

The Nature  
Conservancy



# Hawai'i and Palmyra

*Ho'olele 'Ike  
I Ka Moana Nui*

Spreading Our Work  
Across the Pacific



Coral Gardens at Palmyra Atoll ©The Ocean Agency/Christophe Bailhach

Aloha mai kākou,

I hope this newsletter finds you safe and well in light of the recent wildfires on Maui and Hawai'i Island. To all those affected, particularly those connected to the vibrant and storied landscape of Lahaina, we send our deepest aloha, pule and kōkua for the long process of recovery and healing. Mercifully, I can share that our teams on both islands are safe and our preserves are minimally impacted.

In this time of deep tragedy and suffering, I am reminded of an 'ōlelo no'ēau, "Halau Lahaina malu i ka 'ulu," which can be translated as "Lahaina is like a large house shaded by breadfruit trees." Massive groves of breadfruit once stretched from Lahaina to Olowalu, providing protection, peace and strength for everyone beneath their large shaded canopy and as a food source. Lahaina was once abundant with water. People thrived among the lush wetlands, lo'i kalo and fishponds dotted throughout, while King Kamehameha III's royal residence Moku'ula was located amid a 7-acre freshwater pond Mokuhinia. I am committed to supporting the return to peace, comfort and abundance for this sacred place and its people.

While the tragic losses in Lahaina weigh heavily, our commitment to conserve the lands and waters on which all life depends remains strong. At the back of this newsletter, we share some of the ways we and our partners are monitoring the environmental impact of the wildfires and supporting recovery efforts.

This edition highlights our marine conservation work across the Pacific, including the safeguarding of our coral reefs, restoring declining fish populations, and addressing the impacts of climate change on ocean ecosystems. Through research and development, partnerships and knowledge exchange, our work in Hawai'i and Palmyra advances island conservation efforts in the Pacific and globally.

We're creating a digital twin of Palmyra Atoll to visualize the impacts of future scenarios and turning data into actionable strategies for coral reef conservation and restoration. To better protect coral reefs in Hawai'i, we're collaborating with a diverse array of partners to plan and implement coral restoration and post-storm reef recovery. From community-driven pilot projects in Kahuwai Bay and Kealakekua Bay to the development of a standardized statewide response protocol, our collaborative efforts are shaping a future of enhanced reef resilience and local expertise.

We also introduce FishKit, a powerful suite of decision-support tools designed to enhance fisheries management. This groundbreaking resource from TNC will empower stakeholders to make informed decisions for food security and reef health, with plans to expand its impact to support fisheries planning throughout the Pacific. We dive into the depths of the Pacific Ocean as TNC research uncovers the astonishing journeys of marine life, from frigatebirds covering 5,000 km to one yellowfin tuna's epic 780-mile odyssey. We discover how our innovative FAD (Fish Aggregation Device) Watch Program is repurposing fishing devices to benefit local communities.

We see the opportunity of this moment to bring the decades of transformative and durable conservation to the challenges facing Maui and other islands in Hawai'i and the Pacific. We've leveraged best practices for native ecosystem restoration and erosion control in altered landscapes since TNC established a chapter in Hawai'i and have proved the benefits of natural climate solutions. Thank you for your support of the TNC staff 'ohana and our work.

Mālama,

Ulalia Woodside Lee



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# The Nature Conservancy



Protecting nature. Preserving life.

