

- Home
- Letters to Editor
- Archives
- Contact Us

Search: Text Size:



- News
- Editorial
 - Letters to the Editor
 - Points of view
 - News
 - News Briefs
 - Island Girl
 - Arts
 - Business
 - National Affairs
 - Thinking Out Loud
 - Ke Ola o Hana (Hana Life)

- Sponsored Features
- Home Improvement
 - Environmental Awareness
 - Women in Business
 - Women's Health Month
 - Eat Your Heart Out
 - Healing Arts and Beauty
 - Financial

- Services
- Contact Us
 - Classifieds
 - Subscribe
 - Distribution Points
 - Business Resources

- Community calendar
- Calendar Events
 - Ongoing Events
 - Submit Calendar Listings

News Archives:

Choose Date

Haleakala Times Poll:
No active polls available.

News / The Remnant Wiliwili Forest at Wailea 670

- Email to a friend
- Print

Story photos:

Click thumbnails for full-size image:



The Wailea 670 development proposal presents a situation in which a developer is proposing to destroy most of one of the largest remnants on Maui of a highly endangered Hawaiian ecosystem. This situation is primarily a consequence of defects in the 1988 Environmental Impact Statement, which completely failed to assess the ecological importance of the wiliwili habitat on the site. Subsequently, the owners and policy makers who have relied on it have been misled as to the conservation value of the habitat. Fortunately, the developer has been willing to allow the author and colleagues the opportunity to survey the property for native Hawaiian species. This report attempts to provide the information missing from the 1988 botanical survey so that the owners, policy makers, and the public may better understand the consequences to Hawaiian biodiversity from any plan to develop the site.

The wiliwili trees (*Erythrina sandwicensis*) and other Hawaiian species found on the a'a flow in Wailea 670 are remnants of low-elevation Hawaiian dryland forest. This habitat has been ranked among the 21 most endangered ecosystems in the United States. Fully 95 percent of this ecosystem on Maui has been destroyed by fire, cattle, and alien grasses.

The surviving five percent of this ecosystem on Maui occur mainly on recent a'a lava flows (4000-10000 years old), which keep the vegetation sparse enough to survive the fires that have swept the mountain, and prevent suffocation by invasive alien grasses. Only six large contiguous areas of wiliwili habitat remain on Maui, and Wailea 670 contains one of them, some 130 acres in the southern 19 percent of the property, where a lava flow swept through 10,000 years ago. Because of the unique soil properties of the a'a flow, this portion of the property supports self-maintaining populations of twelve endemic and twelve indigenous native Hawaiian plant species. In contrast, the northern 81 percent of Wailea 670 is devoid of endemic Hawaiian plants.

The developer's current mitigation plan would set aside only 18 of the 130 acres for a conservation easement (86 percent loss of the area). The lower elevation portion of this habitat has already been destroyed by the development of the Wailea Golf Course and Palaeua estates.

Size is critical to the survival of ecosystem remnants. In order for species to stay genetically healthy, they must have minimal viable population sizes. Small populations are prone to random extinction. Large habitats contain a variety of microhabitats that support greater biodiversity. Large habitats contain multiple patches of each microhabitat, which allows one patch to recolonize another if the

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species dies out there. The eight largest wiliwili forest remnants on Maui are, in decreasing order: Kanaio, Pu'u O Kali, then Wailea 670, Makena, La Perouse, Kaupo, Luaia'ilua, and Waikapu. Other remaining remnants are substantially smaller in area, mainly along valleys in West Maui. For this reason alone the habitat at Wailea 670 is important to the survival of the dry forest ecosystem.

But Wailea 670 also supports the survival of some extremely rare plants, Rock's nehe, and the awikiwiki. Rock's nehe (*Lipochaeta rockii*) survives in only two other sites on Maui. The nehe in each of these sites is physically unique, and had they not been botanically lumped in with the more abundant nehe on Molokai, they would meet all the criteria for listing as endangered species. The Wailea 670 population represents one end of the morphological spectrum, its leaves being the least dissected. The neighboring population at Pu'u O Kali, 3.5 miles away, represents the other extreme of the spectrum, its leaves being the most dissected. The author has observed ecological differences as well: the Wailea 670 population dies back to the roots during the dry season, whereas individuals in the Pu'u O Kali population have been found with green leaves even at the height of the dry season. These differences represent the working of nature and may reveal secrets to survival in these harsh dry environments. The developer's plans for Wailea 670 would most likely ruin the habitat for any scientific study that would unlock the secrets of the nehe's adaptations.

