

An underwater photograph showing a person's hand reaching down to plant a specimen of limu (a type of seaweed) on a sandy seabed. The water is clear and blue-green, and the seabed is covered in sand and some other marine life. The hand is positioned on the right side of the frame, and the limu is being placed on the left side of the frame. The overall scene is peaceful and focused on the act of planting the seaweed.

The Undersea

Love a reef, plant limu

A close-up photograph of a person's hand holding a small, root-like organism in a shallow, sandy, and rocky environment. The person is wearing a clear, protective glove. The background is a bright, turquoise water surface. The overall scene suggests a marine or coastal garden setting.

Gardeners

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PHOTOS BY
HUGH E. GENTRY

The Undersea Gardeners

It's overcast, windy and threatening rain, so I'm glad I brought a wetsuit—partly because I've got a wet, slimy lei made of ti leaf and live algae. It sounds like a weird lū'au dish, but the crowd gathered isn't here to party; we're here to plant limu.

"Here, take two," says Ilima Ho-Lastimosa, handing me another seaweed lei. Even though there are nearly forty participants on this stormy day at Kaiona Beach Park in Waimānalo, someone stayed up late the night before to hand-weave these lei, so there are more than enough to go around.

The lei makers and planters are here to support the Waimānalo Limu Hui, one of several nonprofit groups dedicated to restoring depleted nearshore reefs throughout the Hawaiian Islands. The guest of honor is an edible seaweed called limu manauaea (*Gracilaria coronopifolia*). It's an important staple for reef creatures like honu (sea turtles) and just about every herbivore and omnivore that swims past. It was also a staple food for Hawaiians, a sort of nutrient-rich "kale of the sea" that might garnish a poke recipe or be harvested as a consolation prize if one got skunked fishing. But recently limu has been in



decline across the Islands, killed by runoff or overharvested by unscrupulous entrepreneurs. And whither the limu goes, so go the fish that depend on it.

Waimānalo Limu Hui was formed in the summer of 2017 under Ho-Lastimosa's nonprofit organization, Pono Research, and went from a good idea to a fully formed

community-based organization in less than six months. But what makes this organization different is its Hawaiian governance structure. The Kūpuna Council (elders) advises on cultural practices, if they want to. The Mākua Council (parents or adults), which includes Randall Lindsey, Ho-Lastimosa and a handful more, assists with



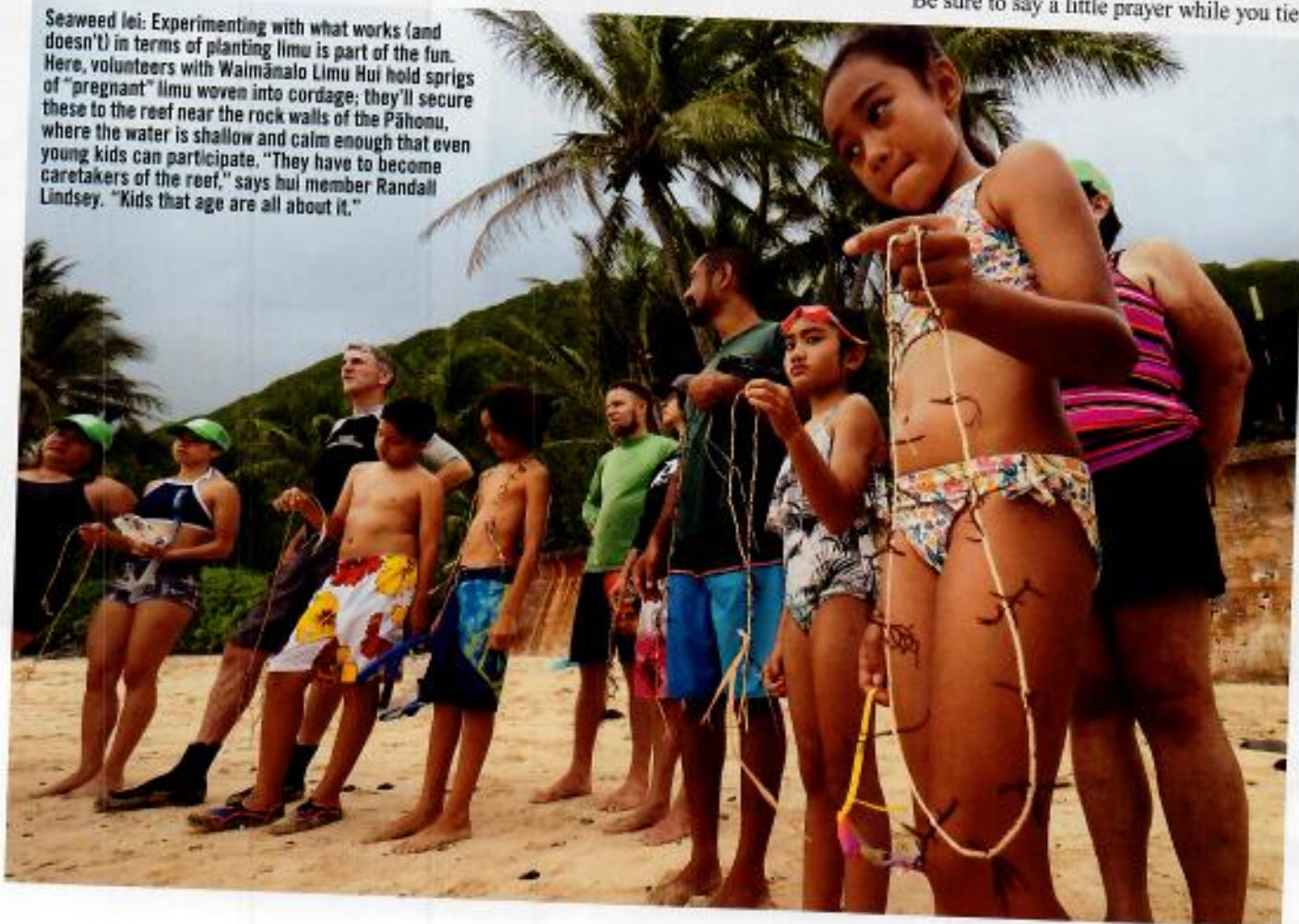
Family farming. Keli'i Makua and daughters Bella and Hazel plant limu manauaea (seaweed) near the Pahonu, or "turtle pond" in Waimānalo (seen at top). Limu manauaea was once an important food source for both fish and humans, and it is an essential part of a healthy reef. But it, and the reefs, have been in decline, so volunteer groups like Waimānalo Limu Hui hope that by planting limu, they can help restore the nearshore ecosystem.



