Winter 2018

The Planet, 2018, Winter

Keiko Betcher
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THE PLANET

CONSERVATION ISSUE WINTER 2018

DEAR READER,

Earlier today some colleagues and I were considering the idea of ditching The Planet's printed magazine. The medium of the future, after all, is pixels on computer screens and sound frequencies from an ear bud. And besides, it would be more environmentally friendly. The idea didn't last long because, ironically, we couldn't sacrifice our precious, antiquated medium: paper.

So it had me thinking: As an environmental publication, should we make the switch from print to pixel? Or can we share stories that raise awareness about environmental issues while also providing a tangible testament to how resources we love can be used sustainably? Do we understand how much we can take from the environment without degrading it?

This issue is an effort to find the answers to those questions. Speaking of paper, we'll take you to a timber town trying to rebuild itself after the deadliest landslide in U.S. history. We'll explore an alternative to open-water fish farming. We'll search the Puget Sound for the endangered Olympia oyster. We'll look at how much energy indoor marijuana growing operations are using.

Maybe one day The Planet will make the switch. The sweet, warehouse-fresh smell of ink will no longer fill the halls when the magazines arrive. But even if we did give up our precious paper*, asking the rest of the world to make sacrifices for the sake of the environment is difficult. Hopefully these stories suggest that it's not always necessary, so long as we know where to draw the line.

To a printed magazine and a healthy planet,

Keiko Betcher
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THE PLANET MAGAZINE is the quarterly student publication of Western Washington University's Huxley College of the Environment. We are dedicated to environmental advocacy through responsible journalism.

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ON THE COVER

On a rainy January afternoon, low clouds obscured the hills during my drive to Darrington, Washington. The weather didn't promise much of a photo opportunity, but when I arrived at the lumber mill the clouds dissipated enough to reveal a stunning view of old trees, new trees and fresh-cut lumber against a backdrop of North Mountain, dusted with snow.

PHOTOGRAPH BY NICK PINKHAM

SAVING CORAL

STORY BY **EMILY MCLAUGHLIN**
PHOTOS BY **ILANA NEWMAN**

The wind howled as the sun sank below the horizon along the Oregon coast. On a cold October evening, Sean Hill walked along the beach in the diminishing light. He noticed a figure in the sand. A few steps closer, he realized it was a sea turtle.

"I could tell it was stranded and in distress," Hill recounted.

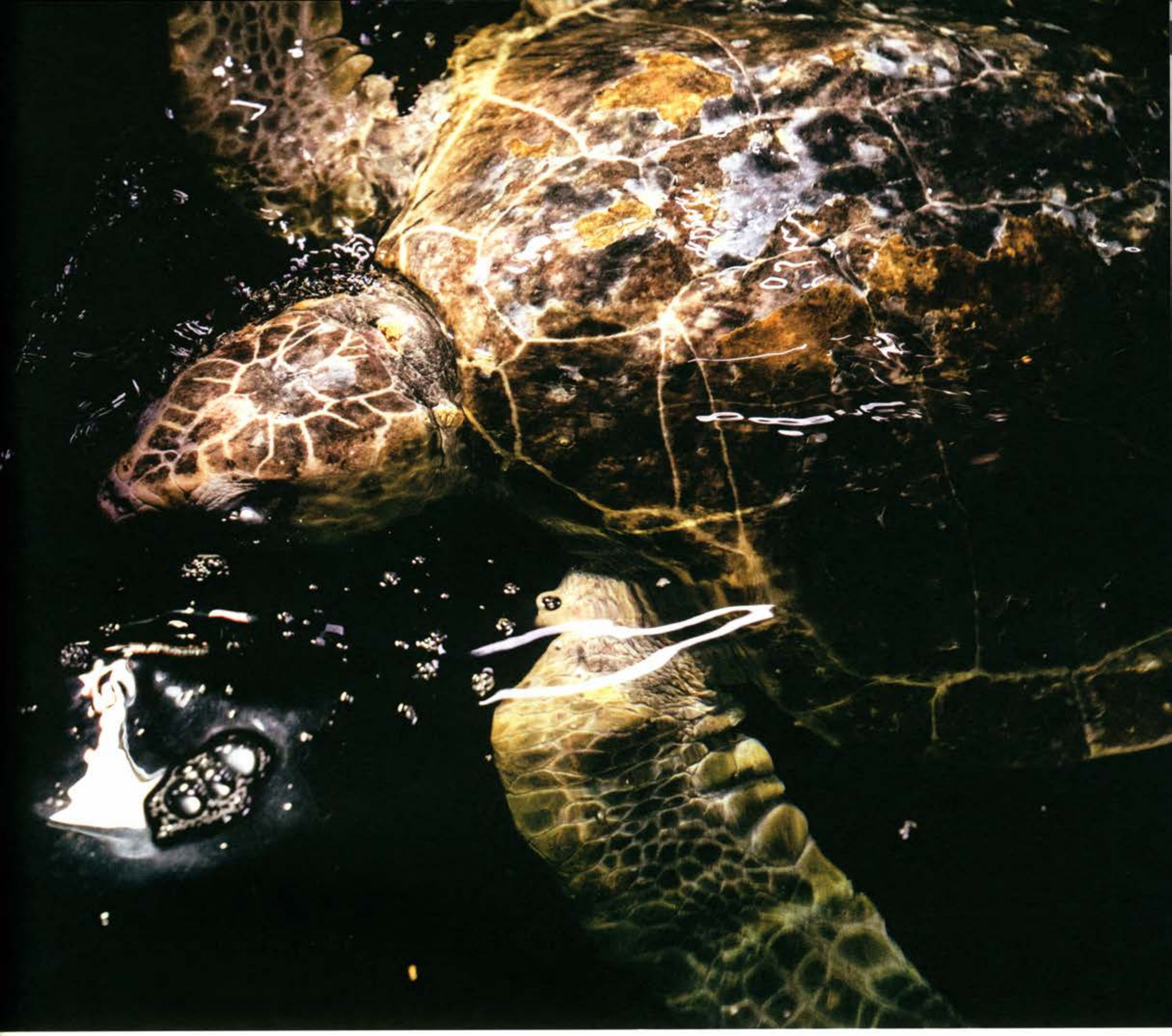
He quickly called the Marine Mammal Stranding Network. Returning to the beach in the dark, a team of four people, including Hill and his wife, Adrianna Lee-Hill, scoured the area where he first saw the turtle. Hours passed and the situation was looking grim. They started to believe the turtle had simply floated back out into the Pacific. One volunteer recommended looking at the GPS data on Hill's phone to determine the exact location the turtle was spotted. That is how they found the nearly lifeless sea turtle.

The volunteers lifted the turtle from the ground together and put her in a car for transport. Lee-Hill remembers the turtle repeatedly lifting her head. It wasn't until later, at the Seattle Aquarium, when they learned it was because she couldn't breathe.

Coral, an olive ridley sea turtle, floats in a tank at the Seattle Aquarium. She was rescued off the Oregon coast in October.

CORAL, THE FEMALE olive ridley sea turtle, was found stranded along the Oregon coast in late October of 2017. She was suffering from cold-stunning, the hypothermic reaction sea turtles experience when exposed to cold water for long periods of time. Olive ridley sea turtles play an important ecological role, yet the species faces many threats. Coral was lucky to survive.

In the Seattle Aquarium, a foreigner to the waters of the Pacific Northwest floated behind a door marked "employees only." After her rescue, Coral was transported here to receive immediate treatment. She spent her days splashing around in a large, black tub the size of a jacuzzi, surrounded by room partitioners to minimize disturbance. If the dividers were



moved out of the way, Coral would be able see the Pacific Ocean through a tiny window.

When aquariums in the Pacific Northwest don't have enough room to rehabilitate a new turtle, the Seattle Aquarium steps in as a sea turtle emergency room. They address life-threatening ailments, then send the turtle to a long-term rehabilitation center to finish treatment.

Without immediate action after cold-stunning, a turtle's immune and digestive systems may shut down. If untreated, their motor skills eventually deteriorate, forcing them to float around aimlessly, bumping into random objects, and potentially injuring them more in the process.

"By the time they are found, nothing is really working," explained Dr. Caitlin Hadfield, senior veterinarian at the Seattle Aquarium.

Coral was emaciated when she first arrived at the Seattle Aquarium, which is typical for a cold-stun. But what happened next was not typical. She stopped breathing altogether. The rescue team at the aquarium went into action, ventilating and helping her breathe for the next seven hours.

"That's actually the first time I've had a turtle do that on me," Hadfield said.

Eventually, Coral started breathing on her own, but after this close call, someone had to watch Coral 24 hours a day. While the rest of the city was sleeping, a dedicated group of individuals kept the turtle alive.

"We didn't know from one minute to the next whether or not she would make it," said Amy Olsen, a member of the team caring for Coral.

Coral's daily care routine started with checking water temperature and circulation. Staff disinfected the water regularly and made sure the air temperature was just right for her. The staff routinely checked on Coral to observe her breathing and swimming patterns. Her team fed her and delivered antibiotics as she fought off remaining infections.

"That sounds like a lot," Hadfield said. But Coral spent most of the day alone to reduce stress as much as possible, she said.

While olive ridleys are the most common species of turtle in the Pacific, they are still listed as "vulnerable" on the International Union

for Conservation of Nature's species list. Many of the threats facing these turtles are due to human impacts, such as hunting, fishing and plastics, Hadfield said. They nest along the Pacific coast of the Americas, from Central Mexico down to Ecuador. Unlike other species of sea turtles, olive ridleys are nomadic.

"Once an adult leaves the beach after nesting, she'll kind of passively drift," said Jeffrey Seminoff, leader of the Marine Turtle Ecology and Assessment Program at the National Oceanic and Atmospheric Administration Southwest Fisheries Science Center.

The Pacific Northwest, however, is out of the olive ridley's range. At the end of the warm season, some turtles get trapped in currents that can leave them stranded in northern latitudes.

"They get caught in cold water and then just start floating around, like some object, and not a living creature," Seminoff said. This is most likely what happened to Coral before she washed up on the Oregon coast, he said.

Before Coral nearly lost her life, she played an important ecological role in the ocean. Olive ridleys provide a mini-ecosystem, Seminoff explained. Crabs, algae, barnacles, crustaceans and clams live on the shells of ridleys, while fish swim next to them for protection in the open ocean. When ridleys come to shore, the eggs they lay provide nutrients that promote vegetation growth and add a food source for many other animals. Sea turtles eat seagrass, small fish and sponges, fulfilling a niche in the marine food web.

"THEY GET CAUGHT IN COLD WATER AND THEN JUST START FLOATING AROUND, LIKE SOME OBJECT, AND NOT A LIVING CREATURE."

- JEFFREY SEMINOFF, *LEADER OF THE MARINE TURTLE ECOLOGY AND ASSESSMENT PROGRAM AT THE NOAA SOUTHWEST FISHERIES SCIENCE CENTER*

"Sea turtles are a species that make up a part of the marine ecosystem that can't be filled by another animal," Olsen said.

In late January, Coral was loaded into a U.S. Coast Guard C-27J Spartan plane with her core team and military personnel. She was flying to SeaWorld in San Diego, California, for the final stage in her rehabilitation. Unlike her previous enclosure, Coral's outdoor habitat is larger and sunnier, giving her more room to stretch out her fins and gain strength for her release back into the Pacific Ocean.

If you ever stumble upon a stranded sea turtle, call The Marine Mammal Stranding Network at 866-755-NOAA (6622).

EMILY MCLAUGHLIN is an environmental policy major at Western Washington University. She has a passion for the earth and all of its inhabitants.

ILANA NEWMAN is a Fairhaven student studying photojournalism, outdoor recreation and environmental education. She spends most of her free time outside taking photos, climbing rocks and exploring.

