

COPING WITH CHANGE AT MAKAUWAHI CAVE RESERVE

PAST CHANGES

Fossils from Makauwahi Cave spanning millennia highlight past climate changes, sea level rise and fall, and extinctions most likely caused by humans. Big landscape changes also took place here during the plantation era, including artificial drainage and complete deforestation.



Excerpt from an 1886 map shows that a large pond (Kapunakea) formerly covered the area just inland from here. Black arrow indicates location of the Makauwahi Cave sinkhole. The pond was drained during the plantation era with the manmade canal on your left. Photo from Grove Farm Museum.



Photo of this landscape taken sometime between 1890–1920, showing the limestone escarpment with cave entrance on left end of picture. Note closely grazed appearance of the landscape. Kapunakea Pond is the strip of water adjacent to the cliff. Photo from Bernice P. Bishop Museum.

PRESENT ADAPTATIONS



Oblique drone aerial of Makauwahi Cave Reserve. Photo by Graham Talaber.



'Ohai (*Sesbania tomentosa*), is an endangered coastal shrub featured here. Photo by Forrest & Kim Starr.



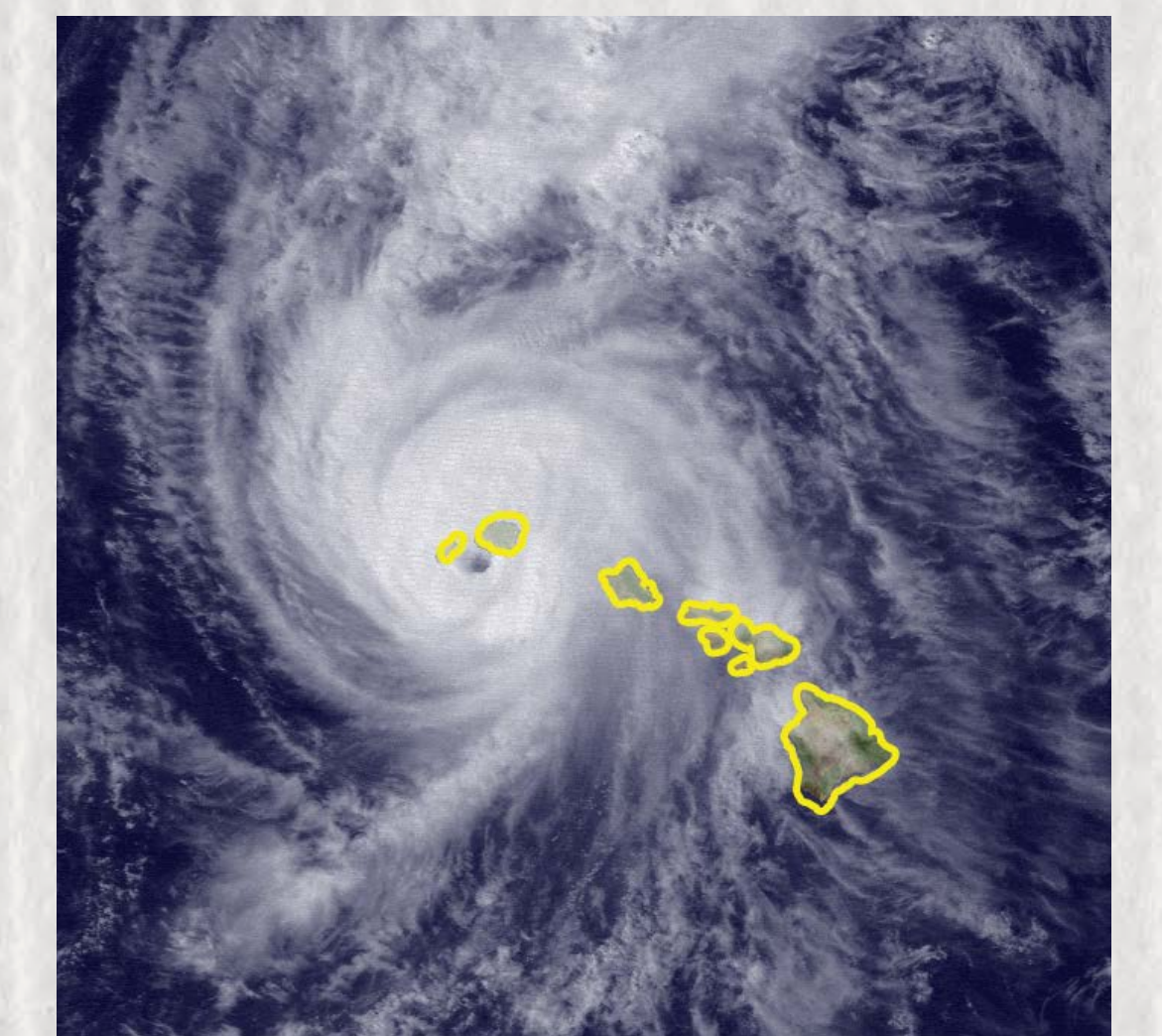
Nene have already moved into the new wetlands and restorations, as have three species of endangered waterbirds. Photo by Tess Sprawson.

FUTURE CHALLENGES

Scientists predict that severe hurricanes, long droughts, intense wildfires, floods, and sea level rise can all be expected to impact this location over the coming decades. Thousands of native plants in Makauwahi Cave Reserve (MCR), as well as the endangered waterfowl and other rare native species on the site, are at risk. To try to cope with these challenges, MCR teamed up with landowner Grove Farm Company, in partnership with public and private granting agencies, to restore the adjacent limestone quarry, in order to foster rare native coastal forest and freshwater wetlands at a higher elevation that is more sheltered from the sea.



A four-year drought in this valley culminated in a large wildfire nearby in 2017. Photo by Lida Pigott Burney.



Hurricane 'Iniki produced 35-foot waves on this coast in 2001. Photo by NOAA.



Floods can strike suddenly, like this one in the cave in 2012. Photo by David Burney.



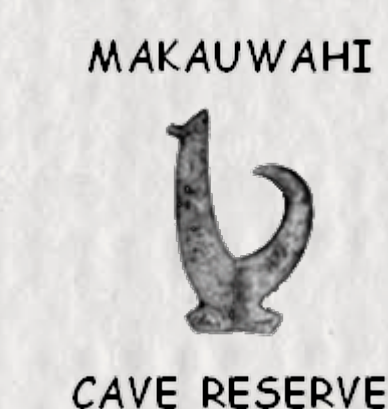
NOAA model predicting effects of 1 meter (3.2 foot) sea level rise shows threat: present shore (dashed line) would retreat inland (blue), flooding freshwater marshes (yellow), and cave floor (red).



MAHALO

Staff and interns of Makauwahi Cave Reserve; CARES Act and Rise to Work jobs programs via County of Kaua'i; Dr. David Burney and Lida Pigott Burney for text and concept; Design Asylum Inc. of Honolulu for production and printing; conservation and research project sponsors, including federal, state, and private sources.

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MCR is dedicated to the study, conservation, and interpretation of one of the richest fossil localities in the Pacific island region, associated archaeological features, and a futuristic conservation project that has sustainably restored adjacent quarry and farm properties to provide habitat for endangered plants and animals. Scan the QR Code to check out our website and more information.

