

Keeping Count in the Pacific

In one of the world's richest aquatic ecosystems, researcher Rob Williams is putting a number on British Columbia's marine mammals

Story by Andrew Westoll
Photos by Rob Williams



CLOCKWISE FROM TOP LEFT: Field assistants Sonja and Chad keep watch in the Hecate Strait; a spyhopping Killer Whale; a colony of lounging Steller's Sea Lions; the endangered Black-footed Albatross. OPPOSITE PAGE: A bow-riding Pacific White-sided Dolphin comes up for air.

I WAKE AT 6 A.M. to the disembodied voice of Dr. Rob Williams, Canadian marine mammal scientist, project leader and Explorers Club fellow.

"Sighting 202! Humpies!"

I quickly take inventory—headache gone, stomach still knotted—and roll off the galley table that doubles as my bed. I drag my nauseated body up through the wheelhouse and onto the deck as Achiever's engine growls. Outside, the early sky is overcast. Mountains of open ocean stretch to the horizon and the boat rocks mercilessly back and forth. Today we are crossing the Hecate Strait off B.C.'s central coast, an 11-hour journey across the fourth roughest body of water on earth.

I find the crew in the observation tower, a makeshift steel platform perched high atop the wheelhouse. Rob is here with two field assistants, Sonja and Olive, and all three are struggling to remain upright as the sea pitches beneath the boat. Over sleek rain-gear and all-weather fleece, each team member wears a chest harness of the sort usually reserved for rock climbers. The harnesses are looped through carabiners attached to the handrails, a necessary precaution in rough waters like these. Achiever rolls like a tin can in the drink and the wind is biting. This is a calm day for the Hecate.

"Morning, Mr. Writer," yells Rob, without dropping his binoculars. "While you were snoozing, we were watching five humpback whales lunge-feeding 500 metres off the bow." Rob smiles but keeps his eyes on the horizon. "How was your first night?"

Before I can respond, Olive drops her binoculars to her chest, points down at the water and screams.

"Shitballs!" she yells in classic Australian. "Minke whale! Ten metres off the starboard side!"

Far below, just a stone's throw from the deck, a black, sickle-shaped dorsal fin slowly sinks into the sea. Olive spins the needle on the giant protractor mounted in front of her and points it at the animal. Rob radios the sighting below decks.

"Sighting 203! Minke whale outside your window!"

Sonja and Rob return their gaze to the horizon while Olive records the angle and distance of the minke into the log-book. A strange sort of energy—the field scientist's equivalent to a jolt of caffeine—courses through the crew. The day has begun. The whales are slowly revealing themselves. This historic survey of marine mammals in British Columbian waters—of crucial importance and the first of its kind—is well under way.

With its reputation as the birthplace of the modern environmental movement, British Columbia seems to be a conservationist's paradise. We imagine a place where the study of ecology flourishes, a land illuminated by biological exploration and discovery. And while partly true, there are still considerable gaps in what British Columbians actually know about their province. Perhaps the most significant of these science gaps involves the waters off B.C.'s coast.

The Pacific coast off B.C. is home to one of the most productive and diverse marine ecosystems on the planet. At least 29 species of cetacean—whales, dolphins and porpoises—can be found throughout the labyrinth of islands and inlets here, from families of orcas to massive humpbacks to lumbering Stellar sea lions. As top predators, these animals play crucial roles in the healthy maintenance of coastal habitats, cycling nutrients up and down the ecosystem. They also play starring roles in the province's lucrative ecotourism business. It is striking, therefore, that no one knows how many of these lynchpin species actually live here or where they can be found.

Rob Williams has organized his professional and personal life around finding answers to these questions. A B.C. native,

he began his career researching the province's iconic killer whale populations. Since then he has studied baleen whales in the Antarctic, river dolphins in the Amazon and sea lions in the Aleutian Islands. But now he has returned home. For most of the year, he lives and works from a modest cabin on a tiny island in Johnstone Strait, off the east coast of Vancouver Island.

"Top predators like cetaceans are incredibly responsive to the health of the marine ecosystems that support them," explains Williams, as we devour vegetarian fajitas in the galley after a long day in the tower. "They act as sentinels, giving us a wonderful snapshot of the overall well-being of their habitat. But how can we begin to manage them without knowing how many there are or where they live?"