Dr. Hadfield demonstrates the equipment used to care for Coral. The area around Coral's enclosure is kept dark and separated from the rest of the room to keep her calm.

Light pollution in northwest Washington is at its lowest over the mountains in the North Cascades, such as Mount Shuksan.

LET THERE BE NIGHT

STORY BY **COLIN MURPHY**
PHOTOS BY **NICK PINKHAM**

Flashback to 1979. Stephen Pauley and his family navigate their sailboat through the Pacific Ocean without the help of a GPS.

"I had to use a sextant to navigate, so that meant learning the stars," Pauley said. "I obviously saw the beautiful skies over the ocean."

He would later move to rural Idaho in the mid-80s where the night sky was dark and pristine. But as the years went by, he noticed the radiance of the stars begin to dim.

"It seemed to get worse and worse one light at a time, which is how it all starts," Pauley said.

ABOVE: *Table Mountain from Mount Baker Ski Area. The glow of light pollution from the southwest reduces visibility along the horizon.*

THE POLLUTION OF water, air and land have been in the limelight for decades, but light pollution remains in the dark. In the remote and undeveloped landscape of Idaho's Sawtooth Mountains lies one of the last few places in the United States where a truly dark sky is visible. This earned it designation as an International Dark Sky Reserve by the International Dark Sky Association (IDA) in 2017. The area owes its success to individuals like Pauley, who helped write the first lighting policy in the area to curb the effects of artificial light at night. The designation is the first of its kind in the U.S. and marks an important milestone for the IDA and the dark sky movement.

The association has been the authority on light pollution around the world since it was founded in 1988 by David Crawford and Tim Hunter, both passionate astronomers. Many people in the dark sky movement are amateur or professional astronomers but the association and related grassroots groups are trying to reach a wider audience.

"At our roots, we are an educational group predominantly aimed at and for young people," said Dave Ingram, the chairman for the northwest chapter of the IDA. "We have to have the help of the older adults. We have to have their attention, and their money and their time; but it's all for the next generation."

When working for the IDA, Ingram spends 90 percent of his time combating light pollution with people who are not directly involved with the organization. One of these people, John Goar, volunteers his summers as a camp host at the Heart of the Hills campground in Olympic National Park in Washington state. In addition to camp host, he is a "dark ranger," hosting stargazing programs for visitors using his homemade telescopes.

"I think it's important that people know about their universe," Goar said. "It puts a new perspective on your role on the planet ... It compels us to take care of the precious planet we do have."

The study of light pollution is an emerging field, with implications beyond the aesthetic and cultural value of a true dark sky.

In the past 100 years, rapid urbanization introduced artificial light to environments that had previously relied on the natural cycles of the sun and moon. Nocturnal animals now face biological and behavioral complications due to interference with natural light cycles. Thirty percent of vertebrates and 60 percent of invertebrates are nocturnal, according to a 2010 study in the journal of Ecology and Society. Many animals use dawn and dusk and the length of the day as cues for behaviors such as foraging, growth, reproduction and migration.

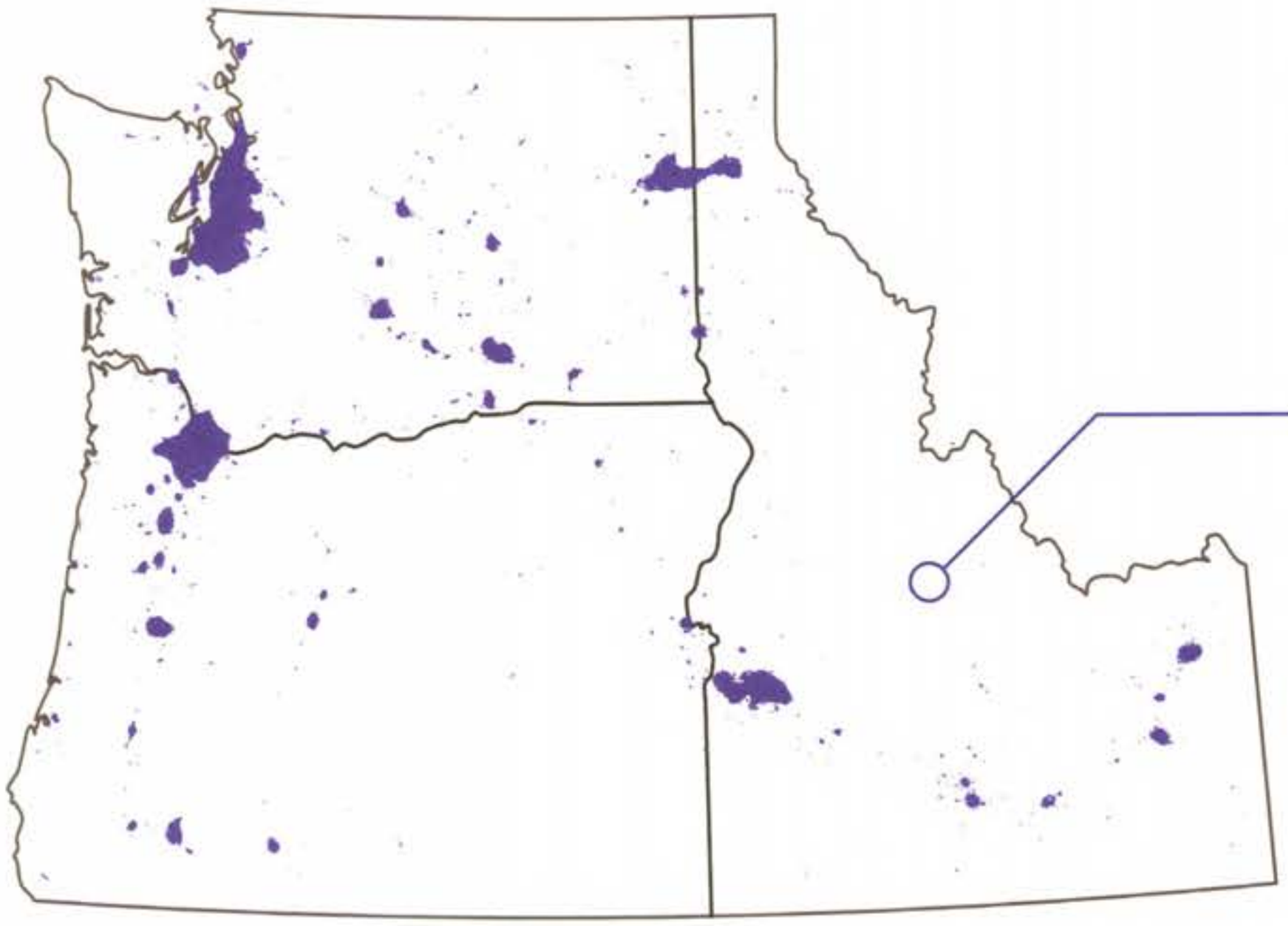
Bright urban lights have disrupted migratory bird behaviors, in some cases altering their course. Evidence suggests artificial lights have affected interactions between organisms within their food webs, according to the 2010 study.

"Every time you [look] in the night sky, month after month, you notice less stars over your head," Ingram said. "People say, 'Well, it's just society, it's just progress, we can't do anything about it.' That's misinformation."

Communities can combat light pollution. The IDA worked closely with the Illuminating Engineering Society of North America to create the Model Lighting Ordinance. This provided a template to help municipalities create standards that reduce excessive glare and keep light contained to specific areas.

Steve Botti is a city councilman in Stanley, Idaho, who helped spearhead lighting policies in the regions around the Central Idaho Dark Sky Reserve. Shielding outdoor lights so they shine toward the ground min-

NIGHT TIME LIGHT MAP



The Northwestern United States at night. Densely populated areas are indicated by clusters of night time light. Light pollution interferes with animal behavior and decreases the visibility of stars in the sky.

Source: 2016 "Earth at Night" satellite image from The National and Aeronautics Space Administration.

imizes light pollution and uses light more efficiently, Botti said. "A lot of it's a win-win situation," he said.

The IDA lists over 1,000 approved lighting products that do exactly that. These products are optimized for energy efficiency and can limit the impacts of light pollution on nighttime ambiance and the environment, Goar said.

More than a dozen cities in Washington, Oregon and Idaho have successfully passed dark sky ordinances, according to the IDA website. Goar is looking to start this process in Port Angeles, Washington, just north of Hurricane Ridge where he hosts stargazing programs. Until this is possible Goar will work as an educator, encouraging people to look up at the stars.

"It takes a village to do this," Pauley said. "Get like-minded people together and draw out a plan and figure out who the power players are." He emphasized people do not need lighting ordinances to make a difference in preserving the night sky.

For communities interested in preserving their dark skies, Botti and Pauley recommend grassroots public outreach and education as a starting point.

"I think it's important that people do have an opportunity to look at the night sky," Goar said. "So many people have never seen a planet in a telescope, or the moon, or a galaxy, or something cool."

ABOVE: *Shielded lights outside Carver Gym at WWU reduce excessive glare and help contain light.*

COLIN MURPHY is an aspiring journalist at Western Washington University. He is committed to telling clear and honest stories from the natural world and celebrating those who try to conserve it.

NICK PINKHAM studies design and computer science. Before Western Washington University, he studied photography and design in Michigan. When he isn't busy studying, he can usually be found out in the mountains.

ABOVE: *Replanting at Crockett Lake on Whidbey Island has been happening since December and was finished in early February. Before planting could occur, more than 40 hectares of the noxious hairy willow herb had to be cleared.*

CURBING THE HERB

STORY BY **ABBY OWEN**
PHOTOS BY **ILANA NEWMAN**

Whidbey Island lies at the convergence of Puget Sound and the Strait of Juan de Fuca. Nearly halfway down the coast, travelers find themselves boarding the Washington state ferry. But they aren't the only visitors here. Crockett Lake, just north of the ferry terminal, is an estuary habitat many migratory bird species rely on.

A UNIQUE ECOSYSTEM where freshwater and saltwater meet, Crockett Lake is an important habitat area for birds and other species. The National Audubon Society designated this lake as an important bird area, partly because it is along the Pacific flyway for migratory shorebirds, raptors and song birds. In efforts to preserve this habitat's biodiversity, the Whidbey Camano Land Trust has spent years tearing out invasive species to make way for native plants. Almost 250 hectares of Crockett Lake are marked as an important area for the conservation of bird populations statewide. Coyotes, rabbits, deer, amphibians, fish and more than 230 bird species can be found there, said Jessica Larson, land steward at the land trust. The trust works to protect and restore habitat on Whidbey and Camano islands.

Volunteers and workers started by removing invasive plants that had taken over much of the land ringing the lake. Hairy willow herb and Himalayan blackberry were the main culprits. The hairy willow herb is an annual plant that can grow two meters tall, sports delicate pink flowers, and has a voracious appetite for wetlands and shorelines. At Crockett Lake, it covered an estimated 40 hectares and competed with the native species in the area. The herb grows and spreads quickly, aggressively crowding out native wetland plants. It's so invasive, Washington law requires its removal if spotted.

