



It's a courtship by the sea, except we're sitting in a Bakken Foundation classroom north of Kailua-Kona, where ReefTeach trainers show color slides of brilliant and broken corals that flourish and die in Kahalu'u Bay. They want us to fall in love with the tranquility, beauty and history of this marine mecca without harming it, as unaware people have done for decades.

“They thought it was only colored rocks,” says The Kohala Center’s Cindi Punihaole of the coral reefs, which delight snorkelers at the popular West Hawai’i beach park. “They just didn’t understand that corals are living.”

Kahalu’u—which means “shore diving”—attracts more than 400,000 visitors every year, many of whom have never entered seawater or seen such animated fish up-close. The most popular beach on the island was being decimated. The ambling, trampling, sitting, jogging, falling and sloshing around on delicate coral polyps, flattened the tiny spires, leaving broken calcium twigs and a colorless dust where before there had been a colorful, flourishing city of life.

“The degradation that we saw at Kahalu’u came from people who had no clue what they were doing. They didn’t do it intentionally”, says Cindi, who is Community Outreach and Volunteer Coordinator for the Kohala Center.

In 2006, the Kohala Center was asked to help expand the ReefTeach program created by University of Hawai’i Sea Grant agent Sara Peck. Community volunteers were trained as Reef Teachers. Their goal for the last six years has been enticing each and every visitor they meet to become an appreciator and protector of the bay.

“We’re giving a voice to those who have no voice,” affirms Matt Connelly, who earned a masters’ degree in ocean science from Cornell University before moving to Hawai’i to head the technical side of ReefTeach programs. He reminds us that coral is in the animal kingdom, just like us. “Coral was the first living organism invoked in the Kumulipo, the Hawaiian creation chant,” he says. The coral polyp was the beginning of life. In the ancient tradition, we came from the ocean, from the coral polyp. An ocean-loving people evolved. Most tropical ancestors lived in harmony with the sea, never taking

more than they needed, each family group caring for a part of the reef. They tended it like a garden. In Hawai'i, they participated in the reef as being part of the ahupua'a, the interconnected system of land extending from the mountains to the outer reef crest. Each ahupua'a contained upland forests for timber, fields for crops, and bounty from the ocean—everything needed for sustainable living.

At the end of 2006, the first ReefTeach training class graduated four people, three of whom are still part of the education team. Tonight, three new ReefTeachers are learning about coral anatomy, fish behavior and how to entice 1,000 tourists per day to keep hands and feet off the coral. From the start, ReefTeach volunteers learn about “reef etiquette” and how to be ambassadors of aloha. “We’re not coral police,” says Jeanie Bevanmarquez, Kahalu'u Bay Education Center manager. “We’re like. . . coral moms.”

For the Love of Heart Coral Because of “coral moms” like Jean and “coral hosts” like volunteer ReefTeachers Chris Lochman and Vince Carr, among hundreds of others, there was an 80-percent reduction in coral trampling in the first six years of ReefTeach. Coral polyps began to grow back.

“In 2008, a heart-shaped cauliflower coral appeared in the bay,” noted Cindi. “We think this coral is the bay’s way of saying thank you.”

Today, reef guardians cherish the “heart coral” for its nod of pink, heart-shaped gratitude sprouting in the center of the busiest bay on Hawai'i Island. Beyond its beauty and tenacity, coral plays a distinctive role in nature’s symphony with dramatic abilities and unique power.

It sounds like science fiction but it’s not. Coral reefs are the largest structures on Earth, built by tiny animals, and they’ve been recreating themselves successfully and sustainably for about 500 million years.

“Everybody calls coral the ‘rainforest of the sea,’” Matt asserts, but in terms of biomass, they’re the most full-of-life ecosystem you can have. Even though about 25 percent of marine species live on the coral reef and depend on the coral reef, they cover less than 1 percent of the ocean floor.” When you take into account all the different kinds of ecosystems, having 4,000 out of 30,000 species of fish on the planet dependent on one ecosystem, the coral reef, that’s a very high percentage.

Unmatched by any other ecosystem on the planet, coral reefs are considered harbingers of change. Besides providing nurseries for spawning fish, coral are like the proverbial “canary in the coal mine”—they are very sensitive to change. “When corals die, it is a sign that something in the environment is amiss,” says Matt. Burning fossil fuels has already changed Earth’s climate, raised ocean temperatures and caused widespread coral bleaching; by adding to ocean acidity, greenhouse gases also make it more difficult for corals to build their calcium skeleton. Degradation of coral reefs may be evidence of increasing climate change—beyond the trampling issue at Kahalu'u.

“So, taking care of them is really important, because if we lose a few, that’s really quite a big loss in the grand scheme of things,” says Matt. The coral colonies are so huge it’s hard to imagine all these underwater life forms working together so amicably. A coral colony is made up of polyps, from one to thousands in number, all genetically identical, but each growing into a new and different organism,” says Matt. Some of the corals in Kahalu'u are 400 years old, but when people step on them, they die forever.

