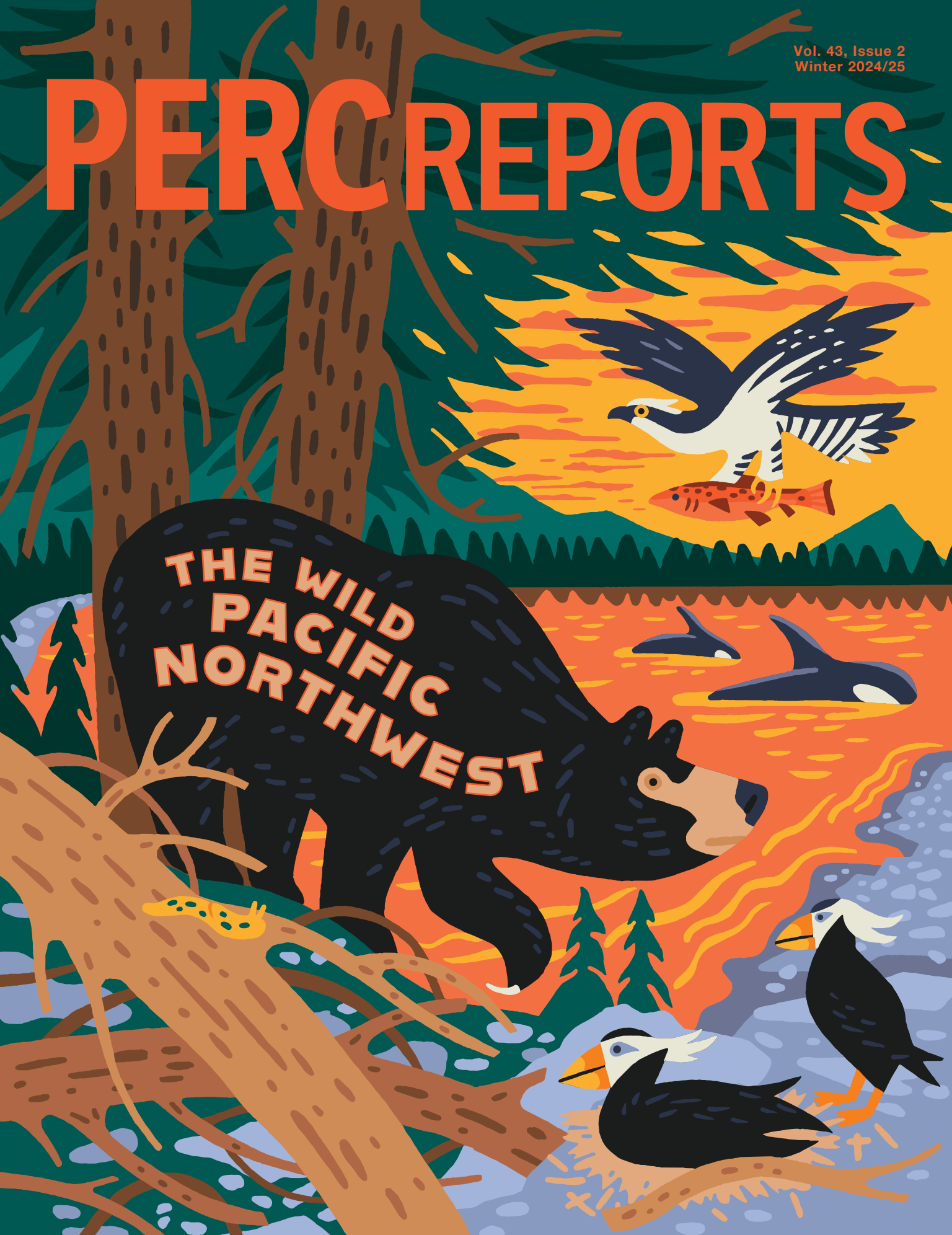


PERC REPORTS



THE WILD
PACIFIC
NORTHWEST



Years ago, I spent summers as a backcountry ranger in Washington's Olympic National Park. My days were spent hiking through the lush depths of the Hoh Rainforest, where mist clings to moss-covered trees, and climbing the rugged slopes of Mount Olympus, where glaciers carve through rocky landscapes. It was there that I fell in love with the Pacific Northwest and the iconic species that define it.

The Pacific Northwest evokes images of old-growth forests, rugged coastlines, and ecosystems that are as diverse as they are complex. Yet today, conserving these unique landscapes requires innovative thinking—and a willingness to look beyond traditional approaches.

This special issue of PERC Reports explores creative ideas to address the conservation challenges of this remarkable place. It spotlights market solutions that have the potential to benefit the wildlife, people, and communities that inhabit the region.

Kicking off, Tate Watkins explores efforts to bring sea otters back to Northern California and Oregon—an idea with significant ecological benefits, but also one that has raised concerns for local fishing communities. It's been more than a century since sea otters called these coastal areas home. Can they be reintroduced without alienating the fishermen who share these shores?

Next, James Workman takes us underwater to examine the fight to save America's kelp forests, which play a vital role in supporting marine biodiversity. As sea urchins decimate kelp beds off the Pacific Coast, Workman investigates a creative solution: cultivating a taste for urchin. This culinary approach could help control urchin populations, with widespread benefits for kelp forests.

Kelvey Vander Hart dives into the plight of Southern Resident orcas in the Salish Sea, one of the most beloved orca populations in the world. With shipping vessel noise disrupting the orcas' ability to hunt, Vander Hart explores a unique proposal to create a market for tradeable noise permits, balancing commerce with conservation in one of the world's busiest waterways.

Then, Jonathan Wood takes us to Oregon's Elliott State Forest, where forestlands are facing competing pressures. In an ongoing battle to protect endangered marbled murrelets, Wood explains how current policy fuels zero-sum litigation instead of fostering cooperative alternatives that could better serve both people and wildlife.

Along the way, we explore issues ranging from water markets and salmon recovery to tribal forestry and grizzly bear reintroduction. It's a reflection of how deeply intertwined the region's ecological and human landscapes are—and the need for creative, market approaches to help navigate these complex challenges.

This collection of stories reflects PERC's mission to bring creativity to conservation, turning challenges into opportunities. With these innovative approaches, we can forge a future where the Pacific Northwest's iconic species and landscapes can continue to thrive.



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The Property and Environment Research Center (PERC) is a nonprofit institute based in Bozeman, Montana, that creates innovative conservation solutions through markets and incentives.

A COASTAL COMEBACK 12

It's been more than a century since sea otters called the coasts of Oregon and Northern California home. Can they be brought back to the region without alienating fishermen?
By Tate Watkins

HABITAT FOR HOO? 20

In a battle of owl vs owl, wildlife managers must choose sides
By Kat Dwyer

KELP WANTED 22

Can cultivating a taste for purple sea urchin help restore America's underwater forests?
By James Workman

RECLAIMING THE FOREST. 30

How local control is helping restore tribal forests
By Todd Myers

OLYMPIC GRIDLOCK 38

Rethinking how we fund national parks can improve your next visit
By Kat Dwyer

ORCAS IN A NOISY WORLD. 40

Killer whales in the Salish Sea are struggling with a growing problem: shipping noise. Could markets help quiet their submarine world?
By Kelvey Vander Hart

MEET THE NEW NEIGHBORS. 50

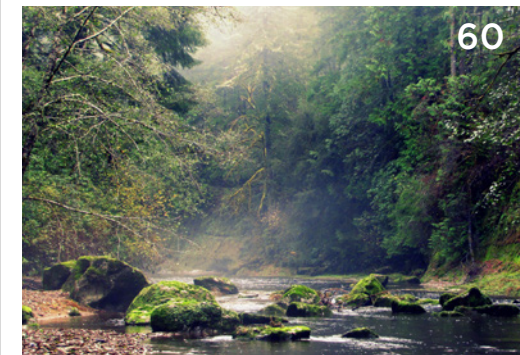
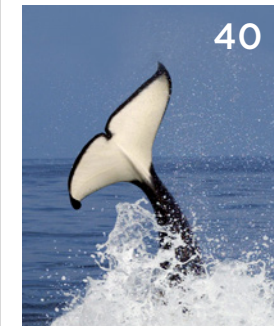
Living with grizzlies requires working with landowners
By Kat Dwyer

THE FLOW OF THE FUTURE. 52

From the headwaters to coastal riverbeds, water markets are boosting streamflows throughout the Pacific Northwest to benefit salmon and other fish species
By Shawn Regan

FOREST FIGHT 60

When litigation pays better than conservation
By Jonathan Wood



Frontiers 5
Snapshots 8
PERC News and Views 10
The Last Word 66

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Cover Illustration by Always with Honor

The spirit of the Pacific Northwest lives in the hearts of the writers, designers, and photographers who helped create this issue. Here is a sampling of the people, places, and passions that went into the following pages.

Tate Watkins greets the Pacific Ocean from Ecola Point off the Oregon coast. An ideal vista to ponder the complexity of sea otter reintroduction.



Jamie Workman experiences the bounty of the Pacific firsthand while salmon fishing with his father.



Designer **Sara Kubler's** love of travel and adventure was born in her home state of Oregon. In between world travels, she explores the Pacific Northwest's mountains, forests, and waterways.



Todd Myers gains new perspective with every step hiking the region's mountains.



As a young man, **Shawn Regan** spent several summers working as a backcountry ranger at Olympic National Park. Last summer he brought his kids back to the area to explore tide pools, discover banana slugs, and fall in love with temperate rain forests.



Tyler and Elsa Lang established their design studio Always With Honor in Oregon, where they were inspired by the state's natural beauty and wildlife. The vibrant colors of the Pacific Northwest remain a lasting influence, as evidenced by their illustrations for this issue's cover and "Kelp Wanted" story.



Kelvey Vander Hart took to the rocky waters of the Salish Sea to get up close with orcas and other marine wildlife to inform her story, "Orcas in a Noisy World."



Thanksgiving on the Oregon coast is an annual tradition for **Brian Yablonski**, who trades in turkey trots and traditional fare for breathtaking hikes and fresh seafood.



Conservation and Conflict in the Land of Giants

Rather than a place to be tamed, the Pacific Northwest remains a confluence of people and wildlife who share this magnificent spot on the map

If you could picture a stocky little bird that resembles a clown, a parrot, and a penguin all rolled into one, you would be looking at a tufted puffin.

This unique species of auk spends most of the year out at sea feeding on forage fish with serrated beaks that can hold 20 to 30 small fish at a time. The rest of the year they nest in burrows on the cliffs and slopes of rocky islands along the Pacific Northwest coast. Puffin pairs mate for life, and their offspring are adorably called pufflings. One of the most observed tufted puffin colonies can be found at Haystack Rock in Cannon Beach, Oregon, where their population has fallen from 600 in the early 1980s to approximately 120 today.

That's also where you can find our family during Thanksgiving. For as long as we've been a Montana family, our tradition is to spend the holiday together with friends on the Oregon coast reveling in stormy days, gorging on steamy Dungeness crab, and hiking in the misty Sitka spruce forests. Most afternoons, you'll find us walking the beach to explore the tide pools of the fortress protruding from the ocean that is Haystack Rock. The puffins are long gone by this time of year, but their massive summer lodge is a reminder of unique and brilliant wildlife that call this part of the country home.

In addition to the tufted puffin, the Pacific Northwest hosts endangered Southern Resident orcas, the most-watched

The saga of the Pacific Northwest has been a never-ending dance between the ocean, land, and wildlife and those eking out a living from the ocean, land, and wildlife.



©Isaac Sanchez



©Katie Musial

population of killer whales in the world, quite particular in its diet (Chinook salmon only, please), and sensitive to noise from shipping traffic. The orcas are among 30 marine mammals, including harbor seals and Steller sea lions, found here.

Charismatic sea otters are also native to the region, but their century-long absence from Oregon and Northern California waters has contributed to an explosion of sea urchins that are eviscerating nearshore kelp forests. It is also home to the mighty Roosevelt elk, the largest of the four elk subspecies in the country, who emerge and then disappear like ghosts into the shrouded coastal forests. And like the Rocky Mountain elk closer to my home in Montana, they often consume great amounts of forage cultivated by landowners for livestock. That the giant Roosevelt elk outweighs all of the other types of elk in America is no surprise. Almost everything is bigger in the Pacific Northwest.

In David Lavender's epic regional history, *Land of Giants*, published in 1950, he wrote of the literally massive allure of the Pacific Northwest to overland travelers in the 1840s:

"Bigger bears than any hunter had ever seen at home. Taller pine trees, fatter fish. Snow peaks incredible against the sun. And something more than romance: there in the greener grass a man's

dream of himself—and all of mankind—could somehow come true ... Two years later a name would be invented for the feeling—Manifest Destiny."

Even environmental conflicts are bigger out here. The largest of them all might be over a small owl that lives a life of seclusion among the mossy giants of the Northwest's ancient forests. Efforts to list the northern spotted owl under the Endangered Species Act gave rise to the famed timber wars of the late 20th century, pitting rural working-class loggers against urban environmental activists.

The wood wars introduced Americans to tree-sitting, gate-blocking, and timber-spiking. Meanwhile, the unsuspecting owl became the mascot and surrogate for old-growth forest protection. And the resulting Northwest Forest Plan, which turns 30 this year, protected more than 10 million acres of federal forests. Logging on federal land in the region subsequently fell by 90 percent, and the economies of entire communities were ravaged. Yet along with loggers, spotted owl populations have continued to decline thanks to the westward destiny of the prolific and rivalrous barred owl.

The saga of the Pacific Northwest has been a never-ending dance between the ocean, land, and wildlife and those eking

out a living from the ocean, land, and wildlife. First it was the seadogs searching for a Northwest Passage to the Orient, ships swallowed whole at the Columbia River Bar. Then it was the fur traders who found and nearly exterminated the sea otter only to move inland to fall upon the beaver. Later it was the lumbermen and coastal canneries who harvested the tallest trees and fattest fish. And finally, it was the dam builders and irrigators who harnessed swift rivers so that the interior could bloom. The timber wars were simply the next song of this dance.

At its core, the manifest destiny Lavender wrote about in the mid-20th century represented dreams of a people and implied a taming of nature. But the Pacific Northwest is not a place to be tamed. Rather, it is a complex confluence of the people and the animals who share this magnificent spot on the map. Escape its urban centers and you will find it is still as big and wild and rugged as the fir-covered volcanoes and unforgiving coastlines. The Great Northwest needs its orcas, sea otters, Roosevelt elk, Chinook salmon, and clownish tufted puffins. But it also needs its farmers, ranchers, fishermen, loggers, longshoremen, hunters, and Indigenous tribes. This will require thoughtfulness and creativity, not simply the force and fight of preceding generations.

That's where the researchers, policy experts, and practitioners at PERC come in. PERC, in partnership with Vancouver, Washington-based M.J. Murdock Charitable Trust, has embarked on a regional project that will spotlight many of our and other partners' innovative approaches. Whether it is conflicts of scarcity, as with orcas and otters, or conflicts of abundance, in the cases of elk and sea urchins, market-based conservation solutions can smooth out the jagged edges by making cooperation rather than conflict the instrument of good wildlife management.

The Pacific Northwest's grandeur calls out for big ideas. Few regions of the United States present as much muchness. There is power in its scale and scenery. And therein lies the opportunity to go big on how we conserve the species and people living off of this land of giants.