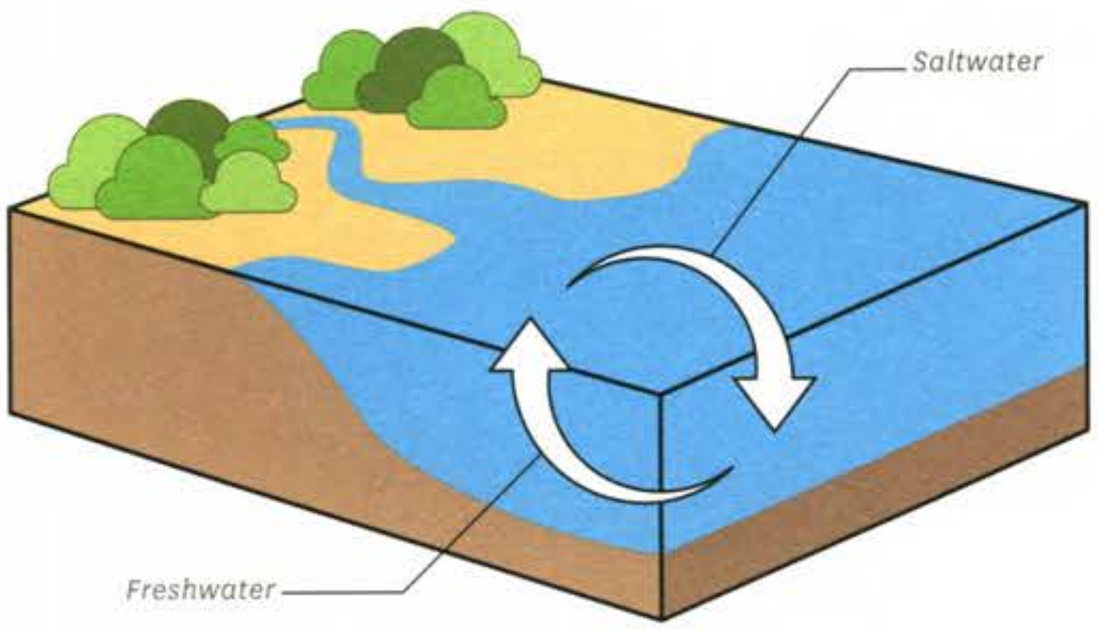
Birds are one reason this weed spread so quickly at Crockett Lake. The birds ate the plant and dispersed the seeds as they flew, said Dyanne Sheldon, a restoration ecologist for Crockett Lake.

Although wetlands can be difficult to reach, the land trust used machinery, manual labor and herbicides to remove the weeds. Since December 2017, the crew has introduced native plants that thrive in the estuary ecosystem, including cottonwoods, sitka spruces and sitka willows.

About three thousand years ago, Crockett Lake transformed from an estuary into a secluded lake after tectonic activity lifted the body of water above sea level, Sheldon said. Later, a tidegate was built, reconnecting the lake with Puget Sound and restoring its status an an estuary.

About half of the world's natural wetlands have been lost as a result of human activity, according to a 2015 study. Additionally, any given bird population in North America could be as low as 5 percent of what it was before the continent was colonized, said John Bower, professor of ornithology at Western Washington University.

DIAGRAM OF AN ESTUARY



An estuary is where freshwater from a river or stream mixes with the saltwater from an ocean. It provides a unique habitat for many riparian species.

ABOVE: *Crockett Lake has over 230 bird species, including various birds of prey, such as this bald eagle.*

Birds play an important role in the environment. Without them, the food web would be shifted out of balance.

"We would have a hell of a lot more insects," Bower said.

Migration is important because it offers a greater variety of food and resources, so birds are able to maximize reproduction, Bower said.

On a January day, workers on the east side of Crockett Lake took off their jackets and hung them on a nearby fence. They spent a moment feeling the sun's rays as it broke through a cloudy sky. The only task left that day was laying mulch down to help protect the saplings from animals and natural elements.

"Every five minutes we have different weather. You put on a raincoat and then the sun comes back out and it's beautiful," said Mark Snyder, a volunteer.

Before moving to the island and working for the land trust, Larson and her sister Amanda grew up in the Auburn area. The trees that once surrounded the home they grew up in are gone, replaced with other houses.

"And that's why the land trust is so important to me," Amanda Larson said. "I've seen the encroachment and the loss of habitat."

In several years, Larson says the trust should have enough funding to build a platform on the northern edge of the lake. A quiet viewing spot tucked away from the hustle and bustle of the ferry terminal, the platform would be a special way to appreciate this unique and important lake.

ABBY OWEN studies communications and public relations. Her dream job would be to run social media pages for outdoor organizations.

ILANA NEWMAN is a Fairhaven student studying photojournalism, outdoor recreation and environmental education. She spends most of her free time outside taking photos, climbing rocks and exploring.

LAND IN LIMBO

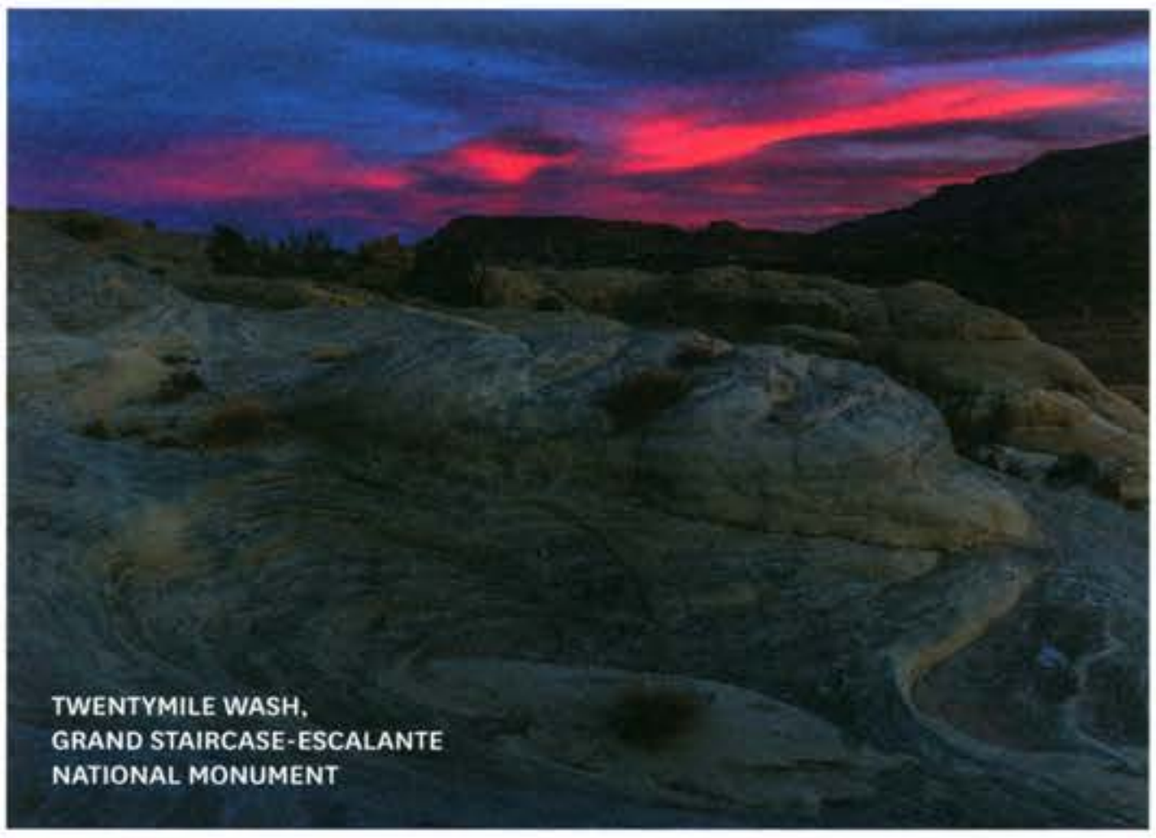
STORY AND PHOTOS BY **MIKE HITCHNER**

After a cold night in the back of my Toyota 4Runner, I woke up to windows etched in frost. I wiped my hand along the icy glass, revealing a rugged and remote landscape. It was the middle of winter and I was deep inside Grand Staircase-Escalante National Monument in southern Utah. The Trump Administration had recently decided to reduce the size of this monument by 50 percent and the nearby Bear's Ears National Monument by 85 percent.

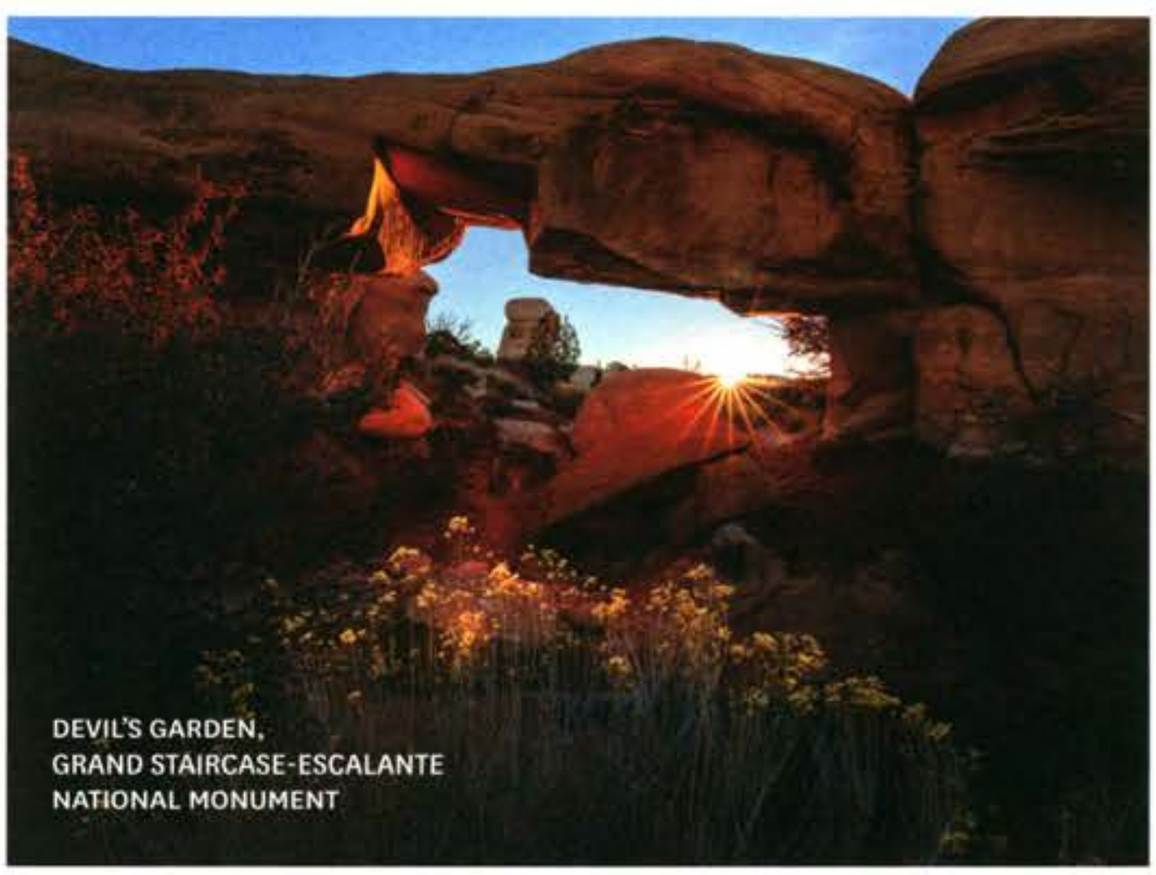
As I crawled out of my sleeping bag and opened the door to the sunrise approaching on the horizon, I noticed a set of tracks. They traced the perimeter of my car. The tracks were not from a canine and far too big to be a bobcat. It must have been a mountain lion, I thought. I couldn't help but think about how the administration's decision might impact this big cat's habitat.

I hope these photographs help people appreciate these lands and inspire them to fight for their conservation. These places are so much more than expansive views and incredible terrain. They offer a penetrating silence, thriving ecosystems and have supported people for millennia.

