

Impact Report 2022



Oceans Initiative

is a team of scientists on a mission to protect marine life and the ecosystems on which they depend, and to share our innovative science to guide conservation action.

Dear Friends,

About twenty years ago, I sat in a small boat and scanned the grey horizon for killer whales. I was in what we now call The Great Bear Sea, and in the middle of critical habitat for northern resident killer whales. Out of nowhere, a line of water formed on the horizon. I thought it was a squall (a local windstorm that arrives out of nowhere) forming and began to get anxious as it approached. After taking a second look through the binoculars, I got chills as I began to make out shapes in the rough water. Stunningly beautiful grey, white, and black shapes caught air as they took a breath before diving back into the water below. It wasn't a squall at all, but a pod of more than a thousand Pacific white-sided dolphins traveling at high speed.

I'll never forget that moment, partly because I went on to study and publish on these dolphins for my doctorate, but also because I was experiencing a quintessential moment of awe. Dacher Keltner, Professor and co-director of the Greater Good Science Center at UC Berkeley, describes awe as, "...the feeling of being in the presence of something vast that transcends your understanding of the world."

While there is still relatively little known about Pacific white-sided dolphins, especially when compared to southern resident orcas, we do know they are sensitive to climate change. We also know that in some places, they may be undergoing a significant population decline or have moved from their usual habitat. While we know when the southern resident killer whale population goes up or down by one individual, or even when an individual is sick, we are still learning basic facts about Pacific white-sided dolphins while they are possibly declining before our eyes.

Biodiversity is, of course, inextricably linked to climate change and we need information about data poor species like Pacific white-sided and other neglected whale and dolphin species to understand whether populations are in trouble.

We are more driven than ever to strengthen and deepen our work on protecting biodiversity in the face of climate change. We look forward to developing a framework to better understand and assess threats to data deficient marine mammal populations; scaling up our cost-effective biodiversity toolkit to be used around the world so we have rough estimates of abundance for dolphins and whales for which we currently have no data; applying innovative solutions to reduce fisheries bycatch; and informing the use of conservation tools like protected areas to support recovery.

Protecting marine mammal biodiversity is not only an imperative to support a healthy planet on which we all depend, but in my experience, we also need to live in a world where wonder abounds. A world where interludes of awe and connection inspire us and reveal what we care about as humans and where we find meaning.

Thank you for fueling our work on exploration and discovery.

With oceans of gratitude,

Erin Ashe

Dr. Erin Ashe Executive Director and Senior Scientist



Our Vision

Oceans Initiative is a global conservation and research organization that delivers innovative science to conserve biodiversity and build resilience in the face of climate change. We envision a world with healthy ocean ecosystems that support marine life and allow people to earn a sustainable livelihood from the sea.

Founded and run by two scientists dedicated to protecting marine wildlife, our team tackles every aspect of marine conservation science with the goal of making conservation both easier for decisionmakers to understand and easier for people to practice. Oceans Initiative is unique in that we operate at the interface of science, conservation, and policy. We serve multiple populations—the wildlife we aim to protect, the policy-makers who rely on our science, and the people whose lives benefit from the ocean. Unlike pure research programs, we start our projects by speaking with managers about the kind of information they need to make sustainable resource management decisions, and shepherd our science through to use in conservation decision-making.

Our People

We are grateful for the opportunity to do our work to protect marine life and to provide a useful service for the planet. Our dedicated, volunteer board helps make this possible. We thank our Board of Directors and our entire team for their many contributions in 2022.

2022 Board of Directors

Erin Ashe, PhD Debra Boyer, PhD Duschka Fowler-Dunning, MBA

2022 Oceans Initiative Team

Erin Ashe, PhD Founder, Executive Director, and Senior Scientist

Rob Williams, PhD Founder and Chief Scientist

Asila Ghoul Bergman Research Associate

Laura Bogaard Research Associate and Coordinator

Marena Salerno Collins Research Associate

Natalie Mastick Jensen Graduate Fellow in Marine Parasite Ecology Melissa Hornbein, MSc, JD Nan McKay Gae Weber, MSW

Catherine Lo Research Associate

Kimberly Nielsen Research Associate

Stephanie Reiss Research Assistant

Karen Sinclair Development and Marketing

Katie Wold Research Assistant

Strategic Plan 2022-2024

Our work guides real-world conservation decisions to prevent extinctions, safeguard marine biodiversity, and protect wild places. Five strategic priorities are central to our work.