Brian Yablonski is the CEO of PERC. In "Frontiers," he describes how PERC seeks to advance creative conservation through incentives, innovation, and cooperation.

Mo' mustangs mo' problems. A recently published study led by University of Wyoming scientists found that wild horses and sage grouse don't always mix. "Over the last 20 years, free-roaming horse numbers have increased to more than three times the targeted goal across BLM lands," said lead researcher Jeff Beck, "and this increase is one of the causes of sage grouse population declines." The study, published in *The Journal of Wildlife Management*, monitored roughly 1,000 female sage grouse in central Wyoming over a 15-year period. It found that in places with incredibly abundant wild horse populations, nest and brood survival declined by up to 18 percent. The researchers concluded that "managing free-roaming horses at appropriate levels would be highly beneficial to sage grouse populations—and other species that rely on functioning sagebrush ecosystems."



© BLM Wyoming

Rebates over regulation. A pilot program seeking to get hunters to voluntarily adopt non-lead ammunition was launched this past fall at seven National Wildlife Refuges. The aim is to use incentives—in this case, a reimbursement issued upon submitting proof of purchase of non-lead ammo—rather than mandates to change hunting behavior. Lead ammo is cheaper than alternatives and has been used by hunters in North America since European settlement, but fears about the effects of the toxic metal on wildlife persist. It has been banned for waterfowl hunting since the 1990s. On the last day of the Obama administration, the U.S. Fish and Wildlife Service sought to ban lead ammunition on all lands it manages, a move quickly reversed by the Trump administration. Now, the agency is experimenting with voluntary incentives—a welcome alternative to heavier-handed approaches.



Virtual fencing in the land of Oz. Innovative ranchers have begun to trade barbed wire for invisible fences in parts of the American West. In Australia, a different type of virtual fencing is sparing kangaroos and other wildlife from vehicle collisions. The roadside system consists of devices mounted on posts spaced 25 meters apart. From dusk until dawn, headlights from passing automobiles trigger the devices, which emit a sound and flash LED lights. Animals seem to have associated the alerts with approaching vehicles, which used to kill approximately 250 kangaroos and wallabies each year along one 12-kilometer stretch where the technology has been installed. Now, in year three of the project, that figure has fallen by about half, suggesting that pushing the conservation frontiers of virtual fencing is worthwhile worldwide.



© Francesco Veronesi



© USDA Forest Service

Underwater monitor. In British Columbia, the Wild Salmon Center is working with the Heiltsuk Nation to improve salmon research with artificial intelligence. It's common for wildlife technicians posted on streams and rivers to monitor salmon and count them by hand as they return upstream to spawn. Accurate and up-to-date counts can be crucial to management decisions, such as when to close a harvest season to ensure enough fish make it upriver to spawn. So-called "Salmon Vision" technology incorporates underwater cameras and A.I. to count fish as well as identify their species and sex. The center, which works to protect rivers up and down the Pacific Coast, is aiming to eventually help additional First Nations in Canada collect better data to supplement existing research and optimize their salmon management.

Getting a fix. In September, the U.S. House of Representatives passed the "Fix Our Forests Act" in a decidedly bipartisan vote. The bill features several PERC priorities aimed at increasing the speed and scale of forest restoration on public lands. Among them are expanding Good Neighbor Authority, reforming rules around litigation that can unduly delay projects, and addressing the *Cottonwood* ruling that hinders on-the-ground land management by requiring federal agencies to navigate duplicative red tape. Policy Director Hannah Downey has testified in front of Congress in support of the bill, and PERC remains committed to working with the Senate on the package.



© Florida Fish and Wildlife

Florida cat. It's become standard in many western states to compensate ranchers for livestock lost to carnivores ranging from wolves to bears to mountain lions. Now, that strategy is moving east to conserve endangered Florida panthers, the official mammal of the Sunshine State. A three-year pilot funded by the National Fish and Wildlife Foundation is providing funds to compensate ranchers for livestock killed by the big cats. It will also offer financial incentives for property owners who make their land friendly to panthers. "Over half of Florida's land area is private ownership," says Tindl Rainey, director of conservation at the Fish and Wildlife Foundation of Florida. "So clearly, private landowners will play a critical role in wildlife and habitat conservation." The big cat used to roam the Southeast, but only 100 to 200 Florida panthers remain today, confined to the southwestern part of the state. Programs like the ongoing pilot aim to boost the wild feline's prospects by recognizing the costs imposed on ranchers and other landowners and working with them as collaborators in conservation.





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"Whose Wild Fish is it Anyway? Adapting Lessons from Commercial and Recreational Rivalries in the Gulf of Mexico"

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"Economic Effects of Wolf Recovery on the Agricultural Sector in the United States"

ONE WILD WORKSHOP

Innovation is the future of wildlife conservation in the Pacific Northwest

Wildlife survival in the Pacific Northwest increasingly depends on resolving human-wildlife conflict. The region's ecosystems, home to iconic species like orcas, sea otters, marbled murrelets, salmon, and more, face growing pressure.

To explore creative solutions, scholars and practitioners from across the country gathered at the M.J. Murdock Charitable Trust in Vancouver, Washington, this past September for a workshop focused on exploring innovative solutions for people and wildlife.

PERC workshops foster intellectual exchange of fresh ideas, blending science, policy, and on-the-ground expertise. Over three days, attendees explored ways to rethink wildlife conservation in the region. Participants presented ideas ranging from the impact of commercial shipping noise on orcas to the recovery of sea otters along the coast. More than just a meeting of minds, the workshop ignited a sense of optimism, with attendees rallying around the notion that innovation holds the key to lasting conservation wins in the Pacific Northwest and beyond.

The discussions that began here formed the groundwork for this special issue and are inspiring future PERC research. Like the workshop itself, we hope to spotlight the region's unique challenges and—more importantly—the creative approaches being pioneered to solve them.

The future may be uncertain, but with leading minds sparking new ideas and solutions, the Pacific Northwest could become home to a promising new model of innovative wildlife conservation in action.

A Coastal Comeback



It's been more than a century since sea otters called the coasts of Oregon and Northern California home. Can they be brought back to the region without alienating fishermen?

BY TATE WATKINS

Over the summer, two male sea otters were spotted near Cannon Beach, Oregon, a couple of hours west of Portland. They floated in shallow waters and climbed on rock outcroppings below the grassy bluffs of Ecola State Park, a picturesque stretch of the Pacific Coast that has served as the backdrop for scenes from *The Goonies*, *Point Break*, and several other blockbuster movies. The sight was a rarity given that the marine mammals have been virtually absent from the state's waters for more than a century—to the detriment of coastal ecosystems.

Sea otters play a major ecological role by controlling shallow-water herbivores such as sea urchins. Without ample predators to control their density, urchins and other herbivores can decimate the underwater kelp forests and seagrass meadows that provide habitat for a multitude of marine species, from crabs and sea slugs to herring and rockfish.

"They have a disproportionately large effect on the ecosystem relative to their abundance," Chanel Hason told a local news outlet when the otters were spotted. Hason is outreach director at the Elakha Alliance, an Oregon nonprofit formed by tribal leaders and conservationists with the goal of restoring sea otters and, consequently, robust marine ecosystems to the state.



"They were valued because it is the softest, richest, most beautiful fur that exists in nature. From the 1700s on, all along this coast all the way up to Alaska, the commercial fur trade exhausted their numbers."

—Peter Hatch, *Confederated Tribes of Siletz Indians*

Peter Hatch, the group's secretary and a member of the Confederated Tribes of Siletz Indians, added that the last recorded sea otter that called Oregon home was killed before his grandfather was born. "They were valued because it is the softest, richest, most beautiful fur that exists in nature," he said. "From the 1700s on, all along this coast all the way up to Alaska, the commercial fur trade exhausted their numbers."

Since then, sea otters have made a comeback in many areas, but the biggest remaining gap in their historical range stretches from San Francisco Bay all the way through Oregon. Only in rare cases do otters like the two spotted last summer wander more than 100 miles down the coast from established populations in Washington.

About a decade ago, abnormally warm waters in Northern California decimated purple sea urchins' main predator, a type of sea star. As a result, the urchins were left to devastate kelp forests unchecked (see "Kelp Wanted," p. 22). "Without these top predators," says Hason, "sea urchins are overpopulating and overgrazing on kelp, which is basically the foundation for our underwater forests and home to thousands of species." Purple sea urchin numbers have boomed by up to 10,000 percent in places, and some areas have lost more than 90 percent of kelp coverage.

Hason adds that, as someone who is working to restore sea otters, the summer sighting was for her "a little glimmer of hope of exactly what we could see in the future here off of our coast."

In 2020, Congress directed the U.S. Fish and Wildlife Service to explore the potential to reintroduce sea otters to the Pacific Coast given their significant ecological role. The Elakha Alliance and other conservation groups, such as Defenders of Wildlife, are supporting the effort, along with several federally recognized tribes. The service has identified Oregon and Northern California as the most beneficial areas to potentially bring back sea otters. It has since held community meetings to gather perspectives and share information, although it has yet to officially propose a reintroduction or specify possible sites, and it continues to evaluate relevant issues—including the potential downsides of restoring the population of a predator with such a big appetite.

A major factor in any reintroduction would be competition between sea otters and commercial, tribal, and recreational fishing interests. Since sea otters lack blubber, they are voracious eaters, consuming up to 30 percent of their body weight daily—far more than seals and other marine mammals. And in addition to preying on sea urchins, they eat a multitude of other bottom-dwelling ocean invertebrates, including valuable crabs, clams, abalone, and other shellfish. The potential harms to local interests will make it crucial to mitigate the impacts of a reintroduction. Cooperative or even compensatory approaches could help make reintroduced sea otters an asset to—or at least avoid making them a liability for—local communities, namely commercial and other fishing operators.

Reintroduction Roulette

Historically, sea otters lived in shallow nearshore waters stretching in a broad arc from Japan to Mexico. Indigenous peoples long held the animals in high regard, trading their furs or using the pelts to make treasured robes. By the early 20th century, however, trappers had wiped out many populations, and as few as 2,000 survived worldwide in scattered colonies. The end of the fur trade and widespread regulation, including through the Marine Mammal Protection Act, reduced pressure on the animals, and reintroductions of translocated sea otters helped modern populations rebound.

In North America, sea otters are categorized into two subspecies: northern and southern. Northern sea otters are found off the Alaska coast and as far south as Point Grenville, Washington. The 1960s translocation of about 400 sea otters to Southeast Alaska grew rapidly, resulting in a population that exceeds 22,000 today. In contrast to the continental West Coast, the region has vast high-quality otter habitat, including many inlets, bays, estuaries, and islands with shallow waters. That reintroduction effort, while a boon for otters, has severely impacted crab fisheries, a precedent that worries fishermen over future reintroduction plans. In general, however, most other

translocated populations have grown much more slowly, especially along the West Coast where linear shallow waters are bound by the continental shelf, restricting otter movements to either the north or south. A 1969–70 translocation of 59 sea otters to Washington, for example, has today become an established population of nearly 3,000.

Not all reintroductions, however, have been successful. In 1970–71, the reintroduction of 93 northern sea otters to the Oregon coast was a total failure, for reasons that are unclear. (The Fish and Wildlife Service has noted that "there is no clearcut explanation for why the Oregon reintroduction failed while others succeeded, and it may have just been a matter of chance.") Despite such failures, northern sea otter populations have rebounded. Today, nearly 100,000 inhabit nearshore U.S. waters, with the vast majority in Alaska.

Southern sea otters, also known as California sea otters, are found off the shore of Central and Southern California. Once thought to have gone extinct during the fur trade, several dozen otters were discovered in 1938, in the mouth of Bixby Creek, near Big Sur. All southern sea otters living today are descended from this single colony. The tiny remnant population grew to approximately 1,000 by 1977, when the Fish and Wildlife Service

listed the subspecies as threatened. A major factor in the listing decision was the fact that the species occupied less than 200 miles of coastline and therefore was vulnerable to a mass-mortality event such as an oil spill. Today, there are approximately 3,000 southern sea otters.

Threats persist to northern and southern sea otters, including the potential for oil spills, entanglement with fishing gear, and predation by sharks and orcas. A reintroduction plan, therefore, might aim to establish new populations of each subspecies, and it seems plausible that it would involve southern sea otters given their more precarious status.

Indeed, shark predation now prevents southern sea otters in Central California from expanding northward to San Francisco Bay and beyond. Establishing additional populations in Northern California and Oregon would leapfrog the open, shark-infested waters that are most dangerous to otters, boosting the subspecies' recovery and eventual delisting prospects, making it an attractive conservation option. It would not only expand the southern sea otters' range and numbers but also connect populations of the two subspecies in the mammal's historical transition range. A past sea otter reintroduction by the Fish and Wildlife Service to California waters, however, does not necessarily inspire confidence—especially with fishing interests.

Taxing Translocations

In the late 1980s, the Fish and Wildlife Service reintroduced 140 southern sea otters to San Nicolas Island, the most remote of the Channel Islands off the coast of Southern California. That effort, however, was riddled with conflict and ultimately deemed to be unsuccessful.

The service contemplated an experimental population of southern sea otters in 1982 as a way to provide redundancy in case the primary colony near Big Sur suffered from an oil spill. That year, Congress amended the Endangered Species Act and created section 10(j), authorizing the reintroduction of “experimental” populations of listed species to proactively expand their range and numbers. The amendment allows for tailored regulations that

seek to avoid unnecessarily burdening local communities and to generate buy-in for the species' recovery. The Marine Mammal Protection Act, however, did not make any such distinction. So in 1986, Congress passed a law permitting under that act the establishment of a new experimental population of California sea otters.

Through the 1986 law, Congress aimed to strike a compromise between wildlife conservation and economic pursuits. Most importantly, it sought to “prevent, to the maximum extent feasible, conflict with other fishery resources”—namely, commercial fishermen. It did so by clarifying that, as long as commercial fishing operations were acting legally and avoided the near-shore waters around San Nicolas Island, they would not be punished for unintentionally harming or killing sea otters from the experimental population. The law also directed the service to cooperate with California state agencies and to actively relocate wandering otters back to suitable waters, which would not only help keep the animals safe but also minimize conflicts with fishing vessels. In short, Congress aimed to insulate the fishing industry from regulatory liability, perhaps even motivating them to become a partner in conserving the species—or at least avoid becoming an enemy of it.

The reintroduction to San Nicholas never went smoothly. Many of the otters died during capture and after release, and mortality persisted despite later attempts to reduce stress on the animals. Keeping otters near the reintroduction area proved similarly difficult. After three years and a high rate of dispersal, only about 15 of the translocated mammals remained in the waters surrounding the island. The service eventually abandoned the reintroduction, and the state soon followed suit. By 1999, the Fish and Wildlife Service proposed declaring the relocation effort a failure, mainly because fewer than 25 sea otters remained in the relocation zone. Additionally, it noted that the San Nicolas population was not adequately isolated from the Big Sur population to survive a large oil spill, further translocations posed too great a threat of mortality, and otters required a much larger range to recover their populations.

After several more years of planning and environmental review, in 2012, the service terminated the San Nicolas Island translocation program. According to the terms of its original plan, the service should have returned all remaining otters from the experimental population to the parent colony in coastal California. But it failed to honor those terms, and the San Nicolas population eventually grew to nearly 150.

