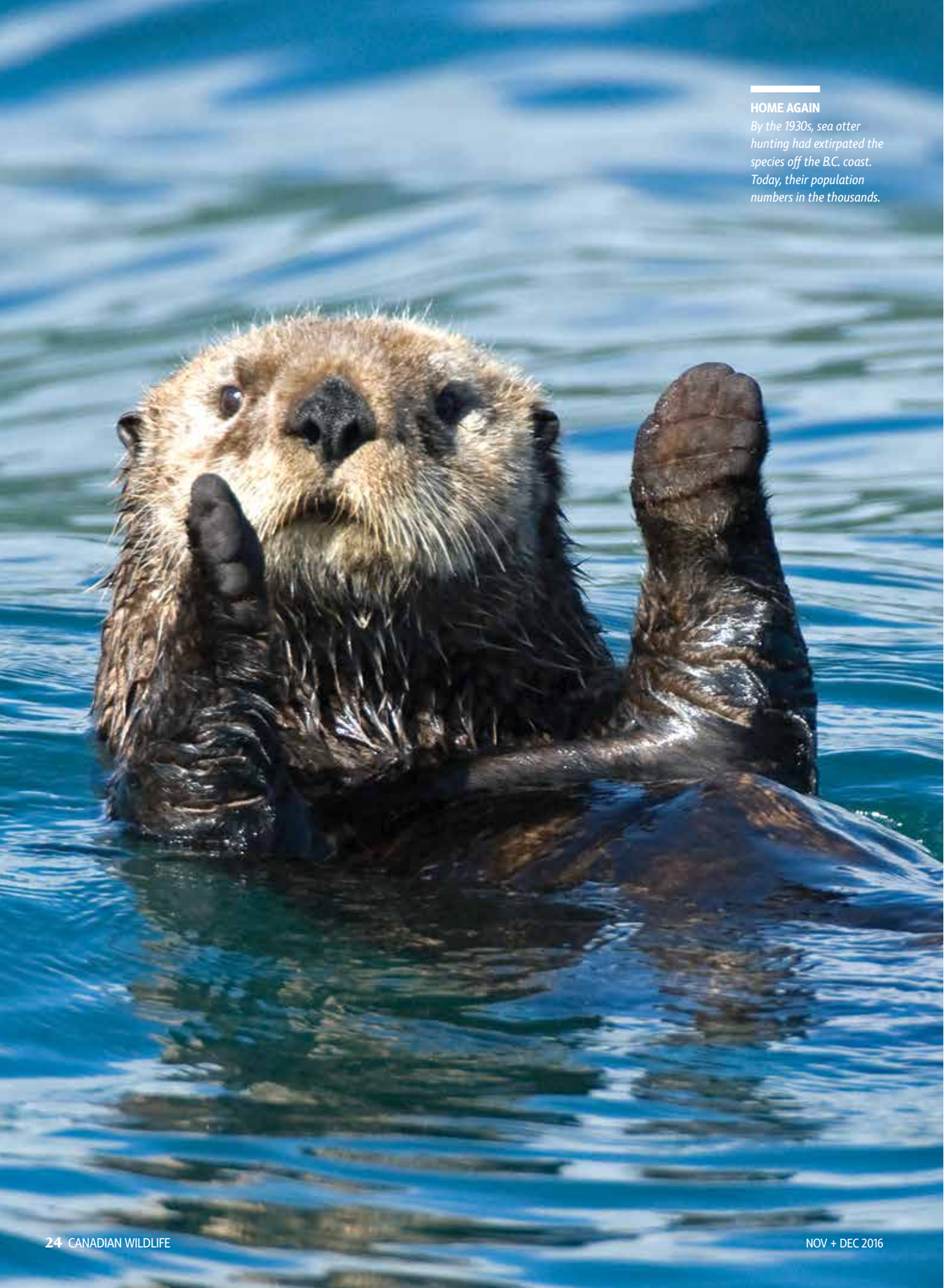


HOME AGAIN
By the 1930s, sea otter hunting had extirpated the species off the B.C. coast. Today, their population numbers in the thousands.

The Two Sides of Sea Otters

Sea otters have made a remarkable comeback off the coast of British Columbia. That's great news for the otters — and a big adjustment for many others

Story and photography by Isabelle Groc

It's a sunny morning in early July, and Linda Nichol is travelling on a small research boat along the coastline at Clayoquot Sound, Vancouver Island. As she travels, she meticulously scans the islets and reefs through a pair of binoculars. Her mission: to count all the sea otters she can find.

