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# Defenders

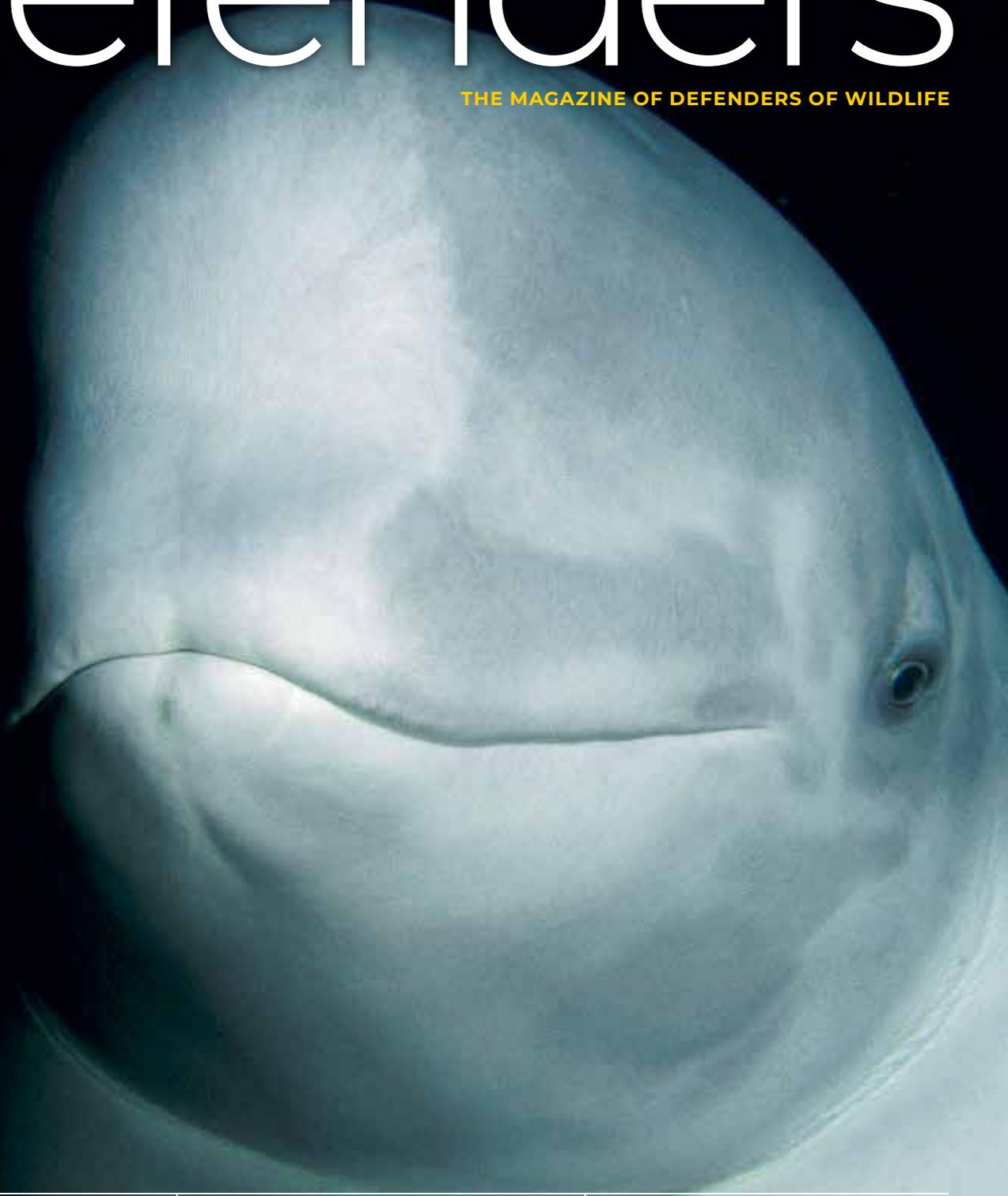
FALL 2022

THE MAGAZINE OF DEFENDERS OF WILDLIFE

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BEING THERE  
FOR BELUGAS

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table of contents

**FEATURE**

**10 BELEAGUERED BELUGAS:**

Can Cook Inlet Belugas Come Back From the Brink?

BY WENDEE NICOLE

**8** Horseshoe Crabs Need Help

**16** Tackling the Extinction Crisis

**OUTFRONT**

**5** Bee Happy; Wolverine Win; Protecting Parrots

**WILD MATTERS**

**6** Plastics: A Pathway for Pathogens; Nature's Naturopaths

**LIVING LIGHTLY**

**17** Ensuring Enchanted Evenings Endure

**WORTH DEFENDING**

**18** Pinyon Jay



16

The Kirtland's warbler—once close to extinction—thrives today because the Endangered Species Act spurred the U.S. Forest Service to change its timber management practices.



