

IN ONE OF NATURE'S MOST ELEGANT PAS DE DEUX, **SALMON AND BEAR** ENGAGE IN A DELICATE DANCE FOR SURVIVAL. THE BEAR IS LOSING...

# Saving our Bears

**RESOLUTE, AND WITH ONLY OUR DESTINATION**

in mind, none of us could anticipate our upcoming meeting on the hillside. On this crisp day in early May, a mother grizzly and her cub were slip-sliding their way down a winter's worth of snow. After popping out of their snowy den this morning, filling her belly with emerging vegetation was the only thing on mom's mind. Calories from her last feast—autumn's spawning salmon—were now long spent on keeping her and her daughter alive. Meanwhile, my team and I, just a few hundred metres below, were inching our way up the slope. Although collecting hair from grizzly bears was, in fact, why we were marching up the hill in the first place, such an impromptu face-to-muzzle encounter was not exactly the opportunity we were seeking.

Fortunately, our uphill battle was slow going, allowing us time to vigilantly scan

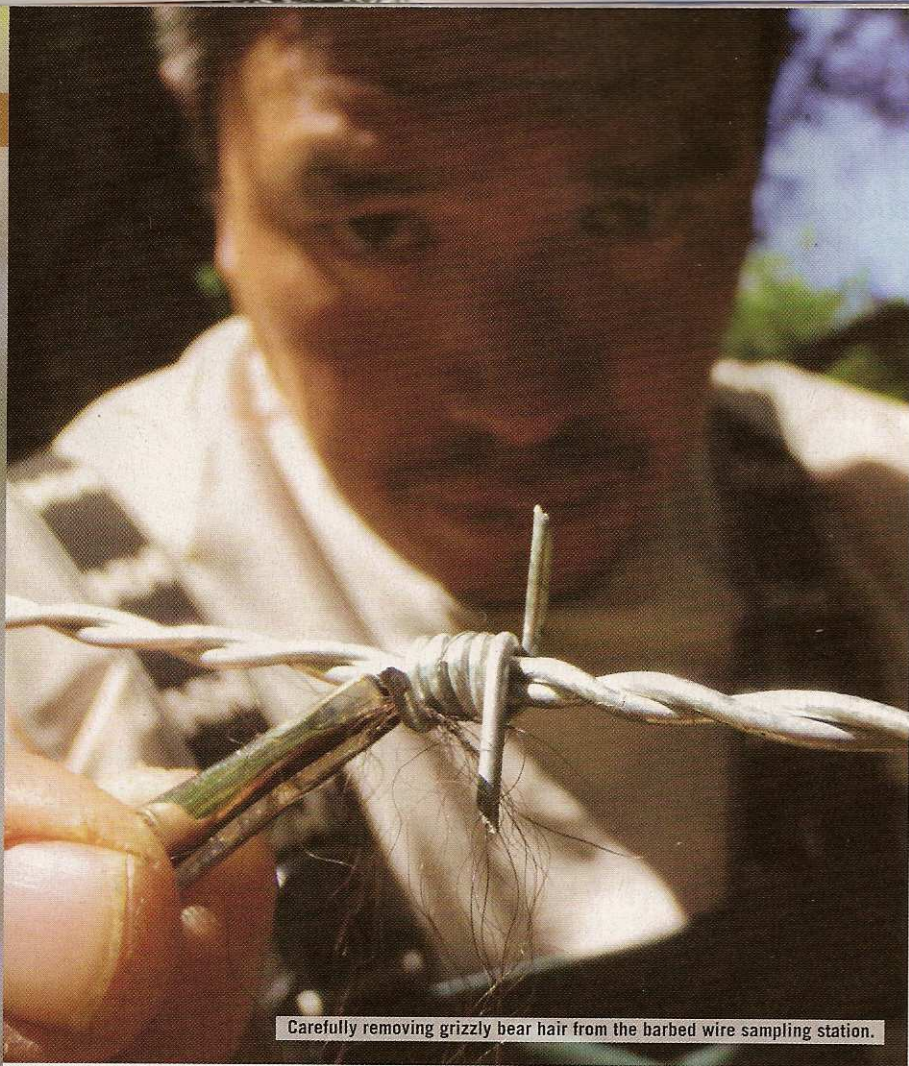
the slope above. Still early in the morning, the wind was rushing down the mountain and concealing our human smells, noisy grunts and occasional curses from the bears. The cursing was due to our constant slipping and falling among the dense vegetation. The earliest of spring plants were busting their way out of the ground. Cow parsnip, devil's club and other delicious bear food was grasping upward for every photon the sun had to offer. Entangled with the still-bare bones of the perennials that were yet to leaf out, this vege-matrix made us work for every foot of elevation.