Only 20 minutes after leaving the Tofino harbour, Nichol, a marine mammal biologist with Fisheries and Oceans Canada, spots her first otter — a single male off Vargas Island. She makes a note of the time so she can later connect the location to the sighting.

Despite her years of experience taking the pulse of sea otter population trends, Nichol says these furry, charismatic marine mammals can be surprisingly hard to find. It's easy to mistake their small, shiny heads on the surface of the water for a piece of kelp or a harbour seal. Sometimes, they're impossible to see behind the waves as boats and animals rise and fall with the swell of the sea.

At least Nichol has a good idea of where to look. Once sea otters discover suitable habitat, they tend to stay and do not move much over their lifetime. "When heading out for a sea otter survey, I always look forward to checking in on them, like old friends," Nichol says. "Finding them in their old haunts, wondering how they have all fared over the winter."

Nichol now has many more friends to check in on. Since she began counting sea otters in the early 2000s, the population has doubled in British Columbia, a remarkable recovery for an animal that, in the 1930s, was hunted to local extinction by fur traders. The otters' comeback began in 1969 with the launch of a four-year program that saw 89 otters from Alaska introduced to the Checleset Bay, near the village of Kyuquot on the west coast of Vancouver Island. Since then, their numbers and range have expanded rapidly. During her last coast-wide survey, Nichol counted nearly 7,000 individuals along the west coast of Vancouver Island and the coast of B.C.'s central mainland.

As sea otter populations grow, however, they are also transforming the environment. Unlike other marine mammals, otters do not have blubber to keep them warm. Instead, they depend on their thick fur coat for insulation against the cold. Because of this unique design, sea otters must eat up to a quarter of their body mass daily to meet their energy requirements. Thus, when they first arrive at an area, they eat all the shellfish they can — primarily sea urchins, but also abalone, snails, clams and crabs.

OTTER WATCHER
Linda Nichol has been monitoring sea otter populations in B.C. for more than a decade. "I look forward to checking in on them, like old friends," she says.

Ecologists are now discovering the far-reaching implications of the otters' voracious appetite. When they are absent in an area, sea urchins eradicate kelp beds and thrive in landscapes termed "urchin barrens." When otters move in, they consume the urchins, promoting the revival of kelp forests.

A recent study led by marine ecologist Russell Markel found that kelp forests were nearly 20 times larger on the west coast of Vancouver Island after otters eliminated red sea urchins. Giant kelp forests provide a productive habitat and refuge for a variety of invertebrates and fish, such as salmon and herring. They also slow down water, ensuring that the larvae of various marine organisms are not swept away by currents, and help reduce coastal erosion.

The otters' comeback may be good news for the kelp forests and the species that depend on them. But the dramatic ecological changes the otters trigger also come with an economic cost for humans.

In an otter-free environment, abalone, clams, crabs, geoducks and other invertebrates increase in abundance, opening up opportunities for First Nations and commercial fishermen to harvest them. Now, from Alaska to California, in all the places the otters are, their appetite creates a conflict with the people who have an economic and cultural interest in shellfish.