The answer, of course, is that informed decisions about cetacean conservation are impossible without this data. So three years ago, Williams partnered with the Raincoast Conservation Society to design and conduct the first systematic survey of B.C.'s cetacean species. The goal of the project is to provide the first reliable estimates of marine mammal abundance and distribution in B.C.'s oceans. Achiever is Raincoast's research vessel, a 22-metre steel-hulled sailboat that has become a respected symbol of grassroots, civilian-led marine science up and down Canada's Pacific coast.

Because it is impossible to count

every whale, dolphin and porpoise in B.C., Achiever follows a map of randomly selected routes, or line transects, through the water. When travelling these lines, the ship's captain maintains a constant speed of approximately 13 km/hr, a bit faster than a brisk walk. Meanwhile, high above the wheelhouse, observers in the tower record every marine mammal they see.

The key to these routes is their randomness. If Williams' estimates are going to be scientifically valid, the transects must be chosen in a way that gives every point in B.C.'s waters an equal likelihood of being sampled. For a simple coastline, this would be relatively easy. But the island archipelagos and complex fjord systems off the coast of B.C. make this exceedingly tricky.

To solve this problem, Williams teamed up with a statistician from the renowned Sea Mammal Research Unit at the University of St. Andrew's, his alma mater. With the help of a geographer, the team developed new computer software that designs statistically reliable line transect surveys for complex coastlines such as these. Their invention has the potential to contribute to marine science in other parts of the world.

"This survey is a wonderful mix between what's theoretically desirable and realistically possible," says Williams. "Our methods will be applicable to other complex coastlines such as Chile's, where reliable

abundance and distribution estimates of marine mammals have, until now, been impossible."

When I express my amazement that this work hasn't been done in B.C. yet, Williams gives a wry smile.

"Until now, questions of abundance have been the last questions scientists have asked. It's not a very intellectual question, or a sexy one. But it's one of the most fundamental and practical in terms of sustainable management."

Recently, the topic of sustainable management of B.C.'s waters has been blown wide open and Williams' research has become extremely timely. For more than 30 years, the federal government has maintained a moratorium on oil and gas exploration here. Since 1972, B.C.'s intricate coastline has been insulated from both the economic windfalls and ecological catastrophes often associated with the energy sector. In the late 1980s, Ottawa briefly considered lifting the moratorium, but abandoned the idea in March 1989 when the Exxon Valdez oil tanker famously ran aground in Prince William Sound, spilling 11 million gallons of oil into the Pacific.

But today, the B.C. government is once again lobbying to have the moratorium lifted. It wants big oil companies to begin extracting crude oil and natural gas from the depths of Queen Charlotte Sound and the Hecate Strait by 2010, just in time

This is not a pleasure cruise. This is scientific exploration in the purest form—observing with your eyes and recording what you see.



Pacific White-sided Dolphins at play

to light the flame at the Winter Olympics in Whistler with homegrown energy. Preliminary investigations of the seafloor in the form of seismic surveys may begin soon, perhaps early next year.

It is these impending preliminary investigations that compelled Williams and

Raincoast to begin this project. Concern about the seismic surveys has also inspired an international crew of cetacean experts to travel to B.C. every summer for the past three years—often paying their own way—to serve as Williams' skilled assistants.

"The problem," says Williams, "is the

oil industry does not just look for oil. They scream for it."

To map resource deposits beneath the seafloor, oil exploration teams fire air guns down into the water and study the echoes that bounce back from the bottom. The power of these seismic blasts is difficult to capture in words; the RCS uses the term "detonate" in its report, as if the guns have the impact of a sonic bomb.

Increasingly, scientists around the globe are finding whales stranded, hemorrhaging from the eyes and sinuses after being exposed to extreme sound sources. Four years ago, seismic surveys were implicated in the deaths of two Cuvier's beaked whales in the Gulf of California. Recently, several whales and dolphins off the coast of England died from gas-bubble lesions caused by seismic work.

"Explosions of high-amplitude sound can kill cetaceans," says Williams matter-of-factly. And although he would prefer seismic tests were never performed in B.C., Williams lets his more pragmatic side guide his research. "We need baseline



ABOVE: A hauled-out Stellar's Sea Lion catches an afternoon nap.

information about these animals so seismic testing—if it happens—is conducted at the least-bad time and place."