Today, all southern sea otters are now fully regulated by both the Endangered Species Act and the Marine Mammal Protection Act anywhere they are found. That means that no matter how responsibly commercial fishing operators are pursuing their catch, there is no longer any liability protection afforded to them if they unintentionally harm a southern sea otter, which can be punished by fines or prosecution.

"We can't control what species or how much of each species otters will eat. Urchin divers, clam divers, and crabbers will be most greatly affected... Each fishing operation is a small business that supports Oregon families."

—A concerned community member from Newport, Oregon





Following the termination of the program, local commercial fishing interests sued, arguing that the Fish and Wildlife Service had effectively pulled the rug out from under them by establishing an otter population on San Nicolas Island while exposing them to liability under the Endangered Species Act and Marine Mammal Protection Act. The district court and the Ninth Circuit disagreed, siding with the service. The case illustrates many of the continued concerns over potential sea otter reintroduction and management.

Cooperative Conservation?

As part of its information gathering for a potential future reintroduction of sea otters, the Fish and Wildlife Service received nearly 600 written comments from 16 community events it held up and down the Northern California and Oregon coasts during the summer of 2023. A pointed comment from one respondent noted that the service “failed to honor” its past management plan in Southern California. “I was there—broken promises and lost fisheries are the trademark” of the service, it read.

That broken compromise has eroded trust, complicating today’s efforts to recover sea otters. The Fish and Wildlife Service claims it is “extremely unlikely” that the total costs of a new sea otter reintroduction would outweigh the overall benefits. The upsides include not only strengthening marine ecosystems by bolstering kelp and seagrasses—which would eventually support myriad other species and make coastlines more resilient to storms and climate change—but also the potential boon to ecotourism from wildlife watching opportunities. (In British Columbia, the willingness to pay for the chance of seeing sea otters nearly rivals the value for whale watching, the top

driver of wildlife tours.) Yet the service has recognized that some groups like the shellfish industry could bear the brunt of those highly concentrated costs, especially at first. Sea otters select large, energy-rich prey, sometimes eating commercially valuable shellfish for nearly half of their diet.

Several tribal nations in California and Oregon have supported reintroducing sea otters, citing the expected ecological benefits. Leaders of two coastal Oregon tribes have even written to the interior secretary calling for a reintroduction within the next five years. Two tribes in Washington, however, have been less enthusiastic about the idea. Concerns they have cited include the lack of a plan or mechanism to eventually control populations of reintroduced otters and the anticipated harms to crab, clam, and urchin fisheries for commercial, cultural, and subsistence uses.

“We can’t control what species or how much of each species otters will eat,” a commenter from a Newport, Oregon, open house, noted. “Urchin divers, clam divers, and crabbers will be most greatly affected. Management of these fisheries will be incredibly complicated with sea otters in the picture,” adding that the effects could be beneficial for some fisheries but “terrible” for others. “Oregon has a few very sustainable and well-managed shellfish fisheries that sea otters could threaten,” it continued. “Each fishing operation is a small business that supports Oregon families.”

Several factors could help to lessen the blow. For one, while Dungeness crab fisheries are important to both Oregon and California, most of the catch comes from the open ocean, beyond typical sea otter habitat. For another, if reintroduced otters can help restore kelp and seagrass habitat, then it would benefit many commercially valuable finfish, such as rockfish and cod. That’s relevant to some of the area’s shellfish harvesters because many fishing operators participate in multiple fisheries, meaning that those increased benefits could help compensate for the costs imposed. A main challenge, however, would be to help affected groups navigate the almost certainly rocky transition that would come in the short term. And unfortunately, when it comes to red sea urchin and other shellfish, including abalone, reintroduced sea otters would leave a significant mark in terms of predation.

Still, a few notable actions could help.

Under the Endangered Species Act, the Fish and Wildlife Service could tailor threatened species rules of southern sea otters to provide regulatory relief. When it comes to the Marine Mammal Protection Act, however, Congress would likely need to intervene, as it did in 1986, to provide similar relief for commercial fishermen. Making such provisions would be a logical first step as a precondition of any reintroduction, partly because it would signal to the people likely to bear costs that their interests are not being ignored.

Beyond that, creative compensation approaches could be explored. There are parallels from past efforts—a prominent one being Defenders of Wildlife’s scheme to compensate area ranchers for livestock lost to wolves when the carnivores were reintroduced to Yellowstone National Park in the 1990s. Adapting this model for sea otters, however, would involve some unique challenges.

“One thing that’s different from wolves and livestock,” Jane Bacchieri, executive director of the Elakha Alliance, says, “is that you’re not dealing with private property here, you’re dealing with a commons” in coastal waters. That may create more complexity when it comes to identifying harms. Bacchieri highlights the need for continued research to understand what the impacts, both positive and negative, might be from a reintroduction over time, adding that her group is not opposed to approaches that incorporate compensation in the case of negative impacts. Elakha Alliance has brainstormed ideas with several partners, including creating an “otter stamp” to channel revenues to affected communities, or perhaps a license plate, although Bacchieri says that finding a method that generates sustainable funding would be key.

Avoiding Alienation

It may be asking too much to hope fishing interests become the friends of sea otters. But as with wolves in the Rocky Mountain West, efforts to reintroduce species should recognize that the vast majority of the people who benefit will not be the ones who suffer the collateral damage, and they should aim to find creative ways to compensate the groups who are harmed. Because the truth is that if the federal government alienates fishermen and other affected communities, they will make the quest to conserve and recover sea otters that much more difficult up and down the Pacific Coast.



Tate Watkins is a research fellow at PERC and managing editor of *PERC Reports*.

HABITAT FOR HOO?



Barred Owl

In a battle of owl vs owl, wildlife managers must choose sides

The northern spotted owl is an icon of the Pacific Northwest. With limited predators and ample prey, the bird once enjoyed a relatively comfortable existence in the dense, damp forests of Washington state. Over the past four decades, however, it has been fighting for its survival.

Spotted owls rely on old-growth coniferous forests for habitat, a reality that sparked the “timber wars” of the 1980s and early ‘90s that pitted environmentalists against Washington’s timber industry. By 1990, the spotted owl was listed as a threatened species under the Endangered Species Act, a designation that restricted logging and other activities that could disrupt the owl’s habitat. Despite environmentalists largely winning the owl wars and significantly reducing timbering in the region, spotted owl populations have continued to decline dramatically. Something else was encroaching on their habitat—the barred owl.

During the mid-20th century, barred owls migrated from their native forestlands in the eastern United States westward. Today, the species is well established in the forests

of Washington. Known as “flying coyotes,” barred owls eat almost anything and are excellent hunters. They also produce more young and therefore often out-compete their spotted owl cousin, posing a serious threat to the region’s native populations.

To counter the invasion, the U.S. Fish and Wildlife Service implemented a program to remove barred owls from the landscape. After spotted owl populations continued to fall, the service proposed a dramatic escalation.

“Removal program” sounds innocuous enough, but the reality is a bit grimmer. To balance the population sizes, the service proposed to shoot more than 400,000 barred owls over the next 30 years.

Killing one species to save another might seem cruel or subjective, and to some degree, it is. Yes, because the spotted owl is federally listed, the service is required by law to make efforts to recover it. If left to nature, the barred owls would likely overwhelm spotted owl populations, outcompeting or perhaps interbreeding with them. But is the service’s plan the best way forward? Ultimately, it will spend over \$200 million killing a species of owl that arrived to the region too late to be considered native. So with help from the federal government and American taxpayers, the spotted owl will try to survive to fight another day.

By Kat Dwyer



Spotted Owl



Kelp Wanted

Can cultivating a taste for purple sea urchin help restore America's underwater forests?

BY JAMES WORKMAN

An old-growth forest anchored by deep roots rises 175 feet toward sunlight, with leathery, dark green fronds spreading into a gently swaying canopy. On those fronds so much depends. Each square kilometer of this Pacific Northwest forest annually inhales enough CO₂ to sequester 1,000 metric tons of carbon, then exhales five million cubic meters of life-giving oxygen in a climate-stabilizing exchange. Since time immemorial, the shadows of this nutrient-rich forest have provided a three-dimensional habitat for more than 1,000 plant and animal species, boosting local biodiversity ninefold wherever it is left intact. Welcome to the Pacific's hidden underwater forest—one made entirely of kelp.

Unfortunately, this forest primeval—an ancient interwoven 1,500-square-mile ecosystem that once ranged from Mexico to Alaska and grew thickest in the wild coast from Monterey to Mendocino—has been reduced to scattered fragments of its former glory. Only this time, we can't blame chainsaws. The last isolated patches of America's giant and bull kelp forests are instead being cut down in their prime by the amoral teeth of a lowly echinoderm known as the purple sea urchin.

With lavender spines gently trundling along, a solitary urchin looks like a tiny ocean hedgehog. It's almost...cute. But over the last decade, its population has exploded. Tens of millions of the menacing prickly hunters scour the sea floor off Northern California alone, having devoured 95 percent of the region's bull kelp beds, always ravenously searching for more.

Illustrations by Always With Honor

This Pacific Coast population bomb detonated when overlapping forces conspired to knock out the urchin's main predator: the sunflower sea star. Over time, this prolific predator evolved chemical receptors to track down urchins, tube feet to grip and pry them open, and a stomach the star could push out through its mouth to envelop and digest spiny urchins externally. Natural selection optimized a dynamic balance. Unfortunately, carbon emissions have both heated up the ocean and made it more acidic, crippling the sunflower sea star's immune system. This weakened state leaves them vulnerable to wasting syndrome, a disease that causes lesions, tissue decay, and massive die-offs. Rescued from their ancient Darwinian nightmare, purple sea urchins happily ballooned to densities 60 times higher than normal.

Yes, nature abhors a vacuum. But other past predators of purple sea urchins that might move in—lobsters, crabs, sheephead, wolf eel—all remain

too limited in range and diminished in number. Why not bring back the urchin's apex predator, the outrageously photogenic sea otter? Boosting tourism while decimating a menace—a single otter can eat 10,000 urchins a year—sounds like such a natural fix that the U.S. Fish and Wildlife Service is exploring the idea. Yet it would be a complicated, uncertain gamble (see “A Coastal Comeback,” p. 12). Establishing a robust population of reintroduced sea otters would cost up to an estimated \$43 million over 13 years—and even then, there's no guarantee the adorable mammal will stick around to fatten up on purple urchins, rather than disperse, starve, or get munched by great white sharks.

That leaves just one prehistoric carnivore who has devoured purple urchins for millennia: us. Native Americans had for at least 3,000 years helped keep urchin populations in check, until coastal tribes were displaced by European settlers who farmed their protein sources. Now, a

cultural confluence of indigenous foraging and Western palates might once again write the recipe for restoring kelp forests—one bite at a time.

A Prickly Problem

People versus urchins seems like a lopsided fight. And indeed, our species has already sallied forth clad in scuba gear using hammers to smash purple urchins in an effort to save Pacific kelp. In a recent dive off the California coast, one volunteer referred to it as “ecologically sanctioned mayhem.” (She elaborated: “If you're angry, it's a cathartic way to get it all out.”)

It's an underwater version of whack-a-mole against a prickly invasion so overwhelming it feels Sisyphean. Not only do urchins thrive in a cold, turbulent place hostile to our presence. But even up close, while weighing in at no more than 3.5 ounces, and reaching just four inches in diameter, the simple-minded and slow-moving purple urchin is also far from helpless. Its bristling sharp spines and smaller, pincer-like pedicellariae can easily puncture our skin and inject venom, a painful deterrent that evolved to protect the urchin's interior, which holds an unusually nutritious treasure. The reproductive organ is known by its Japanese name, *uni*—AKA, urchin gonads.

If those two words don't trigger your salivary glands, consider their appearance. Held under a bright light these soft, fleshy lobes glisten with a slimy, mucous-like coating. The texture is spongy and gelatinous, with a slightly lumpy surface. Cut open, the gobs ooze a thick, viscous liquid.

Could you stomach this goey substance? The stakes go beyond a shallow gastronomic stunt to determine the fate of life on earth, at least in this corner of it.

“If it's bad for nature but tastes good to us, you've got a problem that solves itself,” my late mentor and former PERC Senior Fellow Bobby McCormick told me more than a decade ago. McCormick was a legendary economist at Clemson University who led PERC's



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summer program for environmental entrepreneurs like me. Back then we wrestled with the problem of invasive lionfish, which had escaped aquaria to wreak havoc on Caribbean coral reefs, much as invasive sea lamprey caused mayhem in the Great Lakes.

McCormick's theory, given our species' insatiable hunger and naked self-interest: Adopt a laissez-faire approach that gives fishermen free reign to sell as many of each ocean troublemaker as they can catch, supply restaurants and markets with nutritious protein, and save marine ecosystems in the process. It's a lovely

strategy, beautiful in its simplicity. And the “devour our way out of the kelp forest crisis” strategy may indeed work here if it can align economic and ecological goals.

So, can the purple urchin's voracious appetite be contained by our own? Two Pacific relatives suggest a range of what's possible. Southward along the California coast, dozens of divers seeking red urchin's aka uni can harvest 100 to 10,000 pounds a day, earning \$1 to \$3 a pound in a volatile, nascent \$5 million fishery. In Hokkaido, Japan, the short-spine urchin fishery for premium bafun uni is a mature, \$100-million industry that supports

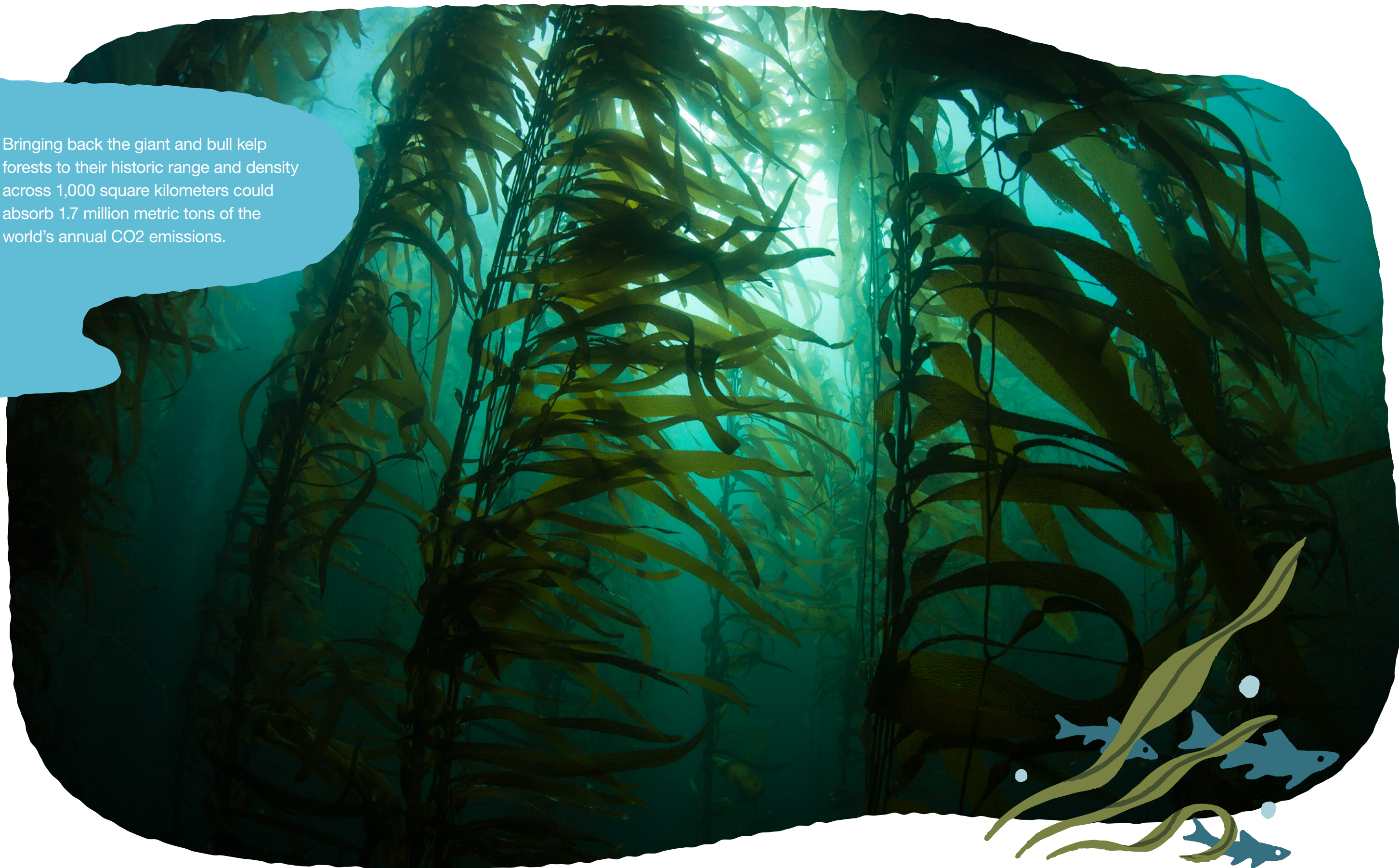
thousands of workers across fishing, processing, and distribution.