Humble, angel-faced creatures, coral rise up out of a cup by depositing calcium carbonate to build a skeleton or calyx. When they get too high off the bottom of that cup, they secrete a new layer. “If you see a piece of broken coral,” Matt says, “you’ll see how they’ve grown this line of holes, kind of like a ladder, and that’s from the coral polyp basically building a ladder to climb up, and up and up.” Known as cnidarians in the taxonomy, corals have a unique job on the planet: besides serving as home

and harbor for millions of organisms, corals sequester, or store, carbon—becoming “carbon sinks”—and emit about a third of the oxygen that humans breathe. Some claim that the planet’s carbon levels are becoming too elevated and that global warming and pollution are ruining the seas and coral reefs beyond repair.

While coral may be the “canary in the coal mine” of the world’s oceans, Hawai’i’s coral reefs are some of the healthiest anywhere.

Scientific research by celebrated Hawaiian marine biologist Kaipo Perez III gives Kahalu’u Bay high marks for preserving coral reef resources. “One of the problems that exists at Kahalu’u Bay is trampling,” he said during a lecture at the Keauhou Beach Resort.

“Preliminary findings indicated that as the coral cover increases, so do the fish,” Perez says. “Kahalu’u is not static, rigid or non-changing.” In conversation with the kūpuna, he heard that in old times, “fish were so plentiful in Kahalu’u that the sun would shine down and we could see the colors of the rainbow.”

When the Kahalu’u “heart coral” appeared at Kahalu’u Bay, it seemed to be a visionary boon to refute the voices of global warming doom, and to assure that the health of the bay was restored.

Here, amid the novice snorkelers and vacation-addled tourists, cauliflower coral, *Pocillopora meandrina* in Latin, was showing its true colors, colors which happen to depend on the zooxanthellae, microscopic algae that live within the coral tissue. One of the most remarkable aspects of coral anatomy is this beneficial relationship between the algae, which uses coral waste products, and the coral, which depend on zooxanthellae for their nutrition. Some experts believe the pink and purple colors of certain coral may be from different strains of zooxanthellae that are more resistant to UV radiation, but this hasn’t been proven. “It shows the coral can recover,” remarks Matt, “but not if poor conditions persist.”

Gentle winds churn the surface when we meet the next morning at Kahalu’u Bay. The moon is almost full, the tides running high. Classroom lessons set aside at last, we are greeted by an optimistic sun above the outstanding cultural and natural wonder that is Kahalu’u Bay. The entire Keauhou – Kahalu’u complex is a center of Hawaiian antiquity. Three ahupua’a extend into the sea here, while the bay itself is protected by a sea wall built around 1400 AD by Menehune, a legendary race of small people, who apparently left space open at the north end of their breakwater to preserve the excellent surf beach and heiau located here.

Sheltered from rough surf, the 4.3-acre bay is an ideal spot for first-time snorkelers, and so they come. They come by the thousands for the beauty, fun and wonder. Surrounded by several hundred visitors, the Kahalu’u Bay Education Center van is embellished with colorful banners and blue, black and gold fins and masks hanging in precise rows near chairs where visitors can sit and properly fit rented gear. “We’re \$13.50 for a whole day,” says Jean. “But we give people an enormous amount of education.” It’s true. In one day you can learn about tubinaria ornata, the thick, golden conical algae that wedges in crevices at the bottom of the sea, or follow the daily routine of Hawaiian elegant hermit crabs who make their homes in small—and often stolen—shells. As the warmth, laughter and splashing drench everyone in instant happiness, there’s an enriching video presentation, dozens of marine identification books, eager volunteers and oceanographers willing to share marine wisdom and tall tales.

The Glory of Sea Teachers: ReefTeach volunteer Fred Lindsay sets up his Friday morning display close to water’s edge: Fish and coral identification panels, rows of books on reef and Hawaiian culture. Fred has been volunteering four hours a week for a year and a half. “In summer, I’m the lone

ranger here,” he says breezily. “In the winter, lots of ReefTeachers are snowbirds” (who live on-island only part of the year to escape cold weather).

We walk among the tide pools while Matt points out mussels, barnacles and periwinkle snails. A daring sea turtle suns on a dark lava rock while a dozen admiring onlookers ooh and aah. Eye-catching hovels shared by limpets, worm snails, and thin-shelled rock crabs, whose shells turn red in the sun. Pipipi, an endemic mollusk, playing host to arthropods and urchins.

There’s a lot going on as we drop away our human-identification and find our ocean body. As we enter the sea, the first thing: humility. Sea urchin spines, slippery moss on lava rocks. Then the humans: North Dakota grandmothers without their canes, ambulating somehow on mushy black sand in two to three feet of water, lurching from slippery rock to helping hand or sea bottom, a soft, graceful landing pad.

Hosts in turquoise blue ReefTeach t-shirts help visitors see what a sustainable relationship with the sea looks like. With colored charts showing stages of health and degradation of the coral, enthusiasts can identify what they see. Sharing aloha, which they consider the top priority, ReefTeachers invite a positive, nurturing experience with Kahalu’u sea life.