Helping to solve the twinned biodiversity and climate crises

We are identifying solutions to buffer threats to whales and dolphins—overfishing, bycatch, noise, ship strikes, contaminants—to build the species' natural resilience to survive the challenges of climate change.

Protecting ocean habitats

We are pioneering efforts to identify and safeguard biodiversity hotspots and acoustic sanctuaries while protecting 30% of the ocean by 2030.

3

Reducing bycatch in global fisheries

We specialize in the science to assess which marine mammal populations are most at risk from mortality in fisheries, ship strikes, and other harmful human activities, and finding practical, affordable solutions to reduce marine mammal deaths in fishing gear.



Engaging communities in ocean conservation

We tell stories to better inform, engage, and inspire individuals to take action in their own communities.



Building greater organizational capacity

Investing in Oceans Initiative's mission allows our co-founders to serve as thought leaders in the field, communicating the organization's science, shaping policy, and ensuring that policy-makers implement effective conservation actions.

Killer Whale Conservation

Oceans Initiative is best known for conducting innovative research to understand human threats to the endangered southern resident killer whale population, and guiding effective and precautionary recovery plans.

A Message from our Chief Scientist

In these highly polarized times, I believe strongly that the scientific method is one of our most powerful tools to understand the natural world. I also recognize that information is necessary but insufficient to change the world.

Dr. Erin Ashe and I met in 2002 at a conference called "Going, going, gone?" that was convened by Earth Island Institute. At that time, there were 82 individuals in the southern resident killer whale population, but even then, we were all concerned about the very real risk of extinction. Two decades ago, the three main threats to recovery (not enough salmon, too much vessel noise and disturbance, and toxic effects of contaminants) were already known. There was real concern about the population going extinct. We have learned so much in the last 20 years, but the population continues to decline.



Dr. Rob Williams

There's some nuance here. It's very important to know how much salmon the whales need to survive and recover. We're proud to have led interdisciplinary efforts to publish some of the earliest estimates of how much Chinook salmon a mother needs to feed her baby, how much the SRKWs need overall, and how much fish we need to start setting aside now to support a fully recovered population. Our science shows that when the ocean gets too noisy (no matter who is making the noise), killer whales give up trying to hunt for salmon. That knowledge inspires the Ports of Vancouver, Seattle, and Tacoma to encourage ships to slow down and make less noise. Our work shows that when ships slow down, the whales start feeding.

I've been speaking with colleagues who witnessed the extinction of other species, and asked what their biggest mistake was. Every scientist answered, "We thought we had more time."

— Dr. Rob Williams, Chief Scientist

But we recently wrapped up a year-long statistical modeling process funded by the Puget Sound Partnership to update our understanding of the cumulative effects of multiple stressors on SRKWs. We were able to convene a virtual expert working group with specialists in killer whale biology, population dynamics, contaminants (ecotoxicology), genetics, and veterinary health. What we discovered stopped us in our tracks.

In some meetings, there has been an undercurrent of complacency. Some agencies, stakeholders, and scientists approach SRKW conservation as though the population has always been small, and is simply fluctuating randomly between 70 and 100 individuals. Our recent population viability analysis shows that is simply not the case. Even if we could maintain the status quo, without threats worsening, this population is fated to decline at about 1% per year for a killer whale generation, and then the decline will accelerate rapidly toward extinction.

There are simply not enough females of reproductive age to recover the population and offset the inbreeding that has accumulated over the last decades. The dynamics show a characteristic sign of a population teetering on the edge of an extinction vortex. It's not too late to save them, but it will take every tool we've got, and we haven't got a minute to waste. I've been speaking with colleagues who witnessed the extinction of other species, and asked what their biggest mistake was. Every scientist answered, "We thought we had more time." We need your help to combine our projects into a holistic Healthy Killer Whale program that acknowledges which threats were most important in getting us here, while looking forward to how we prevent extinction. We need to continue studying the whales' behavior to understand whether mitigation measures are working. But we also need to be much more proactive, precautionary, and risk-averse.

Our science shows that the whales need salmon numbers we haven't seen since the 1980s. In our own work, we are spending more time in the field figuring out humane ways to keep seals and sea lions away from human-built bottlenecks (e.g., bridges, dams, and fish ladders) so more Chinook will be available for the whales 4-5 years from now.