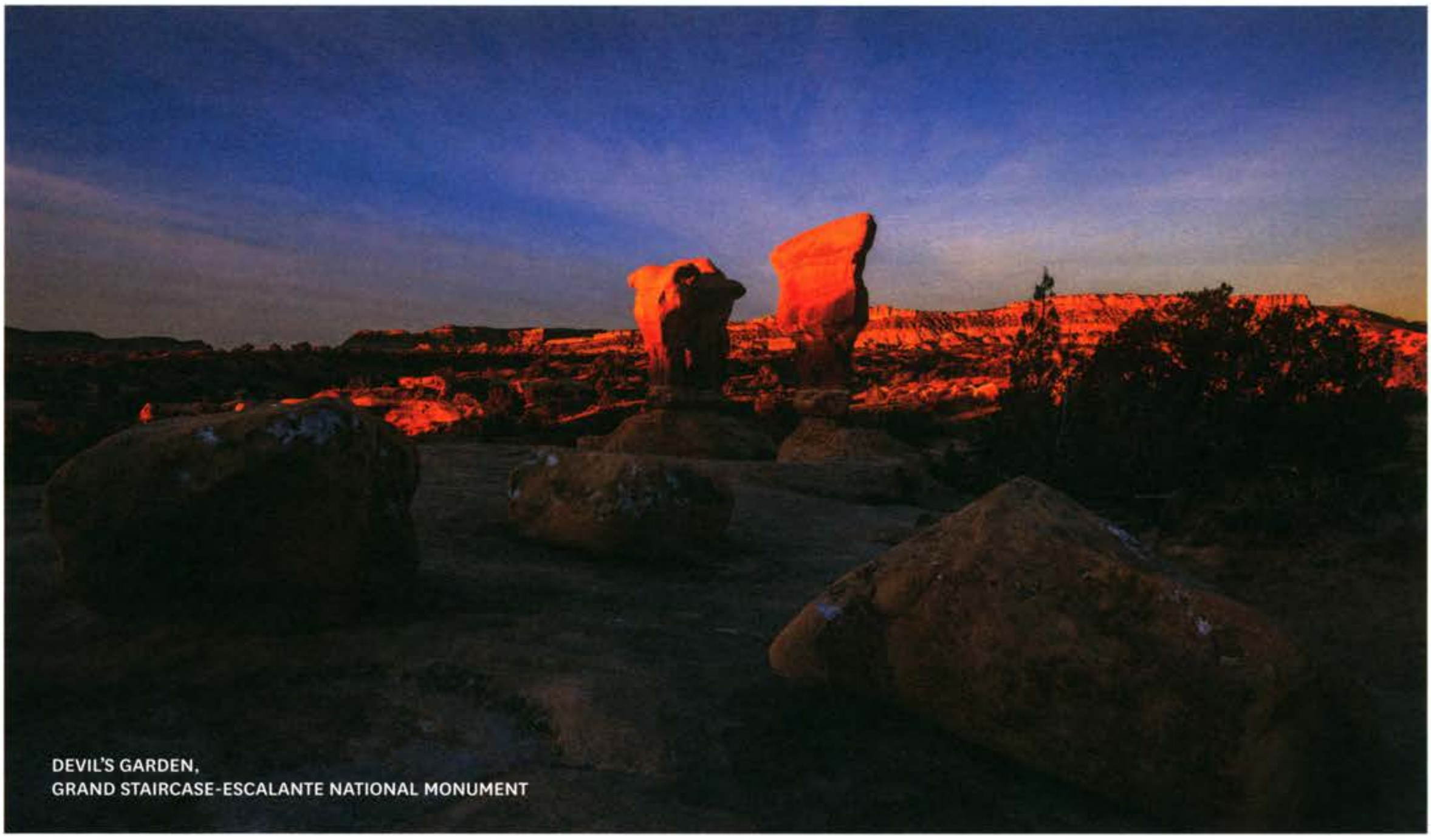
I know this won't be my last trip to this area. I am anxious to see what future trips will bring. I hope what draws me to these lands today might still be found a thousand years from now. As my week in this wilderness concluded and I began my drive back to Bellingham, Washington, I was dirty and tired, and I wouldn't have changed a thing.



TWENTYMILE WASH,
GRAND STAIRCASE-ESCALANTE
NATIONAL MONUMENT



DEVIL'S GARDEN,
GRAND STAIRCASE-ESCALANTE
NATIONAL MONUMENT



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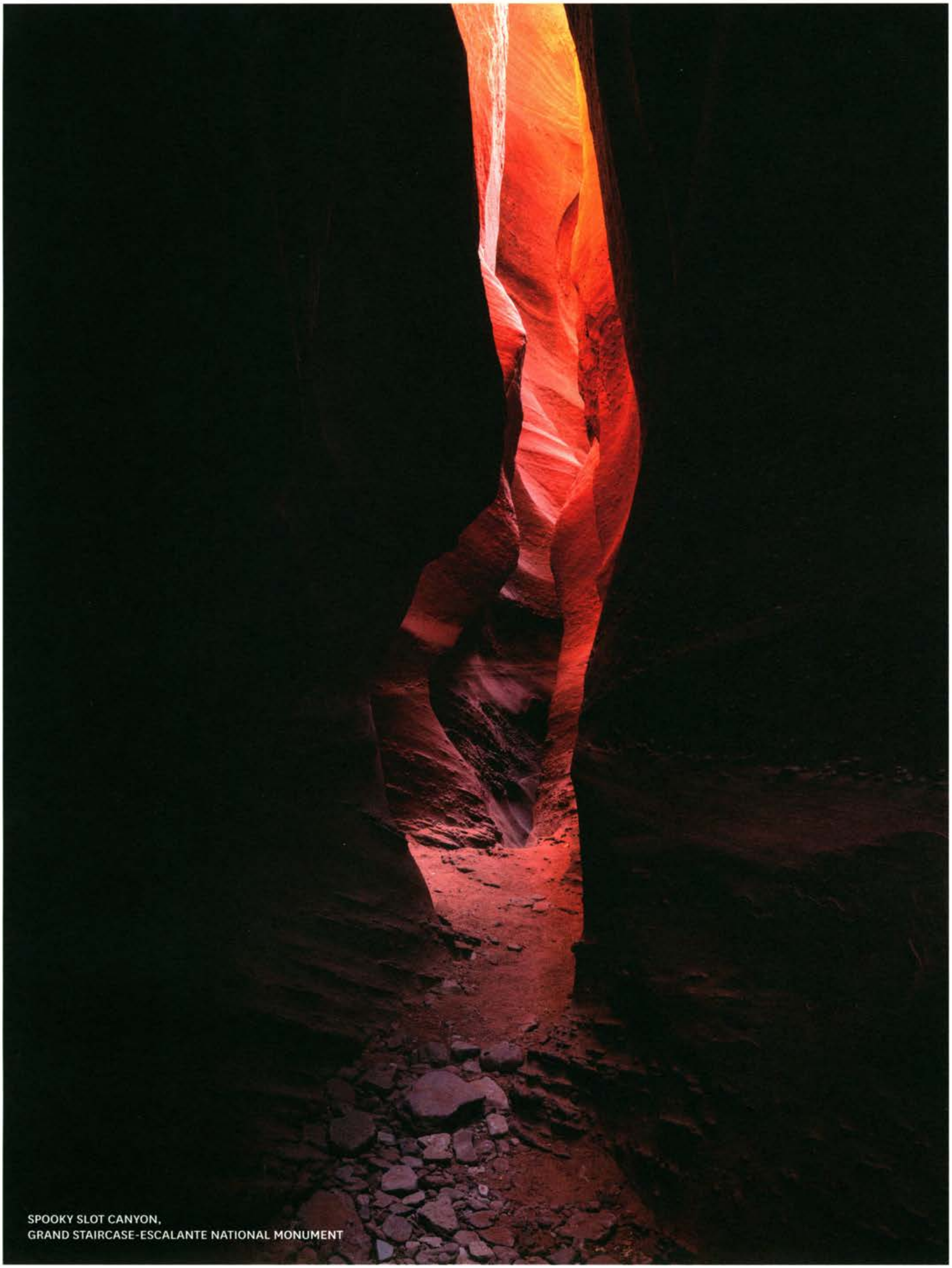


SPOOKY SLOT CANYON,
GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT

Paul Dinnel searches for Olympia oysters on a narrow spit in Fidalgo Bay, Washington.

OH, SHUCKS!

STORY BY **HANNAH PRATHER**
PHOTOS BY **MATTHEW TANGEMAN**

As the tide ebbs from the shore near Sharpes Corner in Fidalgo Bay, Washington, the gray water reveals plateaus of mud. Sea beans along the high shoreline give way to mushy, dark mud coated in bird footprints. Teeming with clams, baby crabs and worms, life beneath the surface is briefly unveiled. With life found in every nook of this ecologically diverse zone, one local bivalve is nowhere in sight: the Olympia oyster.

OLYMPIA OYSTERS (commonly called Olys), the only native oyster to the West Coast of the U.S., have lost more than 95 percent of their wild population due to overharvesting and water pollution. Nonprofits and government agencies are working to restore the ecologically and culturally significant oyster to the region.

Olympia oysters were once a major food source for Coast Salish people. Piles of discarded shells are found up and down the west coast in historical harvesting sites. After settlers came west, Olympia oysters became a major commodity—a delicacy shipped off to San Francisco during the gold rush.

Farmers harvested more intensively as demand grew in Seattle, Portland and surrounding areas. Industry increased in Puget Sound. Pulp from mills and silt from highway construction polluted the waters, contaminating the oysters in return. Though wild Olys still exist, they are few and far between.

In the late 1800's the economy in Oysterville on Washington's Willapa Bay thrived. Fisheries shipped boat after boat filled with Olys, depleting the population to a point where there weren't enough to harvest. When they ran out of oysters the town's industry collapsed, and with it, Oysterville became a ghost town, said Dan Driscoll, of Oysterville Sea Farms.

LEFT: *A small batch of Olympia oysters are shucked and ready to eat at Chelsea Farms Oyster Bar in Olympia, Washington.*

"They were kind of like salmon, where they were this keystone, natural species in Puget Sound and we screwed it up," said Shina Wysocki, manager of Chelsea Farms. "We overharvested and we polluted and ruined their habitat."

Cultivating Olys is a "labor of love" for Wysocki. Chelsea Farms is a family-run shellfish grower located on Eld Inlet in Olympia, Washington. Olympia oysters are only a small percentage of her profit, but she cultivates them for emotional reasons. The farm works with marine advocacy groups to spread ideals of protecting waterways and the oysters.

"I believe that to connect people to the native species, you have to feed it to them," Wysocki said.

Coast Salish tribes have been eating the "Kloch Kloch" for generations, roasting them over fires on the beaches where they were harvested and using them to supplement their diets during winter, said Lucas Hart, marine program manager for the Northwest Straits Commission.

Harvesting wild Olys will likely be limited to provisioning tribal and cultural needs, according to a federal restoration plan published in 2012. Using federal funding, the Natural Resources Conservation Service (NRCS) helps restore the oysters through contracts with private properties and tribes.

"Someday, if there's enough of them, the Department of Fish and Wildlife, working with the tribes, may decide to start harvesting a certain amount," said Paul Dinnel, a retired marine scientist and volunteer with the Skagit County Marine Resources Committee (MRC).

The NRCS is asking Coast Salish people to wait five years before harvesting to allow new generations of Olympia oysters to take hold. The agency wants to ensure a resilient population before it is tapped into.

Oysters can indicate the health of ecosystems. Olys filter several liters of water per day, promoting a balanced ecosystem, leaving them vulnerable to pollution. They tend to live in clusters called oyster beds, creating a habitat with many cracks and crevasses.

"Everything likes to live in those crevasses," Dinnel said. "[Especially] critters that are at the base of the food chain."

