

# The Conservancy launches Reef Revival



Karin Oshida



Venture out on the water in O'ahu's Kāne'ohe Bay and you are likely to see an odd-looking boat called the Super Sucker—a giant, barge-mounted vacuum cleaner that sucks invasive algae off the reef. For Kāne'ohe Bay, it's a potential game-changer: the difference between returning its coral reefs to health or watching them succumb to the chokehold of invasive algae.

In 2005, The Nature Conservancy partnered with the State and the University of Hawai'i to develop the Super Sucker, which can remove well over 1,000 pounds of algae an hour. Today, it is operated by the State Division of Aquatic Resources, whose crew clears invasive algae from about seven acres of reef each year, and then seeds the reefs with native sea urchins that feed on the algae and keep it from growing back.

It's a powerful one-two combination, but it is not enough.

"Right now, we can barely keep pace with the expansion of the invasive algae problem," says Suzanne Case, the Conservancy's Hawai'i executive director. "That's why we're launching a campaign to build a second Super Sucker and operate it in tandem with the State. Adding a second Super Sucker will give us the capacity to get ahead of the problem and start reclaiming large sections of the bay."

The goal is to clear the entire north end of the bay of the most invasive algae by 2015.

## A BAY OUT OF BALANCE

Kāne'ohe Bay is the only bay in Hawai'i containing fringing, patch and barrier reef systems. Traditionally, the bay was home to some of the highest numbers and greatest diversity of fish and corals on O'ahu. But over time these populations have plummeted, in large part due to the threats posed by invasive algae, overharvesting and land-based sources of pollution.

Invasive algae were introduced into the bay for aquaculture about 30 years ago. Fed by nutrient-rich sediment, and without healthy populations of native plant-eating fish and sea urchins to keep them in check,

# es a campaign to restore Kāne'ōhe Bay

they quickly spread. Today, they form thick, tangled mats that are destroying the bay's ecology and turning its reefs into an algae-smothered wasteland.

"The bad news is that these algae species are the very, very worst introduced marine species in the state," says Eric Conklin, the Conservancy's Hawai'i director of marine science. "They smother and kill native corals, which are the core structural organisms of the entire ecosystem."

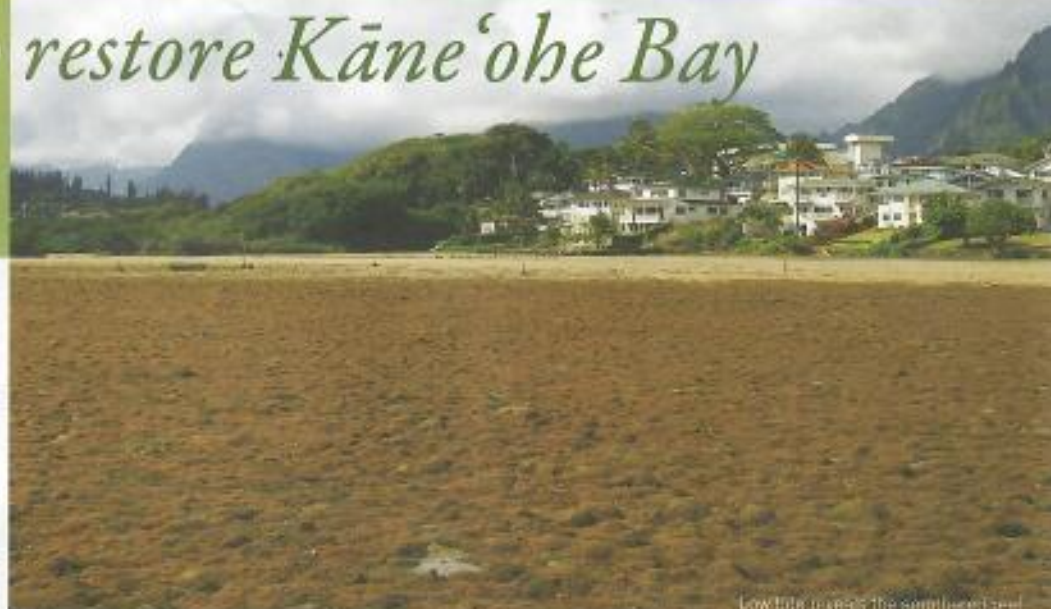
The good news is that their distribution is still restricted. The algae were introduced and became established in the south and central portions of the bay. According to Conklin, there are effective natural barriers that prevent the algae from spreading south to Kailua Bay. But to the north there's one continuous fringing reef that goes up the entire windward coast and, essentially, around the island—a very real corridor for dispersal.

"The north end of the bay is where we are focusing our efforts, because that's the leading edge of invasion," Conklin says. "The plan is to start at the north end and work our way back, keeping the algae contained inside the bay. By having two Super Suckers instead of one, we will finally be able to get ahead of the invasion, removing algae faster than it can grow and spread—and that is going to make a big difference for the bay."

## SEA URCHIN SOLUTION

But cleaning the reefs of invasive algae is only half the battle. The most virulent strains can quickly return. Experiments in the bay have shown that when patch reefs are cleared and left alone, the invasive algae return within months, while on reefs that are cleared and seeded with native sea urchins, the algae are kept in check.

