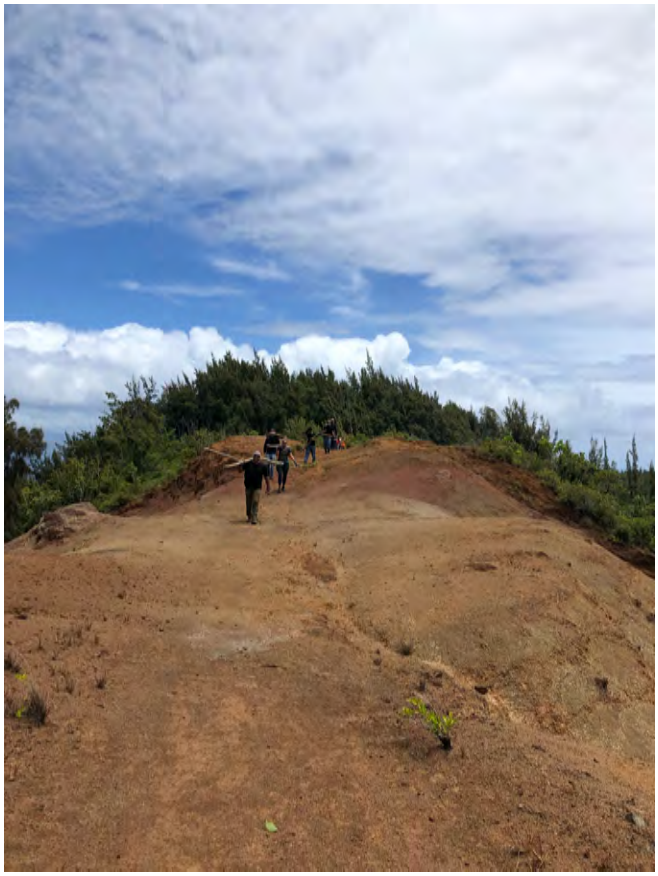
Department of Health Clean Water Branch

Maui Land & Pineapple Co. Inc

Puʻu Kukui Watershed Partnership
An Ahupuaʻa Approach to Watershed Best Practices in West Maui, HI

Quarter 1 January 1, 2020 – March 31, 2020

Quarter 2 April 1, 2020-June 30, 2020



Honolua Scar work crew put soil erosion barriers in place to mitigate further erosion into the streams below.

Overview:

Maui Land & Pineapple Company (ML&P) is an established advocate of watershed management. The largest privately-owned nature preserve in the State of Hawai‘i; created in 1988 by Maui Land & Pineapple Company, transferred 8,600+ acres into a conservation easement, thus creating Pu‘u Kukui Watershed Preserve. The easement is held by The Nature Conservancy (TNC) and managed by the conservation department within Maui Land & Pineapple. In July of 2017, Maui Land & Pineapple signed its fourth contract with the State of Hawai‘i Natural Area Partnership Program (NAPP) to continue management of the Pu‘u Kukui Watershed Preserve. Implementation projects under this contract are outlined in the Pu‘u Kukui Watershed Preserve Long Range Management Plan. This plan details management of the upper watersheds of four streams listed as impaired in the 2016 State of Hawaii Water Quality Monitoring and Assessment Report: Honokowai, Kahana, Honokahua, and Honolua Watersheds. List of impairments are different for each watershed, but all have critical water quality issues of turbidity, Total Suspended Solids, and nutrients.

Pursuant to existing efforts by Pu‘u Kukui Watershed Preserve and identified in the 2016 West Maui Watershed Plans the crucial progressive needs include addressing storm water at multiple levels within the ahupua’a. The goal of this project is to prevent, stabilize, and treat sediment inputs and storm water from entering the stream, being mobilized by heavy rains, and entering the nearshore environment effecting human health, native biota, and precious coral reef ecosystems.

Outcome: Ma uka (mountains side) and ma kai (ocean side) connectivity through Ahupua’a scale management and implementation of Best Management Practices will treat storm water at multiple levels within the ahupua'a, known as a treatment train, will allow these individual projects to act synergistically to improve water quality.

