly hunt in parts of the rain forest. The bears are responding. "In my early years it was really something to see a grizzly bear," Doug Stewart tells me. As a fisheries patrolman, Stewart has been monitoring fish runs in the Great Bear for over 35 years. "Now you see them all the time. I may come across five grizzlies in a morning."

They're doing so well, in fact, that some wonder if the grizzly's return isn't pushing black bears, and some white ones, off the best fishing stations on the rivers. "Where you see a griz, you won't see a black bear—or a white one," says Doug Neasloss, a Kitasoo/Xai'xais wildlife guide. "The black bears give griz plenty of room."

That leads to an intriguing possibility: Perhaps the griz had a hand in concentrating the Kermode gene on Princess Royal and Gribbell Islands. "Grizzlies and black bears coexist everywhere except these smaller islands," says Thomas Reimchen, a biologist at the University of Victoria. "There's not enough habitat for grizzlies on those smaller islands. They need big grassy estuaries, subalpine habitat, and an enormous home range, which those islands don't offer."

The islands do offer something else: the eyes of humans watching over them. "I tell the younger people," says Helen Clifton, "when you see a spirit bear, don't get on the VHF and broadcast it. If you want to tell someone, say you saw mooksgm'ol. They'll know what you mean. And it'll keep the bears safe."

 **Scientists know** how black bears are born white. They're just not sure why. The phenomenon, known as Kermodism, is triggered by a recessive mutation at the *MC1R* gene, the same gene associated with red hair and fair skin in humans. To be born white, a bear must inherit the mutation from both parents. The parents themselves don't have to be white. They just need to carry the recessive mutation. So it's not uncommon for white bears to be born to black parents.

White fur occurs in only one of every 40 to 100 black bears on the British Columbia mainland coast, but the trait is especially pronounced on certain islands in the Great Bear Rainforest. On Princess Royal Island, one in ten black bears is white. On Gribbell Island, directly north of Princess Royal, it's one in three. Biologist Wayne McCrory of the Valhalla Wilderness Society calls Gribbell "the mother island of the white bears."

It's unclear how the trait arose. One theory was the "glacial bear" hypothesis that Kermodism represented a remnant adaptation from the last great ice age, which ended here 11,000 years ago. At that time most of modern-day British Columbia was still icebound, and a white coat may have offered camouflage. But the glacial bear theory raised a question: Why didn't the white fur trait die out when the glaciers receded?

To learn more, Doug Neasloss and I go looking for bears on Princess Royal Island. "Hey, bear," Neasloss says, as he hops out of a boat near the mouth of a small river. It's like he's hailing a friend named Bear, though there are no animals in sight. "You don't want to startle them," says the 28-year-old guide, who works the traditional territory of the Kitasoo/Xai'xais. A can of grizzly-strength pepper spray rests in a holster on his hip. Crunching across barnacle-encrusted boulders, Neasloss parts the curtain of the rain forest. Under the canopy everything turns soft and muted. Lichen drips from hemlock, cedar, and yew branches. His rubber boots leave no print on the spongy ground, which is so green it appears as if the sky has let loose a snowfall of moss.

Neasloss claims a spot under a hemlock tree and pulls his hood tight against the ceaseless rain. He saw a white bear near here recently, he says, though there's no guarantee it'll reappear. At a little past three, he points across the river. A white bear waddles down the riverbank. This bear's bigger and more confident than the Gribbell Island bear. Fat rolls down its belly. It appears to be wearing a coat two sizes too large. It perches over a small pool, then lunges with both paws and comes up with a plump three-foot chum salmon.

Researchers have recently proved that the spirit bear's white coat gives it an advantage when fishing. Although white and black bears tend to have the same success rate after dark—when bears do a lot of their fishing—scientists Reimchen and Dan Klinka from the University of Victoria noticed a difference during the daytime. White bears catch salmon in one-third of their attempts. Black individuals are successful only one-quarter of the time. "The salmon are less concerned about a white object as seen from below the surface," Reimchen speculates. That may answer part of the question about why the white-fur trait continues to flourish today. If salmon are a coastal bear's primary fat and protein source, a successful female can feast on salmon to store more fat for winter, potentially increasing the number of cubs she can produce.

As the rain continues to fall on Princess Royal Island, Neasloss and I watch the spirit bear feed on a bounty of salmon. When the pickings are this good, bears can turn finicky. Some eat only the fish head. Others may slit the belly and suck out the eggs. Some are gluttons. "I once saw a spirit bear eat 80 salmon at one sitting," Neasloss says. This bear prefers to dine privately. It turns with the salmon in its teeth and runs straight uphill to some unseen hideaway. Twenty minutes later the bear returns, nabs another fish, and takes it into the forest. This goes on for hours, until daylight fades from the sky.

 **Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Questions for Spirit Bear Article**

**Comprehension Questions:**

1. Marven Robinson, a wildlife guide, is a member of Gitga'at a First Nation people group in British Colombia (a povidence of Canada). Why might the Gitga’at refer to themselves as part of the “First Nation” instead of a “tribe”?

2. Why did the Gitga’at not speak of the Spirit Bear- even at their dinner tables?

3. Large Grizzly bears do not live on Princess Royal and Gribbell Islands. Why is that?

4. What gene causes the bears to have this unique color?

 -What does this gene do for humans?

5. The gene is thought to have mutated a long time ago what would conditions have been like 11,000 years ago in Canada?

 -Why would this have helped the bear?

**Extension Questions:**

6. Choose a letter to represent a normal MCR1 Gene \_\_\_\_\_\_\_ Choose a letter to represent a mutated MCR1 Gene\_\_\_\_\_\_

7. If a bear is heterozygous for these traits what color will its skin be? \_\_\_\_\_\_\_\_\_\_\_\_\_

8. If a bear is homozygous for a mutated MCR1 gene what will its skin color be?\_\_\_\_\_\_\_\_\_\_\_\_

9. Pretend there is a black bear with black fur. Would you be able to tell if it had one mutated MCR1 Gene?\_\_\_\_\_\_

10. What would happen if a black bear that was heterozygous for the Kermode trait and a white bear mated? Show a punnett square for your explanation of the offspring’s genotypic and phenotypic ratio.

11. What would happen if a black bear that was homozygous for the black haired trait mated with a white bear? Show a punnett square for your explanation of the offspring’s genotypic and phenotypic ratio.