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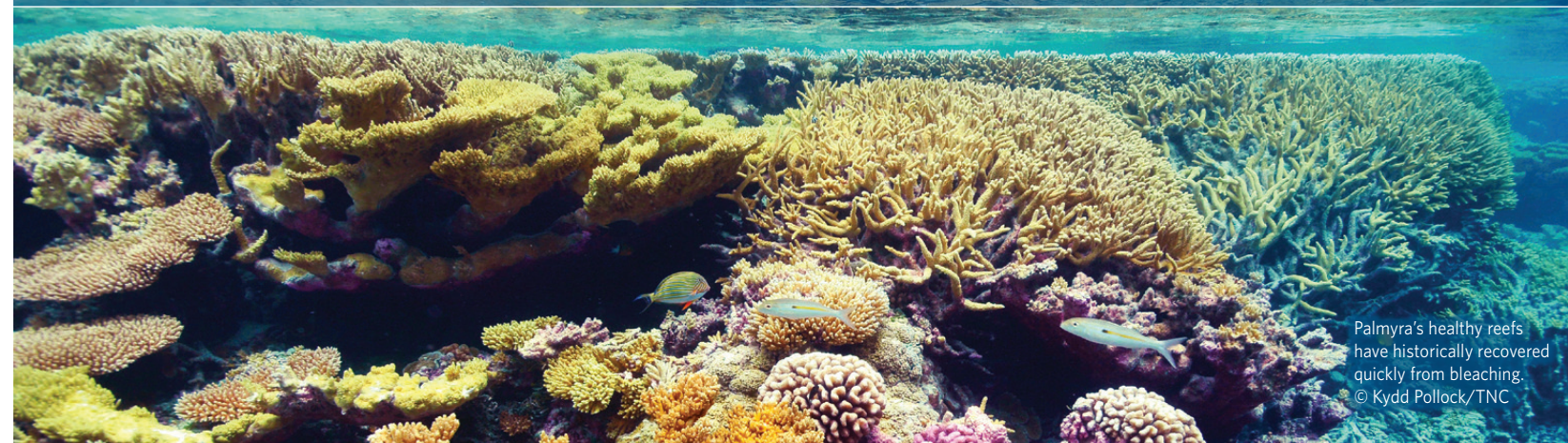
Bernie Kim

The Nature Conservancy Hawai'i and Palmyra chapter is the local affiliate of The Nature Conservancy, an international, non-profit organization based in Arlington, VA.

**The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends.**

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Cover: Barren Island at Palmyra Atoll is rapidly growing despite sea level rise, as Palmyra's healthy reef ecosystem produces ample sediment and coral rubble, allowing for island formation. Once established, atoll islands are quickly colonized by plants, seabirds and land crabs—all adapted to this dynamic process. © Vienna Saccomanno/TNC



Palmyra's healthy reefs have historically recovered quickly from bleaching. © Kydd Pollock/TNC

## A CLOSE CALL FOR HAWAII'S CORALS

Although ocean temperatures hit record highs from Florida to Japan this summer, Hawai'i's corals have emerged largely unscathed. Despite being an El Niño year, 2023 ocean temperatures around Hawai'i have been within normal range, and our recently completed scientific dive surveys on Hawai'i Island didn't reveal bleaching above normal levels. On the other hand, elevated ocean temperatures in the equatorial Pacific are leading to coral bleaching at Palmyra Atoll. Thanks to years of research, we know that corals at Palmyra have historically recovered quickly from bleaching, and we know some of the reasons why, including limited human impact and healthy fish and shark populations. We are convening a team from a dozen institutions to gain even more insights into what makes Palmyra's reefs so resilient to inform reef conservation and restoration in other geographies. Replicating conditions for reef resilience is essential for Hawai'i coral reef health, especially after this year's close call.

## CORAL RESTORATION UPDATE

Working with government, private, academic and community partners, we have made excellent progress laying the groundwork for coral restoration and post-storm reef repair. In close partnership with community volunteers from the Ka'ūpūlehu Marine Life Advisory Committee at Kahuwai Bay and Kapukapu 'Ohana at Kealakekua Bay, we are initiating pilot projects to test the effectiveness of different techniques to restore Hawai'i's corals. At the same time, the post-storm reef response hui we convened developed a statewide response protocol, and we are designing a training program to standardize methods for rapid response and coral reattachment. We are also working with teams from each county to develop island-specific annual plans that document personnel, supplies, communications methods and locations for rapid response. These efforts will help to build both reef resilience and local expertise for ongoing and expanded restoration.

A team of scientists and reef managers from TNC, federal, state and county agencies, universities and community groups developed an early warning and rapid response protocol to guide the repair of coral reefs damaged by a severe storm or hurricane. © Norton Chan



[nature.org/HawaiiPalmyra](http://nature.org/HawaiiPalmyra)

## PROMOTING PARTICIPATORY FISHERIES MANAGEMENT PLANNING

With fish populations steadily declining over the last 100 years, Hawai'i has an urgent need to improve fisheries management. Now there is help. Our marine team worked with TNC colleagues to develop FishKit, a suite of decision-support tools to complement the transparent, science-based FishPath planning process we recently introduced to Hawai'i. FishKit puts all the information planners and community members need at their fingertips, allowing them to weigh the benefits and tradeoffs of various management tools and develop fisheries plans that best support communal interests for food security and reef health. FishKit is already being used by communities, in tandem with local and traditional knowledge, and government agencies in Hawai'i and is now being adapted to support fisheries planning across the Pacific. The app is free upon request and available at [fisheriestoolkit.org](http://fisheriestoolkit.org).

