



Marine menace

Invasive plants crowd out native limu and mar reefs, but a big cleanup is scheduled for Saturday in Waikiki

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Beneath the sparkling blue waters of Waikiki's world-famous beaches, an unwelcome visitor called alien algae is killing native coral, chasing away the natural sea life and upsetting the fragile balance of the ocean's ecosystem.

Three types of alien algae — *Acanthophora spicifera*, *Gracilaria salicornia* and *Avrainvillea amadelpha* — have formed strongholds around the famous South Shore

swells, choking the reefs and overtaking some of the native algae that once grew. Scientists and conservationists first sounded the alarm about these Waikiki invaders about a decade ago; however, they point to a more recent 3-year-old discovery of *Avrainvillea amadelpha*, or leather mudweed, as evidence that invasive algae are spreading and if left unchecked could wind their way from Waikiki throughout the Hawaiian Islands.

"When I used to swim out there in the

Please see ALGAE, A8



Jefferson Elementary School fifth-graders Michel Melichar, left, and Alexander Metcalf get a close look at invasive algae. At top, Celia Smith collects invasive algae in the ocean near the Waikiki Aquarium.

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ALGAE: Collector urchins will be released in Waikiki to help clear out alien plants

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1970s, I would have to push my way through yardstick-tall native plants like sargassum or limu kala," said Celia Smith, a University of Hawaii botany professor and expert on invasive algae. "Now they are all gone, and the herbivores have lost the places where they used to hide. If you go snorkeling, you'll see vast amounts of space out there."

Scientists and conservationists fight a constant battle against the continued spread of alien algae and the degradation of Waikiki's reef. It's a problem that holds serious ecological and economic ramifications for the state, which draws some 6.5 percent of its GDP from its best-known tourist region. That's why it's welcome news that Waikiki Aquarium received a \$43,951 grant at the end of January from the Community Restoration Partnership to bolster its coastal restoration efforts.

"In Hawaii clean water and healthy lands are the key to our economy and quality of life," said Josh Stanbro, director of the Environment and Sustainability Program at the Hawaii Community Foundation, which supported the grant along with the National Oceanic and Atmospheric Administration, the Harold K. L. Castle Foundation, the Weissman Family Foundation and the Hawaii Tourism Authority.

"Given the devastating environmental and economic costs that invasives are incurring, our small but growing partnership has come to the conclusion that these projects are among the best investments we can make in the islands," Stanbro said.

While significantly more needs to be done to address Waikiki's alien algae invasion, Waikiki Aquarium Director Andrew Rossiter called the grant a huge step forward. It will cover the cost of several cleanups and some educational outreach programs, and will allow University of Hawaii students to continue research to better define the problem and find solutions. In the future, Rossiter hopes to secure upward of \$100,000 to hire a restoration coordinator to add continuity to the cleanups. He also wants additional funds to grow coral to replenish the reef and to breed and grow sailfin tangs, a fish that Smith and her students identified as potentially beneficial to release in Waikiki water because it

consumes alien algae while leaving the native algae alone.

But first things first. On Saturday the aquarium will partner with the University of Hawaii Botany Department to conduct the first of five invasive-algae beach cleanups planned for this year. Future Waikiki algae cleanups are slated for March 29, May 3, June 28 and Oct. 25. At Saturday's event from 9 to 11 a.m., volunteers are expected to remove thousands of pounds of invasive algae. They also will release collector urchins from Anuenue Fisheries Research Center to graze on Waikiki's invaders.

"We need all the help that we can get, as we are hoping to make a huge dent in the patches of alien algae," Smith said. "Everyone is welcome, and everyone will have an urgent role to play."

Scientists and conservationists say invasive algae could ruin the region's reefs, affecting everything from the quality of the coral and fish biomass to food supplies and tourism.

"We only have to look to Maunaloa Bay to see what kind of damage that the leather mudweed causes," said Eric Conklin, marine science director for the Nature Conservancy of Hawaii, which led the recent removal of more than 2 million pounds of invasive algae from the East Oahu bay. "It's so thick that it's hard to swim in, and it creates a blanket that stops the oxygenation of the sand underneath, so everything goes black."

Healthy reefs make for clearer swimming waters, a broader spectrum of interesting underwater visuals and greater offshore wave action, Rossiter said.

"Reefs are the supermarkets and high-rise apartments of the ocean — once they are gone everything goes," he said. "If there is nothing in there rebuilding the reefs, they will crumble. They are the break between the Waikiki shoreline and the waves. Without the reefs we wouldn't have good surfing waves, and we'd have huge erosion."