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Defenders of Wildlife is a national, nonprofit membership organization dedicated to the protection of all native wild animals and plants in their natural communities.

**Our work is made possible through the support of our members.**

Jamie Rappaport Clark, *President & CEO*

Heidi Ridgley, *Editor*

Wendee Nicole, *Contributing Editor*

Jennifer Croteau, *Designer*

**Membership Questions**

1-800-385-9712 or [memberservices@defenders.org](mailto:memberservices@defenders.org)

**Feedback**

[editor@defenders.org](mailto:editor@defenders.org)

Or write to:

Defenders of Wildlife  
1130 17th Street, NW  
Washington, D.C. 20036-4604

**Field Offices**

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**On the cover**

Cook Inlet belugas have declined precipitously since the 1980s, and researchers are struggling to find out why.

Check out Defenders' website: **defenders.org**



COVER: BELUGA (CAPTIVE)  
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## Vote for Wildlife

With the impacts of climate change becoming more apparent every day and so much of our biodiversity at stake, the upcoming midterm election is a chance for Americans to defend our wildlife, wild places and the environment around us.

Our country's conservation legacy runs deep. Past American leaders, both Democrat and Republican, have left their mark by creating national wildlife refuges, parks and monuments to provide habitat for wildlife and places for people to recharge and reconnect with the natural world. We deserve members of Congress who will build on this leadership and who will protect and strengthen our bedrock environmental laws, including the Endangered Species Act, Migratory Bird Treaty Act and National Environmental Policy Act. It's our responsibility as citizens to make sure nature is protected. We need elected officials at every level of government who understand that and are committed to the health of our planet, not beholden to the interests of those who want to exploit our natural resources.

Scientists unequivocally tell us we are running short on time because of human-accelerated climate change. With more than a million species at risk of extinction, we

must elect leaders this fall who will take decisive action to lessen its effects. We are witnessing the escalating devastation from stronger storms, overwhelming wildfires, longer droughts and rising seas—all of which displace and endanger people and wildlife all over the world.

Our votes will speak for the wildlife and wild places that cannot speak for themselves—from red wolves to spotted owls and from the West across the Rockies and Great Plains to the rivers and streams of the Southeast. It is up to us to choose the future we want for our planet.

As 2022 draws to a close, we stand at a crossroads. This fall, make your vote a call to action. Let's elect leaders who will address the urgent environmental challenges of our day and restore our nation's natural vitality. We cannot afford to waste one more opportunity. We owe it to ourselves and future generations.

Jamie Rappaport Clark, *President & CEO*

@JClarkPrez  
 Jamie Rappaport Clark

We'd love your thoughts about this issue. Write: [editor@defenders.org](mailto:editor@defenders.org)

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## Bee Happy

Four highly imperiled bumble bee species in California will have a chance at avoiding extinction after an appeals court ruled in May that they are eligible for listing under the state's Endangered Species Act despite Big Ag's claims to the contrary. Populations of Crotch's, Franklin's, Suckley cuckoo and western bumble bees have all plummeted in recent years, decimated by habitat loss, diseases and pesticides. Since the late 1990s, for example, the western bumble bee—once one of the most common bumble bees in its range—has declined by 84 percent. The state can now proceed with listing the four bees as first proposed in a petition filed by Defenders and other conservation groups in 2018. ♦



FRANKLIN'S BUMBLEBEE | JANET HORTON/ALAMY STOCK PHOTO



WOLVERINE | © PIXABAY

## Wolverine Win

The U.S. Fish and Wildlife Service must reexamine its 2020 decision not to list the wolverine under the Endangered Species Act, after a lawsuit brought by Defenders and a coalition of environmental groups. A warming climate is fragmenting and shrinking the habitat of the snow-dependent animal. No more than 300 individuals remain in the Lower 48, but a listing could focus resources and activities on preventing the species from going extinct. ♦

MORE ONLINE Check out: [defenders.org/wolverine](https://defenders.org/wolverine)

## Protecting Parrots

Tens of thousands of parrots have been saved from poaching following Mexico's parrot trade ban in 2008, according to a new report by Defenders. This is promising news for Mexico's 22 parrot species, which are threatened, endangered or in need of special protections. Before the ban, poachers and smugglers illegally traded an estimated 78,000 parrots a year. Criminalizing the parrot trade and increasing funding for conservation efforts and education resulted in a 47% drop in illegal trade, saving up to 37,000 imperiled birds annually. In the 14 years since the ban went into effect, seizures of Mexican parrots in the U.S. declined by 88%. ♦



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SEA OTTER | DAVID LEDIG/BLM

Plastic—invented less than a century ago—is now concerning researchers who have found this omnipresent pollutant can carry land-based pathogens to places throughout the ocean where they would normally never be found.