I watch as a couple from Missouri finds sandlegs, wearing fins and masks to enter the sacred waters. They are squeezing hands, experiencing something fresh in life. Their faces open like teenagers falling in love again, not with each other, but with the sea, the oneness and interconnection we feel in the sea. They’re falling for the sea.

Listening to Coral “Coral is the animal without a voice,” Matt had said last night, but after we don fins and mask and flutter toward the deeper sea today, I hear the sounds of hundreds of life forms in the water. The swoosh of fish flipping by, checking us out. Floating gardens, rockmover fish nudging pellets toward home, cities and hills of color and magic.

I hear scratching. Matt points to a star-eyed parrotfish biting chunks of coral. “They eat it. You can see bite marks on the coral,” he says.

Freshwater springs and human bathers scuffling in shallow waters near-shore make the snorkeling cloudy, but about 50 feet offshore, the water turns crystal clear. Excited to finally see the “heart coral,” a message of hope to bay-caretakers, we search, but can’t locate it. Instead, we see surgeonfish and vegetarian convict tangs nibbling away at seaweed. We spot a hectic wrasse cleaning station where cleaner wrasse swim right into a larger fish’s mouth to feed on parasites. The surgeonfish is groomed and the wrasse gets dinner in a partnership built on trust.

Chris Lochman, a six-year veteran of ReefTeach, points out domino damsels, the endemic Hawaiian dascyllus, which, outside the protected bay, are captured and sold by aquarium hunters for \$1.58 each. What would a coral in this free-living, open sea-loving community have to say? Do they feel fragmented? In uneasy accord with humans? Or thrilled at the adoration by mammalian eyes? A coral reef shelters crabs and petroglyph shrimp while Christmas tree worms and harlequin shrimp mate among the mound and lobe coral crevices. But does the heart coral know the Pacific Ocean covers one-half the planet and it lives at the center of it? The ocean invites contemplation. What is our place beside the immensity of the ocean and how do we fit within our mysterious home, this womb, the ocean?

I hear the rocks rolling around, the thundering of the waves. So close to nature. All manner of life, snails, snowflake eels, crabs, all swimming around and underneath. I sort of melt in and feel a part of things. Maybe that’s what the “heart coral” did too, because as much as we search, it still can’t be found. Dive deeper. Isn’t this what great teachers have always said? I dive again and again, looking for

the heart coral. Isn't that my prerogative as a sensing being, to know my kinship with all life? To align with this magic called "heart coral?"

ReefTeachers of Kahalu'u closely protect the exact location of the heart of the bay so that heavy snorkel traffic won't endanger this tender little pink ballerina, the offering of mahalo nui loa from the larger sea.

When we at last find the "heart coral," it doesn't look like itself. The dramatic heart-shape has dissipated and its dazzling pink color has faded. Are we receiving inevitable revenge from nature because we have refused to change? Can we change? How deep is our ecology?

Matt, the accepted authority on such matters, says the coral does not appear to have bleached or otherwise been harmed by warming temperatures or a new source of pollution. Even though the consensus among scientists is that climate change is definitely caused by human activities like burning fossil fuels and deforestation, there is no definitive sign that global warming has caused the heart coral deterioration. Luckily, there is no sign of disease either. "This seems like a natural aging process," he says.

Jean, pointing to a photo of the fresh pink heart coral, felt sad about the change. "It just no longer exists in the same way it was. It was pink and heart-shaped. Now, its color and shape have changed, so it was a gift of the heart that came and went."

We are drawn to the ocean, but how do the increasing numbers of people affect the living sea? What we do in one place affects the entire ocean. We are connected in unseen ways. "It teaches us," says Cindi, "So you listen to the land. If you listen well, it will teach you. The ReefTeach students have been just absolutely magnificent in embracing Hawaiian teaching. Understanding the different elements that are this island alone, we have 11 elements of the world. And so in an ahupua'a you can learn the old ways. You can learn so much in one day. We're very blessed that we're able to do that."

Still, new ReefTeachers are needed to help preserve the gains in helping snorkelers learn to move with respect. Nobody, however, seems to know what can protect our local bays and the larger shores of the Pacific Ocean from the global warming of oceans. As harmful as overfishing, coastal development and human carelessness can be, the warming planet is quickly becoming the chief threat to the health of coral reefs around the world.

Reef protection efforts are succeeding in recovering our shorelines and oceans; they may also be helping to restore human relationships. I watch the Missouri couple emerge from the sea. They're holding hands again.

An 'ukulele master casually plays underneath the restored pavilion where volunteers have painted honu on the ceiling – the beginning of a Hawaiian Sistine Chapel? Rows of tables draw lei-makers, meals, spontaneous hula. A thousand people from faraway places who have never snorkeled before and can't understand why they haven't mastered it come through here everyday, gathering courage with a sense of adventure, stepping back into the ocean they came from. Then they go home a little more in love with life, having caught the happy virus—the gentle Hawaiian spirit—at Kahalu'u Bay. ❖

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To participate in ReefTeach Training, please contact Kahalu'u Bay Education Center: Phone 808.640.1166 or visit kahaluubay.org