The State is now raising sea urchins in captivity at its Anuenue Fisheries Research Center on Sand Island, with the goal of producing tens of thousands of urchins for out-planting onto reefs. The Nature Conservancy is supporting these efforts and



Low tide reveals the smothered reef.



Kāne'ōhe Bay. D. Schristna/PRH



He'eia ahupua'a. Photo: Kamehameha Schools

will help engage community volunteers to place and protect these urchins on the reefs.

## CONTROLLING SEDIMENT

Over the long term, keeping invasive algae in check will also require reducing the flow of sediment and nutrients into the bay. To that end, the Conservancy is supporting a community-led project to restore a traditional Hawaiian wetland system in Kāne'ōhe's He'eia *ahupua'a*—a large 2,250-acre mountains-to-sea land division with an historic fishpond at its ocean end. The He'eia community is clearing pasture land, planting taro *lo'i* (fields) and restoring fresh water fishponds and native wetlands that act as sediment traps.

"Our long-term vision is to restore Kāne'ōhe Bay's natural resilience and its ability to take care of itself," says Kim Hum, the Conservancy's Hawai'i director of marine conservation. "The Super Sucker, the sea urchins and the He'eia project are all important parts of restoring that resilience."

Building and operating a second Super Sucker will cost an estimated \$2.5 million over the next three years. Thanks in large

part to a \$500,000 challenge grant from the Harold K. L. Castle Foundation, the Conservancy has raised \$1.5 million toward that goal.

"It's critical that we stop the failing health of the bay, and to do that our solutions must be comprehensive and match the scale of the problems," says Eric Co, marine program officer for the Castle Foundation. "The amount of money it takes to confront these problems now, in Kāne'ōhe Bay, is trivial compared to the economic impact of widespread degradation that would result if these species became broadly distributed around O'ahu or throughout the state."

The tools and knowledge to stop the invasion and reclaim the bay exist. But to do it, The Nature Conservancy needs your help.

"Coral reefs take thousands of years to build, but only decades to destroy," says Case. "The Nature Conservancy urges you to *komo mai kau mapuna hoo*: dip in your paddle and join the effort. With your support, we can restore Kāne'ōhe Bay and protect its marvelous marine life for generations to come."

# a blight on Our Reefs



Alien algae have been called the worst invasive marine species facing Hawai'i. Hidden beneath the ocean's surface, the problem is one many of us never see, but for The Nature Conservancy it's a priority threat.

Last year, in east Honolulu, we partnered with Pono Pacific and the community group Mālama Maunalua to clear 3 million pounds of invasive algae from 27 acres in Maunalua Bay. Building on that success, we are now turning our attention to windward O'ahu's Kāne'ohe Bay, where our goal is to remove the worst invasive algae from the north end by 2015.

Kāne'ohe Bay is a marvel of nature. It has large sand flats and is the only bay in Hawai'i with fringing, patch and barrier reef systems. The bay is frequented by green sea turtles and used by hammerhead sharks for birthing grounds, manta rays for foraging habitat and spinner dolphins for resting. Its many human uses include boating, diving, fishing and canoe paddling.

To accomplish our goal, we intend to build a second Super Sucker—the underwater vacuum that we pioneered with the State and the University of Hawai'i in 2005—and then operate it in tandem with the original, now staffed by the State Division of Aquatic Resources.

With a second Super Sucker, we can accelerate restoration of large sections of Kāne'ohe Bay. Equally important, we can help keep the scourge of invasive algae from spreading to other parts of O'ahu.

To do it, however, we need your help.

Maunalua and Kāne'ohe are O'ahu's two largest bays. Both are rich in marine life and centers for ocean recreation. But their invasive algae problems are quite different.

At Maunalua, we removed invasive algae from a single reef flat with a native algae and seagrass community and some isolated corals. The predator seaweed was *Avrainvillea amadelpba*, also known as leather mudweed, which had to be removed by hand.

In contrast, the Kāne'ohe project crosses multiple reef habitats. What's more, there are several gnarly algal species to contend with, primarily: *Kappaphycus sp.*, *Eucaema denticulatum* and *Gracilaria salicornia*, all of which form thick, tangled mats that smother and kill corals. Fortunately, the Super Sucker can remove them all.

The Maunalua Bay project was financed with \$3.4 million in federal stimulus funds, awarded through the National Oceanic and Atmospheric Administration. The Kāne'ohe project is being privately funded. In fact, thanks to a \$500,000 challenge grant from the Harold K. L. Castle Foundation, \$275,000 in matching funds from the McInerney Foundation, \$100,000 from our Board of Trustees—including a special gift from Duncan and Dawn MacNaughton—and donations from several dozen others, we have already raised more than \$1.5 million toward our \$2.5 million goal.

But we still have \$1 million to go. And that's where you, our members and supporters, can make a difference with your contributions to our most important marine conservation project.

Invasive algae are a blight on our reefs. Wherever they exist—be it in Maunalua Bay or Kāne'ohe Bay—they need to be removed. With your kokua, we can do it. Our children and our children's children will thank us.

With Aloha,  
Suzanne Case



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# Hawai'i

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## Reef Revival