Even if animals are not injured by the air-gun blasts, recent research shows their behaviour and migratory patterns can be dramatically altered. As Williams puts it, "Sound is as important to these species as vision is to human beings."

To illustrate this, he introduces me to Annelis, the resident acoustics expert. While we toil atop the tower all day, Annelis sits in the galley, a pair of studio headphones slung over her ears. Her job is to monitor the two hydrophones, or underwater microphones, that are dragging 100 metres behind Achiever's stern. When the hydrophones register the distinct voice of a submerged marine mammal, software on Annelis' computer immediately begins recording and identifies which species she is listening to.

Annelis cues a recording she made yesterday and gives me the headset. Immediately, I am underwater and swimming with a school of Pacific white-sided dolphins. Their vocalizations sound like birds in trees or the chatter of monkeys, and the strength of their echolocation clicks is shocking—I jump as one of the dolphins buzzes the hydrophones from close range.

Williams laughs as I remove the headphones. "Many cetaceans that are most vulnerable to seismic surveys, like sperm whales and beaked whales, can dive for more than an hour at a time. We're not likely to see these animals from the tower. But with hydrophones in the water we can detect some of them. This brings our data even closer to reality."

Williams and his crew spend two months each summer exploring every nook and cranny of Canada's Pacific coast.

Though it sounds idyllic—and believe me, B.C.'s fog-shrouded inlets, craggy islands and vast stretches of ocean are breathtaking to behold—this is not a pleasure cruise. Work aboard Achiever begins at 5 in the morning and often ends close to midnight.

In the two weeks I'm on board we make hundreds of sightings. We motor past humpback, minke and fin whales. We pass rocks teeming with hauled-out sea lions, enjoy the company of playful schools of bow-riding dolphins

and catch fleeting glimpses of the elusive Dall's porpoise. We make four marathon crossings of the Hecate Strait in four marathon days.

This is scientific exploration in its purest form—observing with your eyes and recording what you see—but you need a good pair of sea legs to do it. Sadly, mine are slow to develop. To combat my

constant seasickness, I often retreat to the galley to read a book—*Life of Pi*, by Yann Martel—as the boat rocks back and forth. It's the story of a boy who spends months at sea in a tiny lifeboat filled with a menagerie of zoo animals.

On my last day with Williams and the crew, I read the following passage. It makes me think Yann Martel would have been welcome aboard Achiever.

"If you want to see wildlife," he writes, "it is on foot, and quietly, that you must explore a forest. It is the same with the sea. You must stroll through the Pacific at a walking pace, so to speak, to see the wealth and abundance that it holds." 🌍

Andrew Westoll lives and writes in Toronto, where he is currently working on a memoir of his travels in Suriname, South America.

Rob Williams is a fellow of the Canadian chapter of the Explorers Club. For more information on the Explorers Club visit www.explorersclub.ca.



EXPLORE! The world with your family!

Call us now for your free brochure featuring 67 exciting family trips worldwide!

<p>Egyptian Adventure 10 days from \$1360 CAD <small>Land only.</small></p>	<p>Costa Rica Rainforest Adventure 15 days from \$2150 CAD <small>Local payment 240USD. Land only.</small></p>	<p>Namibia Cheetah Safari 13 days from \$2640 CAD <small>Local payment 200GBP. Land only.</small></p>
--	---	--

Just a sample of the amazing adventures we have to offer.

TORONTO 223 Carlton St • toronto@trekescapes.com • 416-922-7584

VANCOUVER 1847 W 4th Ave • vancouver@trekescapes.com • 604-734-1066

CALGARY 336 - 14th St NW • calgary@trekescapes.com • 403-283-6115

EDMONTON 8412 - 109 St • edmonton@trekescapes.com • 780-439-0024

CANADA-WIDE TOLL FREE 1-866-338-8735




Adventure Travel Centres

Meridian 22 & 28

www.ospreypacks.com

Deluxe wheeled convertible pack





THE GEAR OF THE YEAR 2006 Outside



OSPREY

Pack Your Passion. Go.