Herbivorous reef fish, like these at Ka'ūpūlehu Marine Reserve, help keep reefs healthy. © Kaikea Nakachi



# The Ocean and Sky Connect Us



A red-footed booby soars over Palmyra's lagoon. © Kydd Pollock/TNC



A sooty tern guards its egg amid 50,000 neighbors all doing the same at Palmyra Atoll. © Alex Wegmann/TNC

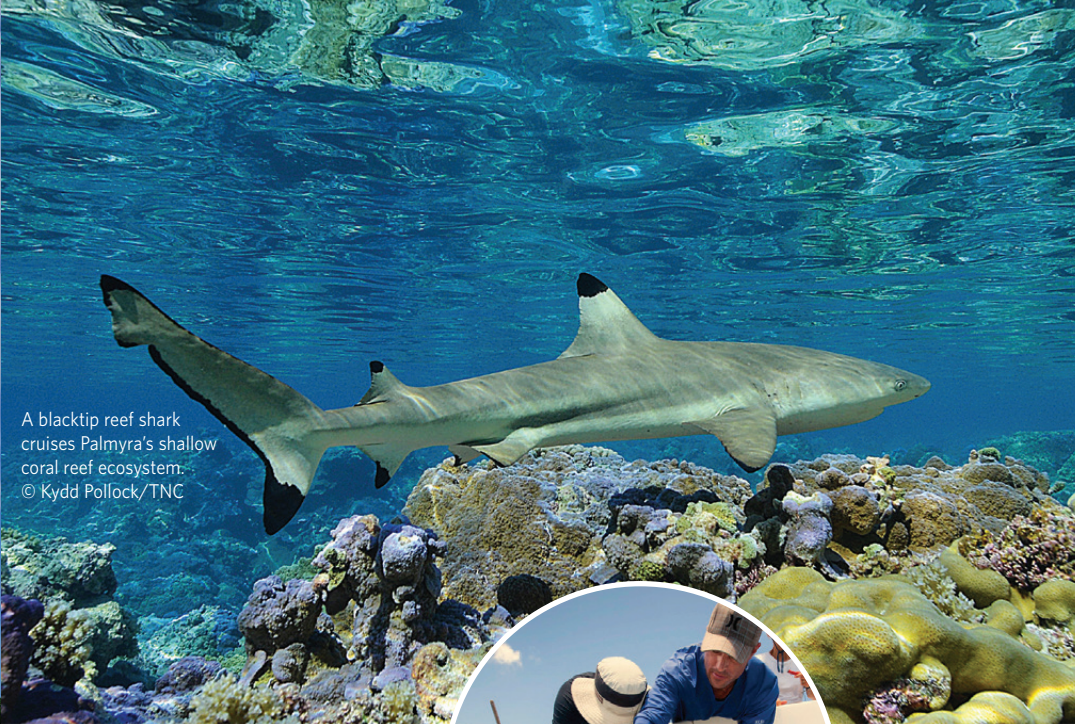
There is a saying that “the ocean connects us.” In Hawai‘i and the wider Pacific, this is patently clear in more ways than one. The ocean is the conduit through and above which birds and marine animals move between feeding and mating grounds, unaware of invisible territorial borders. Our often trailblazing efforts, working with many partners in Hawai‘i and Palmyra, have relevance to island conservation globally.

At Palmyra, an atoll 1,000 miles south of Honolulu, our scientists deployed satellite tracking tags on 99 fish and seabirds to study their movements inside and outside the protected area of the Pacific Remote Islands Marine National Monument (PRIMNM) for up to a year. Monitoring found that bottlenose dolphins stayed within 33 miles of Palmyra, nesting

seabirds like great frigatebirds regularly traveled 55 miles daily on average to hunt for fish and squid to feed their chicks, and grey reef sharks traveled up to 105 miles away from the atoll before returning. A few individuals covered much more distance: One reef manta ray traveled 1,043 miles, a blue marlin 1,491 miles, a yellowfin tuna 1,560 miles, and a frigatebird traveled an astounding 3,109 miles in one trip! These movements are significant because the protected area around Palmyra only extends 50 miles, so some of the far-ranging animals could be vulnerable to fishing and other anthropogenic

threats. These findings will help inform management actions with partner agencies to protect species while moving through these vast areas.