But the global supply from either fishery can't really grow due to finite range and habitat. By contrast, the current supply of purple urchin is virtually unlimited. Which raises the other market dynamic: potential demand.

Acquiring A Taste

For those raised on crispy Filet-o-Fish or canned Chicken of the Sea, this unusual seafood delicacy will be an acquired taste. But your fearless correspondent felt obliged to do his duty. While purple

Bringing back the giant and bull kelp forests to their historic range and density across 1,000 square kilometers could absorb 1.7 million metric tons of the world's annual CO2 emissions.





urchin was nowhere yet on nearby menus, I took my daughter to a sushi bar and ordered those two closest relatives—aka and bafun uni.

Once served, I procrastinated, then opened my mouth and closed my eyes and tried each one in turn on my tongue. With a buttery texture, bafun uni combines a mineral, briny sweetness with that fifth savory taste, umami. Aka uni is similar, only creamier. Both taste like the ocean. Try one and the lingering sensation makes it hard to settle for relatively bland California rolls again—if you can ignore uni’s hefty price tag.

Most can’t. But of course, that’s good news. If local demand is slow to

materialize for purple urchin’s smaller-sized uni and unfamiliar taste, appetites from Asia and indeed worldwide only keep swelling in what is already a wildly lucrative industry. Extracted and cleaned, high-grade fresh urchin gonads wholesale for \$125 per pound. High-end sushi bars can charge \$20 to \$40 for a dab of uni on a single piece of nigiri. The quest to satisfy human desire for that taste has already created a \$300- to \$500-million global market.

While currently undeveloped, a purple urchin fishery could compete for a sliver of that pie. But to become commercially viable, it needs a marketing makeover. Give it an eye-catching,

Japanese color-appropriate name: murasaki uni. Elevate it: a rare luxury harvested from California’s cleaner, colder northern waters. Stress unique health benefits: rich in heart-healthy omega-3 fatty acids and immune-boosting micronutrients. Virtue signal: order the only seafood that uniquely helps replenish pure ocean habitats.

Restaurants along the shoreline Highway 1 have started this effort, cultivating early adopters. For his Harbor House guests, executive chef Matthew Kammerer whips purple urchin gonads into custards, pasta sauces, and candied butter. Surrounding communities have launched the annual Mendocino Coast Purple Urchin Festival, with cooking demonstrations and events harnessing appetites on behalf of the majestic kelp forests they dub “Sequoias of the Sea.”

Such local, bottom-up activity is an essential start, but they’re still baby steps. A random weekend diver may drop off a bag of her afternoon’s harvest to a restaurant’s back door hours before opening. But skilled labor, harvesting from boats or shore, drives up marginal costs of bagging urchin, limiting the number of domestic buyers prepared to pay for it. Even when entrepreneurs dabble in purple urchin “ranching”—collecting, feeding, and fattening up big individuals in landlocked holding tanks—it does little for offshore kelp in the wild.

That’s why accelerating these efforts may require a combination of public and private investment on par with the sea otter’s \$43 million reintroduction expense. How can economies of scale take root, providing retailers and wholesalers with a safe, healthy, reliable, and transparent global supply chain that would extract enough purple urchins to restore the kelp forest ecosystem?

One approach is to keep eyes on the larger ecological outcome. A commercially viable murasaki uni fishery could generate hundreds of jobs and several million dollars in revenues for local coastal economies. And that ignores global

benefits. Bringing back the giant and bull kelp forests to their historic range and density across 1,000 square kilometers could absorb 1.7 million metric tons of the world’s annual CO2 emissions. California’s cap-and-trade program alone pays a conservative market price of \$40 per ton and rising. That means a fishery that harvests urchin to rebuild kelp beds could help generate another \$70 million—every year.

In sum, the potential gains—in money, animal protein, and climate stabilization—are massive. Yet reinserting our hungry and avaricious species into the equation raises the risk of excessive effort. On America’s other coastline, Maine offers a cautionary tale, where overharvesting urchins in the 1980s and ‘90s to meet global uni demand brought about that fishery’s collapse. The once

complex and self-regulating marine ecosystem flipped into the opposite simplified seascape—overly dense kelp patrolled by hungry lobster and Jonah crabs, making it impossible for urchins to ever come back. How can the Pacific avoid the Atlantic’s fate?

To answer, we might draw on lessons from other Pacific Coast sources of seafood—whiting, groundfish, halibut, black cod, pollock, king crab—that have transitioned to rights-based fishery management, a collaborative system known as “catch shares.” In each case, public and private stakeholders set clear conservation and community goals (e.g., restore kelp forests, generate a local seafood exports economy), define the fishery’s scope (purple urchin), allocate quota (with set asides for coastal fishers or Native tribes and concentration limits

to prevent market dominance), determine science-based catch limits (harvesting enough uni to generate profits while avoiding urchin collapse), establish secure and exclusive access rights for participants (not permanent, but long-term enough to trade quota and attract investors), and create strong accountability measures (transparent tracking, tracing, and monitoring) to ensure compliance.

The advantage of such a system is that it is flexible and versatile. It spells out in advance the rights, risks, responsibilities, and rewards for all relevant stakeholders. In the case of purple urchins, for example, a bonus benefit for all stakeholders invested in the urchin catch share could be carbon credits captured through expansion of kelp forest to its earlier expanse, earned and paid in perpetuity. And while the design would involve federal oversight to establish caps by applying objective scientific research, the process would ensure long-term certainty, ownership, and economic incentives for local communities, which builds trust from below.

It’s not about bashing urchins with hammers as an enemy, or offshoring responsibility for reducing emissions to charismatic sea otters. It’s about harnessing our appetite and ingenuity to bring balance back to the Pacific’s underwater old-growth forests. By creating the right incentives—turning a prickly pest into a prized delicacy—we can align market forces, local communities, and conservation efforts to restore the majestic kelp forests. It’s a strategy rooted in resilience, driven by a simple truth, wisely noted by my mentor Bobby all those years ago: When nature is on the menu, we all have a stake in the outcome.

James Workman is an author and entrepreneur working in natural resource conservation markets and an alum of PERC’s Enviropreneur Institute. He is co-author, with Amanda Leland, of the forthcoming book *Sea Change: The Fishermen’s Quiet Revolution to Restore Life Offshore—and On*.





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RECLAIMING THE FOREST

How local control is helping restore tribal forests

BY TODD MYERS

The Quinault Indian Reservation covers more than 200,000 acres on Washington’s Olympic Peninsula in some of the best timber land in the world. And yet, by the 1970s, after more than a half-century of timber harvests overseen by the U.S. Bureau of Indian Affairs, very little timber was growing on large portions of the tribal land.

Today, the forestland looks much different. Second-growth forests are returning. Riparian zones and other sensitive areas are protected. And a tribe-approved forest management plan now ensures that the reservation’s forests are managed more holistically, balancing revenue generation for all reservation landowners with long-term conservation. The story of how this change occurred offers a lesson in the power of local control, incentives, and accountability to improve the stewardship of natural resources for both conservation and sustainable timber production.

For decades, the Bureau of Indian Affairs’ forestry guidelines, written in Washington D.C., focused on maximizing timber production—but with little regard for the long-term sustainability of the forest and revenues from it. A history of the Quinault Indians noted that in the early part of the 20th century, the bureau had “decreed that its agents did not need to practice sustained yield, i.e. remove slash and encourage a second growth” on much of the reservation because it would be expensive; natural regrowth and decay would be adequate. “When the BIA was largely employing non-Indians from the East Coast,” President of the Intertribal Timber Council Cody Desautel explains, “they were focused on timber production.” Future regeneration and non-harvest values were not part of the equation.

As a result, the BIA's federal managers left large amounts of timber slash on the ground after a harvest, leaving little space for natural regrowth. Additionally, western redcedar, once the predominant species in the reservation's forests, contains a chemical that inhibits decay of the wood. So rather than decomposing, the slash choked out potential regrowth. While the problem was apparent to those who lived and worked on the reservation, the BIA's guidelines didn't consider these unique circumstances, and agency administrators had little incentive to modify the rules.

Frustrated by the bureau's economic and environmental management of Quinault forests, the tribe initiated a process that, decades later, put them in control of their own forest

stewardship. "The mismanagement of the forests basically spurred self-governance," says James Plampin, a forester for the Quinault Indian Nation. "Quinault was one of the first."

The process of transferring responsibility for forestry on the reservation started with the tribe requesting changes in how the bureau managed the forests. As late as the 1970s, the BIA did not even know how much timber there was on the reservation. The last inventory had been completed between 1915 and 1917. Additionally, while the BIA provided basic guidelines, it didn't have a detailed forest management plan.

In 1976, the tribe began addressing these shortcomings when Congress allocated funding to create a pilot Quinault tribal forestry program. Initially, the program worked alongside



In addition to generating revenue from timber harvests, the Quinault forest management plan aims to "conserve or improve habitat for fish and wildlife," and promote "cultural values by providing access to and conservation of traditionally used forest resources and land."

the BIA, focusing on activities the bureau had neglected. One of the first priorities was to clear the heavy slash to allow for replanting. The tribe began a program to salvage down wood and use controlled burns to clear the land. The tribe had also started a seed orchard in 1977 to provide healthy, local stock to use in replanting.

Over the years, the Quinault used revenue from harvests on tribally owned land to increase tribal ownership of land within the reservation. The tribe currently owns slightly less than half of reservation land. The remainder of the land is split between private ownership and "allottees," members of Quinault Indian Nation and other tribes who own land on the reservation.

The tribe also wrote forest management plans and created forest practice rules, best management practices, and a sustainable harvest plan. It also developed a robust program of commercial timber harvest. And in 2016, the tribe took responsibility from the BIA for all harvests on reservation trust lands. The difference in incentives and accountability was pronounced.

"We are modeled like private industry where we are doing very active forestry," says Plampin. "We have our [best management practices]. We are protecting streams. We are protecting water quality. We reforest after harvesting."

The tribe's 10-year forest management plan guides its harvest activity. The existing plan expires in 2027, and the tribe is updating the rules based on feedback from reservation residents. "The next two years we will poll the business committee and the allottees for any issues or concerns," Plampin adds. "Are we protecting fish? Are we protecting enough?"

Many factors contributed to the change in forest practices during the half-century since the tribe launched its forestry program. Forestry science has certainly improved. There has also been a broader societal change in the type of forest management supported by the public.

"The mismanagement of the forests basically spurred self-governance. Quinault was one of the first."

—James Plampin, a forester for the Quinault Indian Nation

The most meaningful change, however, was placing more control and accountability in the hands of the tribe. Local foresters who knew the ground and were accountable to the tribal government and landowners played a leading role in changing how reservation forests were managed.

Compared to far-off bureaucrats who lack deep ties to the reservation, tribal authorities are more likely to reflect the priorities of tribal members and adjust to changing information. The BIA's goals for forest management were very different from those of the Quinault tribal government and other landowners. In addition to generating revenue from timber harvests, the Quinault forest management plan aims to "conserve or improve habitat for fish and wildlife," and promote "cultural values by providing access to and conservation of traditionally used forest resources and land."

The bureau had not required its foresters to complete environmental assessments before each timber harvest. However, when the tribe took responsibility from the BIA, the agency immediately required the tribe to complete an assessment before the agency approved timber harvests. As annoying as that double standard was to the tribe, it demonstrates the role that institutional arrangements play in how natural resources are managed. When the bureau was responsible for the costs of

“To the ecologist, it is a laboratory; to the conservationist, a priceless treasure; to the timberman, a waste; to the hiker, a test; to the logger, a challenge; to the camper, the prototypical soother; and to the sports fisher, unrivaled catches. To the Indian people it is all these things and more: it is a reminder of what their ancestors knew.”

—Pauline Capoeman, Quinault historian



complying with the environmental assessments, they weren't a priority. Once those responsibilities were shifted to the tribe, bureau staff decided they were necessary.

Research worldwide suggests that the Quinault's experience of benefiting from local governance is not unique. A recent review of 169 studies on conservation governance found that local decision making, often by Indigenous populations, was more likely to achieve the goals of conservation projects. The authors wrote that “most studies presenting positive outcomes for both well-being and conservation come from cases where Indigenous peoples and local communities play a central role.” In contrast, projects controlled by outside organizations that attempt to override customary practices “tend to result in relatively ineffective conservation at the same time as producing negative social outcomes,” they noted.

That process is clear on the Quinault reservation. Including input and knowledge of tribal foresters not only reduced the conflict between the BIA and tribal members, but it also put reservation forests on a path to generate sustainable revenue and increase non-timber values.

As Quinault historian Pauline Capoeman put it in her history of the tribe, the reservation's forests embody a wide range of values. “To the ecologist, it is a laboratory; to the conservationist, a priceless treasure; to the timberman, a waste; to the hiker, a test; to the logger, a challenge; to the camper, the prototypical soother; and to the sports fisher, unrivaled catches. To the Indian people it is all these things and more: it is a reminder of what their ancestors knew.”

Balancing those values will always be a challenge. But working with residents, foresters, tribal government, natural resources staff, and other stakeholders, the Quinault Indian Nation is well-positioned to sustainably manage its forests, ensuring both economic and cultural benefits for future generations.



Todd Myers is the vice president of research at the Washington Policy Center. His latest book is *Time to Think Small: How Nimble Environmental Technologies Can Solve the Planet's Biggest Problems* (2022).