We need to invest now in carefully designed behavioral studies that can detect early signs of poor health, so that we can give our wildlife veterinary colleagues an early warning that a particular individual may need a check-up. Our veterinary colleagues think that 28% of recent SRKW deaths might have been preventable, if we'd detected disease earlier, or avoided a vessel strike. If we can prevent or delay even one death every few years, we'll turn population decline into recovery.

The two recent births in L pod give us hope, especially because one of the calves is female. Can we count on your help to keep their habitats clean, quiet, and full of fish, so she survives to reproduce? We can't imagine a Salish Sea without southern resident orcas. I don't think you can, either. Thank you for supporting our mission.

Killer Whale Conservation

Helping orcas hunt salmon in a dark, noisy ocean

Oceans Initiative returned to San Juan Island for the 6th year of our land-based SRKW study. Our team collects data from several land-based vantage points on the whales' movement, behavior, distribution and habitat use, as well as the presence and activity of boats and ships. Our study is designed to assess whether we're doing enough to reduce vessel noise and disturbance in the SRKW's critical habitat.

In 2020, the Washington Department of Fish & Wildlife (WDFW) tasked Oceans Initiative scientists with conducting a 3-year study to evaluate the effectiveness of whale-watching regulations, including a new licensing program for commercial whale-watching companies. We are measuring how SRKW foraging behavior is impacted by the number, distance, and speed of all vessel types around the whales. WDFW used this science in a November 2022 report to Governor Inslee and the legislature to recommend changes to the SRKW approach

Protecting endangered Chinook salmon from seal predation at human-built bottlenecks

There should be plenty of fish in the Salish Sea to feed humans and wildlife alike. But in places where we humans have built barriers to fish migration (e.g., fish ladders), seals have learned to take advantage of those chokepoints. And who can blame them? Since 2020, Oceans Initiative has been implementing an innovative, humane, and effective acoustic deterrent technology—GenusWave Targeted Acoustic Startle Technology (TAST)—to reduce predation of Chinook salmon by pinnipeds (harbor seals and sea lions). The TAST generates a sound that startles seals, but is above the hearing range of fish. By keeping the seals just a bit farther from dams and bridges, we give salmon and steelhead a fighting chance to get through those bottlenecks to their spawning grounds.

Following successful implementations in 2020 and 2021 throughout Washington state, our team migrated to the 5th Avenue Dam in Olympia, at the fish ladder leading into Capitol Lake. This allowed



distance rules. In April 2023, Senate Bill 5371 was signed into law requiring all boaters to stay a minimum of 1,000 yards from endangered SRKWs in Washington waters, beginning in 2025. Recreational boaters are being encouraged to stay 1,000 yards away from J, K, and L pods voluntarily even before the law goes into effect. What we hope to see is that the whales have a greater chance to catch salmon and share with their families when the conditions are quiet enough for them to find food.



us to use the TAST to protect the Deschutes River run of Chinook salmon from seal predation. This was among the most successful trials we've conducted to date. Preliminary results from our 2022 trial show that when the TAST was on, the number of seals in the area dropped, the seals moved away from the TAST, and the number of predation events we saw at the surface (where we see a seal with a fish in its mouth) dropped significantly. In 4-5 years' time, we hope the offspring of those spawning Chinook salmon will return to feed endangered killer whales, with enough left over to create fishing opportunities for people throughout the Salish Sea.

Preventing SRKW extinction, one whale at a time

If you felt lethargic, or experienced a sudden shortness of breath, we hope you'd see a doctor right away. But it is hard to tell if a wild orca is sick until it shows up skinny. When our colleagues flying drones over orcas notice an unusually skinny whale, the Washington Department of Fish & Wildlife report it as a "Whale of Concern," and boaters are asked to give it extra space. With our friends and colleagues at the SeaDoc Society and UC Davis, we realized we are sitting on a wealth of data that can be repurposed to evaluate orca health in a completely novel, noninvasive way.