“It’s easy for people to dismiss plastic problems as something that doesn’t matter for them, like, ‘I’m not a turtle in the ocean; I won’t choke on this thing,’” says Karen Shapiro, associate professor at the University of California-Davis School of Veterinary Medicine. “But once you start talking about disease and health, there’s more power to implement change. Microplastics can actually move germs around, and these germs end up in our water and our food.”

The researchers studied *Cryptosporidium* (Crypto), *Giardia* and *Toxoplasma gondii*, a parasite causing toxoplasmosis, which has long been connected to California sea otter deaths,

## Plastics: A Pathway for Pathogens

microfibers, found in clothing and fishing nets. Those that float can travel long distances, spreading pathogens far from their sources on land. Plastics that sink may concentrate pathogens near the bottom of the sea, where filter-feeding animals like zooplankton, clams, mussels, oysters, abalone and other shellfish live, increasing the likelihood of their ingesting plastic and pathogens.

“When plastics are thrown in, it fools invertebrates,” Shapiro says. “We’re altering natural food webs by introducing this human-made material that can also introduce deadly parasites.”

To prevent microplastics from reaching the ocean, cities can step up stormwater treatment technology, manufacturers should follow best-management practices that capture waste, and, on the home front, consumers can avoid exfoliants, cleaners and toothpaste that contain microbeads, and install filters on their washers and dryers. ♦

and has also killed Hector’s dolphins, Hawaiian monk seals and other critically endangered wildlife. In people, toxoplasmosis can cause life-long illnesses, as well as developmental and reproductive disorders, while Crypto and Giardia cause gastrointestinal disease and can be deadly in young children and people who are immunocompromised.

The researchers studied microbeads, often found in cosmetics, and

81% ✓

of American voters across eight western states think loss of habitat for fish and wildlife is a serious to extremely serious concern.

91% \$

believe tax dollars should support land, water and wildlife conservation.

COLORADO COLLEGE POLL 2021, AS CITED IN DEFENDERS’ NEW REPORT: TACKLING THE EXTINCTION CRISIS

## Nature’s Naturopaths

Humans aren’t the only ones tapping nature to cure what ails us. Bottlenose dolphins have been discovered rubbing themselves nose to tail against corals when a skin condition erupts, suggesting the dolphins know the corals have medicinal properties. “It was clear that the dolphins knew exactly which coral they wanted to use,” says Angela Ziltener, a wildlife biologist at the University of Zurich, who observed the behavior in the Red Sea. Ziltener and her team found that by repeatedly rubbing against the coral, Indo-Pacific

bottlenose dolphins were agitating the tiny polyps that make up the coral community to release mucus. Chemical analysis revealed the coral to which the dolphins gravitated had properties useful in treating bacterial infections—another example of the planet’s amazing biodiversity and interconnectedness. ♦

### INSPIRED?

Tell us by writing:  
[editor@defenders.org](mailto:editor@defenders.org)



INDO-PACIFIC BOTTLENOSE DOLPHINS | KIM PETERSEN / ALAMY STOCK PHOTO



© JUDY GALLAGHER

Horseshoe crabs, which are more closely related to scorpions and spiders than crabs, live on the ocean floor and emerge only to spawn in spring.

## Horseshoe Crabs Need Help

Heavily harvested for the biomedical industry, horseshoe crabs throughout the coastal areas of South Carolina are showing a drastic drop in numbers, as revealed in an in-depth Defenders report, which provides harvesting data along with a comprehensive list of previously undisclosed harvest locations.

To help recover horseshoe crabs as well as the migratory bird populations that depend on their eggs, the South Carolina Department of Natural Resources (SCDNR) must take concrete, enforceable steps to restrict harvests for the biomedical industry, including revising harvest permits and undertaking a horseshoe crab survey, says Christian Hunt, Defenders’

Southeast representative and the report’s author. The state must also sever financial ties to Charleston-based biomedical company Charles River Laboratories and prohibit the use of crab containment ponds. These crudely dug containments can hold thousands of crabs for weeks or months without food while depriving migratory birds of the crabs’ eggs.

“It’s time for the state to treat the horseshoe crab as a public trust resource, not a private commodity,” says Hunt.