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Olympic Gridlock

Rethinking how we fund national parks can improve your next visit

At Washington's Olympic National Park, snow-capped peaks tower over a landscape teeming with diverse wildlife, from mountain goats and Roosevelt elk to gray whales and sea urchins. The mountains give way to temperate rainforests that sprawl toward rugged cliffs overlooking the rocky coastline. A drive up Hurricane Ridge or a hike through the Hoh Rain Forest can leave you awestruck by the park's natural wonders.

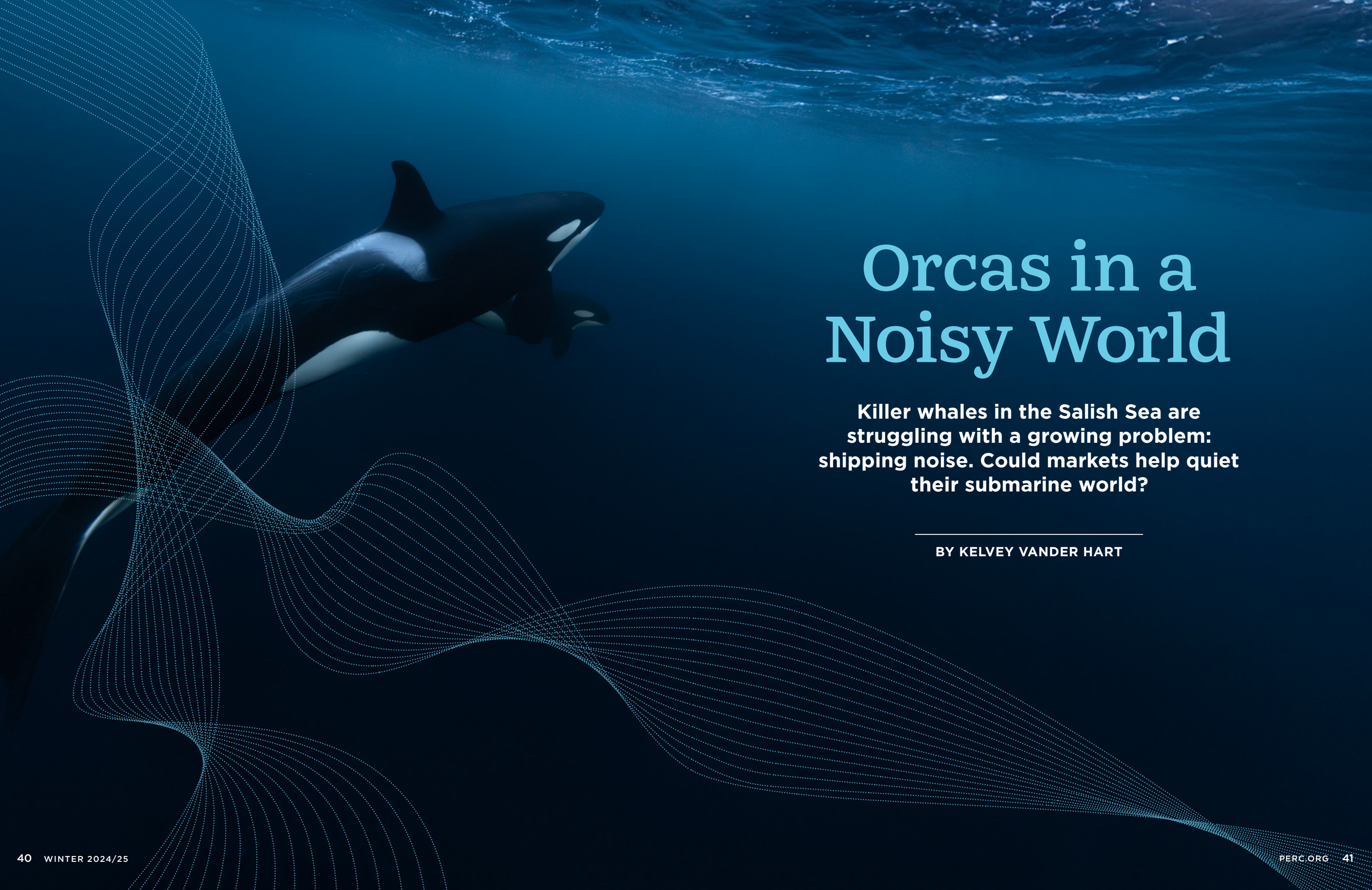
Of course, that's assuming you can get past the front gate. There, it's become common for would-be visitors to sit idling in a line of traffic 30 cars deep for hours before being granted entry. With crowds overwhelming the most popular areas, park managers have instituted a "one-in, one-out" visitor policy. A recent afternoon visit revealed an estimated wait time of three hours to the Hoh Rain Forest, with overflowing trash cans and portable toilets serving as the only amenities in sight. Is this the best we can do for America's best idea? Not by a long shot, thankfully.

In response to booming visitation, several parks have instituted inventive practices to improve visitor experience. Whether it's a reservation system in Glacier that's easing congestion on its famous Going-to-the-Sun Road or an infrastructure upgrade in Zion to better facilitate visitor flow at the park's south entrance, creative thinking is helping several parks keep pace with their popularity.

These types of improvements, however, require innovative funding solutions as well. PERC's new report, "A Path Forward for America's Best Idea: Lessons Learned for Our National Parks From the Great American Outdoors Act," outlines recommendations to enhance the Interior Department's stewardship of America's treasures by rethinking how to tackle the maintenance backlog, implementing smarter approaches to user fees, and charting a more defined path for the parks' long-term financial health. Learn more at perc.org/parks.

By Kat Dwyer





Orcas in a Noisy World

Killer whales in the Salish Sea are struggling with a growing problem: shipping noise. Could markets help quiet their submarine world?

BY KELVEY VANDER HART

The Salish Sea is a wild place. Stretching between Washington and British Columbia and extending to meet the Pacific Ocean, it is one of the largest inland seas in the world. And it teems with life—more than 3,000 species live in and around the sea.

I boarded the *Glacier Spirit* on a balmy summer day this year to spot some species that call the Salish Sea home. After sailing for a bit, I stood shoulder-to-shoulder with fellow wildlife enthusiasts as we stared across the Strait of Juan de Fuca at Vancouver Island. Filling the water between our drifting ship and the shore was a glorious sight: whales.

It was one of the most remarkable things I have ever witnessed on the ocean or land. Humpback whales surrounded our ship, surfacing, breathing, and diving in what could be mistaken for a choreographed dance. We counted at least 15 individuals, and there was nowhere to look without catching a glimpse of a spout breaking the surface or a flash of a whale tail.

Yet, as we started our slow trek back to port, something was still missing from the day's adventure. I continued to scan the horizon for what I knew lurked beneath the waves: orcas.

The presence of orcas in the Salish Sea extends beyond what humans have documented, with much of our earliest knowledge coming from tribal legend. Coastal Native American tribes referred to the creatures as "blackfish," a nod to their black-and-white coloring, and many tribes consider the animals



The Salish Sea

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British Columbia

Washington

Pacific Ocean

Salish Sea

US-Canada Border

Olympic Peninsula

Olympia

Seattle

Strait of Juan de Fuca

Vancouver Island

Victoria

Vancouver



sacred. Orcas have certainly earned their legendary status. They are massive creatures, growing to lengths of more than 30 feet, and can weigh up to 11 tons. Wild orcas can live incredibly long lives, with many living past 50 and some even as long as 80 years or more.

But lately, the orca population here, known as the Southern Residents, hasn't been doing so well. Declining salmon numbers have played a role, as adequate food resources are critically important. Increased marine pollution, both in terms of chemicals and debris, means these orcas are also at risk of ingesting plastic, absorbing toxic chemicals, or becoming entangled in fishing gear. But one specific factor has become especially worrisome for this infamous orca population: noise from shipping vessels.

Masters of the Deep

It isn't just their long lives or massive size that make orcas extraordinary. It's their status on the food chain. Orcas are found in every ocean on the globe and are the top predator wherever

they swim. While diets vary from pod to pod, orcas as a species have been documented consuming everything from blue whales to great white sharks to sea lions. Technically, orcas are the largest dolphin species, but their fearsome behavior as ravenous predators has earned them their "killer whale" nickname.

"They're the apex predators of the ocean, just pure power," mused Rachel Rodell, the *Glacier Spirit's* onboard naturalist. "They're exactly perfect for what they're here to do and for this environment. We just get to observe."

Puget Sound Express, the family-owned business that runs the *Glacier Spirit*, is just one of the many wildlife tour operators out on the sea. Wildlife enthusiasts flock to the area, and tourism is big business in the region. Many animal lovers like me come specifically hoping to glimpse one of the Southern Resident killer whales, some of the most famous orcas in the world.

Most Americans first came to know about orcas by seeing captured ones displayed at aquariums and marine parks or highlighted on film. Orca captures in the Pacific Northwest began in earnest in the 1960s, and many of the victims were

Southern Residents. These captures continued until Washington state policymakers adopted legislation in 1971 implementing the first protections for orcas in American waters. Then, in 1972, Congress passed the Marine Mammal Protection Act, effectively ending orca captures. At the time, 71 Southern Resident orcas remained in the Salish Sea.

Orca research also began in earnest in the mid-20th century, and Southern Residents quickly became the most studied population on the planet. Through this research, the world learned that Southern Residents stick to a rotation of seasonal ranges, usually form large family groups, and are smaller compared to other orca ecotypes, such as the transient population of so-called "Bigg's orcas" that also frequent the Salish Sea. Residents are also often found close to shore, making them easily spotted from the coastline.

Bigg's killer whales and Southern Resident killer whales may share the same sea at times, but that's about the only thing they have in common. Transients are nomadic, tend to travel in small groups, and typically grow bigger than their resident



Increased shipping causes problems because sound does not travel underwater like in the air—it travels faster, for longer distances, and at louder volumes. For animals that rely on hearing more than sight, including orcas, loud noise is a constant irritant.



cousins. A critical difference between the two ecotypes, however, is prey. Transients are mammal eaters; they traverse the Pacific Northwest coast hunting seals, sea lions, porpoises, and other mammals, but they eat no fish. Residents, on the other hand, eat Chinook salmon almost exclusively—and are highly reliant on sound because they use echolocation to hunt.

While other orca populations that had individuals taken during the captures of the 1960s have recovered, Southern Resident numbers are still lagging. Their population peaked in 1995 when nearly 100 individuals were documented in the Salish Sea, but numbers have since declined. Residents are the only orca ecotype listed as endangered under the Endangered Species Act. As of October 2024, only 73 documented individuals remained in the Salish Sea.

One reason resident orca numbers have plateaued is the difficulty of keeping calves alive. In 2018, the world heard the heartbreaking story of Tahlequah, a resident orca who swam more than 1,000 miles carrying the body of her dead calf. But Tahlequah is far from the only resident to have lost a calf. Michael Weiss, research director of the Center for Whale Research, estimates that half of the calves born to Southern Residents do not survive to see adulthood.

A Noisy Sea

Sailing through the Strait of Juan de Fuca may not guarantee any orca sightings, but it will ensure you see plenty of ships. During the afternoon I spent aboard the *Glacier Spirit*, we spotted every vessel you could imagine: other wildlife watchers,

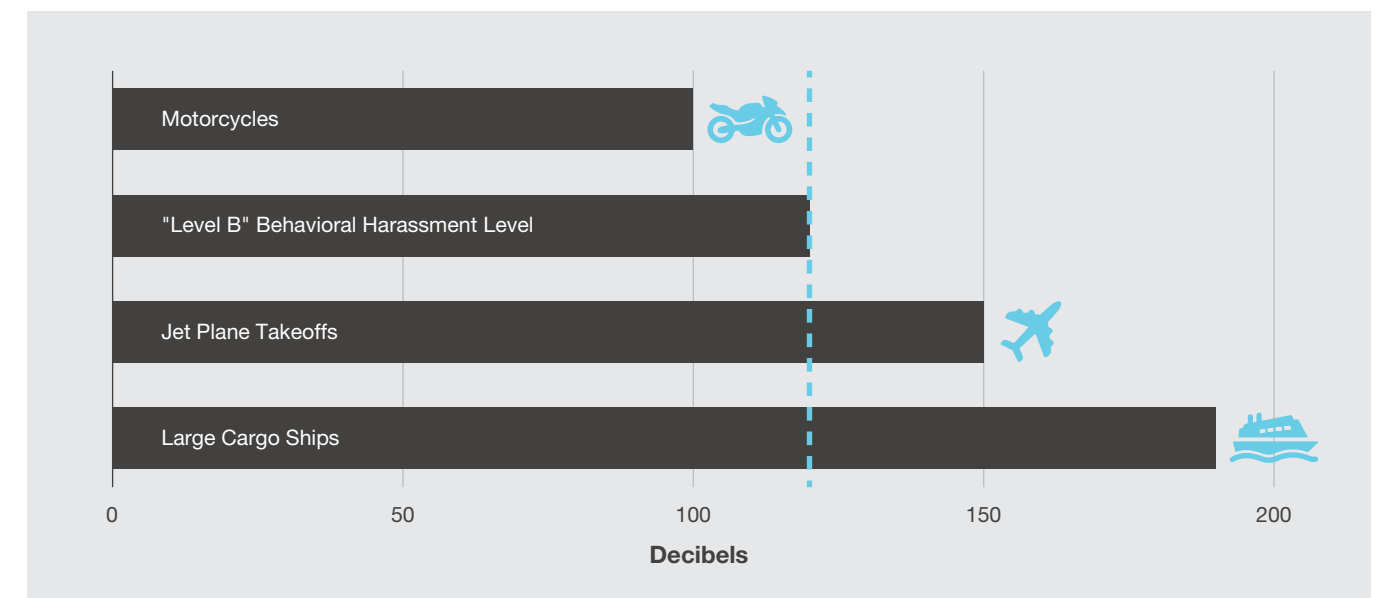
fishing boats, cruise liners, ferries, and even small military boats accompanying a massive nuclear submarine. But nothing stood out as much as the large industrial ships.

The first Salish Sea shipping ports were established in the 1800s. Like much of the rest of the world, the sea saw an uptick in commercial shipping beginning in the 1990s. A decade of trade liberalization resulted in freer markets and increased imports from nations like China. Global shipped cargo nearly tripled from 1990 to 2021, growing from 4 billion tons to nearly 11 billion tons. With more shipping came an increase in marine noise pollution, something that economist M. Scott Taylor has been studying for several years.

Taylor is a prominent economist at the University of Calgary known for his work on the environmental impacts of trade. Over his career, Taylor has used detailed empirical data and advanced economic modeling to analyze the environmental consequences of economic growth, especially in contexts where trade-driven resource use affects ecosystems. His work spans a range of topics, including the effects of globalization on wildlife populations. Recently, Taylor has turned his attention to the plight of the Southern Resident orcas, studying how shipping traffic in the Salish Sea has intensified noise pollution.

To examine how increased shipping noise might affect the Southern Residents, Taylor has assembled extensive datasets of vessel traffic in and through the Salish Sea. “I find that booming trade with Asia, post-1998, created a huge increase in vessel kilometers traveled” in critical habitat areas for the Southern Resident killer whales, Taylor explains. According to

Noise Emission Levels



his research, kilometers traveled by commercial shipping vessels increased by more than a third in the two decades after 1998 compared to the two decades before that year. While the Salish Sea already sees thousands of annual commercial ship transits, shipping traffic is expected to grow significantly again in the coming years, thanks partly to several major fossil fuel projects that will begin exporting their products.