And Wailea 670 is one of only four other sites on Maui where the awikiwiki (*Canavalia pubescens*) survives. Awikiwiki is the vine whose purple flower is the original source for the Mauna Loa lei, and has the highest priority rating for becoming a Federally listed endangered species. The Hawaiian word "wiki" – which we find in "Wikipedia" – means "fast," and the Native Hawaiians chose the awikiwiki as the plant to represent the essence of "fast." Had the awikiwiki been listed as an endangered species when it was first proposed, or should it become listed during Wailea 670's proposed build-out, the regulations of the Endangered Species Act would apply. Because there are so few habitats on Maui where the awikiwiki survives, one can infer that the Wailea 670 a'a flow would qualify as Critical Habitat for the recovery of the awikiwiki. The failure of the Department of the Interior to heed the advice of its own Proposed Rules and list its candidate endangered species has subjected it to numerous law suits. It is notable that one of the threats to the awikiwiki mentioned by the Proposed Rules is development on Maui. Since development is not proposed for any of the other four populations of awikiwiki, this can only be a specific reference to the development proposed for Wailea 670.

The developer kindly allowed the author and colleagues to conduct a series of transect surveys in order to better characterize the distribution, abundance, and diversity of native vegetation at Wailea 670. Random transects were walked through the area around the HKEA a'a flow. All specimens of the least numerous species were noted: naio, awikiwiki, nehe, heuhiuhi, a'ali'i, akoko. These include a single akoko tree and two dead akoko trees (*Chamaesyce celastroides* var. *lorifolia*), which were discovered by the author on 2003 and were not listed in the 1988 botanical survey. Representative samples of more numerous species were also recorded: wiliwili, ilie'e, maiapilo, anunu, koaliawa. Plentiful species such as uhaloa and ilima were generally not recorded.

The results of the transect surveys were revealing: The 1988 botanical survey recommends that one patch be preserved because it contained awikiwiki and "several species considered rare, uncommon or depleted such as the nehe, 'anunu, maiapilo, and heuhiuhi." The transect study found, however, that these species are scattered throughout the a'a flow, and not relegated to a single patch. And this is fortunate, because some time between 1991 and 1993, the owners at the time graded this patch and destroyed the plants, which may have been a violation of the 1992 County zoning ordinance requiring that "Existing native Hawaiian species shall be retained or relocated."

The 1988 botanical survey and its updates had three other severe defects, in addition to mischaracterizing the abundance and distribution of the native Hawaiian plants in the site: (1) it proposed using plants in landscaping as its conservation measure, which no conservation agency would accept as a justification for habitat destruction, and (2) as to habitat destruction, it stated "the proposed development of the site is not expected to have a significant negative impact on the botanical resources," and (3) it failed to assess the inventory of remaining wiliwili habitat on Maui and evaluate the importance of the Wailea 670 a'a flow to that inventory. This recommendation in the Environmental Impact Statement evidently was not challenged at the time. But there is now data giving a better picture of the scarce distribution of surviving wiliwili habitat on Maui.

Another crucial issue that I only briefly mention is that there are numerous cultural sites throughout the wiliwili habitat: Native Hawaiians lived in this woodland without destroying it. The preservation of nature here will also preserve the handiwork of Hawaiians' ancestors, and testify to their own survival on the a'a.

It is within the Maui County Council's zoning power to preserve this remnant of nature for future generations. The only conservation condition passed by the Council Land Use Committee was the developer's own plan, which placed only 18 acres into a conservation easement. Fortunately, the whole Council unanimously passed an amendment that would place into the conservation easement the entire 130 acres of habitat, "excluding any portions that the State Department of Land and Natural Resources, the United States Fish and Wildlife Service, and the United States Corps of Engineers find do not merit preservation, but shall not be less than 18 acres and shall not exceed 130 acres." Thus, should the current bill become law, the fate of the forest will be delegated to these State and Federal agencies. One can hope that the institutions will function as intended to protect our natural heritage, and that the wiliwilis at Wailea 670, and all the native species surrounding them, will live to see another century.

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Dr. Lee Altenberg is faculty with the University of Hawaii Outreach College. He earned his Ph.D. at Stanford University in 1985 in population genetics. He has published research articles in Ecology, The American Naturalist, Evolution, Genetics, Theory in Biosciences, and Artificial Life, and served on the National Science Foundation panel on Advancing Theory in Biology. He has lived on Maui since 1994 and has served as a docent with The Nature Conservancy, a volunteer with the Auwahi Restoration Group, and on the board of the Native Hawaiian Plant Society.

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Lee Altenberg, PH.D.

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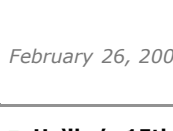
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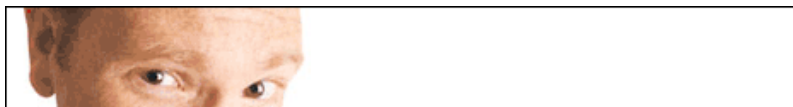
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February 26, 2008

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