As part of our FAD Watch Program, we work with commercial tuna purse seine fleets in the Pacific to locate and intercept drifting Fish Aggregating Devices before they ground on Palmyra’s reefs, and then repurpose the devices’ satellite buoys for a TNC-led artisanal fishing project throughout Micronesia. Tracking the drifting FADs also provides important scientific data about fish biomass inside and outside the PRIMNM beyond the atoll; this data is especially important because the area has been



A blacktip reef shark cruises Palmyra’s shallow coral reef ecosystem. © Kydd Pollock/TNC



TNC staff observed the first grey-back tern chick to hatch on Palmyra’s Barren Island. © Hannah Martin/TNC



Scientists are tracking fish migration as part of comprehensive program to study island ecosystems. © Tim Calver

Depth (m)

0 12 24 36 48 60 72

Temperature

28°C 29°C 30°C 31°C 32°C

Benthic Classes

● Coral/Algae ● Rock

● Seagrass ● Rubble

● Microalgal Mats ● Sand

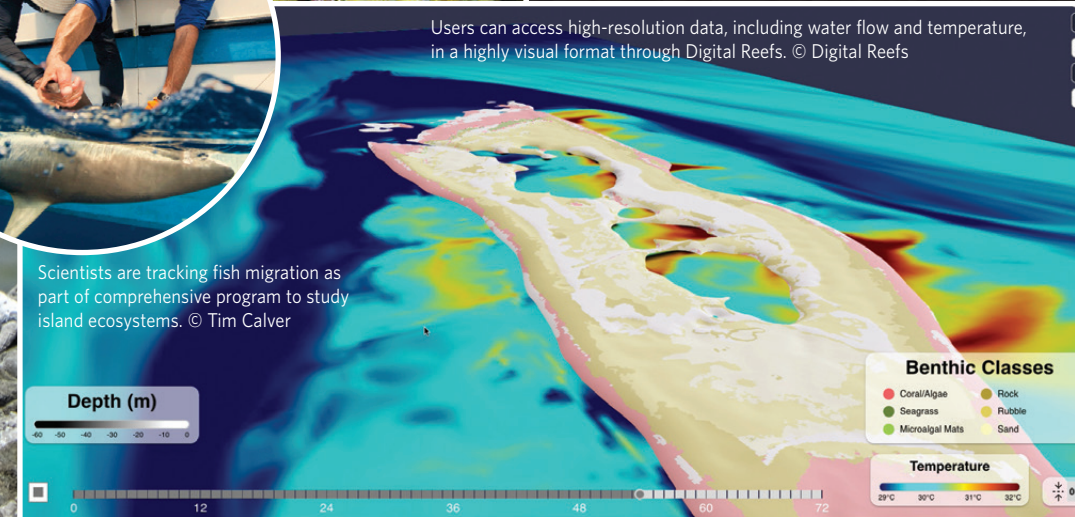
Temperature

28°C 29°C 30°C 31°C 32°C



The satellite buoy of a Drifting Fish Aggregation Device (dFAD) washed up on Palmyra’s shoreline. These are the brains of the dFADs that send fishers the location and biomass of fish underneath the dFAD. © Kydd Pollock/TNC

Users can access high-resolution data, including water flow and temperature, in a highly visual format through Digital Reefs. © Digital Reefs



largely unstudied. We’ve started to scale the FAD Watch Program beyond Palmyra shores, introducing it to the new Minister of Fisheries for the French Polynesian Government in Papeete, where it was very well received, and also exploring this type of initiative for the Cook Islands.

With 2023 on track to be the hottest year in recorded history, the state of our global coral reefs is dire, but Palmyra Atoll provides a source of novel tools and insights to help reefs around the world. “Digital Reefs” enables users to visualize how reefs may be impacted by future increases in sea levels and ocean temperatures, and how they may respond to restoration efforts such as propagating and outplanting more thermally tolerant corals. Building on this work, TNC and partners are deploying similar tools to inform reef conservation in Belize,

Hawai‘i, the Marshall Islands and Palau, with additional interest emerging in the Bahamas, Dominican Republic, Indonesia and Taiwan.

