

ENVIRONMENT | ECOLOGY



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David Chai, director of natural resources at the Four Seasons Resort Hualalai, points to the pond which won an award for its use of phytoremediation.

FOUR SEASONS POND WINS ENVIRONMENTAL PROTECTION AGENCY AWARD

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When a chef at Four Seasons Resort Hualalai needs fish or shrimp for a dish, a fresh supply is available at the fifth hole of the golf course.

That's where the "living machine" is located.

The 3-million-gallon pond is an example of phytoremediation — the treatment of environmental problems using plants.

Water in the Four Seasons pond is filtered by floating islands of plants with extensive root systems that are colonized by nutrient-consuming bacteria. The water is then clean enough to be stocked with moi, mullet, milkfish and Pacific White Shrimp, which are used in the resort restaurant.

The pond — dubbed a "living machine" for its use

of micro-organisms — was recognized by the Environmental Protection Agency at an awards ceremony Thursday in San Francisco. The facility is only one of two recipients from the state.

"The selection for the award was based on the promotion of innovative ideas, addressing of environmental problems over the long term and the ability to be replicated in other places," said Dean Higuchi, EPA press officer in Honolulu.

The pond, called Lake Punawai, was built in 2001 with the requirements of being energy efficient, visually pleasing and able to provide fish for the restaurant, said David Chai, director of natural resources at Four Seasons Resort Hualalai. The resort partnered with Natural Systems Inc. and

▶ SEE POND PAGE 4A

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DEAN HIGUCHI
EPA PRESS OFFICER IN HONOLULU

► POND: System allows fish, shrimp to be grown, saves money

CONTINUED FROM PAGE 1A

Ocean Arks International to create a phytoremediation system that met the criteria.

Two-and-a-half acres in size and 10 feet in depth, the pond is lined with a foot of gravel and features two floating islands of plants. Chai said bacteria and micro-organisms were introduced to the root systems and gravel bed.

A three-horsepower pump circulates water through the islands, allowing plants and bacteria to remove pollution and excess nutrients, such as phosphorus and nitrogen.

"We have basically built a mini-ecosystem to keep the pond clean and remove waste from the fish," Chai said.

About 80,000 shrimp and thousands of fish live in the pond and can be harvested for the resort restaurant. Oysters are also found in the waters, although their role is in filtration, not food.

The pond saves energy costs for the Four Seasons as well, Chai said.

"If we set up another area as a fish pond without this system, it would cost close to \$10,000 a month in power —



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On the fifth hole at the Four Seasons Resort Hualalai's golf course, a pond was built four years ago that filters water through plants, allowing fish and shrimp to be grown in the pond and used at the resort's restaurant.

this one runs about \$400," Chai said.

The dual benefits for the environment and Four Seasons also contributed to the selection for an EPA award.

"When the EPA looked at this project, we saw a good example of how a business

can interact with the environment and turn it into something positive for both their operations and natural resources," Higuchi said.

Honolulu officials hope to replicate the pond's success in the heavily polluted Ala Wai Canal, which borders

Waikiki. Pending approval by the state Board of Land and Natural Resources, a 3,396-foot-long, 30-inch-wide floating platform of plants would be placed in the canal to clean up the urban waterway, according to an Oahu newspaper.