Fighting our way up mountains and bumping into bruins form only part of our teams' great adventure. With grizzlies as our guides, we are exploring the extreme western edge of North America. The land meets the sea on the central coast of British Columbia in an area we dubbed,

and is now internationally known as, the Great Bear Rainforest. Although myriad threats loom, this area has largely been spared by modern industry. Wildlife trails outnumber roads by about a billion. Trees with silo-sized girth, festooned with lichen, moss and other accoutrements pepper the lush watershed floors. In the fall, many rivers are still choked by spawning salmon. And importantly, and owing to this primordial condition, this ancient temperate rainforest still safeguards one of the planet's last grizzly bear-salmon strongholds.

To keep it this way, we have assembled a passionate team comprised of conservationists, scholars and local Heiltsuk First Nations people. I serve as director of science for the Raincoast Conservation Foundation, which spearheaded the study. It fits our mandate, which is to tackle the area's most urgent conservation problems

PHOTO: LARRY TRAVIS



Carefully removing grizzly bear hair from the barbed wire sampling station.

***DNA extracted from the hair identifies the species, sex and identification of each individual bear. It's one of a whole battery of ecological sleuthing tools that would make CSI stars envious***

with good science and something we term 'informed advocacy.' To accomplish this, we partner with scientists from academic institutions—in this case, the University of California (Santa Cruz), where I am a postdoctoral researcher. What complements our applied conservation biology is local knowledge. We need team members that come from communities that have lived with bears and salmon in these ancient forests for millennia. Increasingly, too, these local people are becoming legal stewards of the area's resources.

By the numbers, our recipe for adventure is quite unique. We're seeking only a few milligrams of hair from each of only a few

dozen 100- to 500-kilogram grizzly bears that roam our 2,500-square-kilometre study area. Working from dawn to dusk, we set up and monitor close to 100 hair-snagging stations. Over six weeks, we will set up and take down 2,300 metres of barbed wire fencing, pound more than 600 fencing staples, pour about 1,100 litres of smelly bait and collect more than 500 hair samples.

Why on earth are we going through all this trouble for a little hair? We're searching for solutions to one of the most critical questions facing coastal B.C. today: how to guarantee grizzlies enough salmon to ensure their survival. Why is this a

challenge? Another predator—humans—usurp as much as 80 percent of the salmon destined for spawning gravels. Setting nets and hooks at river mouths, commercial and sport fisheries remove most of this seasonal bounty, year after year. Add an ocean in biological distress and dams that block the passage of salmon en route to spawning areas and it's not looking good for salmon or bears.

The problem is that coastal bears evolved with, and depend upon, salmon. Up to 90 percent of their yearly protein is derived from this oceanic subsidy. The size of a bear's litter and the survival rate of both mom and cubs depends on the amount of salmon consumed.

In return, the bears serve as gardeners of coastal forests. They leave behind salmon remains and the fishy nutrients fertilize the forests, which, in a most elegant measure of reciprocity, eventually fuel the food web in the streams on which juvenile salmon depend. Against a backdrop of ever-declining salmon numbers, however, not sharing the wealth of salmon with bears has consequences for bears, forests, and ultimately, salmon.

Our team is rapidly assessing those consequences. Hair grown over last year's salmon runs retains a lot of information about the bears, and we need to get it before it falls out during the summer moult. Once we collect these little 'windows' into ursine lives, we use a whole battery of ecological sleuthing tools that would make *CSI* TV stars envious. DNA extracted from the hair identifies the species, sex and identification of each individual bear. This allows us to track bear numbers over time and sound early-warning bells if we detect declines. Isotope analyses (a chemical tool that recognizes molecules that come from the ocean) on the same hairs estimate how much salmon each bear has consumed, which is critical in linking food use to population health. And finally, our hormonal assays, also conducted on hair, give us insight into stress levels, reproductive activity and starvation for a complete assessment of bear health in these lean times of limited salmon.