Since 2003, we have used land-based theodolite tracking to measure breathing rates and swimming speeds of presumably healthy orcas of known age and sex, to measure impacts of boats on orca behavior, including resting and feeding. By going back through tens of thousands of data points, we are seeing a hint that, just as labored breathing or feeling sluggish can be a sign of poor health in humans, those "whales of concern" tended to have shorter dive times and slower swimming speeds than the rest of their pod. As we continue this work, we want to measure whether a whale having trouble keeping up with its pod can give us an early clue that the whale may be ill. Wildlife veterinarians are often called upon to intervene in efforts to save a sick whale. The current gold standard to determine if a whale is ill is to look for severe emaciation in the fatty deposits in an orca's head. The "peanut-head" shape is unmistakable. Sadly, it appears only when the whale is near death, when medical interventions can be too late.

We're working with wildlife veterinarians at the SeaDoc Society and in British Columbia to ensure real-time reporting with the people who can give the whale a health checkup, and intervene if it could prevent a sick whale from dying. If veterinarians can save one whale through the administration of deworming medication or antibiotics, it can make the difference between population growth, or continued decline toward extinction.



2022 in Numbers



4,800 the number of person-hours of being on call to track killer whales.



the number of hours we spent actually measuring behavior of killer whales! As the whales spend less time in the Salish Sea in summer, it takes more time and effort to collect data.



the number of Pacific white-sided dolphins typically found in our BC study area.



800 the number of nautical miles we spent searching for those dolphins, mostly in the freezing rain mostly in the freezing rain.



the number of dolphins we spotted in our 2022 field season. These are wild, unpredictable animals, but this was the first and only year we got skunked on a dolphin field expedition.



the number of acoustic recording files captured by our autonomous recorders of underwater noise, fish calls, and whale song in Puget Sound.



the number of gigabytes of data characterizing Salish Sea marine soundscapes, the equivalent of 615 thousand floppy disks or 592 million pages of plain text the equivalent of 615 thousand floppy disks, or 592 million pages of plain text.



the number of nautical miles we covered on the boat to collect those recordings.



662 the number of big, fat Chinook salmon it takes to support a healthy SRKW population each d healthy SRKW population each day.



the number of southern resident killer whales remaining in the population in 2022.



the number of management and technical reports we submitted to decision-makers and peer-reviewed, scholarly articles published to guide precautionary decisions about salmon and orca conservation and predator management to protect salmon.



the number of early-career researchers we had to lay off during Covid, thanks to your generous support.



the number of photographs collected to identify individual harbor seals at our TAST project in Olympia.



80,000 the number of people we reach through social platforms.

In 2022, Oceans Initiative launched *Sanctuary*, a series of short films telling the story of Robson Bight (Michael Bigg) Ecological Reserve, the world's first killer whale sanctuary.

During those early, turbulent days of Covid, while working from home, we discovered a newfound appreciation for our home as a place for work, family, and refuge. Whale habitats are no different. In the waters off the northern end of Vancouver Island lies a very special place, a protected area for whales known as Robson Bight (Michael Bigg) Ecological Reserve. Here, the whales find sanctuary—food, shelter, and community.

In summer months, the northern resident killer whales are seen in Robson Bight so regularly that pioneering orca researchers like the late Dr. Michael Bigg first named these salmon-eating killer whales "residents" because they were seen so reliably. In this safe haven, the whales behave differently than they do in the surrounding waters—we observe less traveling, and instead we see more feeding and more rubbing on smooth pebble beaches. Beach-rubbing behavior is so unusual that we now consider it a cultural trait that defines northern resident killer whales. This sanctuary was not imposed by governments. On the contrary, a remarkable community came together to protect the area. In our film, we honor some of the original heroes behind the creation of Robson Bight who went to the public in the early 1980s to convince logging companies and policymakers that the killer whales needed protection. We interviewed several of the change-makers whale-watch operators, fishers, scientists, and First Nations—involved in the protection of the Tsitika Valley and who protect Robson Bight to this day. The film also features some of the late Robin Morton's pioneering underwater footage of orcas rubbing on the beaches of Robson Bight.

We find this community-led creation of a sanctuary for northern resident killer whales an inspiration. We want to use Robson Bight as a powerful model of stewardship that can inspire our Salish Sea community to provide sanctuary for southern resident killer whales to help them hunt for salmon undisturbed.



Which Species will we Save?

As conservation funding and management decisions react to crises, we risk losing seemingly abundant species through sheer neglect. At Oceans Initiative, we are pioneering non-invasive ways to understand environmental, animal, and population health of a poorly studied species—Pacific white-sided dolphins.