logistics and community engagement. But it's the board of directors, the 'Ōpio Council (young adults) that's really in charge. "The youngest board member is 19. The oldest is 37," Ho-Lastimosa tells me. I ask why. "Because I'll be dead soon!" she laughs. I laugh with her, mostly because she is healthy and energetic but also because we

both understand the scope of this effort. "This isn't a twenty-year project," she says. "This is for perpetuity." "We gave ownership to the young ones right away," adds Lindsey, a firefighter when he's not planting limu. "They have to become the caretakers of the reef, and kids that age are all about it."

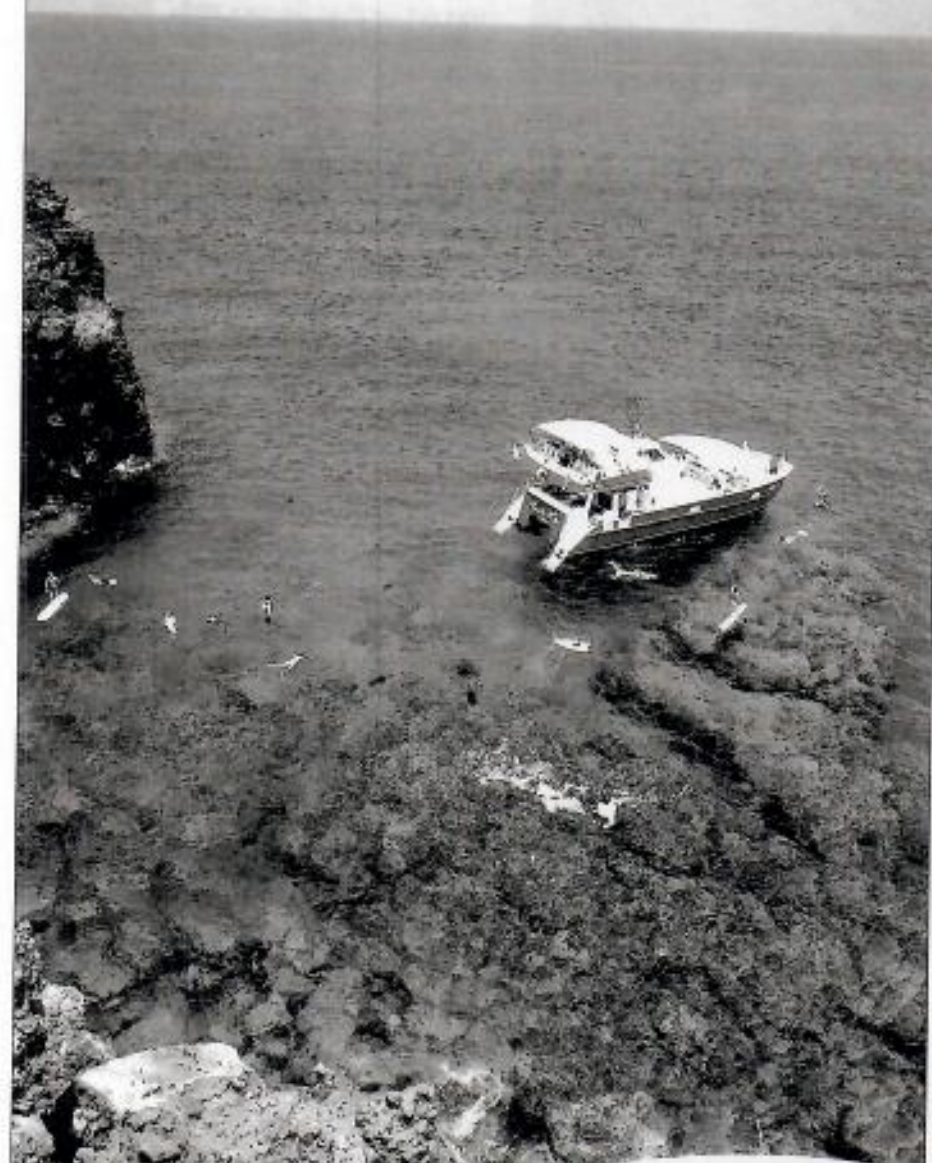
Seaweed lei: Experimenting with what works (and doesn't) in terms of planting limu is part of the fun. Here, volunteers with Waimānalo Limu Hui hold sprigs of "pregnant" limu woven into cordage; they'll secure these to the reef near the rock walls of the Pāhōnu, where the water is shallow and calm enough that even young kids can participate. "They have to become caretakers of the reef," says hui member Randall Lindsey. "Kids that age are all about it."



We circle up, pule (pray), then receive instructions on planting. Talkative and animated, Kainoa Puana has taken it upon himself to teach newcomers like me how to plant limu. "Tie it to a rock," he says. "Even better if you can tie it through a bigger rock. Snorkel out and find a good spot not far from the rock wall," Puana points to the Pāhōnu, a.k.a. the "turtle pond," a rectangular, mostly submerged rock wall that encloses half a football field's worth of shoreline. It was built in ancient times as an enclosure for captive sea turtles, which the ali'i (chiefs) would eat. The pond's collapsed walls were partially restored in the 1960s, but time and tide have made necessary another restoration—but created what might be ideal limu habitat.