A TNC-supported study found that seabird restoration projects are working, which is a good thing for marine ecosystems. The marine-derived nutrients from seabird guano nourishes plants and trees on land and enhances the resilience of coral reefs.

In Hawai‘i, the removal of invasive kiawe trees from TNC’s Mo‘omomi Preserve on Moloka‘i and installation of fences to keep out invasive animals has led to wedge-tailed shearwaters establishing a colony in the thousands. On Kaua‘i, TNC’s active management in the Alaka‘i Plateau preserves nesting habitat for rare seabirds, including the globally threatened Hawai-

ian Petrel and the Newell’s Shearwater.

At Palmyra Atoll, the eradication of invasive rats in 2011 and the native forest restoration currently under way creates important nesting habitat for seabirds. In 2020, TNC deployed seabird decoys mimicking real birds and “seabird discotheques” playing the calls of targeted seabirds 24/7. This April, TNC scientists were elated to see that one of the species targeted by the social attraction efforts—a grey-back tern chick—was discovered and fledged at Palmyra, an event that likely has not occurred in decades.

This exciting roundup of our efforts throughout the Pacific highlights just some of the many initiatives we carry out with many partners to protect the lands and waters on which all life depends. While we may be on different islands, the skies and ocean connect us.

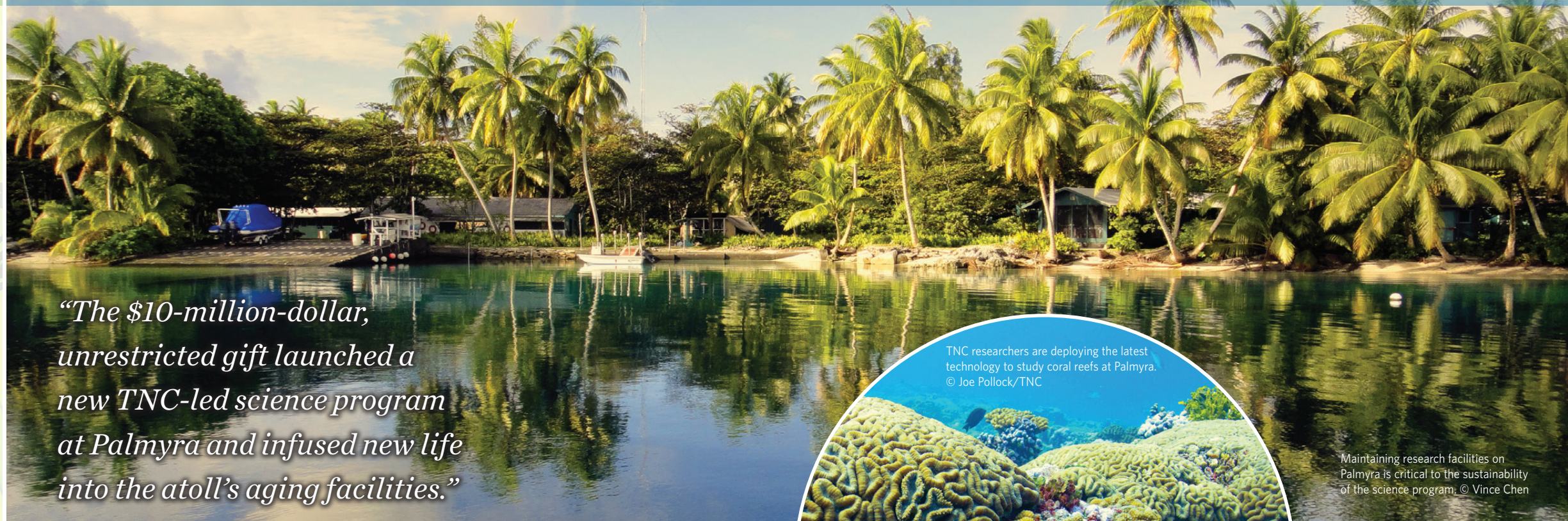
## Celebrating Legacy Club Members

Mahalo to our new Legacy Club members who have included TNC in their will, trust, retirement plan or other estate plans. In their honor, we planted and dedicated rare native loulu palms (*Pritchardia schattaueri*) in Kona Hema Preserve on Hawai'i Island. Their vision and generosity will help safeguard Hawai'i's lands and waters for years to come.