Although we can count every southern resident killer whale each year, from birth to death, we estimate the size of most wildlife populations by statistical sampling, in much the same way we use polls to predict who will win an election. Estimating abundance is essential to conservation. When populations are small and nearing extinction, or declining at an alarming rate, a population is listed under endangered species legislation to protect animals and their habitat. But the decision about which species deserve funding to be studied at all is often a function of their legal listing under endangered species laws. No data? No listing. No listing? No funding to detect declines.

Dr. Ashe calls this vicious cycle a "data-gap trap" and she is developing cost-effective tools to take what we know about a species' life history and the human threats it faces to make informed judgments about whether a species deserves closer attention. Our long-running study on Pacific white-sided dolphins illustrates this issue well. Erin curates a long-running photo-identification study of more than 1,000 individual dolphins with identifiable markings. (Many thanks to all of you who support this work through a symbolic dolphin adoption!)

In a paper published in *Mammalian Biology*, Dr. Ashe explains why so much depends on that decision to score a pair of photos as one individual seen twice or two individuals seen once. Most of the decisions are obvious. Some nicks and notches in dorsal fins are unmistakable. But in ambiguous cases, we were trained not to call it a match unless we were 100% certain. But Erin's new work shows that if you are overly strict, and fail to recognize a true match, you overestimate abundance and underestimate survival (i.e., how long dolphins live). If you err too generously in calling two photos a match when they aren't, you think there are fewer dolphins in the population than there really are, and you overestimate their survival rates. That's not precautionary.



Matching is an important process, but it is also painstaking work that can cost a lot of money in staff time. For every 10-14 days photographing dolphins in the field, it can take 6-12 months to carefully examine thousands of photographs and match them against a catalog of a thousand dolphins. We have careful protocols to avoid making mistakes, but cost is a factor. With your support, we can have the hard drives and computing power we need to incorporate AI and machine learning into this project to vastly and quickly narrow down the number of potential matches. We'll still rely on the best matcher of all—the human eye—to make the final call about whether we're seeing an old dolphin friend or a new one, but this technology will transform our studies of Pacific white-sided dolphins and the many other species being neglected in conservation and management.

In the middle of a biodiversity crisis some are calling the world's 6th mass extinction event, we need every tool at our disposal to save critically endangered species without taking the seemingly common ones for granted. After all, common species are essential to ecosystem function and resilience, and as the passenger pigeon teaches us, we can lose common species in the blink of an eye.

Sound Ocean

Whales, dolphins, fish, and other marine wildlife live in an acoustic world. Our team is working to identify noisy habitats that we need to make quieter, and quiet habitats we'd like to keep quiet.

Measuring noise in marine waters a Puget Sound Vital Sign Indicator

Puget Sound Partnership has recognized that a healthy, resilient Salish Sea depends in part on humans keeping quiet enough for marine wildlife to hear each other. Noise from vessel traffic and other human activities makes it harder for marine species to hear predators, prey, and each other. Puget Sound Partnership recently added 'Noise in Marine Water' as a Vital Sign Indicator for understanding the health of Puget Sound water quality, and to report on noise made by human activities. We are thrilled that Oceans Initiative's proposal was chosen to help develop this new framework. Our vision is to create sites where the soundscape is dominated by the sounds of wind, waves, fish grunts, and whale song, rather than the clanging of propellers or the jackhammer pulses of pile-driving.

In 2022, we conducted a pilot study to establish a baseline for the existing noise levels in Puget Sound and explore how these noise levels relate to known

thresholds likely to disturb fish and marine mammals. Our biologists deployed bottom-mounted SoundTrap hydrophones at strategically selected sites across a gradient of vessel traffic. We equipped community scientists with low-cost hydrophone kits to supplement data collection, and we collected spot recordings across Puget Sound to fill in any geographical gaps. Upon completion, this pilot study will help Puget Sound Partnership define targets that are grounded in evidence and support a long-term monitoring program for the 'Noise in Marine Water' Vital Sign Indicator.

P.S. Please watch this space. We've also given our hydrophone kits to National Geographic's Pristine Seas scientists as they search for the world's most intact marine ecosystems. We have recordings from Palau, Niue, and Rapa Nui (Easter Island), and can't wait to put our Salish Sea recordings in a global context.