"See the little bumps on the limu?" Puana asks the group. "Those are spore pods. If the spores are released, we are hoping they'll drift into the rock wall and take root." Tiny cracks in the rock just might protect the baby limu from hungry reef fish. Puana, a teacher at Kamehameha Schools, shouts after us as we walk to the sea as though reminding us of our homework after the last bell. "Most important! Be sure to say a little prayer while you tie

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Algae man: Most of the limu that Waimānalo Limu Hui and other volunteer groups around O'ahu plant come from "Uncle Wally." It's small aquaculture operation at the Anuenue Fisheries Research Center in Honolulu (seen here and above). But even with the hardiest stock, survival in the ocean isn't guaranteed. "When they approached me, I was going to tell them, 'Don't do it,'" Ito says of the Waimānalo hui. "But after twenty minutes of listening to them, I said, 'Go for it!' ... I knew they were in it for the long term."

it down—give the limu good intentions."

So, with two lei tickling my neck, I snorkel out. The need for some sort of human intervention is obvious. The reef is in a sad state, mostly gray with a few hopeful patches of coral. A squadron of weke (yellow goatfish) cruises by, but little else. A sheltered, nearshore area like this should be busy with honu and their little cleaner-



fish friends. But like a bad office party, no one sticks around once the snacks are gone. Finding a promising planting site, I attempt to tie a lei to a coral-encrusted rock. It's just challenging enough to be frustrating, with the swell pushing me off just as I'm about to tie the knot. I bless the little algae with hope for a prodigious life. With one down and one to go, I notice that