Increased shipping causes problems because sound does not travel underwater like in the air—it travels faster, for longer distances, and at louder volumes. For animals that rely on hearing more than sight, including orcas, loud noise is a constant irritant. The Marine Mammal Protection Act designates continuous noise near an orca at 120 decibels or more as “Level B” behavioral harassment, and violations can result in fines, jail time, or vessel forfeiture. For perspective, large cargo ships can emit up to about 190 decibels of noise, even louder than a plane taking off.

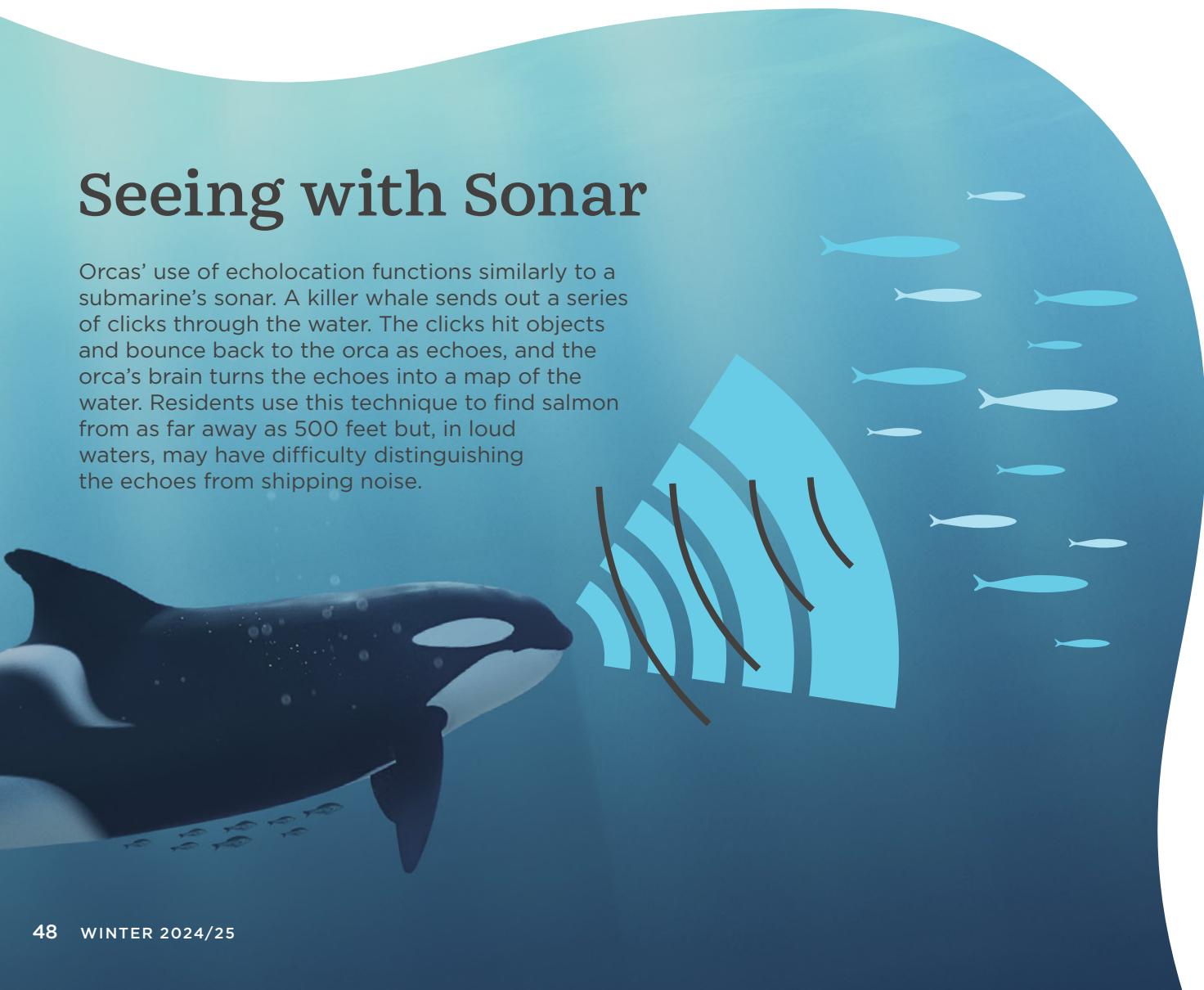
But if Southern Resident orcas swim in the same noisy waters as transient orcas, why is one group struggling while the other thrives? When I asked Rodell, the naturalist on my wildlife-watching tour, she agreed with other experts who have pointed out that it might come down to hunting methods.

“Transient orcas are hunting by stealth,” she explained. “They’re really not talking to each other because other marine mammals will hear them coming. Residents are much more chatty as they use their echolocation as a hunting tool.”

Orcas’ use of echolocation functions similarly to a submarine’s sonar. A killer whale sends out a series of clicks through the water. The clicks hit objects and bounce back to the orca as echoes, and the orca’s brain turns the echoes into a map of the water. Residents use this technique to find salmon from as far away as 500 feet but, in loud waters, may have difficulty distinguishing the echoes from shipping noise.

Seeing with Sonar

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Taylor says that while an abundant supply of salmon is critical, it’s not the key factor affecting resident orcas today. Chinook salmon populations have risen and fallen over the past several decades, yet there was no similar rise and fall in Southern Resident populations during the same period. “My estimates show that while more salmon helps,” says Taylor, “the increase in salmon needed to offset the negative impacts of increased noise is just too large to be credible. Salmon stocks would have to rise to levels not seen in the last 50 or 60 years, and this is just not going to happen.”

Instead, Taylor’s initial research seems to indicate that increased shipping noise has directly contributed to a drop in the Southern Resident population. With the Southern Resident population peaking in 1995 and global shipping traffic growing since the 1990s, the data show that resident orca numbers have fallen as increased shipping has made the waters noisier over the past two decades.

While there is plenty of focus on dwindling salmon populations, not as much attention has been placed on solving the problem of marine noise pollution, leaving a path wide open for the development of innovative solutions. In a forthcoming report to be published by PERC, Taylor argues that there is a win-win option for both resident orcas and the shipping industry: a market for tradeable shipping-vessel noise pollution permits.

Quieting the Ocean

Under Taylor’s proposal, noise pollution permits would effectively establish an upper limit on allowable sound emitted from shipping vessels in the Salish Sea and function similarly to carbon cap-and-trade programs. Regulators would allocate a specific number of permits based on this limit. Part of establishing a permit program would be developing a structure to measure units of sound—something Taylor has spent years creating in rigorous detail. Large commercial ships create more noise than small boats, but even when it comes to large vessels, the type, design, and age of a ship’s technology significantly changes its noise emissions. Establishing a way of estimating sound output based on the size, speed, hull shape, ship load, and propulsion system is essential for an effective and functioning noise permit market.

Taylor recognizes that a system of noise permits might look similar to a tax on noise, but he notes a key difference. “With a pollution tax, the government sets the price, but the quantity bought is not under their control,” he says. “With the permit system, the government controls the number of permits issued but not their price.”

Open and competitive auctions would allow individual market participants, not the government, to determine permit prices. Permits would also be tradeable. If one shipping company did not use all of its permits and another needed more, they could arrange a private transfer and set the price

By placing a value on silence and allowing the market to innovate, we can maintain a thriving shipping industry while creating a quieter ocean for orcas.

without government intervention. Making permit sales open to the public could also allow conservationists to buy permits and then hold rather than use them.

“The beauty of these systems,” Taylor says, “is that they incentivize shipping firms to choose quieter vessels, to perhaps lower speeds, alter ship length, switch out noisy ships for quieter ones, and investigate more thoroughly methods to reduce propeller cavitation”—the process that causes noise. “The basic idea is that firms and the private market are the best place to figure out how to reduce noise at the lowest cost. Imposing a speed limit or a rule saying you needed to have this or that technology will likely be inferior and more costly.”

Many of the solutions for marine noise pollution proposed by orca advocacy groups would require regulatory intervention and negatively impact the shipping industry. However, innovative research like Taylor’s shows that policymakers do not need to sacrifice commerce for conservation. Market-based solutions can reduce noise without unduly hampering shipping, and Taylor is collaborating with PERC to further explore the potential for noise permits to help conserve orcas.

Smoother Seas Ahead

A new Southern Resident calf was first spotted in mid-September, a rare and hopeful sight. As a new member of the so-called L-pod, the calf should be a cause for celebration. Yet, by late October, reports indicated that the young orca was emaciated and struggling to breathe, a stark reminder of the challenges that remain.

If nothing changes, Southern Resident numbers will continue to drop. The demise of Southern Resident orcas would be a tragedy for the wildlife tourism industry, animal lovers, and the Salish Sea’s natural and cultural heritage. Yet, there is a different path forward—one that aligns economic activity with conservation. By placing a value on silence and allowing the market to innovate, we can maintain a thriving shipping industry while creating a quieter ocean for orcas.



Kelvey Vander Hart is a senior fellow at the Wilberforce Institute, a think tank dedicated to market-based solutions for animal welfare. She writes about ocean conservation and marine life at *The Saltwater Chronicles* and market-based environmentalism everywhere else.



MEET THE NEW NEIGHBORS

Living with grizzlies requires working with landowners

The grizzly bear is an iconic symbol of America's wildlife. The creatures are massive (adult males can weigh up to 600 pounds), shockingly fast (they can sprint at speeds of up to 40 mph), and can be deathly dangerous for anyone unlucky enough to startle one in the woods. Terrifying statistics aside, the bear also represents some of the best of America—a rugged, wild, and impressive creature, unique in its power and revered for its strength. After being hunted to near extinction in the 19th and early 20th centuries, grizzly populations today are rebounding.

Unsurprisingly, a U.S. Fish and Wildlife Service plan to reintroduce the

ferocious bear into Washington's North Cascades has been met with mixed emotions. Some conservationists and wildlife advocates cheer on the idea, noting that reintroduction would help solidify the bear's recovery by expanding its current range to more of its historical territory.

Others view reintroduction differently. Rural ranchers and farmers recognize the potential for conflict. From livestock loss to the threat of human mauling or death, living among grizzlies comes at a real cost. Reintroduction, therefore, can be tricky.

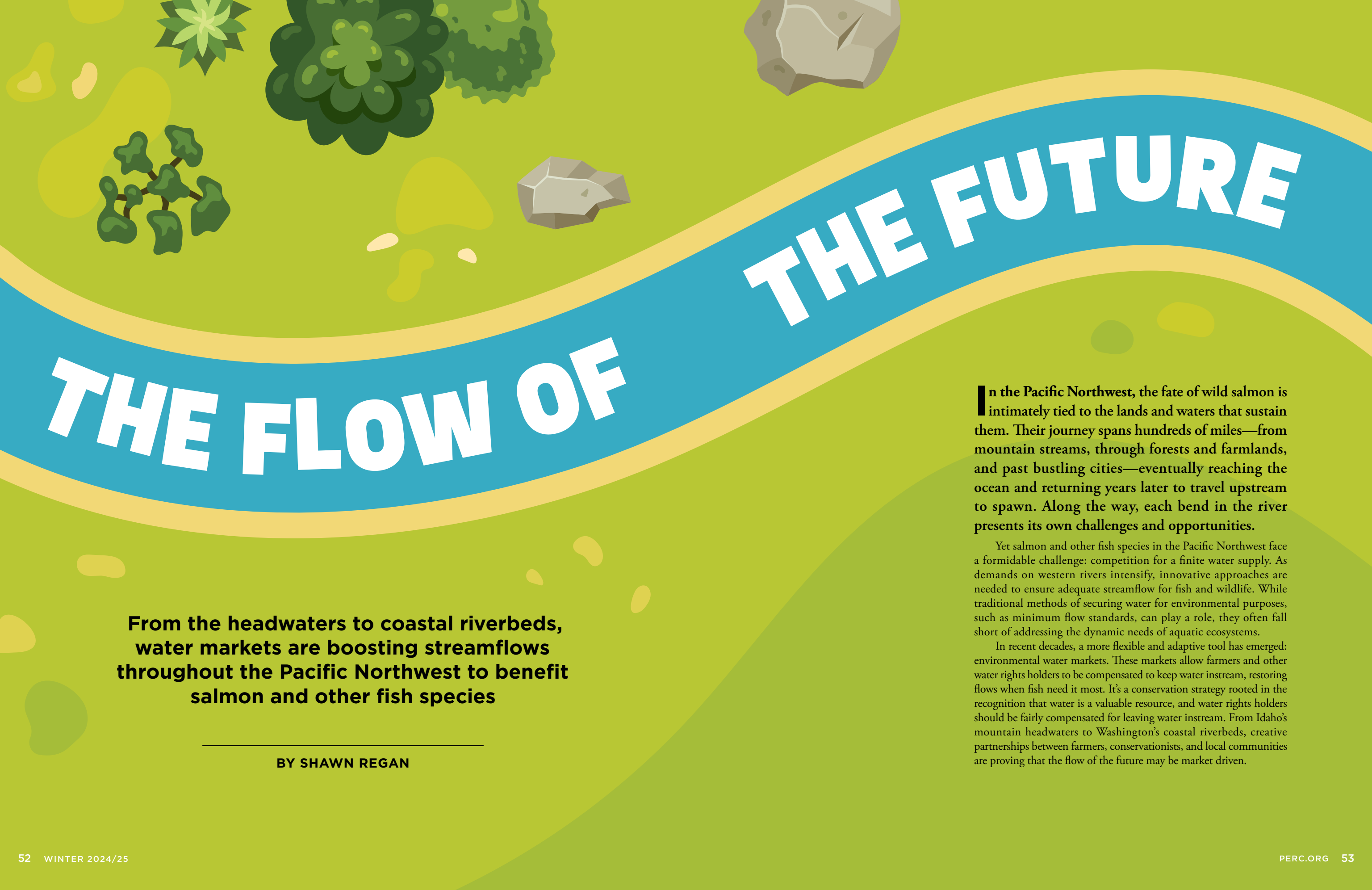
To successfully reintroduce grizzly bears to the North Cascades, limiting human-wildlife conflict must be a priority. The landowners and communities who will bear the costs of living with grizzlies should be viewed as partners and considered in the Fish and Wildlife Service's management decisions.

Two ways for the agency to take a cooperative approach would be to focus

reintroduction and recovery on federal lands and limit regulations the species would trigger on private lands. Likewise, regulations should adapt as the new population grows and its range expands. Additionally, compensating landowners for any losses they experience can and potentially increase wildlife tolerance among locals. Conservation organizations are well poised to be partners in a compensation program, essentially paying for the conservation outcomes they would like to see.

Ultimately, successful wildlife recovery depends on making imperiled species assets, rather than liabilities, to the communities that have the greatest influence on their long-term survival. Grizzly bear reintroduction should follow this ethos, aiming for both the bear and its human neighbors to thrive, side by side.

By Kat Dwyer



THE FLOW OF THE FUTURE

From the headwaters to coastal riverbeds, water markets are boosting streamflows throughout the Pacific Northwest to benefit salmon and other fish species

BY SHAWN REGAN

In the Pacific Northwest, the fate of wild salmon is intimately tied to the lands and waters that sustain them. Their journey spans hundreds of miles—from mountain streams, through forests and farmlands, and past bustling cities—eventually reaching the ocean and returning years later to travel upstream to spawn. Along the way, each bend in the river presents its own challenges and opportunities.