The cluster-like oyster beds are formed by empty Oly shells and provide a nesting ground for future generations of larval oysters. The beds offer habitat for plankton, supplying food to other marine organisms including dungeness crabs and juvenile salmon.

These are some of the biggest reasons people want to restore the native oyster, Hart said. The commission where he works is one of many working to revive the oyster's population.

"The cultures and economy are very closely tied to how well our marine ecosystems perform," Hart said.

Northwest Straits and state Fish and Wildlife officials choose suitable restoration sites based on factors such as accessibility and tides. Volunteers spread Pacific oyster shells as a place for the oyster larvae, or "spat," to attach. If oysters can't latch onto surfaces, they will not survive to adulthood.

Across Fidalgo Bay, Dinnel pulls to the side of a road situated between two oil refineries. He walks over a beach of discarded clam and oyster shells that crunch beneath each step. He reaches the water's edge and starts sifting through the shells. Though the tide is high, he manages to find a few native oysters. He picks up one large Pacific oyster shell and finds five native Olys attached to it.

This is one of the most successful Olympia oyster restoration sites in the Salish Sea, where numbers have grown from 50,000 to 4.8 million since 2002, according to a 2016 report by Dinnel.

Over the winter, young oysters live in mesh bags, protected from predators such as starfish, moon snails and invasive Japanese oyster drills, until they become hardy enough to live independently.

Volunteers and members of the shellfish industry do most of the restoration work. Hart started his career with Northwest Straits as a volunteer in Jefferson County's MRC. In the spring, a group of volunteers from Whatcom County's MRC will pull on their boots and wade in the water to help build habitat and release the oysters into the bay.

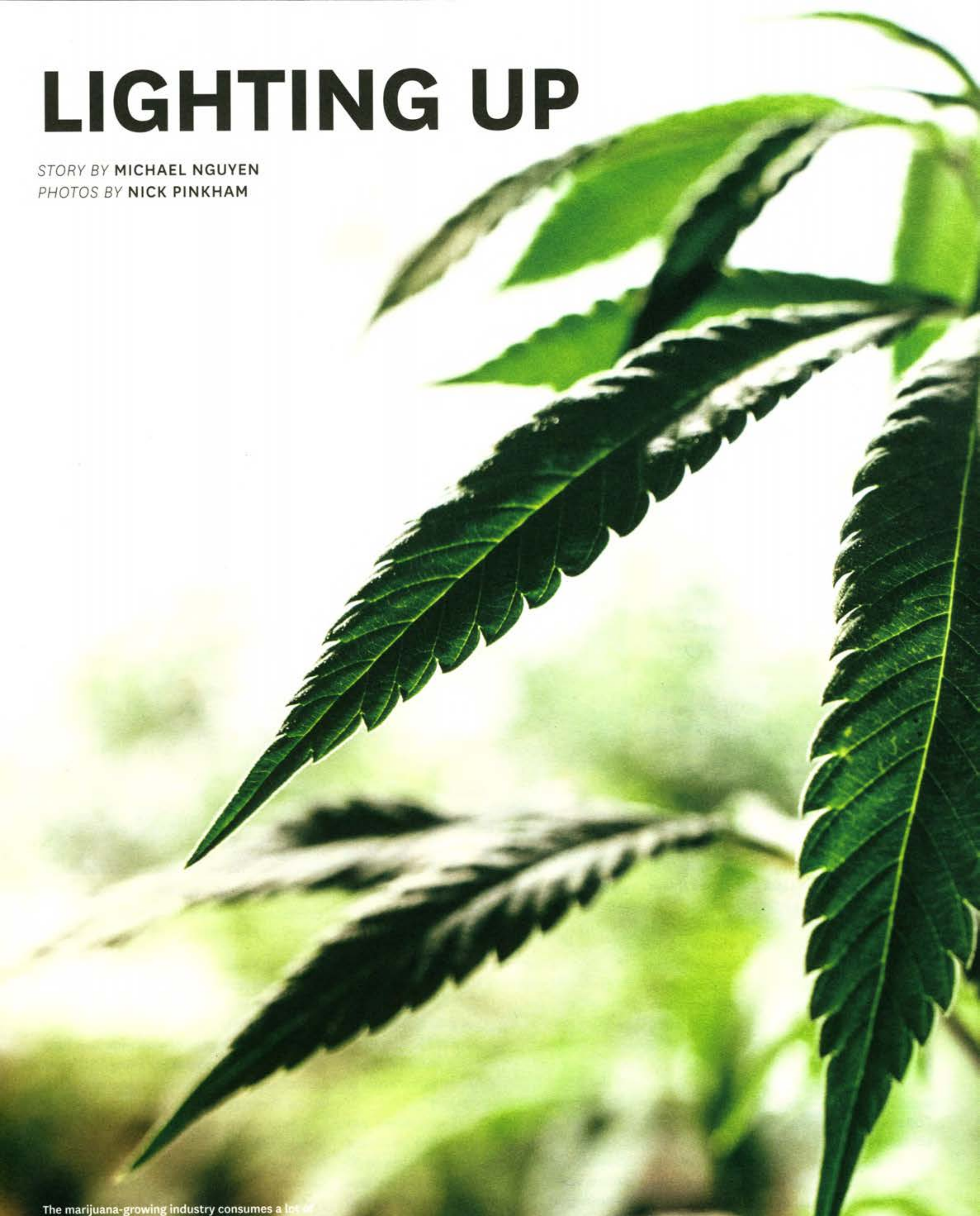
"Can oysters take hold?" Hart said.

HANNAH PRATHER is an environmental studies major at Huxley College. Her two favorite things are cooking (and eating) food and loving the earth.

MATTHEW TANGEMAN is a visual journalism student with a passion for deep powder, alpine granite and long, epic days in the mountains.

LIGHTING UP

STORY BY **MICHAEL NGUYEN**
PHOTOS BY **NICK PINKHAM**



The marijuana-growing industry consumes a lot of electricity, but some companies are trying to be more energy efficent.

Warm, orange light pours from a cracked-open door. Beyond the door, the lights on the ceiling are too bright to look at directly, and their heat intensifies. These grow lights beam down on a small room full of cannabis, creating a perfect environment for the plants to bud. Fans line the walls, circulating air to keep the plants from overheating and drying out. Trent Prengel inspects their leaves carefully, one by one, making sure mold and tiny bugs are out of the picture.

PRODUCER SALES IN Washington state hit an all-time high of $67 million in 2017. As the marijuana industry continues to expand, concerns over the environmental impact of energy consumption to fuel these lights and fans are on the rise. Indoor grow operations, valued at $6 billion, account for 1 percent of total electricity usage in the United States, according to a 2011 study in the Journal of Energy Policy.

Trent is a grower at Solitude, a grassroots marijuana growing operation he runs with his father Randy. The father-son combo initially got involved with the industry for medical purposes and are now working to develop sustainable practices for growing cannabis. They built their indoor growing and processing facility from a shipping container with less than 100 square meters of space.

"Looks are deceiving," Randy said. "But if your heart's in the right place good things happen."

Indoor cannabis cultivation is an energy-intensive process, requiring electricity to operate lighting, dehumidification, ventilation, air conditioning and irrigation control. These indoor operations can run growers anywhere from $3,000 to $100,000 per month, amounting to one third of production costs, according to a 2016 study by an energy consulting firm.

Every kilogram of cannabis produced in a standard operation results in 4.6 metric tons of CO2 emissions—11 cross-country trips in a fuel-efficient vehicle, according to the 2011 study.

David Montgomery is trying to help cannabis companies make their product while using fewer kilowatts. As a consulting energy management engineer for Puget Sound Energy (PSE), he encourages customers to make their homes and businesses more energy efficient through rebates.

ABOVE: *Trent Prengel holds an old high-intensity discharge (HID) bulb. His grow operation recently upgraded to more efficient and longer-lasting Gavita grow lights.*

"The reason we do that is because, first of all, it's good for the environment," Montgomery said. "It provides value for our customers. It also helps us avoid future investment in infrastructure and energy supply."

Since joining PSE, Montgomery has collaborated with different growers on around 70 projects in the last four years, totaling 40-50 million kilowatt hours in savings. That equates to turning off 1.6 million 100-watt bulbs for an entire day.

Trail Blazin' Productions, a marijuana growing and processing company in Bellingham, Washington, received a rebate for over $150,000 from PSE in 2015.

"PSE has been great to work with. They have offered fantastic rebates for using LED grow lights," said Juddy Rosellion, grower at Trail Blazin' Productions.

Solitude recently switched from 10 high-intensity discharge (HID) lights with six-month lifespans to four Gavita grow lights that cover the same area, use less energy and last up to two years. The market is saturated with old HIDs, Trent Prengel said.

ABOVE: *Warm light spills out from the doorway of the room where marijuana plants grow at Solitude in Olympia, Washington.*

"People are trying to get rid of them," he said. "I mean, we got a whole trailer full of them now. It's just like a computer or anything else, there are new updates."

The Prengels plan to push back the fence around their facility, to make room for greenhouses.

"We are planning to make it year-round, supplementing as much sunlight as possible, and use a completely renewable resource process from seed-to-plant to extraction-to-sale with no harsh chemicals used in the process," Trent said. "One hundred percent organic."

Crystal Oliver is the co-founder and president of Washington's Finest Cannabis, a cannabis operation in Eastern Washington, and a board member for the Cannabis Farmers Council. She believes the future of marijuana cultivation is in the sun.

Greenhouses take advantage of free sunlight, while protecting plants from the elements. Supplemental heating and lighting allow for year-round production, cutting down electricity usage.

During prohibition, it was hard for growers to run outdoor operations, Oliver said. When marijuana was legalized in Washington, growers faced conflicting land-use policies from local municipalities, such as city councils and county commissioners.

"My opinion is that certainly the future is greenhouse cultivation," Oliver said. "As long as land-use issues and energy code don't get in the way."

Growing marijuana has come a long way from quiet underground operations, but growers such as Solitude and Washington's Finest Cannabis are still learning how to navigate the new industry.

"Everything grows," Randy Prengel said, beating his hand against his chest. "This grows, those grow, we grow."

MICHAEL NGUYEN studies public relations journalism and entrepreneurship at Western Washington University. He loves to learn about people's passions so he can create connections to help them achieve their goals.

NICK PINKHAM studies design and computer science. Before Western Washington University, he studied photography and design in Michigan. When he isn't busy studying, he can usually be found out in the mountains.

CANNABIS AND ENERGY CONSUMPTION

Marijuana growing operations account for 1 percent of the national energy budget.

Saving 40-50 million kilowatt hours equates to turning off 1.6 million 100-watt bulbs for an entire day.