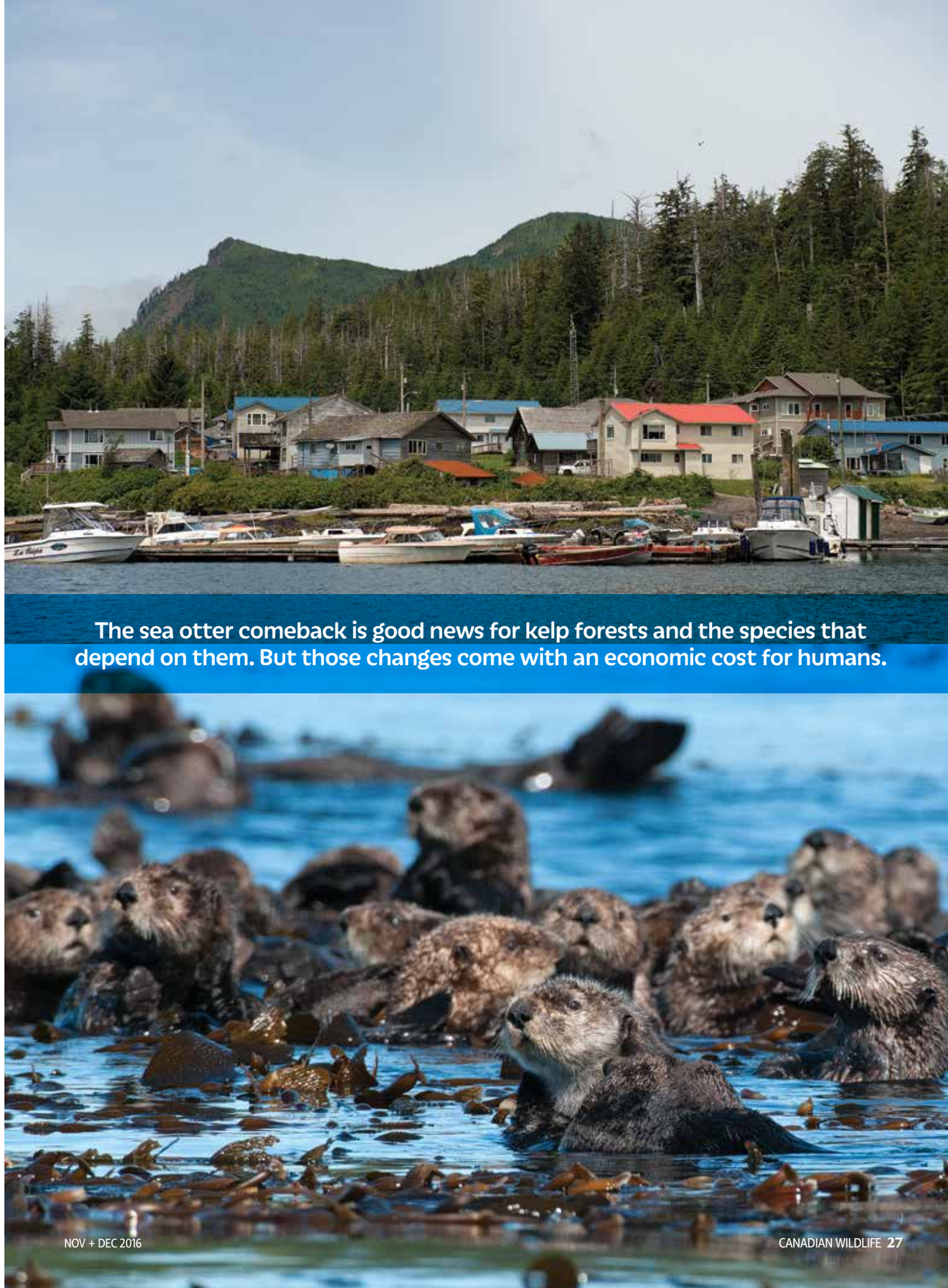
For example, when there were no otters around to eat them, northern abalone grew to large sizes and were easy to harvest, as they were found in open, shallow waters, competing with urchins for rare kelp food. Over-exploitation led to their demise and the closure of the abalone fishery in the early 1990s. Recovery efforts for the species, federally listed as endangered since 2011, are now more difficult with the return of sea otters, but the relationship between otters and abalone is far from simple.

Lynn Lee, a PhD candidate at Simon Fraser University who studies the interactions between the two species, finds that while otters directly reduce the number of abalone, they don't drive the species to extinction. Instead, abalone adopt a new lifestyle. To escape otter predation, the invertebrates become more cryptic, hiding in crevices in deeper waters. With increased kelp habitat, they have plenty of food. "They get the benefit of being protected, and they get food when the kelp forest grows around them," Lee says.

Thus, otters and abalone co-exist in a restored natural system, but that leaves the commercial fishery out of the new balance. As abalone move to crevices, they not only persist in lower densities over larger areas; they also tend to stay small to fit in their narrower habitat, below sizes allowed for commercial harvests. "Having sea otters around is much better in terms of increasing productivity in the ecosystem, but that means that the food items that we have come to depend on in the last 100 years are not going to be as abundant as they were," Lee notes.

Abalone is not the only affected species. For example, some areas previously open to the commercial harvest of geoducks — the largest burrowing clam in the world — were closed after sea otters, a predator, moved in. "We see 30 to 50 per cent reduction in geoduck biomass once sea otters move in in an area," says Grant Dovey, the executive director of the Underwater Harvesters Association. "The sea otters are very proficient excavators."

However, the presence of sea otters in an area does not always mean a fishery is no longer viable. In the area of the cluster of islands called the Mission Group in Kyuquot Sound, where otters have been present for decades, geoduck beds are still harvested, which suggests that while otters may have painful impacts in the short term, they don't necessarily cause permanent harm. "We are hopeful that once sea otters reach carrying capacity in particular areas, there will still be a geoduck resource to harvest, but we are realistic," says Dovey. "Some areas seem to co-exist; some areas don't."



The sea otter comeback is good news for kelp forests and the species that depend on them. But those changes come with an economic cost for humans.

Archeologists, scientists and First Nations communities say that humans and sea otters have a long history of living in balance, a balance that can be restored.