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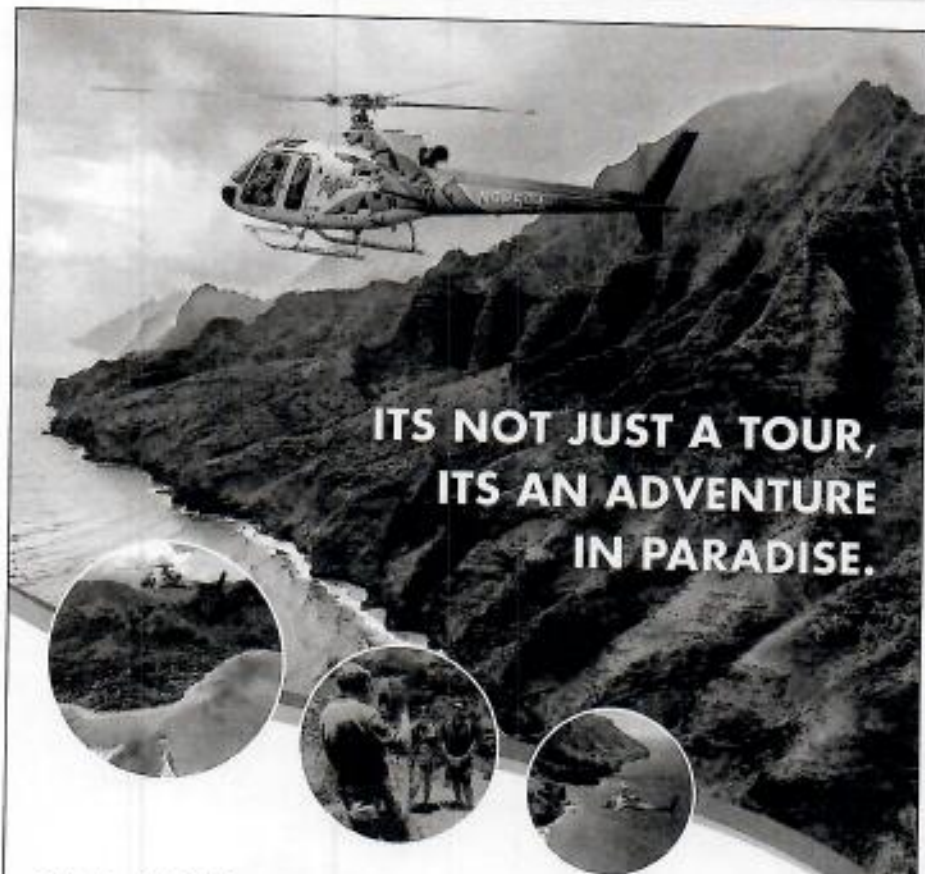
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The Undersea Gardeners

everyone else has opted to wade around in the waist-deep water near the Pāhōnu, so I join them. I find a large rock with a natural hole to loop the lei through and knot it with gusto. A kid near me dives down and simply buries the lei in the sand, which might be as valid a technique as any other, I find out.

"The hope is that the limu doesn't get munched before it spores," says Puana afterward. "Maybe burying it will keep it safe for a bit longer?" There might be no wrong way to help the reef, but Waimānalo Limu Hui is looking for the best way.

Without a specific purpose like reef restoration, harvesting pregnant limu is prohibited by state law. Aside from a few isolated patches on the neighbor islands, most limu sprigs are grown in tanks, which are where Waimānalo Limu Hui sourced theirs. I'm curious about the process: How often does it spore? How do you grow it? It seems every algae-related question I ask leads to Uncle Wally. Wally Ito meets me at the Ānuenue Fisheries Research Center near Honolulu Harbor. It's a collection of tanks and pipes and bubbling water run by the state Department of Land and Natural Resources, where helpful aquatic creatures like coral and sea urchins, which eat an invasive, reef-choking algae called gorilla ogo, are bred for release. Ito leads me past these projects to his eight small tanks, which have seen better days. "They're probably older than you," he says.

Ito has worked and volunteered at Ānuenue since 2006, and with the approval of the state, he has been chipping in about twenty hours a week to raise limu. He's too humble to call himself an expert, he says. "I just know what other people are doing and what I'm doing that doesn't work." Either way, it has paid off; Ito casually scoops up delicate branches of limu from a tank. "It turns out this is a high-maintenance aquaculture project," he says.

The saltwater well that supplies Ānuenue contains silica and microscopic creatures called diatoms, which are problematic for limu. Ito picks up a handful, about a pound and worth about six dollars wholesale. But it's shaggy and unappetizing—not what you'd want in your poke bowl. "That's the diatoms competing with the limu," Ito says. Diatoms can't tolerate a dunk in fresh water, but the limu can. Ito fills a bucket and rinses away like he is hand-washing silk delicates.