Rossiter said that he does not think that Hawaii's political and business sectors fully understand the dangers that alien algae pose to Waikiki and other areas of the state.

"It's great that we are working on our shorelines, but quite frankly we first need to work on our reefs," he said.

Though Rossiter would

GROWING PROBLEM

Three types of invasive algae off Waikiki



NAME: *Acanthophora spicifera*/
SCIENTIFIC:
COMMON: Spiny seaweed

FIRST FOUND: Most likely arrived on a barge from Guam. Discovered in Hawaii in the 1950s.

WHERE FOUND NOW: Established off Maui, Molokai, Lanai, Kahoolawe, Oahu, Kauai, and Hawaii Island.

WHAT IT LOOKS LIKE:

- >> Brittle branches often fragment, contributing to its spread. Grows upright to about 9.8 inches.
- >> Can be shades of red, purple or brown.
- >> Most abundant algae on Hawaii reefs, often crowding out other algae.



NAME: *Groenlandia salicornia*/
COMMON: Gorilla ogo

FIRST FOUND: First found in 1971 in Hilo Bay. Introduced to Kaneohe Bay and Waikiki in the 1970s as a source of the thickening agent agar.

WHERE FOUND NOW: Can be found in Kaneohe Bay and from Maunaloa Bay to Pearl Harbor and Waikiki.

WHAT IT LOOKS LIKE:

- >> Brittle seaweed forms thick interwoven mats up to nearly 6 inches.
- >> Dark green or brown when grown in shaded areas, the sun gives it a yellow tint.
- >> Among most successful invasive algae on reef flats.



NAME: *Acrainvillea amadelpha*/
COMMON: Leather mudweed

FIRST FOUND: First identified in shallow water at Kahe Point and Koko Head. Thought to have arrived after 1981.

WHERE FOUND NOW: Found on Oahu at Kahe Point, Koko Head, Diamond Head and in Waikiki at depths from 1 to 33 feet.

WHAT IT LOOKS LIKE:

- >> Plant have one to four thin, wedge-shaped blades.
- >> Green to green-gray, often covered with silty sand, appearing muddy brown.
- >> Forms dense clumps; overgrows coral rubble. In Mamala and Maunaloa bays, thick communities cover surfaces where plants and animals live, crowding out other algae and native seagrass.

Source: University of Hawaii Botany Department, www.hawaii.edu/reefalga/invasive_algae



The sailfin tang, the striped fish in the front with the orange tail pictured here at the Waikiki Aquarium, is an herbivore that eats invasive algae. Collector sea urchins, one of which is on the bottom behind the sailfin tang's mouth, also graze on invasive algae.

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INVASIVE ALGAE IN WAIKIKI

Invasive algae off Waikiki has been recorded from the Waikiki Natatorium War Memorial to the Hilton Hawaiian Village, shown in red. An alien algae cleanup on Saturday will focus on an area fronting the Waikiki Aquarium.



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like to see greater support for eradication of invasive algae, pockets of support have emerged.

Beth Churchill, senior vice president of sales of marketing for Aqua Hospitality, said she and others in the hotel company are disheartened by conditions in

Waikiki.

"When I volunteered during a cleanup, I looked down and all I could see was a blanket of brown," Churchill said. "Invasive algae is everywhere."

Mike Murray, COO and senior vice president of sales and marketing for Wai-

kiki Beach Activities, said more members of the visitor industry need to get involved in maintaining Waikiki's iconic sand and surf as a vital resource and huge part of the state's visitor brand.

"I urge people to join the cleanups or do their part in

some other way," Murray said. "We are developing our own cleanups for corporate and group travelers who want volunteer ideas."

Stephanie Dowling, regional director of public relations for Starwood Hotels and Resorts in Hawaii and French Polynesia, said the company recognizes that supporting healthy reefs has a direct impact on the health of the tourism economy and community, and takes part in efforts like the algae beach cleanup to help care for reefs and oceans.

While Hawaii does a great job of protecting its reefs in the Northwestern Hawaiian Islands, it needs to do a better job protecting the reefs around its other islands, said HTA Chairman Ron Williams, who as CEO of Atlantis Submarines is well acquainted with Waikiki's underwater experience.

"I don't know how top of mind the issue of invasive algae is for the state's visitor industry. We obviously preach it all the time, because we see it all the time," Williams said. "It's a blue world. We all have a responsibility to protect this most important resource."