

Geothermal debate finds new fuel in rainforest preservation issue

Last in a series

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By Jim Borg

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PAHOA, Hawaii - For 60 years, Henry Auwae has been gathering medicinal herbs in the Wao Kele O Puna rainforest.

Auwae, 79, who lives in Keaukaha outside of Hilo, is a Hawaiian herbal medicine doctor, or kahuna la'au la-paau.

His practice depends on his access to the forest of the ahupua'a, a traditional land division extending from the mountain to the sea. The ancient rights of native Hawaiians in these undeveloped areas have been affirmed by the state Constitution.

Auwae gathers pink opiko to make tea for women who have had miscarriages. He finds true koli, the castor bean plant, useful in the treatment of diabetes.

"Wao Kele O Puna produces these



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plants with a quality and potency I have found nowhere else," says Auwae, who last year went to Washington, D.C., at the invitation of the Smithsonian Institution to share his knowledge.

But since the True/Mid-Pacific geothermal enterprise began bulldozing the forest to clear an eight-acre drilling site last fall, Auwae says he has

become concerned about the future of his natural-medicine chest.

"Much opiko had been uprooted," he said after one visit. "Also knocked down were the koli and pa'iniu. Due to the difficulty I encounter in finding these plants, I was very disturbed by this destruction. I also saw knocked down medicinal plants and trees which take many years to grow..."

Auwae in February made his objections known in an affidavit to the U.S. 9th Circuit Court of Appeals.

A lawsuit by the Pele Defense Fund challenged the 1985 decision by the state Board of Land and Natural Resources that allowed the state to swap its Wao Kele O Puna property, a natural area reserve, with land owned by the Campbell Estate in Kahauale'a, nearer Hawaii Volcanoes National Park.

While residents in the Wao Kele

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Henry Auwae, at home in his medicinal garden outside Hilo.



KILAUEA RIFT: The Geothermal Power Struggle

Geothermal: Fear of destruction propels foes

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ahupua'a kept their gathering rights. Campbell Estate hopes to develop extensive geothermal-energy fields in the part of the forest designated as the Kilauea middle east rift geothermal resource subzone.

On May 4, the San Francisco-based 9th Circuit Court upheld a lower court ruling sanctioning the exchange.

Forests are good for at least two reasons: for the wealth of plants and animals they embrace, and because plants cleanse the air of carbon dioxide, a suspect in possible global "greenhouse" warming.

While many Americans are concerned about the slash-and-burn destruction of the Amazon rainforests of Brazil, the situation on this southeast slope of Kilauea Volcano is certainly less severe.

Hawaii, the fourth smallest state, ranks seventh highest in state-owned forest lands, totaling 900,000 acres, with another 270,000 acres in national parks and wildlife refuges, and 29,000 acres under sole or shared management of The Nature Conservancy.

But there's a more disturbing perspective. Hawaii's lowland rainforests have been chopped to about a tenth of their pre-settlement extent, estimates Jim Jacobi of the U.S. Fish and Wildlife Service's Mauna Loa research station.

The question of the remaining forest's intrinsic value is open to debate.

A biological survey of the forests in Puna was completed in 1985 by the University of Hawaii botany department for the state Department of Planning and Economic Development.

Leading the team was botanist Charles Lamoureux, associate dean for academic affairs in the UH Colleges of Arts and Sciences. Building on work by the U.S. Forest Service, Lamoureux placed the landscape into several categories based on vegetation, ranging from pristine ohia forest to barren lava flows.

Lamoureux concluded that geothermal development could



Charles Lamoureux
Led biological survey

indeed destroy native habitats, but that the most abundant tracts of pristine ohia forest were in the new state land, swapped with the Campbell Estate, at Kahauale'a, far from the Kilauea geothermal subzone.

He defines pristine as "a more or less intact wet native forest community" — closed canopy forests with lower layers of other native trees, tree ferns and shrubs. Introduced exotic plant species are rare in these areas, except where they have been established by rooting pigs, he says.

Nearly all of the forest in Wao Kele, where the geothermal subzone is situated, is a wet ohia forest overlaid by foreign shrubs, primarily strawberry guava, says Lamoureux.

Wao Kele certainly qualifies as a lowland tropical rainforest (below 3,000 feet in elevation, more than 100 inches of rain per year, and more than 50 percent native canopy cover). In all, the state Division of Forestry and Wildlife lists nine other such forests on five islands. However, the 27,000-acre Wao Kele tract is part of the largest single expanse of U.S. tropical rainforest, totaling 60,000 acres.

The state estimates that development of 100 megawatts of power on Kilauea's middle east rift would mean razing 350 acres, about 1.3 percent of Wao Kele and about 0.6 percent of the entire Puna lowland forest.

Installing plants to provide 500 megawatts to Honolulu would require proportionately more cutting.

Everyone agrees that roadways between drill sites and power plants will create avenues for the migration of even more foreign species, since every vehicle can carry seeds in on its tires.

The Campbell Estate says the roadsides will be inspected periodically and exotic interlopers will be dosed with herbicide. Environmental groups say they doubt this botanical border patrol will catch every alien.

While no one disputes Lamoureux's conclusion about the near-pristine nature of Kahauale'a forest, much of which is over 3,000 feet in altitude, others argue the Puna forest ecosystem should be considered as a whole.

Says Nelson Ho, regional vice president of the Sierra Club: "What we've got is one botanist isolating one chapter in the book of the rainforest and saying, 'There are better pieces of literature than this. Let the developers do what they want.'"