"It's like washing rice. You have to wash it until the water runs clear." The clean

limu looks skeletal, with little pinpoint bumps. "Oh, these are pregnant," Ito says as he drops the washed batch into a bucket of seawater, ready for a hui to outplant. Ito supplies algae to the dozen or so groups on O'ahu engaged in limu replenishment, hoping, like they are, that their efforts become more successful over time. But success is hard to measure; whether or not it's working is decided mainly by the participants' very subjective impression of the reef's overall health.



This laborious and possibly thankless mission is a tough sell for hui members and even devotees like Ito. "When they approached me, I was going to tell them, 'Don't do it.'" Ito seems like he's just old and wise enough to avoid pointless labor. "I was afraid the Waimānalo guys would get burned out, get discouraged," he says. "But after about twenty minutes of listening to them, I said, 'Go for it!' They were organized from the beginning, and I knew they were in it for the long term."

Luana Albinio, a sprightly member of the Kūpuna Council, stays on shore at Kaiona Beach Park, watching the little ones and talking up a storm. She's a kupuna teaching Hawaiian studies at Enchanted Lake Elementary, and even on her days off spares no time in schooling anyone who wanders within earshot about limu. "I was born in the '40s, you know. I grew up right here. Back then the limu was thick on the beach. We would catch he'e [octopus] and collect limu, just enough for us and to share with friends." I imagine eating raw octopus poke seasoned with limu from a calabash on the beach. Albinio smiles when I tell her this. "And fruit! From whatever tree is nearby."

We're interrupted by a minor ruckus. One of the participants has caught a small octopus and shows it to the children. "That was my childhood," Albinio says. "I want everyone's childhood to be like this, on this beach, long after I'm gone." ■■■



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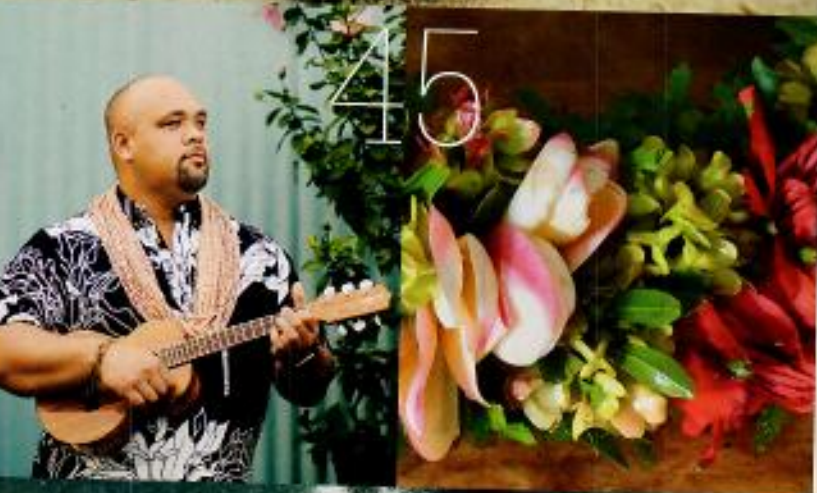
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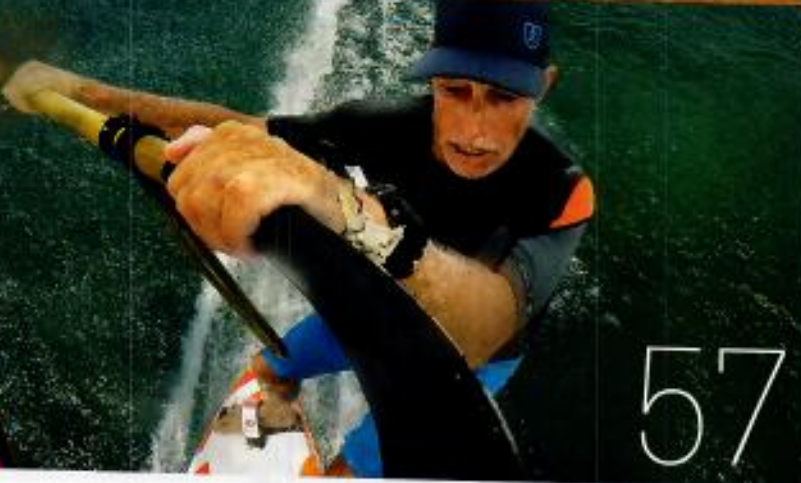
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