Behavioral responses of wild Pacific salmon and herring to boat noise

While there is growing concern about impacts of boat noise on marine wildlife, few studies have quantified the impacts of anthropogenic noise on ecologically, economically, and culturally important fish. A few years ago, Rob used part of his funding from his Pew Fellowship in Marine Conservation to support an early-career woman in science, Inge van der Knaap, to conduct experiments to measure Pacific herring and juvenile pink and chum salmon behavioral responses to three levels of boat noise. We found that fish responded to boat noise in the same way that they respond to predators. The fish formed tight schools, and swam away from the source. Salmon were less sensitive to noise than herring, but the results tell us that the noise our boats make are unknowingly choosing ecological winners and losers, and putting a thumb on the



scale of the delicate balance between predator and prey. Now armed with a PhD, Dr. van der Knaap is inspiring us to reexamine all of our acoustic archives to see if rockfish in the Salish Sea show similar responses to vessel noise. Maybe we can make rockfish conservation zones more effective if we keep them quieter, or site them away from shipping lanes? Please get in touch if you want to help us explore this fascinating new line of conservation science.

Noise from deep-sea mining may span vast ocean areas

We are living in the midst of both a climate and biodiversity loss crisis. If we are to save life on earth as we know it, we need to electrify everything. But where will we find the rare earth metals to build the batteries to transition from fossil fuels to renewable. energy? Some companies are proposing to mine the deep sea for metal-rich nodules in the deep (4-5 kilometers deep!) sea for the cobalt, manganese, and lithium we will need to power clean energy. As the International Seabed Authority decides whether to permit this new industry, we explored ecological impacts of deep-sea mining. To be clear, retrieving metallic nodules 3 miles underwater is not exactly the same as picking apples from a tree. The process is more akin to bulldozing the seabed, along with species and ecological communities that have never been described by science. The nodules themselves are formed over millions of years of metals precipitating from saltwater, so any environmental damage is effectively irreversible in our lifetimes. Current proposals to measure impacts of this activity involve comparing biodiversity in mined and adjacent unmined ("precautionary reference zones") sites.

Our new research, published in the peer-reviewed journal *Science*, aims to see how noise from seabed mining can travel across the ocean, with unknown environmental consequences. We partnered with The Pew Charitable Trusts and researchers from Curtin University, University of Hawaii, and Japanese National Institute of Advanced Industrial Science and Technology, to model the noise from proposed mine sites in the Clarion-Clipperton Zone located in the middle of the Pacific Ocean between Hawaii and Mexico. Proponents of deep-sea mining have yet to release recordings from real-world mining trials, so we used proxies from coastal dredging and gravel mining as proxies. These commonplace proxies no doubt underestimate noise generated from mining activities that can operate miles below the ocean surface, but even these proxies suggest that noise from just one mining operation will propagate through the entire water column, from rigs at the surface, mining tools at the seabed, and pumps along risers to bring nodules to the surface. Together, noise from mines at all proposed contract areas may span millions of square kilometers.



July 7, 2022 · Volume 377, Issue 6602





The Dumbo Octopus is found in the deep sea environment. © National Oceanic and Atmospheric Administration

The International Seabed Authority adjourned its latest meetings with a refusal to issue any permits for now, given concerns about unknown and unknowable environmental impacts. We are cheering on the transition to cleaner energy sources, but let's find a way not to destroy one ecosystem to save another. Currently, only 12.5% of electronic waste is recycled. As we look for rare earth metals, let's start by mining landfills.

Dr. Rob Williams co-chaired a two-year work group with the Ocean Modeling Forum to develop statistical tools to assess sustainability of bycatch in data-poor fisheries in lower-income countries.

Every year, approximately 500,000 marine mammals are caught accidentally ("bycaught") in global fisheries. Aside from the obvious conservation implications, drowning is a particularly gruesome way for air-breathing animals to die. We would not tolerate such inhumane deaths in any agricultural setting.

In most wealthy countries, there are policies in place to change fishing practices when bycatch exceeds some allowable harm level, such as 1% of the population's size. This is why you see the dolphin-safe logo on most cans of tuna you buy in North American grocery stores. But we need data to trigger those management rules. The gold-standard shipboard surveys conducted by US and European agencies to estimate marine mammal abundance can cost over \$100,000 each day, lasting for weeks or months. That's not including the sophisticated statistical analyses to turn those sightings into estimates of population size, and the number of individuals a population can afford to lose to bycatch without falling below critical levels.



