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O'ahu other 1st

### Ku'u Aloha No Ho'omaluhia

From lovely hibiscus flowers (*Rosemallows*) and ferns to *kōlea* (Pacific golden plover, *Pluvialis fulva*) birds and *koloa* ducks (Hawaiian duck, *Anas wyvilliana*), Ho'omaluhia Botanical Garden features various native plants and animals for the public to see. Located in Kāne'ohe on the island of O'ahu, the garden has maintained plants that have grown abundantly to this day. Ho'omaluhia represents its name well, being a place of tranquility, peace, and serenity. Through the years, the garden has continued to enchant its visitors by providing beautiful scenery of plants from all around the world. My mother and I believe that with a little more attentiveness to the wellness of the plants, and more importantly, our environment, Ho'omaluhia will continue to grow and flourish.

Ho'omaluhia is at the windward base of the Ko'olau Mountain Range. In 1965 and 1969, the city of Kāne'ohe was faced with devastating floods. Because of this, the U.S. Army Corps of Engineers had to take on the task of designing and building a 2,200 foot earthen dam on Kamoali'i Stream (O'Connell, 2014). A 400 acre garden park was an added benefit of the project. This is what they decided to name Ho'omaluhia, translating to "a place of peace and tranquility" (O'Connell, 2014). With all my family growing up on the windward side of O'ahu, Ho'omaluhia was a place where we spent a lot of time together taking pictures, having picnics and feeding the ducks. Ho'omaluhia was so cherished to my parents that they even considered it being the location for their wedding. This is a big reason why Ho'omaluhia is my *wahi pana*

(special place). Unfortunately, my family and I have not stopped there much after my brother and I started elementary school.

I asked my mother, Darcie-Ann Chung, to tell me about her earliest memories at Ho'omaluhia. "I remember taking you and Bubba to the fish pond to feed the ducks when you guys were 2 or 3," she told me. She describes Ho'omaluhia as a place of serenity. Recently, we took a drive through the garden and she never noticed any major change in scenery. My mother spotted numerous native plants from the moment we got there, such as yellow hibiscus (*Rosemallows*) and a variety of fern species such as the *hāpu'u* (*Matteuccia struthiopteris*), *kupukupu* (*Nephrolepis cordifolia*), and *'ama'u* (*Sadleria cyatheoides*) ferns. All these plants are native to Hawai'i, with all of them being endemic except for the *kupukupu* fern which is also native to other parts of the world (Native Plants Hawai'i, 2009). While driving through Ho'omaluhia, you are constantly surrounded by different species of trees, bushes, and flowers. Everywhere you turn is a plant that may come from Hawai'i or other regions such as Polynesia, Melanesia, Malaysia, Africa, Sri Lanka, and India (O'Connell, 2014). Walking inside allows you to go down different tracks that give you access to courtyards, lakes, and campsites. "It still looks the same, not much has changed. Actually, some trees look overgrown!" she said to me. We think that over time, fewer people have paid attention to the trees and bushes. As more and more people visited the attraction, the demand for security workers has spiked. This means that more money could have gone into security and not into looking after the plants. Another change my mother noticed in the garden was the number of visitors who were walking and driving around. "It was never like this before. There are so many people!", she was telling me. However, the trees, flowers, and bushes still remained untouched (for the most part).

If the people who run Ho'omaluhia managed to conserve so many plants over the years, my mother and I have almost zero doubt that the garden will continue to thrive in the future. The air in the roadways is very damp and humid, which I believe is one of the reasons why the trees are still reaching high. The garden is on private property, being open from 9 AM- 4 PM daily with security. This means that the plants and animals should remain unharmed which will allow them to continue to prosper. The climate in Kāne'ohē (and most of the windward side of O'ahu) has always been on the rainier side, providing plants with moisture to help their growth and abundance. The annual rainfall in Kāne'ohē is 68 inches, with frequent cloudy weather.

The only problem my mother can recall happening at Ho'omaluhia is when feral pigs (*Sus scrofa*) were attracted to the lush plant life and made their way into the garden. The aggressiveness of the pigs caused the formation of mud bogs because they would tear into the ground looking for worms. This threatened plant and animal life because pigs because they had the risk of getting dug out and/or smashed. The problem was solved back in 2014 when local hunting groups offered to kill off the pigs free of charge, but they got to keep them for consumption or other purposes. Since then, the garden has grown back into a beautiful place and the plants and animals there have been thriving. However, in the last century, the average precipitation has decreased which reduces freshwater availability and cooler weather. This can affect land-based ecosystems.

Plants' resources are based on things like temperature, climate, the nutrients in their soil, and CO<sub>2</sub> in the atmosphere (Tilman and Lehman, 2001). Kāne'ohē experiences humidity from January to May and extreme mugginess throughout the rest of the year. With global warming becoming a problem, increasing temperatures can cause photosynthesis and cellular respiration

processes to become imbalanced over time. Some native plants are not as adapted to the changing climate as much as some invasive species, so this could cause native plants to lose ground. Furthermore, invasive plants that are making their way into the islands are competing with native species for equal amounts of oxygen, nitrate, and other nutrients. In addition to all this, the people who live on the windward side and even all around the island should know how their actions affect the growth and wellness of terrestrial plants. With modern transportation becoming more and more popular, the amount of soot particles, hydrocarbons, sulfur oxides, nitrogen oxides, carbon monoxide, and carbon dioxide have shot up. One dangerous hydrocarbon produced by car exhausts is benzene, which can not only kill plants, but it can also cause cancer in animals. Car exhausts also produce soot particles into the air, which makes it very difficult for plants to undergo photosynthesis. With continued use of commercial vehicles, elements that make their way into the atmosphere can contribute to environmental issues like global warming and acid rain.

If people become more aware of the harm they could be doing to our environment, we could lessen the pollution in the air. Using biodiesel fuel can make the amount of hydrocarbons, carbon monoxide and soot particles in the air significantly reduced (Rambo, 2020). Public transportation via bus reduces the number of cars driving around. With fewer cars on the road, fewer chemicals are being put into the air. Electric and hydrogen-powered vehicles are currently being developed, and the cost to power an electric vehicle is about half of what it takes to fuel a gas-powered car. At Ho'omaluhia, if more people chose to walk instead of driving, that could make a world of difference in the wellness of the plants.

While the garden is very gorgeous, there can still be actions taken to maintain its beauty.

Ho'omaluhia is a place where families from all around the world can create long-lasting memories and experience deep bonding moments. With Ho'omaluhia being located in my hometown (Kāne'ōhe), the garden is not only special to me, but it is also special to my parents. Ho'omaluhia holds a special place in our hearts and we believe it will continue to astonish its visitors in future generations, but only if the right actions are taken to improve our environment.

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