Charles River bleeds an estimated 150,000 crabs a year to create a product used to test for cleanliness in medical devices and instruments. A few decades ago, scientists discovered horseshoe crabs have properties in their blood that attack foreign bodies. But in more recent years, scientists have developed more viable, ethical and efficient synthetics. Charles River has not adopted the synthetic alternative, and the biomedical industry harvest in South

Carolina has grown from fewer than 5,000 crabs in 1991 to 150,000 today. Among the five properties Defenders found where poaching likely occurred for years is Parris Island—a site that should be strictly off limits to all but the U.S. Marine Corps.

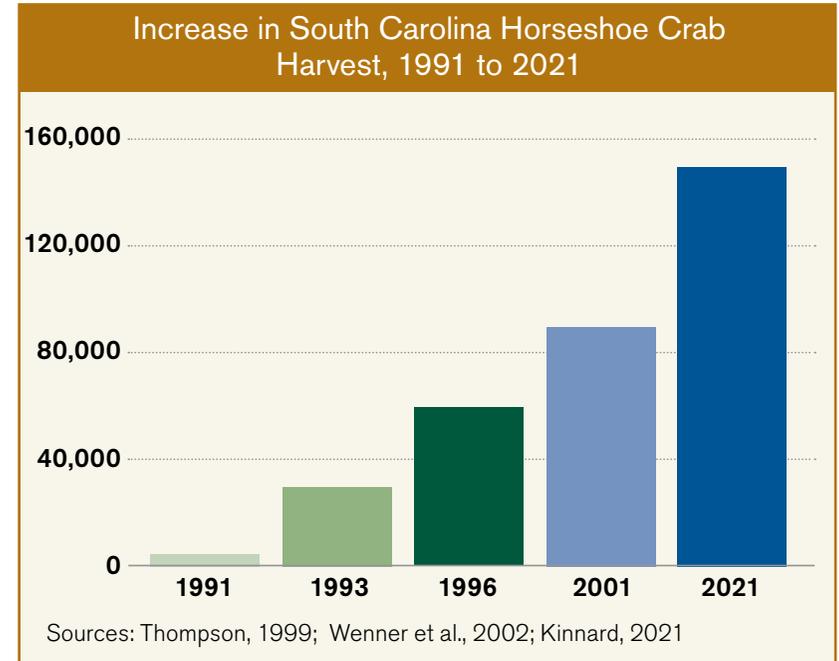
“The unregulated and often illegal harvest in South Carolina has caused incredible damage, degrading priority habitats for shorebirds and crabs alike,” says Hunt. “The state agency receives roughly \$1.5 million a year from Charles River, which constitutes a major portion of its revenue. This is most definitely creating a conflict of interest that is jeopardizing species.”

Shorebird biologists from multiple states now consider runaway harvesting in South Carolina the most significant shorebird conservation issue in the region. Today most if not all the threatened red knot’s foraging areas suffer from heavy horseshoe crab harvesting disturbance, with harvesters and birds vying for the same resources at the same time.

The horseshoe crab, which has existed relatively unchanged for hundreds of millions of years, dwells on the ocean floor between Maine and the Yucatan Peninsula, emerging on beaches to spawn in early spring. Migratory birds, including the red knot, time their flight each year to intersect with this event, so they can feast on the crab’s energy-rich eggs. But this harvest, and subsequent bleeding of the animals for medical purposes, can kill up to a third of female crabs each year. After bleeding, the horseshoe crabs are released, but often show decreased movement, failure to respond to tidal rhythms, impaired breeding behavior and diminished immune function.

Defenders’ work to stop the illegal harvest of horseshoe crabs on public land includes suing the U.S. Fish and Wildlife Service (FWS) in 2020 for failing to regulate the harvesting on a national wildlife refuge. Defenders settled the case when FWS said it would comply with the law.

**MORE ONLINE**   
Check out: [defenders.org/intervention](https://defenders.org/intervention)



FWS

In January, Defenders and the South Carolina Coastal Conservation League, represented by the Southern Environmental Law Center, sued SCDNR and Charles River Laboratories for violating the Endangered Species Act over the practice of detaining horseshoe crabs in containment ponds. ♦

Red knots fuel up on horseshoe crab eggs before continuing their journey to Arctic breeding grounds.

# Beleaguered Belugas

Can Cook Inlet Belugas Come Back From the Brink?

