



*By* **Land**  
*and by*  
**Sea**

Gwaii Haanas is a world's first: a fully protected ecosystem that starts beneath the waves and climbs up mountains. Now you can see it like few have before

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**Situated in the southern part of the Haida Gwaii archipelago**, about 100 kilometres off the coast of British Columbia, Gwaii Haanas is a place where the water and the land have always been inseparable. Against the backdrop of the San Christoval Mountains, which form the islands' backbone, bears carry salmon deep into the forest, where the fish carcasses feed the trees. Marbled murrelets spend their lives at sea, but nest far inland on large branches high in the canopies of the old-growth forest. The ecological richness of the islands has sustained the Haida people for thousands of years, and they are deeply connected to the land and the water.

Today, the region has a new significance. From mountaintop to sea floor, Gwaii Haanas is the first fully protected, vertical ecosystem in the world — combining the Gwaii Haanas National Marine Conservation Area Reserve, established in 2010, and Gwaii Haanas National Park Reserve and Haida Heritage Site, which grew out of Haida protests against logging in the region almost 30 years ago.

Gwaii Haanas now protects water over a surface area of 3,500 square kilometres and, through the terrestrial park, a further 1,500 square kilometres of land, recognizing the interdependence between the land and sea ecosystems. “Before we had a traditional management regime of putting things into separate boxes without understanding the linkages between species, the forest and oceans,” says Jason Alsop, a member of both the Council of the Haida Nation and the Archipelago Management Board, which includes representatives from the federal government and the Haida Nation. “Now, it is opening the perspective in the way people look at management,” he says. “It recognizes the relationship between the land and the sea.”

To further develop Gwaii Haanas, the Archipelago Management Board is working on an integrated land and sea management plan to be completed by the end of 2015, which will include a marine-zoning component to regulate human activity in Gwaii Haanas and more thoroughly protect its ecosystem.

Regulation, however, is not the only issue in furthering the conservation of this pristine region. The threat of invasive species has also



**IN THE SYSTEM**

*Gwaii Haanas protects 1,500 square kilometres of land and 3,500 square kilometres of water, as measured by surface area. The conservation program breaks ground by recognizing the interdependence of marine and terrestrial ecosystems.*







*Gwaii Haanas breaks through the barriers of traditional management*



## The Rat Patrols

*Rats have invaded Gwaii Haanas. Here's how Ottawa and the Haida Nation are fighting back*

In 2013, Parks Canada completed an airdrop of rat poison on two islands in Gwaii Haanas in an effort to restore seabird colonies decimated by the invasive rodents. The two target sites, Murchison and Faraday islands, located within the Juan Perez Sound, were chosen to protect rat-free adjacent Ramsay Island, which is home to one of Canada's largest remaining colonies of ancient murrelets.

This rat eradication was the second phase of a five-year project called Night Birds Returning, launched in 2009 by Parks Canada and the Haida Nation. The name of the project refers to the behaviour of ancient murrelets, which come to shore under the cover of darkness to lay eggs in burrows on the forest floor. When the chicks emerge from the burrows at night, they tumble down through the forest to the shoreline, as their parents call to them from the sea.

The war on rats is not new on the islands. In the northern part of Haida Gwaii, Langara Island once had the largest known colony of ancient murrelets in the world. But the number of breeding pairs plummeted from 200,000 to 14,000 after a rat invasion in the 1940s. Rats were eradicated there in 1995. Since then, the bird colony has been showing signs of recovery.



### LAND. WATER. CULTURE.

*Long-standing efforts by the Haida Nation to preserve traditional lands lie behind the creation of protected areas at Gwaii Haanas. Today, the challenge is developing management regimes to ensure the unique ecosystems remain safe in the future.*

raised its head. Rats are a major concern. First documented in Haida Gwaii in the early 1900s, these non-native rodents have spread throughout the archipelago as a result of increased shipping and the movement of logging equipment around the islands. The result has been dramatic population declines in many bird species, particularly ground-nesting seabirds such as ancient murrelets, Cassin's auklets, fork-tailed storm-petrels and Leach's storm-petrels. "The birds have no evolutionary response. They don't know how to defend themselves," says Laurie Wein, who leads a rat-eradication project for the reserve. "Invasive species are the number-one threat to the ecological integrity of Gwaii Haanas."

Rats, which prey on eggs, chicks and even adult birds, also affect shorebird populations and can even change the composition of intertidal ecological communities. One study, for example, found that the number of successful black oystercatcher breeding pairs was, on average, 50 per cent lower on rat-invaded islands than on rat-free islands. As fewer oystercatchers eat invertebrates, such as limpets and chitons in the rocky intertidal zone, these invertebrates

become more abundant and, in turn, graze on marine algae, leading to a deterioration of food sources and habitat for other species. "It is an example of a cross-system... cascade triggered by the rats," says Anne Salomon, assistant professor at Simon Fraser University's School of Resource and Environmental Management.

Salomon is also witnessing how deer, another introduced terrestrial species, are not only affecting the forest environment but also feeding on intertidal algae, possibly contributing to further changes in the marine environment. "We see the effects of what happens when humans introduce an invasive terrestrial predator and how that changes the entire ecosystem," she says.

Restoring the ecological balance of these fragile, unique islands will be one of the challenges of the new integrated conservation approach to land and sea in Gwaii Haanas. "As we manage marine and terrestrial landscapes, we need to be thinking in a holistic approach," says Wein. And with a groundbreaking approach to conservation management, that's just what this ecologically important region will receive. 🌿