

FROM PASTURE TO SANCTUARY IN 10 YEARS: AN INTRO- DUCTION TO FARM CENTER'S WORK, TRANSFORMING THE WORLD ONE WATERSHED AT A TIME!

By Sophia Bowart and Neil Logan



Multi-strata agroforest at FARM Center. Photo: N. Logan, 2018.

The story of Hawaii's current ecological predicament is similar to other colonized tropical islands. In short, the indigenous populations were subdued and relieved of their natural resources. This process has left deforested lands across the globe. The vast majority of Hawaiian forests has been logged and will never return to their former glory, state of abundance, and rare diversity. What can be regained, however are functional ecosystems and watersheds, but this will take focus, knowledge, and lots of hard work!

On the island hundreds of thousands of acres have been transformed from lush tropical evergreen



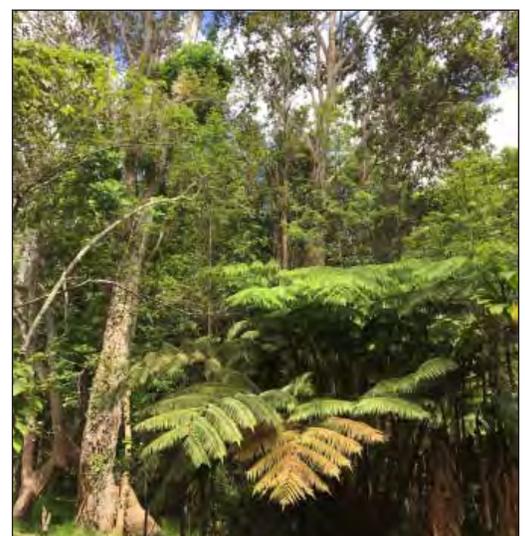
Denuded pastures of Kohala and Mauna Loa. Photo: F. Pasini, 2016.

forests of *Acacia*, *Erythrina*, *Santalum*, *Diospyros*, and others into grasslands of low diversity and dwindling productivity. On the Kohala mountain road in North Kohala, Hawaii, there are majestic views peering across the massive valleys made by Mauna Loa and Mauna Kea. A description of the ecology of the region before 1840 reads more like a well-manicured garden of great diversity and beauty than the eroded and desiccated landscape of 2019 (Tummons, 2002). Today, the garden has been replaced with acres of grass that stay brown at least half the year. Soils are eroding, and grasslands are failing due to overgrazing and lack of nutrients. Is there a plan for restoring degraded lands like these that have become so common all over the planet?

One plan, as presented and demonstrated by Forest Agriculture Research Management Center (FARM Center), is to take degraded pastureland and return it to forest, while building soil, producing value, and leaving behind rare endemic forest species.

In 2008, Sophia Bowart and her family purchased a 20-acre parcel on the Kohala Mountain and began planting trees to help restore the watershed. Forest Agriculture Research Management Center (FARM Center) was created six years later, with her husband Neil Logan, out of the need to systematize and develop functional agroforestry systems to share with the local community and expedite the process of adopting afforestation.

Costs are extremely high in Hawaii. For the past 100 years, cattle ranching has been very successful because it allows huge agricultural acreage to be managed with only a few laborers. The neighbors to the south of FARM Center are able to run 300 head of cattle on 300 acres with only 3 ranch hands! Unfortunately, tropical pastures don't stay nutritionally rich for long because the nutrients are constantly being leached from the soils via rain. Today it is obvious that the pastures are worn out and need to rest, but the ranching operations can't afford to rest the pastures long enough to bring them back to health. FARM Center has been working to research and demonstrate methods and systems for



Mauna Loa endemic forest. Photo: N. Logan, 2017.



Multi-strata agroforestry system with manioc emerging through taro 4 months after planting. Photo: N. Logan, 2017.

regenerating the soils and hydrologic cycles that are economically viable to allow for a transition in land use.

In 2010, Sophia Bowart and Neil Logan began to implement agroforestry systems inspired by Ernst Gotsch. At the start, there were only ~11 species identified on the property. It was essentially an open pasture with a *Casuarina* windbreak on the south and east boundaries. Initially the goal was to figure out how to get a foothold in the tight Kukuuyu grass mat. Every seed and cutting that might be useful in the harsh pioneering environment was collected and planted. Plantings were dense and diverse to help overcome the extreme winds of the site and to combat the aggressive runner grass with sheer numbers. In time, the guilds began to radiate outward, shading out the grass. These efforts created just enough change in the conditions that new organisms became better suited. New, more desirable species were planted and/or moved in and replaced the Kukuuyu grass without weeding, spraying herbicide, or really much management at all.

Today, (the end of 2018), the project has moved through the pioneering and accumulation phases of succession and is now at the very beginning of the abundance step. There is now what most people would consider a “forest” with at least 5-7 layers of stratification and emergent species reaching 40-60 feet in height. There are many productive fruit trees, NTFPs, and annual vegetable crops. The site stays lush and green all year even during times of drought. This has been accomplished without



Endemic guild of Koa, Hapu, Loulu, Iliahi and Nai’o. Photo: N. Logan, 2018.

the use of pesticides, herbicides, and chemical fertilizers and with only rainwater to irrigate! In addition to the food and other products, there are endemic, long-lived species interspersed throughout the farm. These will be long-term (climax) species that will outlast us and replace the farmed species in time.

There are half a dozen rare endemic species at the site that will outlive all other tree crops such as *Santalum paniculatum*, *Acacia koa’ia*, *Erythrina sandwicensis*, *Diospyros sandwicensis*, and *Tetraplasandra hawaiiensis*. This project is a demonstration of how it is possible to take a degraded pastureland and return it to forest, while building soil, producing value, and leaving behind our rare endemic forest species. This essentially reverses the current trend in agriculture where forests are cleared to make way for crops, then turned into pasture,



Kohala leeward pasture. Photo: N. Logan, 2012.

later to be abandoned as wasteland. Currently, FARM Center is developing tools and educational materials to help others achieve what we are doing. As a project sponsored by United Plant Savers, FARM Center is honored to continue to give sanctuary to rare medicinal, edible, and culturally significant plants in the North Pacific.

Please visit our website (www.farmcenter.org) for more info and to find out how you can participate in helping restore watersheds everywhere. ■

REFERENCE:

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QUOTING:

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Neil Logan is an applied ethnobotanist trained in permaculture and Syntropic Farming. He has developed a bio-regional database of ethno-ecology, Hawaii's first Living Fuel Break prototype, site-specific project plans, and has consulted on large acreage in arid Hawaii. In addition, Neil has been working with the United Plant Savers and the Hawaiian Reforestation Program to accurately assess the threats to Hawaiian Sandalwood and how to restore its habitat. Neil founded the consulting firm Integrated Living Systems Design in 2006 and now co-directs FARM Center.

Sophia Bowart has a background in non-profit development and sustainable business management. She initiated and managed the development of Mohala Lehua Farm (a forest farm devoted to regenerative Hawaiian ecosystems) in 2006 and completed her MBA in Sustainable Business Management in 2009. In addition to being a co-presenter and co-author with Neil Logan, she has also worked to promote the Buy Local/Eat Local Campaign and the Hawaii Alliance for a Local Living Economy (HALE). Her passions for the economics of sustainable agriculture have inspired her to co-found FARM Center.



Agroforest regrowth after pruning with Sandalwood and Nai'o in foreground and background. Photo: N. Logan, 2017.



Recently pruned agroforest with an abundance of wood and organic matter to feed future crops. Photo: N. Logan, 2018.



Cassava, Banana, Loulu Alahe'e, Koa'ia guild. Photo: N. Logan, 2018.