BY WENDEE NICOLE

Once upon a time, according to the folklore of the Tyonek Tribe in the Athabaskan region of Alaska on the western edge of Cook Inlet, humans could communicate with belugas. To this day, they have a special relationship with them. “One day I saw an elder I call ‘Stan the Man’ sprinting,” says Justin Trenton, environmental director of the Native Village of Tyonek, southwest of Anchorage. “He’s usually pretty chill, so I thought something was wrong. Turns out he was running to the bluff to look at a beluga. Tribe members get so excited just to see them, and they always talk about the big numbers there used to be.”

Hundreds of these highly intelligent white whales could once be seen navigating these northern waters, but Cook Inlet belugas have declined precipitously since the 1980s.

“Now, you’re lucky if you see a pod of 10 belugas at a time,” says Nicole Whittington-Evans, Defenders of Wildlife’s Alaska program director, who recalls a wonderous fall day on Cook Inlet when the fog hung low over the water. Suddenly she heard chirpy musical notes offshore, and a group of about 10 adult belugas with their calves rose above the surface, their heads and bodies enshrouded in fog.

“The last population estimate in 2018 puts Cook Inlet belugas at just 279, which is a population decline of over 75% from a population of 1,300 individuals in 1979,” she says. And nobody knows exactly why.

Highly social animals, beluga whales have a distinctive squishy bulge known as a “melon,” under the skin on their forehead. This large mass of fatty tissue aids in echolocation, generating the high and low frequency sounds that help them forage and navigate in the turbid waters of Cook Inlet. It also produces the chirps, clicks, whistles and squeals they use to communicate. “Belugas are considered canaries of the sea because they are extremely vocal and have a sing-songy approach to com-

munication,” says Whittington-Evans. Some also call them canaries in the coal mine since the decline of these top predators may prove a harbinger of things to come.

Protected in 2008 under the Endangered Species Act and named after the 192-mile-long tidally influenced natural waterway that empties into the Gulf of Alaska, Cook Inlet belugas are the only one of the five beluga populations in Alaska designated as endangered. “Cook Inlet is the most easily accessible place in Alaska to see belugas,” says Whittington-Evans. “It’s also directly adjacent to the largest human population center in Alaska—Anchorage—with approximately 290,000 people. That puts the Cook Inlet beluga population very close to a lot of human activity.”

But pinpointing the precise cause of the decline has proved elusive.

In the 1970s, oil development on the North Slope resulted in a boom economy that led people, including subsistence hunters from other parts of Alaska, to relocate to Anchorage. “Subsistence harvesting increased in the late 70s and early 80s,” says Whittington-Evans, “and that was initially thought to be the reason for the decline.”

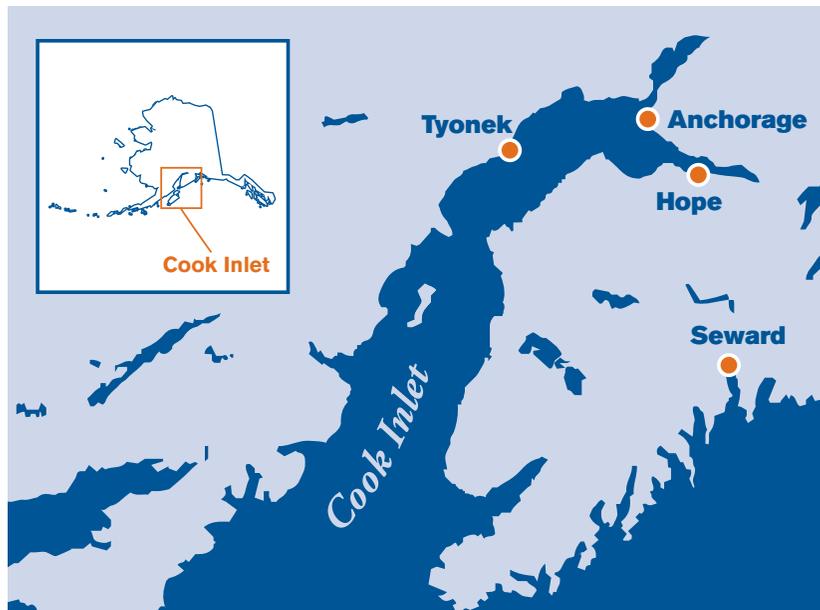
But the Tyonek people and other tribes voluntarily stopped hunting Cook Inlet belugas in 2005. After hunting ceased, the population had a small increase for three years, but in 2010, it started on a steady annual decline of more than 2%.

“They’re always saying that it’s Tyonek’s fault, but it’s been nearly 20 years since hunting ended and the population’s still going down,” says Trenton. “The only thing that’s increased is development, and there’s been a lot of oil and gas spills. They say, ‘Oh, it’s only very little,’ but after 20 years, all the small spills add up.”