Yet salmon and other fish species in the Pacific Northwest face a formidable challenge: competition for a finite water supply. As demands on western rivers intensify, innovative approaches are needed to ensure adequate streamflow for fish and wildlife. While traditional methods of securing water for environmental purposes, such as minimum flow standards, can play a role, they often fall short of addressing the dynamic needs of aquatic ecosystems.

In recent decades, a more flexible and adaptive tool has emerged: environmental water markets. These markets allow farmers and other water rights holders to be compensated to keep water instream, restoring flows when fish need it most. It's a conservation strategy rooted in the recognition that water is a valuable resource, and water rights holders should be fairly compensated for leaving water instream. From Idaho's mountain headwaters to Washington's coastal riverbeds, creative partnerships between farmers, conservationists, and local communities are proving that the flow of the future may be market driven.

Upper Teton River Basin

BUY THAT FISH A DRINK

In the American West, water rights are largely governed by the prior appropriation doctrine, a system rooted in the region's arid history. This doctrine operates on a simple but rigid principle: "first in time, first in right." In other words, the earliest users of a water source have priority access, even in times of drought, as long as they put that water to a "beneficial use" such as irrigation or municipal supply. If water goes unused, the right can be forfeited or deemed abandoned.

Historically, leaving water in streams to support fish and wildlife was not recognized as a beneficial use. Over the past few decades, however, states across the West have developed new policies to allow water rights to be leased or transferred to instream purposes. These legal innovations have paved the way for environmental water markets, through which conservation groups can buy or lease water rights to boost streamflows at crucial times.

In the Pacific Northwest, such markets are unlocking creative opportunities to protect salmon, steelhead, and other aquatic species, enhancing habitats from high-mountain tributaries to coastal riverbeds. By compensating users for leaving water in the river, these approaches align economic incentives with ecological needs, helping sustain the lifeblood of the region's iconic waterways.



FROM FARMS TO FISH

In the high elevations of eastern Idaho, the Teton River's headwaters are the lifeblood for farms, local communities, and the fish and wildlife that call the valley home.

For generations, farmers in Teton Valley practiced flood irrigation, channeling water from streams and ditches to spread across their fields. This method, while seemingly inefficient, had an unintended benefit: As flood-irrigated water slowly seeped into the ground, it replenished the valley's aquifer, feeding the Teton River with a steady supply of cool water during the dry summer months.

But times have changed. In recent decades, farmers have switched to more efficient irrigation systems, like sprinklers, that deliver water directly to plants' roots, minimizing water loss. This shift, however, has come at a cost: Less water seeps into the ground, leading to lower aquifer levels and, ultimately, diminished streamflows to the river.

This shift in irrigation practices has had a ripple effect on the Teton River's aquatic ecosystem, particularly for native Yellowstone cutthroat trout, which depend on cold, oxygen-rich waters. Reduced flows have shrunk their habitat, making the trout more vulnerable to predators, disease, and rising temperatures.

Recognizing the interconnectedness of farming and fish, Friends of the Teton River, a local conservation organization, has partnered with local farmers, paying them to flood irrigate their fields during the spring, when water from snowmelt is plentiful. By doing so, farmers help replenish the aquifer, slowing down water and keeping river flows more consistent throughout the drier months.

"We need to sink that water up here in the highlands, as close to the mountains as we can," says Wyatt Penfold, a Teton Valley farmer. "Disperse it out, slow it down, and then it's there for everybody, even as far as Washington and the salmon."

Building on the success of an initial pilot project, local partners are now developing a market to encourage more aquifer recharge in the valley. By bringing together conservation groups and others who benefit from higher streamflows, this emerging market could be a model for other headwater basins, offering a win-win approach for both farms and fish.

Bend,
Oregon



TRADING WATER, SAVING SALMON

Flowing through central Oregon, the Deschutes River is renowned for its stunning beauty and world-class fisheries. Yet water diversions for agriculture and other uses have led to streamflow declines, particularly during the crucial summer months when native fish species like redband trout and steelhead are most vulnerable.

To tackle these challenges, conservation groups in the region have developed a suite of water market tools that allow farmers to temporarily or permanently lease water rights back to the river. At the heart of these efforts is the Deschutes River Conservancy, a nonprofit group that has been restoring flows and enhancing water quality since 1996. The conservancy has united a diverse coalition—including local farmers, environmental advocates, and tribes—focused on finding practical ways to restore streamflows and improve water quality.

The conservancy's approach includes a mix of flexible water leasing options. Temporary instream leases allow water rights holders to dedicate their water to the river for a season or two, while forbearance agreements compensate farmers who voluntarily refrain from diverting water during peak stress periods. These short-term solutions are complemented by permanent transfers, where water rights are retired from agricultural use and legally protected for instream flows.

This layered toolkit provides a wide range of options. Genevieve Huber, the conservancy's senior program manager, credits the group's success to patience, many meetings, building trust, and "lots of coffee." That perseverance has paid off: Over the past two decades, the conservancy and its partners have restored over 300 cubic feet per second of flow to the basin's rivers and streams.

These increased summer flows provide cooler, more oxygenated water, which are vital for the survival of young salmon and steelhead. The Deschutes River Conservancy's approach serves as a model for how water markets can bridge the gap between agricultural needs and ecological health, highlighting a path forward for regions grappling with similar challenges of water scarcity and conservation.



©Dan DeLuca

FINDING FLOWS FOR FISH SURVIVAL

Across Oregon and Washington, conservation groups are using innovative market tools to support salmon populations facing pressure from low flows, rising temperatures, and competing demands.

The Freshwater Trust, based in Oregon, takes a focused approach to water conservation in the region. Using advanced analytics and satellite monitoring, the trust identifies when and where additional streamflows can yield the most benefit for fish and aquatic habitats. Their data-driven strategy includes real-time information and predictive modeling to ensure that every action has the maximum ecological return. This precision allows them to identify critical areas within the river system that suffer from low flows and high temperatures.

Since 1993, the Freshwater Trust has partnered with more than 200 landowners across Oregon to implement a diverse set of solutions, including short-term leases, permanent transfers, split-season leases, and a variety of other flow restoration projects. Collectively, these efforts have restored between 98 and 163 million gallons per minute each irrigation season, significantly boosting flows during critical months for salmon and steelhead.

Meanwhile, the Washington Water Trust is using creative leasing mechanisms to enhance streamflows, particularly during drought years. One standout example is their reverse auction program on the Dungeness River in northwestern Washington. During critically dry seasons, the trust invites irrigators to submit bids on how much compensation they'd need to leave portions of their land unwatered for the season. Bids are evaluated based on the seniority of water rights, proximity to key habitat areas, and the cost-effectiveness of the flow restoration.

The results are encouraging. The water trust has helped boost streamflows in the Dungeness River in drought years, providing critical support for salmon and steelhead during their migration and spawning seasons. These increased flows have improved habitat conditions, helping to stabilize fish populations and support the river's overall ecosystem.

Together, these organizations demonstrate how flexible, market-based strategies can adapt to the complex and variable needs of water users. By aligning incentives, The Freshwater Trust and Washington Water Trust are making a tangible difference in restoring flows and creating a more resilient future for both fish and people.

Oregon &
Washington

Columbia River Basin

STREAMS OF CHANGE

As the Columbia River winds its way toward the Pacific Ocean, it plays a vital role in the life cycle of salmon. These waters serve as migration corridors and nursery grounds for young fish preparing for life in the ocean, as well as pathways for adult salmon traveling upstream to spawn. Decades of habitat degradation, altered flows, and development have made this journey increasingly treacherous.

For decades, the nonprofit Wild Salmon Center has worked to protect and enhance riparian zones and floodplains throughout key watersheds in the Columbia Basin. Their projects aim to reconnect wetlands, remove barriers to fish passage, and restore tidal estuaries. By doing so, the group provides salmon with areas to feed and grow, helping bolster their chances of survival.

Such efforts extend beyond habitat restoration. The organization has also been a leader in modernizing water laws to enable innovative, market-based solutions. One recent notable success is the advancement of Oregon's split-season leasing program, which allows irrigators to allocate water for crops in early summer and leave it instream later in the season, when flows are most needed for fish.

These programs have the potential to benefit both farmers and fish. Take, for example, Tony Malmberg, a rancher from eastern Oregon who draws water from Catherine Creek—a critical nursery for spring Chinook salmon. In early summer, Malmberg's alfalfa thrives with minimal irrigation, but later in the season, he knows the creek needs water to protect salmon. Through a split-season lease with the Freshwater Trust, Malmberg is compensated for voluntarily leaving late-summer water in the creek rather than using it for a final, low-yield hay crop. "The hot season is when the water's highest value is staying instream for salmon and river function," Malmberg recently told the Oregon Legislature.

In 2023, the program was made permanent, marking a win for both farmers and fish. By driving these reforms, groups like the Wild Salmon Center, Freshwater Trust, and other creative conservationists are laying the foundation for water market strategies that balance agricultural demands with the needs of the region's iconic salmon populations.



THE FLOW FORWARD

The Pacific Northwest's rivers and the salmon that call them home face significant challenges, but innovative water market solutions offer a promising path forward. From the high mountain headwaters to the tidal estuaries, creative collaborations are proving that conservation and economic interests don't have to be at odds. By harnessing the power of markets, the region is advancing new strategies to cooperatively resolve competing demands over scarce water supplies. If these efforts continue to expand, the flow of the future may truly be one that benefits people, wildlife, and communities.



Shawn Regan is the vice president of research at PERC and executive editor of *PERC Reports*.



FOREST FLIGHT



©Oregon Department of Forestry

When litigation pays better than conservation

BY JONATHAN WOOD

Northeast of Coos Bay lies the 80,000-acre Elliott State Forest, Oregon's oldest state forest. Because of the area's steep slopes, it has not been harvested as intensely over the last century as many other forests in the Pacific Northwest. As a result, the forest has a mix of old-growth and second-growth trees that provide habitat for a variety of rare species, including the northern spotted owl and marbled murrelet, a small seabird that nests in forests.

But the forest was not established for environmental reasons. Instead, its existence is due to the federal government granting Oregon lands at statehood to support public schools, as it did for other western states. These parcels—known as state trust lands—came with an important string attached: They must be used exclusively for the benefit of schools, including to generate revenue to cover educational expenses. In 1930, the state consolidated its dispersed state trust parcels through an exchange with the federal government, creating the Elliott State Forest, subject to the same limitation. Over time, the forest generated nearly \$300 million to support schools.

Oregon has changed much since the 1930s. Public demand has grown for conservation and outdoor recreation, supporting an ascendant environmental movement. These environmental values repeatedly came into conflict with the state's duty to manage the Elliott to generate revenue for schools, which it did by selling timber. Environmental groups responded with lobbying campaigns demanding restrictive management plans for the forest and with lawsuits to block logging.



©Brett Lovelace

Marbled murrelets are seabirds that nest in Elliott State Forest.

Environmentalists claimed to value the land far more than the timber industry did...so all that was needed was a mechanism for environmentalists to compensate the school trust fund to conserve the land.

The forest eventually went from an asset supporting public schools to a liability. It generated a \$3 million loss in 2013, with the state predicting continued losses into the future. To cover those shortfalls, the state announced plans in 2013 to begin selling off the forest. As one might expect, many environmentalists objected to this also, fearing that the land would be purchased by timber companies and intensively logged. They lobbied against the sale and threatened lawsuits against the state.

The Path Not Taken

It should have been relatively easy to resolve this conflict. The State of Oregon was obligated to do whatever would most benefit public schools. Environmentalists claimed to value the land far more than the timber industry did. And those claims were credible, considering the forest's unique wildlife and environmental values as well as the resources those groups had put into lobbying and litigation to influence how the forest was managed. So all that was needed was a mechanism for environmentalists to compensate the school trust fund to conserve the land.

Oregon offered that opportunity by putting part of the forest, three parcels totaling nearly 3,000 acres, up for sale to the highest bidder. The state invited bids from anyone, not just timber companies. Its press releases promoting the sale specifically solicited bids from environmentalists, noting that "buyers of all types, including conservation buyers, are encouraged to bid on the properties." In making that pitch, Oregon was following the lead of other states that had used conservation land sales or leases to resolve similar conflicts over state trust lands.

No such bid would come in. Rather than offering to buy the land, environmental groups chose conflict. They surveyed the land for endangered and threatened species, hoping to identify potential regulatory headaches that might discourage timber companies from bidding. Such efforts were successful. The discovery of threatened marbled murrelets in the forest in 2014 reduced the state's asking price from \$22 million to a mere \$3.5 million, a change environmentalists later criticized as a giveaway to industry despite their role in causing the price drop.

Environmental groups also issued public threats against any prospective purchasers. Cascadia Forest Defenders, an activist group, sent a letter to logging companies. "Do not bid on these sales," they warned. "If you become the owner of the Elliott, you will have activists up your trees and lawsuits on your desk. We will be at your office and in your mills. ... We will never stop this fight." Less confrontational groups merely threatened to sue the state and anyone who purchased the land, hoping to block the sale or any future logging.

Ultimately, the three parcels were sold to timber companies for \$4.5 million, money the state used to cover its losses from the remaining land in the Elliott while it worked on a plan for the rest of the forest.

Costly Conflict

Of course, that wasn't the end of the story. In 2016, a trio of environmental groups—Cascadia Wildlands, Center for Biological Diversity, and Portland Audubon—sued Scott Timber Co., the purchaser of one of the parcels known as the Benson Ridge tract. They alleged that the company's plan to harvest trees on 50 of the parcel's 355 acres would harm marbled murrelets and required an Endangered Species Act permit. The groups sought an injunction against logging those acres until the company acquired the permit.

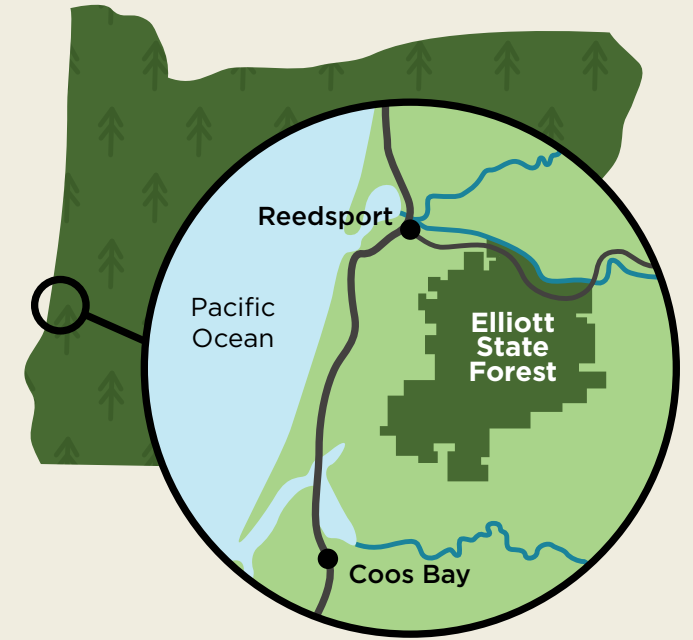
While the case is still pending, the environmental groups have been successful so far. They secured an injunction, which has been upheld on appeal. As a result, the company will have to get a federal permit before logging that part of the parcel. On its face, this seems like a clear win for the environmental cause. But that headline is belied by the details. The decision may be less of a win than it seems, and it was extremely costly.