With colleagues from University of Washington's Ocean Modeling Forum, Rob co-chaired a 2-year working group made up of some of the top marine mammal scientists from around the world, and with funding from Lenfest, we created modeling tools to provide a way for managers and other stakeholders to explore bycatch scenarios, based on simple information about marine mammal life history and rough estimates of abundance and bycatch.

The part we're most proud of? All of these tools and approaches were made available online in a free, web-based *Marine Mammal Bycatch Impacts Exploration Tool* for countries that want to improve sustainability of their commercial fisheries but have little funding for this kind of research.

Looking forward, we aim to partner with fisheries economists to try to quantify how much more money countries can earn by selling sustainable seafood products to lucrative US markets, rather than selling seafood to countries with lower environmental standards. If countries can see how much they stand to gain by enacting safer fishing practices, we can build a business case for investing in sustainable fisheries.

As the world opens up again, we are reinvigorated to take our rapid-assessment tools to countries to work with local scientists to estimate abundance of marine mammal populations using low-cost, small-boat surveys, as we have done in Indonesia, Palau, Patagonia, and elsewhere. Statistical tools are great, but they still require data. And putting the power of data collection in the hands of local scientists and communities with the most to gain from sustainable fisheries is the right thing to do.

What Covid is teaching us. Agility. Flexibility. Adaptability. Responsiveness. Teamwork.

In the early days of Covid lockdowns, when large group gatherings were prohibited, we were forced to get creative. Our SRKW field crew lived together as a socially isolated household, but we also bought a very expensive, high-resolution digital camera to help us collect data with fewer human observers. Think of pixels in your photographs as forming triangles between boats and whales. Dusting off our old trigonometry skills, we were able to use a camera to help measure the number, distance, and speed of boats around whales. We were thrilled when our crew of early-career researchers published the methods in *Marine Pollution Bulletin*. The science is important, but so is giving paid positions and career-advancing mentorship opportunities to our team, many of whom come to Oceans Initiative for their first paid job in science. We are proud that, thanks to the generosity of our community, we did not have to lay off a single team member during the pandemic, even though our inability to hold in-person fundraisers has taken a toll.

Covid also made it extremely challenging to conduct our usual boat-based fieldwork on Pacific white-sided dolphins in the Broughton Archipelago, BC, Canada. Dr. Ashe's long-running study on the biology and conservation status of Pacific white-sided dolphins is also at the mercy of the vagaries of research funding. We were thrilled to meet the founders of Flukebook, a new Al/machine learning tool for matching cetacean photos, in 2022. When they offered to help design an algorithm to help identify potential matches between dolphin photographs, we leaped at the chance. Comparing tens of thousands of photographs from a single field season against a thousand dolphins in a catalog is a time-consuming, labor-intensive task. Computers can speed this up exponentially.

Covid also inspired us to go back to a pilot study we started on disease surveillance in dolphins, so that we can predict whether dolphins may be carrying a virus, fungus, or bacteria that could affect not only their own populations, but also the resident, fish-eating killer whales they swim with. None of these research opportunities can be predicted.

Science is a dynamic, creative process. The unrestricted gifts you make to Oceans Initiative are the key to allowing us to adapt to crises. We want to thank you for supporting our mission at a time when the need has never been greater.



Financials

Our full year 2022 financials reflect positive growth in support to \$1,113,000, including some financial obligations to be spent in 2023. Corresponding expenses in 2022 were \$943,000.



2022 Support

Total Support	\$1,113,000
Corporate and Other	\$81,000
Individual Contributions	\$242,000
Foundation Grants	\$347,000
Government Grants	\$443,000







2022 Expenses

Program Services	\$780,000
Management and General	\$163,000
Total Expenses	\$943,000



Get Involved

Please spread the word about the work we do, and know that your involvement makes all the difference in the world.

Oceans Initiative is a transboundary team that includes a Seattle-based 501(c)3 nonprofit as well as a Canadian registered charity (Oceans Research and Conservation Association, dba Oceans Initiative) based off northern Vancouver Island. We rely on your donations to do the ocean conservation work that we do. Help us keep whale and dolphin habitats clean, quiet, and full of life by making a tax-deductible donation today. For online donations, please visit our website at **oceansinitiative.org**.

Canadian residents may donate to our charity at **canadahelps.org**.

EIN: 90-1015993 CRA Reg #: 808781330RR0001

Thank You to our Recent Partners





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oceansinitiative.org



Image: Contraction of the second second



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