For such a wealth of information, you might think we'd consider wrestling

## We're *searching for solutions* to one of the *most critical questions* facing coastal B.C. today: *how to guarantee grizzlies enough salmon to ensure their survival*

blood—to attract bears to our strategically placed, barbed-wire, hair-snagging stations. Lured by these luscious fragrances, bears' remarkable olfactory senses draw them to our stations from several kilometres away. These stations are non-reward by design; visiting bears often stay only a few seconds, but they leave behind a precious look into their lives. Importantly, this time-tested method has very little impact on the bears we study, especially compared with alternatives that involve capture and handling.

I spend a lot of time thinking about these samples and the bears that donated them. For me, safeguarding this population from salmon declines matters more than anything else.

So, what are the solutions for safeguarding their future? Our modelling work, which complements our outside

adventures, is already providing some answers. We now know that only moderate reductions in fishing levels, for example, can pay unexpectedly large dividends to coastal bears. Accordingly, we are lobbying Canada's Fisheries and Oceans department to implement fishing plans with lower harvest rates. Plus, we are proposing that some salmon runs be managed solely for bears—for their benefit and for the benefit of entire coastal forests. These would be runs that spawn in newly created parks and conservancies.

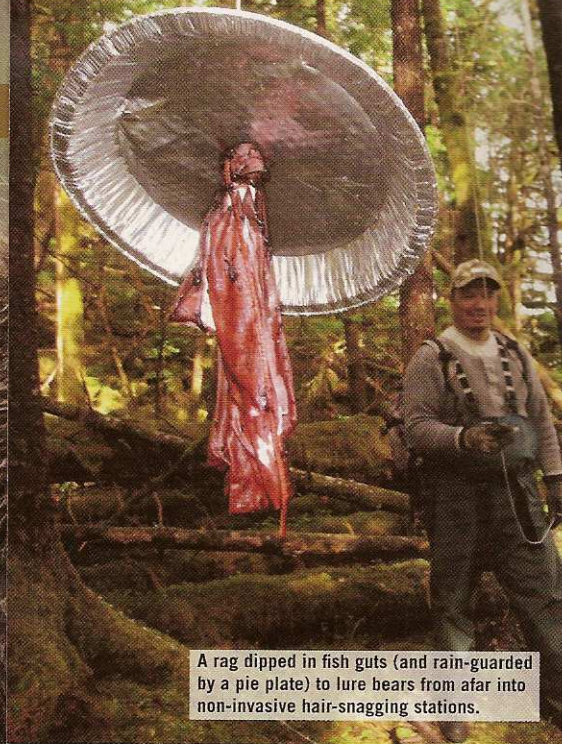
As we near the top of our intended climb that morning, we look forward to ending our own suffering. After a good stretch and a bite to eat we'll install a hair-snagging station. We think it's an ideal place: a bowl between two avalanche shoots that's situated in good travel terrain that links the valley bottom to the high country. We could envision a bear or two lumbering down to meet us. Munching away on a granola bar, I see that our vision is bang on. About 50 metres above us, mother bear is putting on the brakes and raising her nose for a sniff. She's well aware of us. The cub, blissfully ignorant, skids into her rear end, almost knocking her down the steep grade upon us. Fortunately, her powerful shoulders and robust claws prevent what would surely be the mishap of the season. Instead, they sit and watch us going about our work. 🐾

Explorers Club member **Chris Darimont** is an NSERC postdoctoral fellow at the University of California (Santa Cruz) and director of science at Raincoast Conservation Foundation in Bella Bella, B.C. He studies animals as varied as rodents, birds of prey and lions from the Canadian Rockies to East Africa.

He is happiest, however, working on and for the carnivores of British Columbia's Great Bear Rainforest. For more information on the Explorers Club, visit its website, [explorersclub.ca](http://explorersclub.ca)



PHOTO: CHRIS DARIMONT, RAINCOAST.ORG



A rag dipped in fish guts (and rain-guarded by a pie plate) to lure bears from afar into non-invasive hair-snagging stations.

mother bear for a few tufts. Thankfully, it's a whole lot easier, safer and less invasive to scour the forest for shed hair. It is, however, stinking hard work. That's because we use a blend of fine aromas—rotting fish essence and eau de cow's

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