While it will take substantial time and money, the logging company is almost certain to get a permit. If the federal government refuses to allow any economic use of the land, it would be constitutionally obligated to compensate the landowner for the unregulated value of the land. For that reason, permit requests are almost never denied entirely. Instead, the federal government uses the permit process to extract modest changes to an activity or mitigation for its effects, although this too is subject to constitutional restrictions on how much the agency can ask for.

The probable outcome of the case is that the timber company will, in exchange for a permit, not harvest trees during the marbled murrelet's nesting season, forgo harvesting part of the land, or improve habitat elsewhere. That outcome would be better for murrelets than unrestricted logging, to be sure, but inferior to the permanent habitat conservation that could have been achieved if environmentalists had purchased the land outright.

Nor did that win come without a cost. In 2022, at the conclusion of the trial phase of the case, the three environmental groups filed a motion reporting nearly \$1.2 million in attorney's fees to that point. The case has since been appealed and, while the groups have not yet reported their costs for that phase of the case, it would not be surprising if the attorney costs have doubled.

This presents a puzzle. The Benson Ridge tract sold for a mere \$787,000, or a little more than \$2,000 per acre. Given the option to buy and permanently conserve the land at that price, why would anyone spend roughly twelve times as much—\$24,000 per acre—on litigation over a part of the parcel that, even if it succeeds, will merely force the landowner to get a permit? From a conservation perspective, this makes no sense. But it is, in fact, an understandable response to the incentives created by federal law, which heavily subsidizes litigation and unintentionally puts a thumb on the scale against other conservation approaches.



"Do not bid on these sales. If you become the owner of the Elliott, you will have activists up your trees and lawsuits on your desk. We will be at your office and in your mills... We will never stop this fight."

—A letter to logging companies from Cascadia Forest Defenders

Subsidizing Suits

The Endangered Species Act, like several other environmental laws, authorizes "citizen suits" through which virtually anyone can enforce the statute against the federal government, states, or private parties. Providing a right to sue, however, doesn't mean that anyone will exercise it, especially where doing so is expensive. So when Congress passed the act, it provided that the prevailing party can demand that the losing side pay its costs, including attorney's fees, a practice known as "fee-shifting."

Courts can award attorney's fees under the Endangered Species Act whenever they deem it "appropriate." In practice, fees are awarded whenever a party "substantially prevails" and achieves some benefit through the litigation. In theory, either side of a lawsuit could seek attorney's fees under this provision. But the vast majority of fee awards are to plaintiffs, and courts have adopted heightened standards for defendants seeking fees.

At first blush, it might seem like this arrangement shouldn't encourage litigation that much. Groups seemingly still bear the costs of cases that they lose and are merely made whole for those that they win. But that's not how it works in practice. The amount of fees awarded is almost always far more than necessary to reimburse a prevailing plaintiff. When courts award fees, they do not look at the actual amounts paid to the attorneys in the case. Instead, they set a hypothetical hourly rate for each attorney and then multiply that rate by the number of hours each attorney reported working on the case. In theory, this method could equate to the actual costs to litigate the case, if the hourly rate selected by the court matches the rate the attorney actually charged. But that will rarely happen in practice. Instead, court-set fees usually exceed the rate the party would pay if they lost the case.

The environmental groups that brought the Benson Ridge case, for instance, assert hourly rates ranging from \$140 an hour (for the work of a law student intern) to \$650 an hour (for an attorney with 30 years of experience). An experienced attorney at a nonprofit organization will often make somewhere between \$100,000 and \$200,000, which equates to an hourly cost to the organization of \$50 to \$100. Assuming the court accepts the rates asserted, as most do, the work of a law student intern will be compensated at a rate higher than virtually all senior nonprofit environmental attorneys are actually paid.

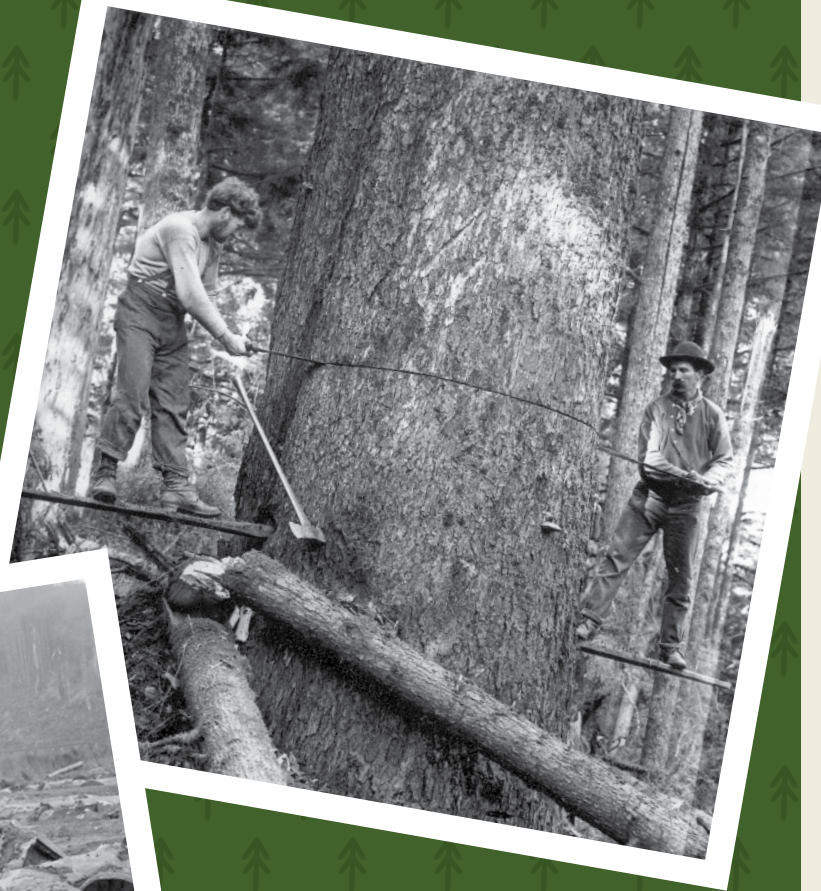
Some of the attorneys involved in the Benson Ridge case are employed by their organizations, rather than working for outside firms. Public financial forms show that one of the attorneys involved in the case makes less than \$125,000. This translates to an hourly rate of less than \$62.50. The rate for that attorney asserted in the Benson Ridge case, however, is \$515 an hour, which represents at least a 700 percent profit margin for the organization whenever it can recover for the employee's time in an attorney's fee award.

None of this is meant to criticize the particular organizations and attorneys involved in that case. They are simply responding to the incentives that policy creates. The point, instead, is that the way attorney's fees are calculated, they often do not simply make litigious groups whole but lavishly reward them for bringing Endangered Species Act cases.

Whatever the (Opportunity) Cost

With that background, it's easier to see why a group would choose to litigate over the Elliott State Forest rather than to purchase it and permanently conserve the habitat. If the groups had bid and won the parcel, they would have secured a huge conservation win but would have been on the hook for the purchase price. If the conservation value of the parcel far exceeded the purchase price, a group would presumably pursue that option. But if the conservation value and the purchase price are reasonably close, such that the group is

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almost indifferent between purchasing the property or not, it might look for other options to pursue its goals.

While litigation initially seems like a poor alternative, considering the reduced conservation benefit and high costs, the prospect of attorneys' fees can change this calculus substantially. Litigation could result in the worst possible outcome—spending several hundred thousand dollars for no conservation benefit. But it could also offer the best outcome. If the case succeeds, the group can secure a conservation benefit, albeit a more modest benefit than could be achieved from purchasing the land, while also generating a windfall.

Under current policy, the choice faced by the environmental groups in the Elliott State Forest case was not in fact to spend \$787,000 to permanently conserve 355 acres of habitat or spend \$1.2 million litigating over a permit. Instead, the litigation calculus was something closer to purchase the land or litigate and lose \$150,000 if the case fails or make more than \$1 million on net if it succeeds.

In such a circumstance, a group should choose litigation even if the odds of success are only 50/50, so long as the difference in value of the conservation outcome between the two options is less than \$450,000. If the odds of success are greater, the group will favor litigation even if the difference between the conservation value it can achieve and what could be achieved through other strategies is far greater.

The Endangered Species Act has famously been described as demanding species protection "whatever the cost." We might think of the law's attorneys' fees provision as favoring litigation whatever the opportunity cost. Under it, little or no consideration is given to the extent to which a lawsuit produces real-world benefit or the alternative ways a group could have achieved the same or more conservation benefit. The result is a heavy thumb on the scale in favor of litigation—so heavy that it can induce groups to favor litigation even in the face of a cost-effective way to secure a bigger conservation win by other means.

In the end, the scales are tipped in favor of conflict, not necessarily what's best for species conservation. If we truly care about conserving places like the Elliott State Forest, it's time to ask: Should we be subsidizing litigation this heavily, especially at the expense of more direct and cost-effective conservation approaches?



Jonathan Wood is the vice president of law and policy at PERC.

Whose Wild Fish Is It Anyway?

Lessons from the commercial and recreational rivalries in the Gulf of Mexico could benefit Pacific Northwest fisheries

BY JAMES WORKMAN



VANCOUVER, WASH.—In the waters of the Pacific Northwest, the challenges that divide commercial and recreational fishers mirror decades old rivalries that have played out in the Gulf of Mexico. There, the two sectors—each with their own political clout—have battled fiercely over a long-overfished prize: red snapper. Worth more than a quarter-billion dollars, the snapper fishery raises deceptively simple questions among harvesters and anglers alike: Is it a food source, or a game species? And who gets to reel in how many, from where, and when?



Up and down the West Coast, from California to Alaska, similar conflicts are increasingly arising over valuable species like salmon and halibut and groundfish. And once again, both sides feel entitled to a larger slice of the ocean's bounty. Like the red snapper wars in the Gulf, the stakes in the Pacific Northwest go beyond who gets the bigger haul—they touch on the very meaning of conservation, responsibility, and how we balance competing human interests with the health of the ecosystem.

Both commercial and recreational fishers like to cast themselves as stewards of the sea. But beneath the surface, the competition for limited resources strains that shared identity. When you spend your days on a charter boat helping folks catch a fish big enough to tell stories about, it's easy to feel the water stretching endless around you, full of promise. The vastness of the ocean tricks you into thinking no single rod

and reel can make a dent in it. But up here, as in the Gulf, the truth is something harder to reckon with: The combined pressure from millions of rods and reels takes a toll, especially when those reels are targeting the most valuable, most fertile adults in the population.

In the Pacific Northwest, fish like salmon and halibut hold the same mythic status that red snapper and grouper do in the Gulf. These are the species that carry stories with them, not just for fishers, but for the cultures and communities tied to them. For Indigenous nations of the Pacific, fish in particular are more than a catch—they're part of the cultural fabric. Yet, like in the Gulf, commercial fishers depend on the stocks for their livelihood, just as sport fishers crave the thrill of reeling in a monster catch for their freezer or wall. The more they're chased, the more the competition heats up, and the more each side feels like they're losing out.



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What stands out in the Pacific Northwest is the scope and complexity of the conflict. Quite often, the competition isn't just between commercial harvesters and sport fishers—it also includes treaties with Indigenous tribes that enshrine fishing rights, as well as environmentalists fighting overfishing in the age of habitat destruction, damming, and climate change. So, how do you manage a resource that so many feel they have a claim to, a resource that stretches across political boundaries, tribal jurisdictions, and international waters? The answer, as the Gulf experience suggests, might lie in systems like catch shares.

Catch shares offer a way out of the “derby” madness, where fishers race against the clock and each other to catch as much as possible before the (shrinking) season closes. This system, already showing its value with halibut in Alaska and spreading through fisheries along the Pacific Coast, assigns specific portions of the total allowable catch to individuals or groups. When fishers know what their share is, they're no longer racing, no longer risking life and limb to beat the competition. They can focus on quality over quantity, on fishing smarter rather than harder, and on keeping the resource healthy so that there's more to fish tomorrow. It's a method that's helped rebuild fish stocks in the Gulf—after more than a half century of rapid decline from overfishing, catch shares brought about a dramatic recovery in snapper populations—and could help reconcile tensions over fisheries here.

But it's not just about the system; it's about the data. Up here, where fish migrations stretch across vast and rugged terrain, good data is critical. Just as Gulf captains turned to smartphones and tech solutions like iAngler to track recreational catches, Pacific Northwest fisheries could benefit from similar innovations. After all, if you're going to

manage an invisible resource, which may depend on freshwater ecosystems as much as the ocean itself, you need to know how many fish are coming out of rivers, and how many get caught before they ever get the chance to spawn.

Technology offers hope in this regard. In the Gulf, recreational anglers are already logging their catches in real-time, giving scientists the data they need to make more informed management decisions. Imagine that same system applied in the Pacific Northwest, where every fish caught by a recreational angler is logged and tracked. Instead of just counting on rough dockside surveys, fishery managers would have a real-time snapshot of what's coming out of the water and what's going back in.

Still, the biggest hurdle to overcome, whether in the Gulf or the Pacific, is the mindset of the participants themselves, and their associations. Most fishers, whether commercial or recreational, want the same thing—a healthy, thriving ocean that can sustain them for generations to come. But getting to that point requires more than good intentions. It requires collaboration and compromise, something that's been hard to come by in the past, but is slowly starting to take hold, especially as more fishers realize that the old ways just don't work anymore.

In the Pacific Northwest, as in the Gulf, it's not enough to just let everyone fend for themselves. Species like lingcod or halibut need real stewardship, and that means putting in place systems that hold everyone accountable, from the guy catching two salmon on his weekend trip to the commercial vessels hauling in hundreds of pounds at a time. It means breaking down the walls between commercial and recreational fishers, between state and federal regulations, and even between nations when the fish cross borders as easily as the currents carry them.


As the story of red snapper in the Gulf has shown, there's hope for recovery. But it takes work. It takes commercial fishers who once fought tooth and nail against any regulation but now work within the system to keep the resource sustainable. And it takes recreational anglers who've learned to see beyond their personal catch to the bigger picture of what it means to have dominion over the fish of the sea.

Along the Pacific Coast, where the stakes are just as high, the solutions may well follow the same path—a shared dominion, where the ocean's bounty is managed for the good of all, not just the lucky few who get to reel in the biggest fish.



James Workman is an author and entrepreneur working in natural resource conservation markets and an alum of PERC's Enviropreneur Institute. He is co-author, with Amanda Leland, of the forthcoming book *Sea Change: The Fishermen's Quiet Revolution to Restore Life Offshore—and On*.



A high-angle photograph of a rugged coastline. On the left, a steep cliffside is covered in a dense forest of tall evergreen trees. A narrow, winding path of water flows down the cliff face, eventually emptying into a larger body of water. In the center, a large rock formation features a natural archway. To the right, another rocky outcrop is topped with a cluster of evergreen trees. The ocean extends to the horizon under a pale, overcast sky. Several large, dark rock formations are scattered in the water.

"The landscape of the Pacific Northwest seems to breathe with an ancient, primordial energy—part wilderness, part mystery."

—David Guterson

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