The most recent National Oceanic and Atmospheric (NOAA) recovery plan for the population lists three issues of the highest concern for Cook Inlet belugas, mostly connected to human activity: noise, potential catastrophic events and “cumulative effects” of multiple threats—from increased pollution to



COOK INLET | © HEARST MEDIA PRODUCTION GROUP; BABY BELUGA WHALE | © CHANDRA TOLLEY; BELUGA WHALE ALLIANCE



decreased prey.

Noise pollution is devastating for a creature that depends on sound waves to navigate waters filled with glacial silt. “Belugas depend on echolocation for communication and knowing where they are in their surroundings,” says Whittington-Evans. “When there is a lot of noise, this can hamper their ability to communicate with their pod and know where they are in relation to prey, boats or the shore.”

Factor in shipping traffic to and from Anchorage, local boats traveling among communities throughout the inlet, oil and gas development, commercial and personal fishing activity and airports—aircrafts generate noise that enters the water and can be heard by wildlife—and it’s not hard to understand why noise is identified as a high concern, says Jill Seymour, NOAA recovery coordinator for Cook Inlet belugas.

The recovery plan lists catastrophic events—including large oil spills or natural disasters—as another threat of highest concern. “If a big earthquake or landslide occurred in a particular location where belugas were concentrated, that could have a disproportionate effect on the population,” explains

Seymour. An oil spill could similarly devastate the population, even leading to extinction.

Then there’s the high-concern threat of cumulative effects. It’s essentially a combination of multiple things like changes in prey availability, noise and climate change, says Seymour. This encompasses all the other serious issues—from smaller oil spills and leaks to reductions in salmon populations and warming oceans.

Climate change is slowly but steadily increasing the ocean temperature in Cook Inlet, affecting levels of prey such as salmon and hooligan and reducing the extent of sea ice, which can help belugas escape from predators. “They don’t have a dorsal fin and that adaptation allows them to navigate better under sea ice,” says Seymour. “Killer whales are a predator of belugas, including in Cook Inlet.” Yet the tall dorsal fin of killer whales means they can’t easily get under sea ice. With less sea ice, belugas may be more vulnerable to predation.

While oil and gas development was not directly identified as a problem in the recovery plan, its occurrence is linked to underwater noise and pollution. “It is one way that contaminants enter the ocean,” says Whittington-Evans. “Once in the environment, these

A survey team with Defenders’ Alaska Director Nicole Whittington-Evans in the center scouts for belugas (inset) from the shore of Cook Inlet.

substances move up the food chain and can accumulate in predators like beluga whales and ultimately threaten their immune system and reproductive health.” As of 2021, 16 offshore oil and gas platforms are operating in Cook Inlet, and many more wells could be drilled if lease sales continue.

In May, Defenders applauded the Biden administration for canceling a Cook Inlet lease sale from the 2017-2022 “five-year plan” created under the previous administration. But a few weeks later, Biden turned around and included one in the proposed 2023-2028 National Outer Continental Shelf Oil and Gas Leasing Program plan, according to Defenders’ Alaska Policy Advisor Patrick Lavin. Defenders is urging the administration to change course and remove the lease sale from Cook Inlet—not yet a done deal—to reduce impacts on the beleaguered belugas.

While the noise, pollution and habitat degradation associated with human populations is clearly a major threat to Cook Inlet belugas, the proximity of people could also be the beluga’s saving grace.

“Many individuals and researchers are involved in Cook Inlet beluga recovery, but they can’t be everywhere all the time,” says Sey-

mour. “And we need as many eyes as possible to collect information.”

The Alaska Beluga Monitoring Partnership—which includes Defenders, NOAA Fisheries, the Beluga Whale Alliance and other organizations—has leveraged this proximity to human development to help save the species. The partnership developed community science programs along Cook Inlet, allowing community members and tourists to observe and report beluga behavior, weather conditions, noise, human activity and other information that can help NOAA Fisheries identify critical information about habitat use, threats and more. Photos taken by volunteers also help researchers identify specific individuals.

Starting in 2019, the partnership established six monitoring and observation spots along the inlet. These spots include: Ship Creek, Mile 95.3 on the Seward Highway, Twentymile River, Kenai River, Kasilof River and The Point. Anyone can try spotting belugas at these locations, but volunteer teams keep regular watch at each one.

“If our goal is to get people to spread awareness and also collect sightings data that is scientifically valuable and used in beluga conservation and management, there’s no need

for us to get out on a boat when underwater noise is arguably the top threat to the recovery of this population,” says Suzanne Steinert, the alliance’s founder and director. “We can stay along the shoreline in small groups, quietly observing the whales as they swim right by us.”