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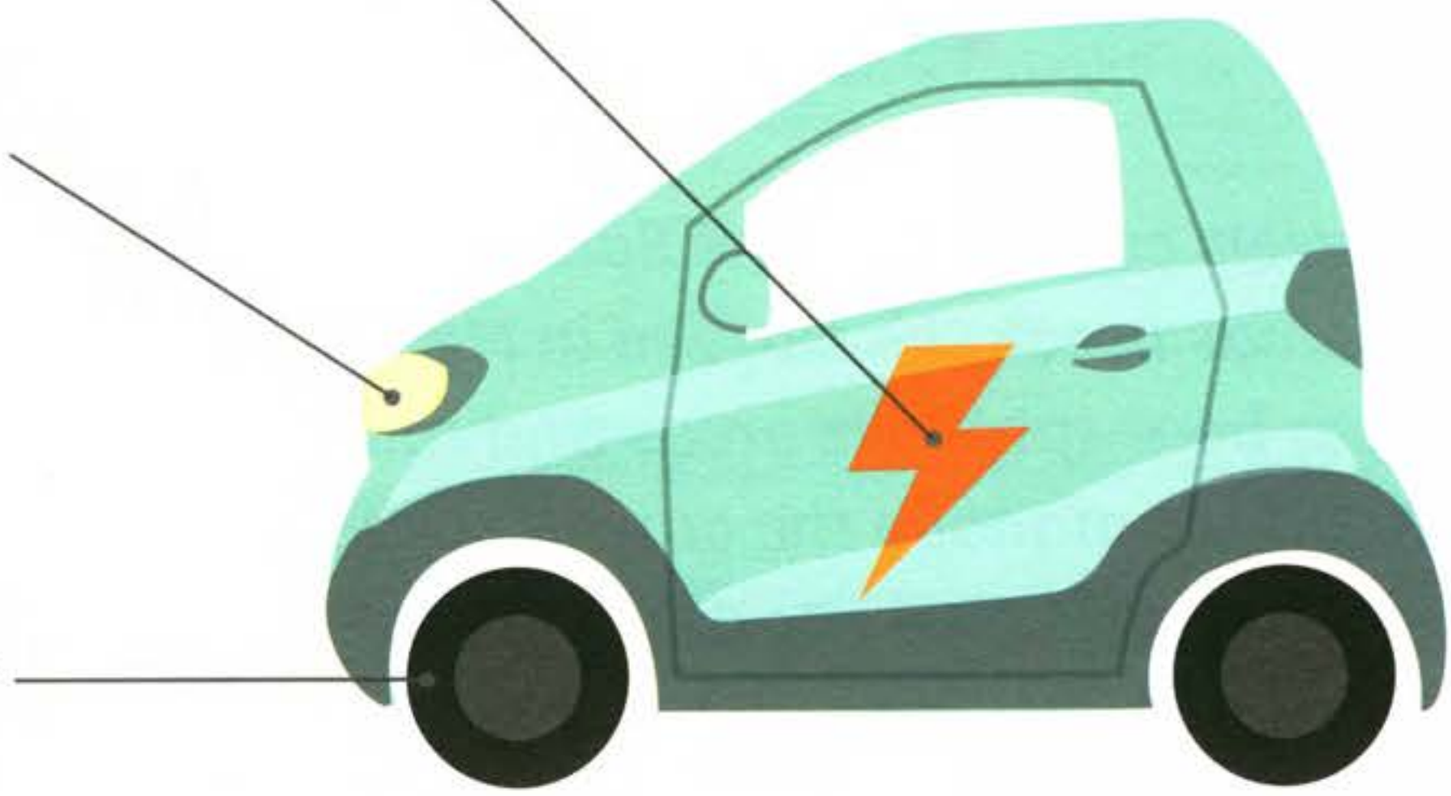


CUT THE VOLUME

STORY BY **ALEC WARD**
PHOTOS BY **REGAN BERVAR**

ABOVE: *An orca swims past a whale-watching boat off the coast of Vancouver, British Columbia. Noise from vessel traffic can make it harder for orcas to communicate and hunt. Photo courtesy of Hannah Gabrielson.*

Vessels cut through the Salish Sea off the San Juan Islands as a pod of orcas break the surface in May of 2017. A crew aboard a whale-watching boat spots the orcas and radios in the sighting.

Ready to manage the crowd, state Fish and Wildlife Officer Taylor Kimball overhears the chatter and speeds off to the scene in his green enforcement boat. Kimball knows summer customers are eager to get as close to the orcas as they can. But enforcing space around them is beneficial to the species' survival.

OVER THE LAST two years, the endangered Southern Resident orcas have not had any successful births and nine have gone missing or died in the Salish Sea. One of the threats to this population is noise pollution. Orcas rely on sound to live in the ocean, but the heavy vessel traffic in the Salish Sea interferes with the underwater soundscape. People are making efforts to strengthen noise regulations, including whale-watching groups who have voluntarily followed similar regulations for over two decades.

Light cannot travel far once it passes beneath the surface of the ocean. But because sound travels four times faster in water than it does in air, orcas echolocate, using calls and whistles to hunt, communicate and navigate. Vessel traffic interferes with these behaviors. Excessive noise from boat engines can mask communications and alter behavior, such as causing the orcas to travel when they might rest. Disturbing Southern Residents increases the energy the struggling population uses to survive, according to Jason Wood, a marine biologist at the San Juan Whale Museum.

There weren't any official regulations on the distance between vessels and Southern Residents until 2011, when the National Oceanic and Atmospheric Administration (NOAA) adopted them as part of protections triggered by the Endangered Species Act. In 2013, a grant to monitor Southern Residents created a position for Kimball to work out of Whatcom County, increasing patrol time on the water. Kimball saw the transition from suggested guidelines to enforced regulations regarding orca conservation.

"[When] people are speeding by, or people are watching the whales, and they look over and they see my patrol boat there, they stop and they think, 'Am I doing everything I should be?'" Kimball said. "Just our presence out there helps dramatically."

The 2011 regulations showed no economic effect on whale-watching tourism, according to a NOAA analysis. Brian Goodremont, past president of the Pacific Whale Watch Association, owns San Juan Safaris, a whale-watching tour. His is among the Pacific Northwest whale-watching companies that follow voluntary guidelines. These guidelines include slowing vessels down when they're within 800 meters of Southern Resident orcas and staying 180 meters away from them at all times.

An example of efforts to strengthen noise regulations is the Senate Bill 5886, formerly 6268, the Orca Protection Act, sponsored by Washington state Sen. Kevin Ranker, D-Orcas Island. The bill would establish new regulations on the interactions between vessels and Southern Resident orcas. The Orca Protection Act proposes a speed regulation and would double the time Fish and Wildlife officers monitor the water.

"Even if Senate Bill 6268 passes, it's still not as restrictive as our own voluntary guidelines," Goodremont said. He said he's never seen commercial guides cause disturbances, but has seen fishers or recreational boaters cause changes in orca behavior.

Orcas may dive for minutes at a time and it's hard to predict their whereabouts underwater, often leaving enforcement up to wildlife officer discretion, Goodremont said.

Commercial guides are experienced and want what's best for the whales, so they can continue educating the public about Southern Residents, Kimball said. Other governments are beginning the transition from suggested guidelines to enforced orca regulations.

Canadian regulations allow vessels to be closer to orcas than in the U.S. The Port of Vancouver's Enhancing Cetacean Habitat and Observation (ECHO) program was developed in 2014 to reduce the impact of shipping activity on cetaceans. The program led to an unprecedented trial where roughly 60 percent of the vessels moving through the Strait of Georgia voluntarily slowed down to 11 knots, or 20 kilometers an hour, in the summer of 2017.

While orcas pass through invisible underwater borders, commercial vessels cross national boundaries. Situated between the U.S. and Canada, the Strait of Georgia is a busy shipping route and an abundant summer feeding ground for orcas.

ABOVE: *Washington Fish and Wildlife Officer Taylor Kimball navigates through Bellingham Bay on a routine patrol trip.*

A majority of the Southern Residents' diet consists of Chinook salmon, a population that continues to decline. Vessel noise cancels out the sound frequencies orcas use to hunt for salmon, forcing them to travel greater distances to find food. This causes them to expend more energy.

"Masking of echolocation wouldn't be such a problem if there were fish all over the place," Wood said.

As ecologically intertwined species, Chinook salmon and Southern Resident orca restoration goes hand in hand, he said. Though the proposed regulations would limit the detrimental effects on the Southern Resident orcas' hunt, a lack of food is still a major threat to the orcas.

"Over the last decade we have seen the whales continue to decline," said Lynne Barre, the Seattle branch chief for the Protected Resources Division of NOAA. "For me that means the things that we're putting in over the last decade and all the efforts we've been working on haven't really been sufficient."

The proposed bill focuses on vessel noise but also requires coordination of recovery strategies between Washington and British Columbia. As of March, 2018, the bill passed the state Senate. While other threats facing Southern Resident orcas remain, efforts to protect these mammals continue to increase.

ALEC WARD studies environmental science at Huxley College of the Environment. He has an appetite for adventure and is passionate about marine life.

REGAN BERVAR is a Bellingham native studying visual journalism. She believes in the power of a picture to say 1,000 words.

FISH OUT OF WATER

STORY BY **ERIKA OSLAND**
PHOTOS BY **JACOB LAND**

Henning Gatz zips his small gray car around the corners of Mount Baker Highway heading east from Bellingham, Washington. As he drives, he chats about everything from geodesic domes to the recent political climate. The houses begin to grow more spaced apart and the Nooksack River flows with vigor after the week's heavy rain. His destination is a hatchery that will release fish into that very river later this year. With a new net-pen ban in Washington state, hatcheries much like this could be the future of farmed salmon.

GATZ IS AMONG those working to develop the future of land-based farmed fish. Washington state Sen. Kevin Ranker, D-Orcas Island, proposed a bill (SB 6086) in February to ban commercial net-pens, effectively ending the practice in Washington by 2025. In March of 2018, the bill passed and now Washington will join California and Oregon in banning the open-water fish farms within state jurisdiction. The phase-out could dramatically change how fish farming is done in the Pacific Northwest.

The bill was created following the failure of a net-pen last August, releasing nearly 250,000 Atlantic salmon—designated as an invasive species by the state Department of Fish and Wildlife—into the Salish Sea. There was immense public outcry and a push to stop net-pen farming in Washington. In January of this year, the net-pen's owner, Cooke Aquaculture, was found at fault for the Cypress Island failure after a state investigation. Hilary Franz,

"THE REASON WHY ATLANTIC SALMON FARMING EXISTS IS BECAUSE THAT PRODUCT IS VERY CHEAP."

- SARA SMITH, *A PROFESSOR AT BELLINGHAM TECHNICAL COLLEGE IN THE DEPARTMENT OF FISHERIES AND AQUACULTURE SCIENCES*

LEFT: *Each spring, salmon from the Skookum Creek Fish Hatchery are released into the Nooksack River.*

Washington's Commissioner of Public Lands, revoked the lease after the state report. In December of 2017, Franz also terminated Cooke's Port Angeles lease, shutting down two additional net-pens.

Sara Smith, a professor at Bellingham Technical College in the department of Fisheries and Aquaculture Sciences, imagines the future of Pacific Northwest fish farming on land. Open net-pens, like the ones used by Cooke Aquaculture, are structures built in open waters to raise salmon. They are designed so water flows freely between the pen and the surrounding environment. Companies using them do not have to pay for waste removal or water to raise the fish in, which keeps costs low. Land-based systems reuse their own water, filtering it out and oxygenating it to maintain a healthy water quality for fish. Because of this, on-land aquaculture costs more.

"The reason why Atlantic salmon farming exists is because that product is very cheap," Smith said.