Edward Gregr, a research associate with the Institute for Resources, Environment and Sustainability at the University of British Columbia, has taken steps to quantitatively model the costs and benefits brought by sea otters. He estimates the economic loss to commercial invertebrate fisheries — which include red sea urchins, Dungeness crabs, geoducks and others — is about $6.5 million per year, with the decline in geoduck catch making up over half of the cost.

Gregr, who recently completed a PhD on ecosystem services in the presence and absence of sea otters, also discovered new benefits. He found a 30 to 40 per cent increase in living biomass in areas such as Kyuquot where sea otters are at their maximum number, which in turn results in more food available to larger, commercially valuable fish species, such as halibut and salmon. Gregr translates this benefit to an increase of $12 million per year to the commercial fishery.

Even more surprising, the recovery of sea otters — an appealing and iconic species — can attract tourist dollars. Gregr estimates tourism revenue could grow by $48 million per year based on a recent survey of Vancouver Island visitors, which found that willingness to pay for a wildlife tour increased by an average of nearly $228 per visitor if there was a high chance of seeing sea otters. “There is more value in a sea otter present system than a sea otter absent one,” Gregr concludes. “Tourism pretty much offsets the loss of the invertebrate fishery.”

However, while tour operators in Tofino may benefit from sea otter-related tourism opportunities, these profits may never reach remote First Nations communities that are often the most affected by sea otters and have taken a direct economic and cultural loss because of the reduced shellfish harvesting opportunities. “When the otters first came back, it really disrupted the clam beds, the crabs and the sea urchins. I haven’t eaten a sea urchin in 10 years,” says Joe Martin, a Tofino-based canoe carver and a member of the Nuu-Chah-Nulth First Nations.

Archeologists, scientists and First Nations communities suggest that people and sea otters used to live in balance. Indigenous people likely hunted otters to protect clam beds and other shellfish resources. “In the former days, people were always in their canoes at the front of every native village, so the sea otters knew they could not go past that point or they would be hunted,” Martin says.

These ancient otter management practices may help resolve the modern conflicts between people and otters. “Communities are interested in revitalizing traditional customs and experimenting with ways that shellfish and otters might have been managed in the past, including traditional hunting practices,” says Jenn Burt, a PhD candidate at Simon Fraser University and Hakai research scholar. Burt is working with First Nations communities to understand what factors enable and constrain co-existence with sea otters in a larger initiative involving First Nations communities and researchers Anne Salomon and Kii'iljuus Barbara Wilson.

Over the summer, Burt and her colleagues visited indigenous communities in B.C. and Alaska that have lived with sea otters for the past 40 to 60 years. “Going to these communities that have experienced different lengths of time with sea otters allows us to almost get a crystal ball into what communities might expect to see,” Burt says. She was joined by hereditary chiefs from other First Nations who have not yet experienced the return of sea otters so they could learn from other communities how they could best prepare when the sea otters arrive. “People cope better with things when they know what’s going on,” Burt says.

Based on his costs and benefits analysis, Gregr proposes specific management solutions at a regional level. “These results could really inform an evidence-based decision-making process,” he says. For example, Gregr envisions that otters could be actively kept out of Clayoquot and Nootka sounds to preserve the geoduck and crab fisheries, while other areas such as Kyuquot would keep their sea otter populations intact. Under such a scenario, Gregr suggests that the affected communities receive a monthly shipment of urchins to compensate for their loss. Another option would be to exclude sea otters to a distance of five kilometres from coastal communities to preserve access to traditional foods. “I think we could solve the sea otter problem,” he says.

ENVIRONMENTAL IMPACTS
Sea otters eat up to a quarter of their body mass daily. They are voracious sea urchin predators, which promotes the growth of kelp forests.

Back on the water, Nichol, who has not surveyed Clayoquot Sound since 2013, is curious to learn if the otters had ventured into new areas. As the day nears its end, she decides to investigate a spot she had not previously surveyed, near Long Beach, looking for rafts, the floating aggregations that the animals form to rest. Shortly after getting to the site, she encounters a female and pup raft of about 12 animals, building more evidence that the animals are colonizing southward.

“When I watch otters, I’m thinking about the constraints and the risks they face,” she says in a later interview. “They are food-limited. They have to think about protection from the weather. They have to maintain their high metabolic rate. They have to think about predators. They have all those things they are balancing, and I think about that as I look where they are. Does this area meet those needs?

Judging by the success of their reintroduction, the sea otters off the B.C. coast have certainly found enough of those areas. Looking to the future, it seems likely they’ll continue to have a place for years to come.