Steinert calls it some of the most predictable whale watching you can do anywhere, and, since the best

beluga-watching months are April and later in September, they’re also developing a shoulder season for Alaska tourism. During summer months, belugas become harder to spot.

The Cook Inlet Beluga Photo ID project also makes use of community enthusiasm to study and protect the whales, identifying individual belugas using scars and markings. This information contributes to a better understanding of the whales’ biology, behavior and conservation status. In addition to their own photos, the project accepts those taken by the community at large, submitted through its website. “We’re looking at why they aren’t recovering,” says the project’s lead scientist, Tamara McGuire. “We take note of where the whales are at different times of year, what kind of habitat they are using, and what they are doing in their habitat.” From this information, researchers piece together birth and death rates, seasonal habitat use and more data that is fed to NOAA Fisheries for official recovery decisions.

McGuire’s group is one of few with a permit to study Cook Inlet belugas in the water. One time, she and her crew saw a large group of belugas, when something magical happened. “Our skipper said, ‘hey, what’s that one whale doing over there by itself?’ My first thought was, ‘I don’t care, I’m trying to get pictures of 200, not one.’ And he said, ‘No, you really need to look, there’s something unusual going on.’” At first, they thought the whale was hurt, stranded or sick. “And then all of a sudden, there’s a little tiny newborn popping out of the water like a cork!”

Baby belugas are gray, in stark contrast to the bright white adults. Newborns have distinct fetal folds from being rolled up in the womb. All the information gathered on births, as well as deaths from strandings or when a known beluga disappears, allows researchers to determine birth and death rates. “Modelers look to see if it is a problem with the death rate or a problem with the birth rate.

As it turns out, it’s both,” adds McGuire.

Tyonek Village is also a partner in collecting data on belugas, their behaviors and other pertinent information that could help turn the tide for this population. “We have citizens that go out and take pictures. We do our best to try to monitor them the safest way we can,” says Trenton. He gave cameras to tribal members who live at a fish camp that’s right on the inlet, and when NOAA Fisheries

or other beluga-monitoring groups see belugas heading for Tyonek, they give him a heads up. “They’re always calling to let everyone know that the belugas are coming because usually when you see belugas, it’s a sign of fish.”

Trenton’s concerns for the future are not just focused on belugas but the entire Cook Inlet ecosystem. “It’s our job to be good stewards of the land and the ocean,” he says.

“We like to say that’s their garden. We’ve got to take care of the garden for them to flourish and now we’re damaging the resources in their gardens. If belugas go, everything will start collapsing.”

—Wendee Nicole is an award-winning writer based in San Diego. She regularly writes for Defenders, as well as Environmental Health Perspectives and other publications.



© ANDY BURCH

A pod of beluga whales swim in Arctic waters.



LAURA MORSE/NOAA

The murky waters of Cook Inlet make it hard to photograph belugas underwater. This photo (above) was taken in the Arctic Ocean, and the opening spread with two adults and a calf was taken underwater in the much clearer waters of Hudson Bay in Canada.

## Tackling the Extinction Crisis

In the dense forests of northern Michigan and Wisconsin, the Kirtland's warbler—once frighteningly close to extinction—thrives today because the Endangered Species Act (ESA) listing of this engaging little bird in 1973 spurred the Forest Service to change its land-management practices, including how timber is harvested. The Kirtland's warbler population has since increased by more than 1,400%, and the U.S. Fish and Wildlife Service removed the bird from the Endangered Species List in 2019.

The red-cockaded woodpecker is one of the many species that relies on habitat found on federal lands.

More listed species could be ESA success stories, according to a new Defenders report, *Tackling the Extinction Crisis*, if the Forest Service, Bureau of Land Management



RED-COCKADED WOODPECKER | MARK RAMIREZ/FWS

(BLM) and other federal agencies managing large tracts of natural areas received the funding needed to make the meaningful progress toward habitat restoration and species recovery that is desperately needed at a time of overwhelming biodiversity loss.

“We see and experience the cumulative effect of choices made over the last few centuries that brought us here,” says Lauren McCain, lead author and Defenders’ senior federal lands policy analyst. “The good news is that action taken now can help prevent future extinctions and safeguard vulnerable wild animals and plants in our trust,” she says.

While the actions and partnerships needed vary widely, they all have one thing in common: investing money in species recovery at the federal level. Like the warbler, the Borax Lake chub in Oregon recovered and was delisted from the ESA in 2020 after the BLM invested in protecting 520 acres around the fish’s namesake lake from grazing, off-roading and mineral development.