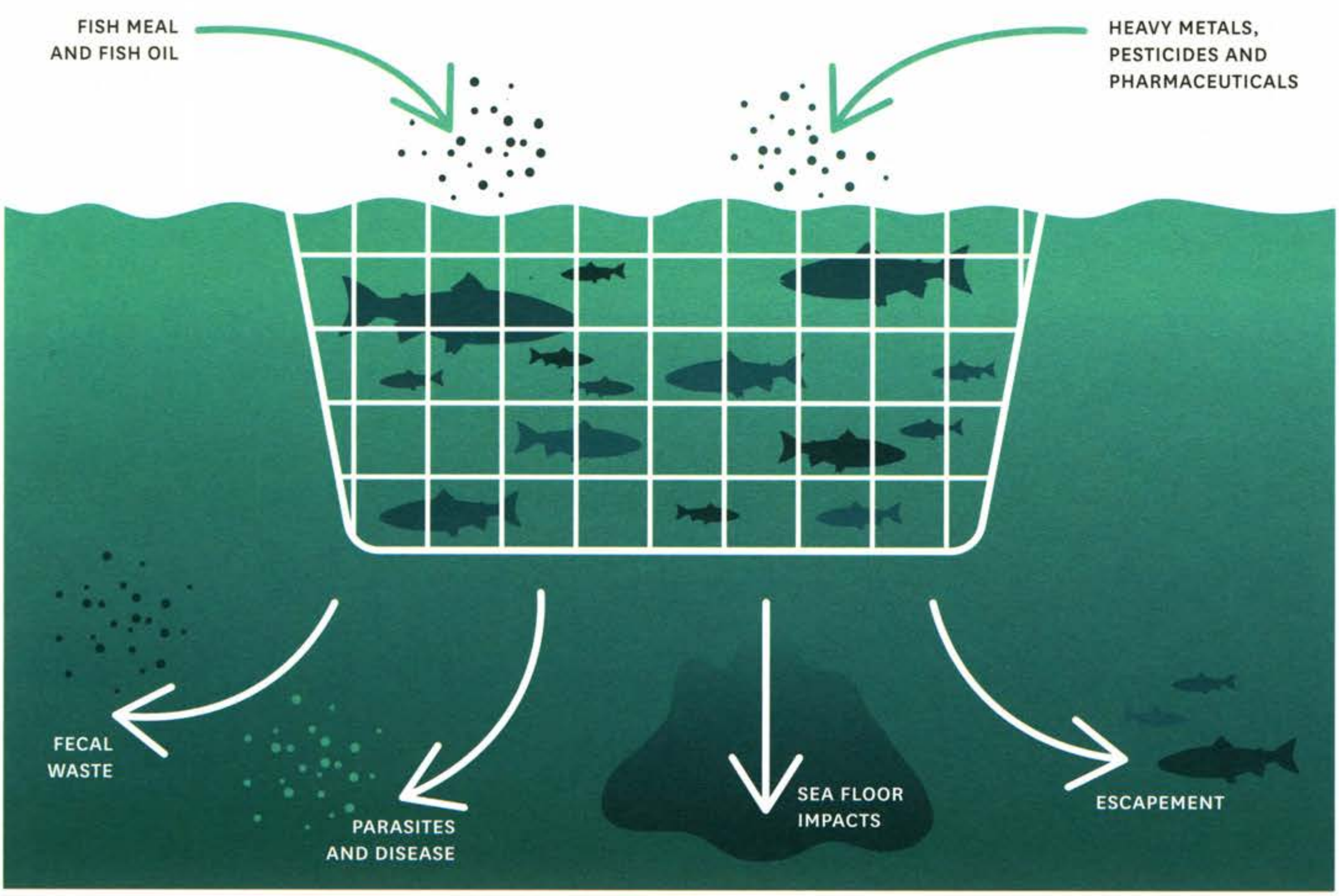
If raising Atlantic salmon in net-pens exceeds the cost of catching Pacific salmon, companies lose the financial incentive to use and develop better systems. Smith hopes the phase-out will push companies to focus on developing more efficient and sustainable fish-farming technology.

One alternative to open-water fish farming in the Salish Sea is moving to the Pacific for deep-water fish farming. This method was considered a viable option in a 2013 study by the National Oceanic and Atmospheric Administration. Stronger currents offshore would dilute pollutants from the pens and carry them away. Smith acknowledged this system may improve waste disposal, but doesn't address the risks associated with raising non-native species in the open environment.

"That just sounds like a bad idea," Smith said.

Another alternative is land-based aqua-

WHAT IS A NET-PEN?



Open-water net-pens spread disease and sewage into the surrounding ocean and can harm wild fish populations. A break in a Cooke Aquaculture pen released 250,000 Atlantic salmon into the Salish Sea.

ABOVE: *Henning Gatz stands in front of a land-based aquaculture system at Skookum Creek Fish Hatchery.*

BELOW: *Skookum Creek Fish Hatchery raises thousands of coho salmon in a land-based aquaculture system.*

culture systems, like Aquacare Environment, a Bellingham-based company. Gatz is the company's president and founder. About five years ago, the company helped the Lummi Nation remodel their salmon hatchery. Today, this hatchery releases nearly 1 million coho and 500,000 Chinook into the Nooksack River each year and raises more Chinook to be released elsewhere. With Aquacare's help, the hatchery runs more efficiently, recycling around 80 percent of their water. Aquacare designs and implements this technology at large-scale commercial fish farms as well. Since 1987, Aquacare Environment has has looked to the future of fish farming on land.

"I was way ahead of my time," Gatz said.

He believes efficient and sustainable technology for land-based aquaculture already exists. His company and others have developed new systems for farming. When fish farming first began, engineers mimicked stream channels, called raceways. Raceways are long, narrow rectangular pens in which water enters one end and exits the other. This resulted in poor water quality at the exit of the pen. Most of today's raceways are old and need to be replaced with modern technology, Gatz said.

"Would you buy a typewriter today?" Gatz asked.

Modern pens are circular and use centrifugal force to push solids into the center to drain. This method improves water quality but the circular design uses space less efficiently than previous models. Gatz and his team designed a hybrid of the past and present systems, creating a space-conscious oval that can utilize that same centrifugal force.

Cleanliness of pens was the main reason noted for collapse at Cypress Island in the state report. Though commercial net-pen farming is doomed in Washington state, that doesn't end a market for fish. With the new ban on net-pens, Atlantic salmon open-pen farmers in Washington state may turn to alternative, land-based farming techniques.

ERIKA OSLAND is an environmental studies major at Huxley College of the Environment.

JACOB LAND studies visual journalism at Western Washington University. He spends the majority of his free time exploring the Pacific Northwest.

Mairi Poisson and Chester, a dog that leads scientists to animal scat, take a break after training.

WHO LET THE DOGS SCOUT

STORY BY **LUCY CARRELL**
PHOTOS BY **NICK PINKHAM**

Mairi Poisson weaves her way through the dense trails of the Conservation Canines (CK9) facility. Her research assistant, Chester, an energetic 14-year-old Labrador-Golden mix, bounds beside her. She has a sample of wolverine scat from the facility's feces freezer and hides it in the bushes of the Pack Forest off of Highway 7 east of Olympia, Washington.

"Let's go find it!" Poisson says.

Chester shifts into focus and raises his nose toward the scent, directing him like a compass. After a moment of hustle, he sits down in the thick ferns and looks eagerly toward Poisson. "Show me," she replies.

Chester points to the scat with his nose and looks up to Poisson with a long, pink tongue and a satisfied expression. She smiles back and praises, "Nice work, Chester." She hurls his bright yellow ball down the trail and chuckles as he crashes after it.

BELOW: *Mairi Poisson checks to see what Chester found. Chester is trained to stop and sit down when he finds his target.*

ABOVE: *The Conservation Canine kennel at the University of Washington's Pack Forest Mount Rainier Institute.*

ABOVE: *Mairi Poisson opens the scat freezer and removes a wolverine sample. The fridge is full of samples from around the world used to train the dogs.*

HANDLERS LIKE POISSON have been working with CK9, a program out of the University of Washington, following the noses of rescue dogs all over the globe since 1997. Samuel Wasser, director of the university's Center for Conservation Biology, founded CK9 after he realized the potential for using dogs to follow scents in wildlife field research. The methods he pioneered are still used today to study endangered killer whales in the Pacific Northwest.

Scat-sniffing dogs are a special breed. They work without bias and provide data from vast, remote areas in a non-invasive manner. This enables scientists to abandon traditional methods, such as trapping and tagging, that may harm endangered species.

"Every sample they find is golden," Wasser said.

CK9 dogs are not like the common family pet. Their high energy often translates into behavior perceived as aggressive, like chewing on furniture and growling at people, making them unwelcome in a family home. These challenges land the dogs in shelters where people are afraid to adopt them. CK9 takes advantage of their energy to help researchers study animals in the wild. Dogs have around 50 times as many smell receptors as humans do, according to a 2016 study by the University of Alabama. The dog's powerful nose is able to detect biological material like scat and carcasses, but CK9 methods are also used to trace toxic chemicals, determine origins of poached elephant ivory and navigate killer-whale research boats.

Nothing motivates the CK9 dogs like a game of fetch. They are rewarded with a throw of the ball when they learn to recognize certain scents, which can take less than a day.

Handlers form a strong bond with their dog so they can communicate. They learn to read the subtleties of dog body-language, like stiffness of posture, eye movement, drooling or a change in gait. This leads researchers to scat covered under several meters of snow, in the middle of rivers or in the ocean.

"I wouldn't ever want to go out [into the field] and not go the extra mile," said Jennifer Hartman, a CK9 field research scientist and dog handler.

CK9 has played a large part in researching endangered Southern Resident orcas in the Pacific Northwest since 2007. A decrease in successful orca births prompted Wasser to study whether or not the whales were getting pregnant. CK9 dogs cruised aboard research boats where they could smell killer-whale scat from almost two kilometers away, even in fast-moving currents.

Something as subtle as a tail wag can change the course of an expedition, said Collette Yee, another CK9 field researcher and dog handler.

"My job as a handler is to translate everything the dog is telling me to the boat driver so they can drive right up to where we need to be," Yee said.

Once the dog led them to the floating scat, they played ball and skimmed the waters to collect and preserve the sample. Researchers looked at the hormones and genetics in the scat to understand the diminishing whale population. Thanks to samples the dogs located, the team detected progesterone, a pregnancy hormone, in the scat of female whales. This showed the whales were getting pregnant, but up to 69 percent of detectable pregnancies were unsuccessful.

Wasser recognized three main disturbances threatening the killer whales of the Pacific Northwest: whale watching boats, toxic chemicals in the water and lack of prey. His recent research compared stress levels associated with these disturbances.

The killer whale's preferred food source is the endangered Chinook salmon. Food scarcity triggers nutritional stress—his study found stress hormones to be lowest when fish were most abundant.

Nutritional stress triggers orcas to use their fat reserves, releasing toxic chemicals into their bloodstreams and potentially killing unborn calves. If the whales are well-fed, these chemicals would remain dormant in their fat and pregnancies would be more successful, Wasser said.

Next, CK9 will research the relationship between big carnivores such as wolves, cougars, coyotes and bears in Eastern Washington. In preparation for that adventure, Chester will continue to seek out scents that will help the team discover more findings in wildlife conservation research.