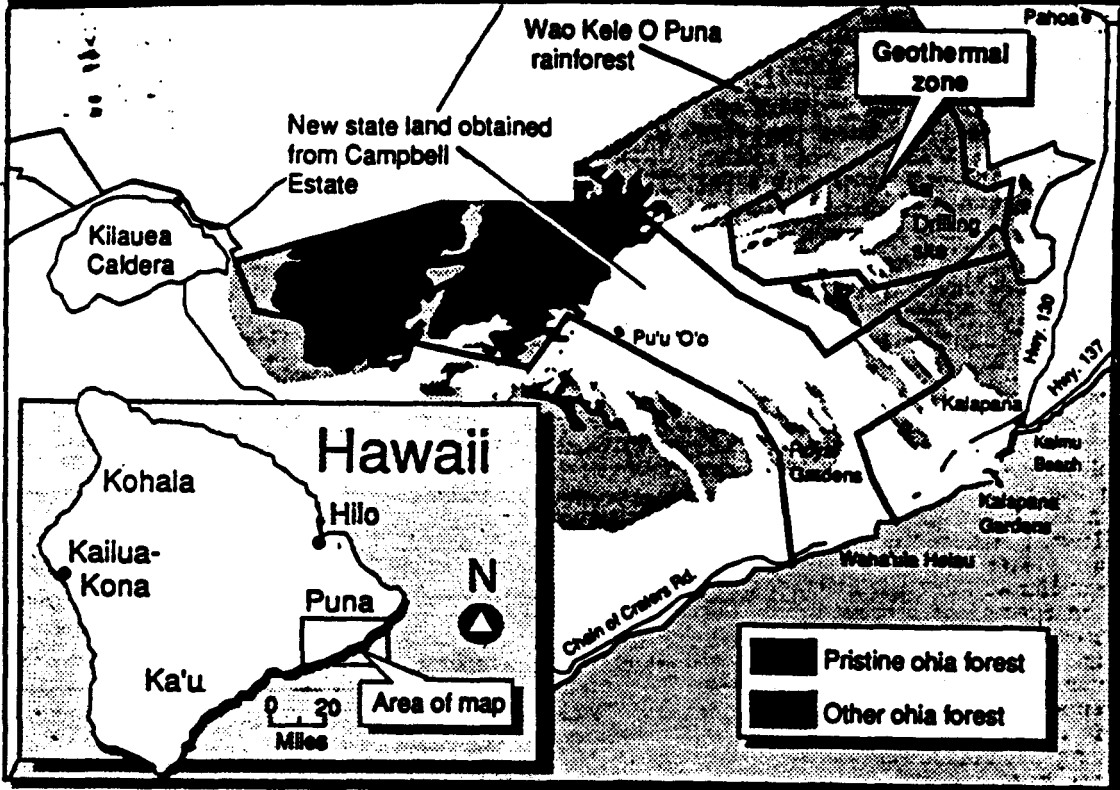
"My general feeling is none of these areas warrants sacrifice," says Dan Taylor, chief of resource management at Hawaii Volcanoes National Park. "They might be weedy and somewhat degraded, but any forest that gets cleared never comes back."

UH botany professor Dieter Mueller-Dombois argues that an important measure of a Hawaiian forest's value is its ability to re-colonize lava flows. In this process ohia is particularly adept and strawberry guava and other alien invaders largely irrelevant, he says.

"I agree pristine forest is extremely valuable, but the question in this particular situation is whether there is still enough native vegetation around to reinhabit the new lava flows," says Mueller-Dombois. "A forest is not a static unit that sits there and has no other function but to remain pristine."

The Wao Kele forest is also important for studies of the evolution of kipukas, oases of forest in the lava desert. biolo-

The ohia forest and geothermal development



SOURCE: KILAUEA, The Newest Land on Earth—Bishop Museum Press

Advertiser graphic by Greg Taylor

The state land at Kahauale'a, obtained from Campbell Estate, contains Puna's best-preserved tracts of ohia, far from True/Mid-Pacific site, shown in this map based on Lamoureux survey.

gists say. Since the land swap, lava flows have wiped out much of the lower Kahauale'a forest and the small areas of pristine ohia found in the middle east rift geothermal subzone.

What about birds?

The Lamoureux team's ornithologist, Andrew Berger, concluded: "Only a few endemic forest bird species inhabit the forests of the east rift zone of Kilauea Volcano, and their populations are low in comparison to their numbers at higher elevations. None of these endemic forest birds is considered to be endangered or threatened with extinction."

A small number of Hawaiian hawks occupy the east rift zone range, Berger said, but they range far enough to avoid any objectionable effects of geothermal development.

Sheila Conant, UH associate professor of general science and a research associate at the

Bishop Museum, disagrees. Conant, who has studied the ecology and breeding biology of Hawaiian birds since 1964, says roads and noise will have a serious effect on the bird populations.

"To suggest that birds could 'move away' from an immediate source of danger or irritation is unrealistic," she says. "If the birds can move away before they are killed, they will be forced to move either to an unsuitable habitat or to a habitat which is already occupied by members of their own species. In either case, the individuals that move have little chance of survival because the resources they require will not be abundant enough to support them."

For Hawaii's energy planners, who hope to reduce the state's dependence on fossil fuels, Conant's scenario for Wao Kele's displaced birds has a familiar ring.

What will Hawaii's growing population do when oil for electricity is no longer abundant?

The arguments over geothermal energy in Hawaii ultimately may be refined to a painful trade-off between finite natural resources — the living legacy of Wao Kele and the geological remnants of long-dead forests we now import as fuel.

Judging from recent protests, much of the opposition to geothermal development may be focused against industrialization of any kind in the relaxed, rustic Puna district. Residents understandably may not want to see their lifestyles sacrificed on the altar of air-conditioned Honolulu high-rises.

Then again, trees and birds don't vote.

"I think the protests will continue," says state Sen. Andy Levin, D-1st District (Kailua-Kona-Ka'u-Puna). "I think the development will continue."

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