To join the Legacy Club, please contact Lara Siu at (808) 587-6235 or [lsiu@tnc.org](mailto:lsiu@tnc.org).

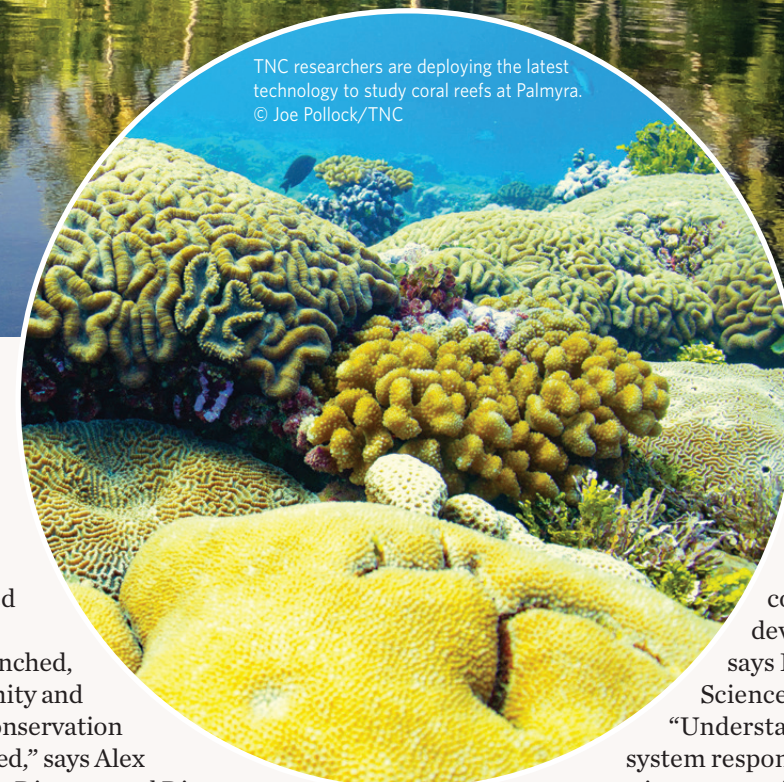
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 In memory of Iris J. Hustace  
 In memory of Misao Kuwaye Sakamoto  
 In memory of Jean Goo Wright

# A Transformative Gift Launches Palmyra's Science Program



*“The \$10-million-dollar, unrestricted gift launched a new TNC-led science program at Palmyra and infused new life into the atoll’s aging facilities.”*

TNC researchers are deploying the latest technology to study coral reefs at Palmyra. © Joe Pollock/TNC



Maintaining research facilities on Palmyra is critical to the sustainability of the science program. © Vince Chen

The future of Palmyra Atoll as one of the world's most unique science hubs looks bright. A team of Nature Conservancy scientists is exploring how islands around the world can become more resilient to climate change. But back in 2018, with an airstrip in need of critical repairs and science research in need of funding, the future wasn't so clear. That's when an extraordinary gift from an anonymous donor changed everything.

The \$10-million-dollar, unrestricted gift launched a new TNC-led science program at Palmyra and infused new life into the atoll's aging facilities.

“This donor understood our mission, our values and the importance and impact of our work for both people and nature, locally and globally,” says Lori Admiral, Director of Philanthropy for TNC Hawai'i. “The donor's contribution was both purposeful and unprecedented,” she adds.

The gift established a new Climate Adaptation and Resilience Laboratory, where scientists explore nature-based solutions that can be scaled to help open ocean, coral reef, and island ecosystems around the globe survive climate-related impacts.

“Once [the Program] was launched, we engaged our science community and started to press play on all the conservation science initiatives we'd envisioned,” says Alex Wegmann, formerly the Program Director and Director of Science for Palmyra and currently TNC's Lead Scientist on Island Resilience. “This all happened in a relatively short amount of time, in large part because of the gift. The unrestricted nature of the gift allowed us to really tailor the program we built to Palmyra and adapt our lessons learned during the build process, which made the end result more durable.”

The research conducted at Palmyra is giving the world insights into changes to coral reefs, fish migration and seabird populations. Scientists are using the latest technology—including satellites, drones and diver-collected information analyzed with machine learning and artificial intelligence—to track changes at a pace and scale never before possible.