Species that rely on federal lands to recover include some of North America’s most charismatic animals: the black-footed ferret, Canada lynx, jaguar, Mexican gray wolf, red-cockaded woodpecker and red wolf, as well as lesser-known species: the Dakota skipper, California tiger salamander, Gila trout and many mussel species in the Appalachians.

“All these species, whether big or small, are essential elements of ecosystems,” says McCain. “When they are lost or depleted, nature’s careful balance is disrupted. We cannot bring back the passenger pigeon or the Carolina parakeet and other extinct species, but we have the power to save the endangered species that remain and restore the biodiversity fundamental to our own well-being. More resources to the agencies charged with this important work could make the difference.” ♦

## Ensuring Enchanted Evenings Endure

“Wow, the fireflies tonight are magical,” observed Nate Russell as he sat in his Silver Spring, Maryland, backyard this summer. “There’s almost too many to count. I’m glad climate change hasn’t affected them yet.” In fact, the larger threats to these little beetles right now are pesticides, light pollution, residential development, and homeowners and property managers misled to leave leaf-free, immaculate yards.

The U.S. is home to about 170 of 2,200 firefly species worldwide. About a third of the U.S. population is doing okay, but at least 18 species face some risk of extinction, according to a 2021 ICUN Firefly Specialist Group and Xerces Society analysis.

Fireflies spend almost their entire larval life hidden from our view forging for earthworms, snails and other prey. They only flash and fly for a few weeks at the end of their lives. The magical moments we witness are meant to attract mates and carry forward the next generation. But it can’t happen if their larvae are raked and bagged with the leaves and underbrush.

Last fall, Russell had too much on his plate, and for the first time since he can remember, he didn’t rake. “I felt bad about it, thinking my neighbors would get mad,” he says. But he shouldn’t have worried: His county’s Department of Environmental Protection actually encourages homeowners to “Leave the Leaves” in fall to help the loveable insects. This season, Russell had more fireflies than he could ever remember.

Fireflies occur with the greatest diversity in the Mid-Atlantic and Southeast, but no matter where you live, when you leave the leaves, you’ll help other insects like bumble bees and butterflies, which rely on leaf litter for habitat to survive over the winter, too. This is also true for frogs, salamanders and



NATURE PICTURE LIBRARY/ALAMY STOCK PHOTO

small mammals. Leaves also provide nutrients for soil and plants.

If you must rake, the agency recommends that residents leave behind leaf piles and mulch garden beds with leaves.

As for Russell, he’s already taken the extra time he’s saved by not raking this fall to set up a new hammock in his yard to relax and daydream about next summer’s glow. ♦

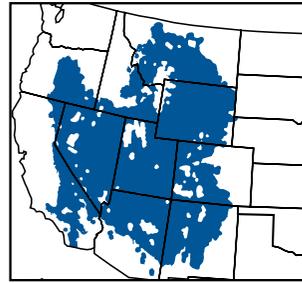
### More tips to protect fireflies

- **Embrace the Dark** Turn off unnecessary outdoor lights, light only what is needed and use dimmers, motion sensors and timers. If you live near firefly habitat, turn off or shield outdoor lights during mating season. Light pollution harms many nocturnal creatures, but it poses a special threat to fireflies that rely on detecting one another’s luminous signals to mate. Artificial light can suppress males’ advertising flashes by more than 80 percent and prevent females from responding.
- **Go Wild** Replace lawns with native grasses and wildflowers where females can lay eggs. Leave leaf litter and woody debris or pile on the edges of yards to create habitat for firefly larvae and their prey.
- **Lose Control** Let fireflies help control your grubs, slugs and snails instead of pesticides, and control mosquitoes at the larval stage by eliminating standing water, which is more effective and safer than spraying.

worth defending

# Pinyon Jay

A gregarious bird that moves in chatty, wandering flocks, the pinyon jay plays a significant role in regenerating the western woodlands by extracting and burying the nuts of the pinyon pine that gives it its name and major source of food. But with habitat destruction and drought accelerating, these birds are facing a precipitous population decline. It's hoped Endangered Species Act protections can bring this bird the boost it needs to carry on.



The message is simple: love and conserve our wildlife.

—Steve Irwin

Excellent spatial memory helps them find buried seeds

Expandable esophagus lets them fly with throats bulging to a caching site

Often remain part of the flock into which they were hatched



© CHRISTINA SELBY

**85%**

Population decline in last 50 years

**500+**

Individuals in a flock

**14.7**

Age of oldest recorded (banded and released)

**40**

Number of seeds capable of carrying in one trip

# Don't let the sun set on wildlife protection.



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