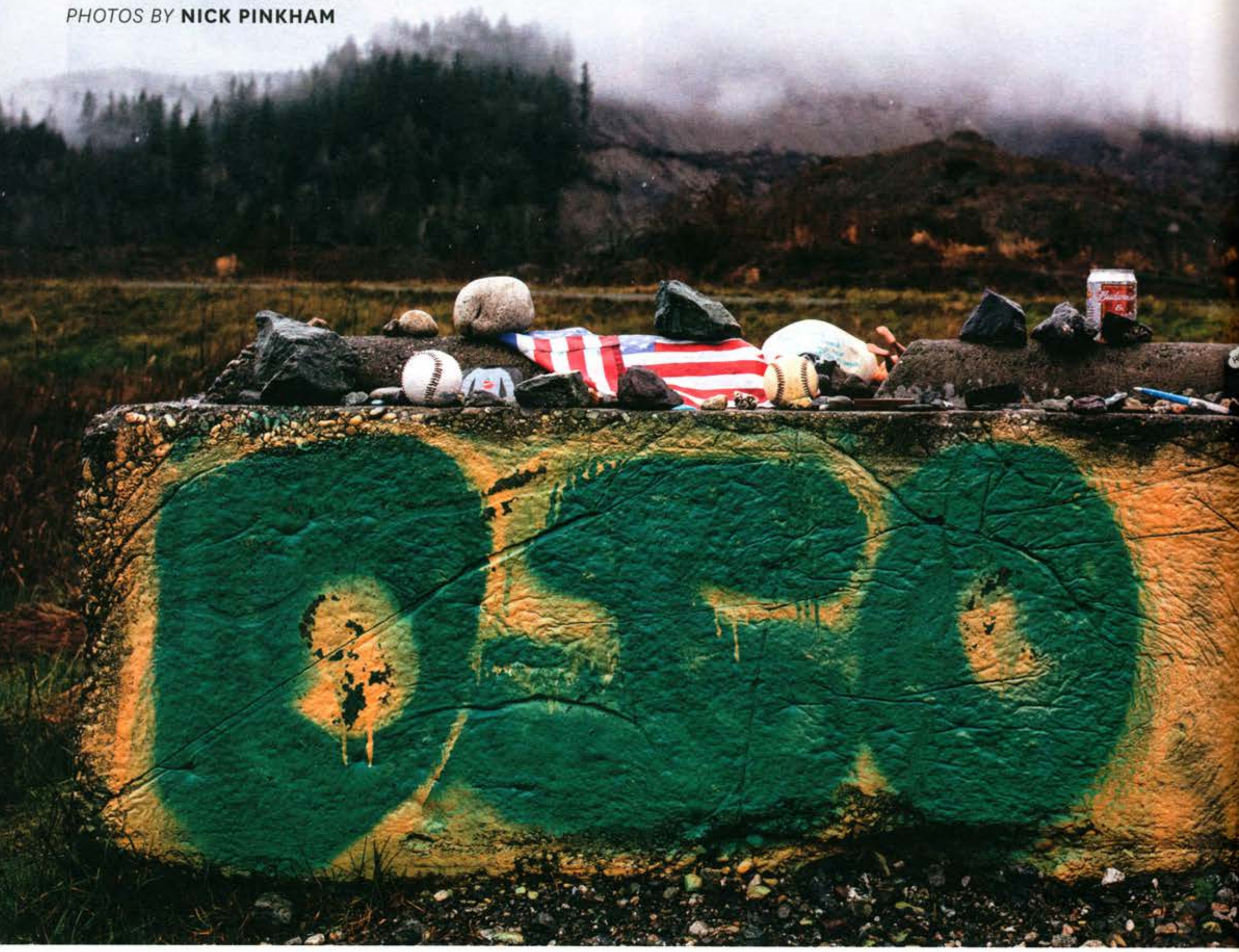
"You get the whole picture of what's going on in an ecosystem just from the scat," Poisson said. "It's really incredible."

LUCY CARRELL is a student at Huxley College. She studies environmental education in hopes of fostering a positive relationship between people and the natural world.

NICK PINKHAM studies design and computer science. Before Western Washington University, he studied photography and design in Michigan. When he isn't busy studying, he can usually be found out in the mountains.

BRANCHING OUT

STORY BY **TIMBER LOCKHART**
PHOTOS BY **NICK PINKHAM**



From the entrance to the Oso Memorial site, a soft, white mist hangs low on the distant mountains. Mementos including beer cans, a neon-colored plastic lei and a weather-worn baseball sit atop concrete barriers. The words "Oso" and "strong" are spray painted in green capital letters on the cement blocks. Forty-three Western red cedar saplings planted at the site recall the lives lost to the deadliest landslide in the United States' history.

DARRINGTON, A LOGGING town east of Oso, is a community on the mend. Survivors and family members of those lost in the landslide won a lawsuit against the state of Washington and Grandy Lake Forest Associates, a logging company. Two summers following the landslide, state and local officials joined heads to create the Darrington Collaborative. The ten-member steering committee was chosen to represent community voices, conservationists, recreationalists, educators and timber fallers.

On March 22, 2014, more than 16 million metric tons of sand, till and clay flooded the North Fork Stillaguamish River. Forty-three lives and 40 homes were lost, covered in debris in the wake of the catastrophic landslide. In the months leading up to the slide, precipitation was almost double the average, providing an opportunity for debris to carve its way down the mountain.

Today, evidence of the catastrophic event remains. Heaps of soil littered with broken tree trunks extend from the edge of State Route 530 to the bottom of the barren, newly formed cliff.

Steve Skaglund, a third-generation logger and 49-year resident of Darrington, recalled the day of the landslide as surreal. The road out of town was rendered impassable by the newly formed mountain of rubble, keeping many commuters from reaching their jobs. Alongside neighbors and local business owners, he helped clear a path. Members of the community contributed every piece of equipment they had, Skaglund said.

"If you ever had a doubt in humanity, the doubt went away by about day three," Skaglund said. "Everybody knew that no one was going to get paid for this, but we didn't care. This is what needs to be done."

"EVERYBODY KNEW THAT NO ONE WAS GOING TO GET PAID FOR THIS, BUT WE DIDN'T CARE. THIS IS WHAT NEEDS TO BE DONE."

- STEVE SKAGLUND, *A THIRD-GENERATION LOGGER AND 49-YEAR RESIDENT OF DARRINGTON*

Local morale and the local economy were stunted by the natural disaster. Darrington was once economically booming in an era of mass timber production. Now, residents face higher rates of poverty, decreased school enrollment and falling housing prices, said Oak Rankin, member of the Darrington Collaborative.

Rankin is the unofficial executive director of the Glacier Peak Institute, established after the dust from the landslide had settled.

"People that have disagreed for a long time are coming together to partner and work together and find things in common to create benefits for the economy, the community and ecosystems in this area," Rankin said.

ABOVE: *An unopened beer can and other mementos sit on a makeshift memorial along the entrance of Steelhead Drive, the site of the Oso landslide.*

RIGHT: *The Oso landslide occured on March 22, 2014. It was the deadliest landslide in United States' history.*

One of the aspects unique to the Darrington Collaborative is a focus on funding science, technology, engineering and math (STEM) education for their school district. As part of the collaborative, the Glacier Peak Institute expands youth participation in ecological restoration projects in the area.

Rankin and Mike Town, a teacher at Tesla STEM High School in Redmond, Washington, pioneered an educational exchange between students from suburban Redmond and rural Darrington.

"I've been teaching for 33 years and this has been kind of one of the more powerful moments I've had," Town said.

He beams as he recounts how his high school students enjoyed designing science curriculum using Minecraft, drones and map-making technology to share with the middle schoolers. Darrington students bring knowledge of trees, mountains and salmon to the table. They learn from one another, as kids do, Town said.

"So, as we develop these programs, we'll work on building these urban-rural relationships and partnerships," Rankin said. "How do we really start to break that divide and offer something phenomenal?"

For Darrington, the answer is timber. The collaborative allows community members to decide how their timber dollars are spent. Rather than sending the receipts from timber sales for processing at the federal level, the funds remain controlled by Mount Baker-Snoqualmie National Forest for reinvestment in restoration projects.

Tom Uniack is on the collaborative's board of directors and brings knowledge about ecosystem management to the table.

One aim of the collaborative is to create old-growth characteristics within existing second-growth forests. Restorative thinning, as opposed to clear cutting, removes smaller trees and creates more room for older trees to thrive. When timber is clear cut it grows back into a thick stand of trees, all the same age. Restorative thinning allows a complex understory to develop, improving soil quality and overall ecosystem health.

Skaglund was invited to serve on the collaborative and speak on behalf of local loggers. Only a few loggers remain, but younger generations in his community pursue the science and management aspects of forestry. Skaglund said he hopes the logging industry will continue to provide a living in Darrington.

"Darrington isn't the Darrington that it was 20 years ago," Skaglund said as he steered his truck onto a logging road. Moments before, he gave a left-hand wave without fully removing his hand from the steering wheel, smiling as one of his fellow loggers drove past.

"To people who've never logged, they've never seen what we get to see," Skaglund said. "Quite a few mornings out of the year when you get to work, you work for awhile and the sun starts coming up over the side or the top of the mountain and you can see for miles and miles to the Puget Sound. At that point it doesn't matter if you make four dollars an hour, ya know?"

TIMBER LOCKHART studies recreation and environmental studies. She is also the Mountain Environments Research Institute coordinator and has a passion for making outdoor science more accessible.

NICK PINKHAM studies design and computer science. Before Western Washington University, he studied photography and design in Michigan. When he isn't busy studying, he can usually be found out in the mountains.

BELOW: *Steve Skaglund oversees logging projects all over Washington state.*

THE PLANET MAGAZINE | **MULTIMEDIA**

LEFT TO RIGHT, TOP TO BOTTOM: *Nick Pinkham, Michael Nguyen, Colin Murphy, Shaylen Widom-North, Hannah Prather, Timber Lockhart, Lucy Carrell, Justin Thompson, Warren Cornwall, Leah Olver, Emily Cone, Sophie Kastelic, Ilana Newman, John Simmons, Grace McCarthy, Erika Osland, Abby Owen, Alex Martinez.*

NOT PICTURED: *Emily McLaughlin, Jacob Land, Jacob Richie, Matthew Tangeman, Alana Strong, Regan Bervar, Alec Ward.*

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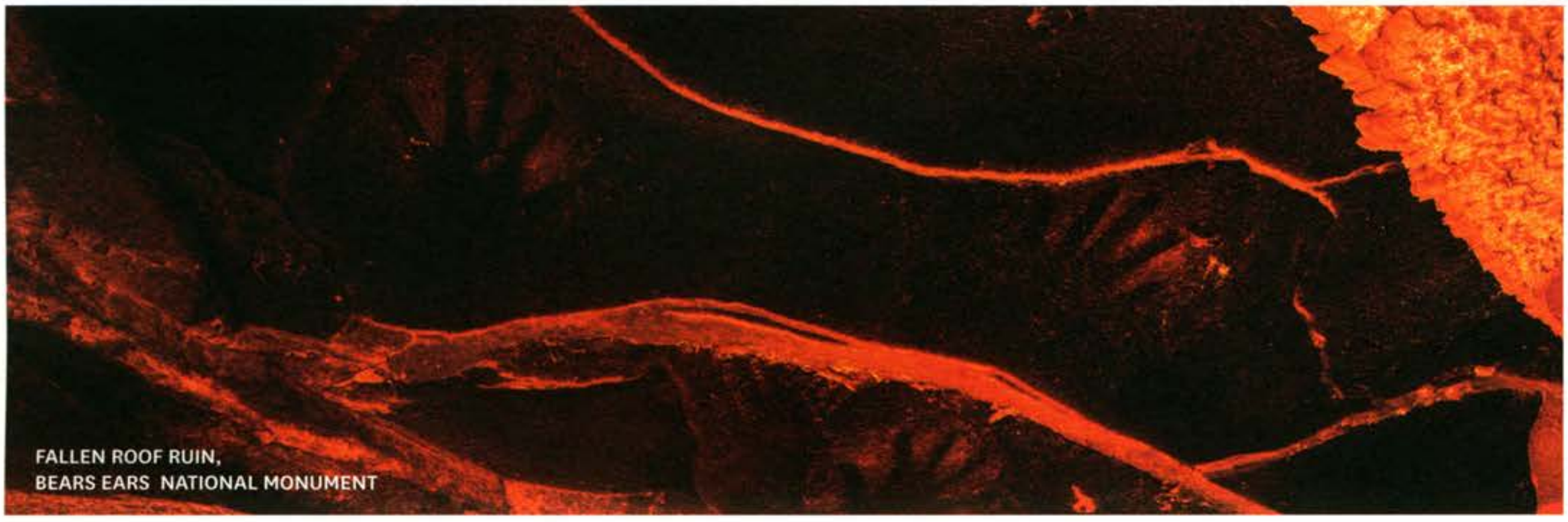

FALLEN ROOF RUIN,
BEARS EARS NATIONAL MONUMENT

"You are not Atlas carrying the world on your shoulder. It is good to remember that the planet is carrying you."

- VANDANA SHIVA