They are also studying seabird colonies, which provide nutrients that are foundational to the health of islands and coral reef ecosystems. Potential management tools, like the control of disease-carrying mosquitoes and the removal of

introduced coconut palms for the benefit of native birds, are also being tested at Palmyra. If proven effective, these tools could be applied on hundreds of other Pacific Islands.

“Palmyra is an ideal place to conduct this critical science and develop these conservation tools,” says Eric Conklin, Director of Marine Science for Hawai'i and Palmyra.

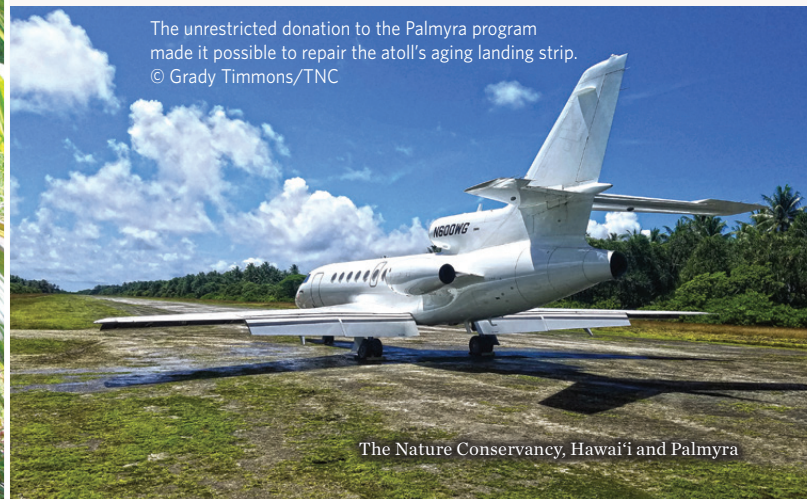
“Understanding how this near-pristine system responds to a changing climate and to strategic conservation actions provides invaluable insight into how to better manage these ecosystems in the rest of the world, where people have a much bigger impact.”

In addition to funding research for years to come, the gift provided financial and operational stability to the Palmyra program itself. Critically, the gift covered the cost of resurfacing Palmyra's airstrip, the atoll's most-used entry point. “Without this, we wouldn't have been able to operate our facilities,” says Wegmann. This repair extended the airstrip's life into 2030. The gift also allowed TNC and its partners to leverage matching private and public funding, multiplying the value of the donation.

Asked how he would summarize the impact of the gift to Palmyra, Wegmann said: “This very significant gift allowed TNC to do what TNC does best, which is build durable, high-value, high-impact conservation programs that deliver results that are globally significant.”



Loulu palms are endemic to Hawai'i. © Grady Timmons/TNC



The unrestricted donation to the Palmyra program made it possible to repair the atoll's aging landing strip. © Grady Timmons/TNC



Intact native Hawaiian rainforest like that found in Pu'u Kukui Watershed Preserve feeds our aquifers and provides island residents and businesses with a consistent and high-quality freshwater source. © Alison Cohan/TNC



The multi-tiered structure of a native Hawaiian rainforest like TNC's Waikamoi Preserve allows for effective and efficient water capture. © Alison Cohan/TNC



We maintain innovative monitoring tools such as this fire camera on Mauna Loa, which provides an early warning detection system for fires that could threaten our forest preserves and partner landscapes. © TNC

## Fire Response and Prevention

The devastating fires that swept through Maui and Hawai'i Island in August underscore the importance of collaborative fire prevention and mauka to makai (mountain to sea) land management. We are working with communities and partners to ramp up—and implement—fire planning and risk reduction.

To better protect Hawai'i's vulnerable native forests, we are bolstering our long-standing fire mitigation practices: creating firebreaks, clearing flammable grasses from access roads, and maintaining emergency response infrastructure such as helicopter landing zones, fire cameras and water tanks. On Maui, we are co-managing efforts to assess the impacts of toxic runoff from the fires on fresh water and coral reefs.

Recovery will take a long time—and we are here for the duration.

You can help the Maui recovery effort by donating to the Maui Strong Fund.



Some of our forest preserves are surrounded by former pastureland, such as at Kaiholena on Hawai'i Island, where we work with partners, including local ranchers, to reduce invasive, fire-prone grasses. We also maintain water catchment tanks for possible use in firefighting. © Shalan Crysdale/TNC