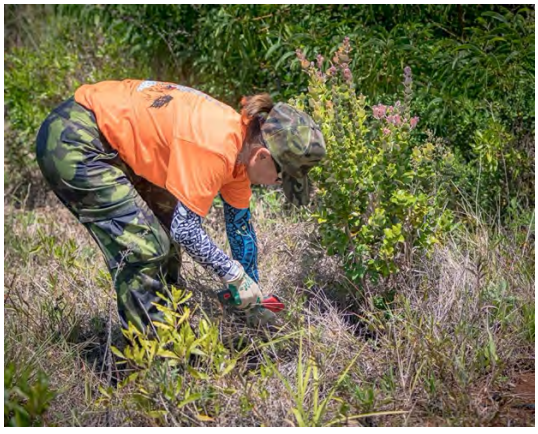


Fig 2: During COVID time, PKW crew made extra efforts to ensure that plants are cared for at Wao Kele o Honolua.

Project Effectiveness Monitoring Plan and Activities

Summary:

In the first quarter of 2020, PKW started off with a bang! With the onboarding of new staff, the team was activated to proactively carry out the deliverables of this grant. Partnerships with school groups, Maui's hotel lodging association employee pool and private businesses and community groups synergistically created a perfect opportunity to utilize all skill levels of volunteers with PKW crew to implement the goals of this Department of Health grant. Plans were initiated with training to commence the pushpile stabilization, establish the native nursery and seed bank and landscape restoration, stream and gulch restoration, loʻi restoration, conservation fence maintenance and feral ungulate management. Unfortunately, regardless of the planning and implementation that had been put into place, all areas were brought to a screeching hault with the introduction of the global COVID-19 pandemic. The PKW crew was briefly furloughed placing this project and all of its plans in jeopardy of not being able to fulfill the deliverables. The return of the crew set in motion a shift in protocols according to the State and County government requirements on Covid-19 and the lock down of all non-essential personnel. New policies and standard operating procedures were put in place at the end of quarter one and into quarter two. Once vehicles could be attained, field work became a viable option to keep social distancing while ensuring that the team also complied with the buddy system. There was a re-energizing of infrastructure projects which included trail and road maintenance. The objective was to give another option for trained volunteers to come to a safe environment and also support PKW efforts. The Department of Health has clear understanding of the affects COVID-19 pandemic has had on all communities. Strict protocols that came with this pandemic adversely affected volunteer support, helicopter operations, and close proximity organizing. PKW continues to move foward with optimism and stride with the onboarding of newly trained staff, standard operating procedures and the ability to "capture the water" to serve the people of Maui County.

Water Quality Monitoring of Marine Waters & Inland Waters:

For quarter one and two of this fiscal year, there was no water quality monitoring done due to Covid-19. The YSI unit has been ordered and will be used for this purpose. This approved grant identified USGS Consultant John Stock to come to Maui to "identify location for new erosion pin sampling sites to monitor management practices, create protocols for push pile and fill terrace BMP's, and develop protocols for evaluating tensile strength of native Hawaiian plant species for effective stabilization of historic terraces and legacy sediments found in and along stream banks." This consultant along with guest speakers, line itemed in the grant, were not able to travel due to the Covid pandemic. The 14 day quarantine required by the State of Hawaiʻi would be too costly for the project and experts. PKW is now working on potential back up plans with partner agencies to fulfill this deliverable.

Best Management Practices (BMPs)

1. Push Pile Stabilization
2. Establishment of Native Plant Nursery and Seed Bank
3. Landscape Restoration
4. Stream and Gulch Bank Restoration
5. Loʻi Restoration
6. Conservation Fence Maintenance
7. Feral Ungulate Management
8. Invasive Plant Management

Push Pile Stabilization:

In these first two quarters, there was no push pile stabilization accomplished. Covid-19 re-directed the crews efforts to other areas of the grant. This task will be worked and anticipated to be completed in the coming quarters.

Establishment of Native Plant Nursery and Seed Bank:

The PKW crew began its native nursery initiative by setting the infrastructure in the first and second quarters. Construction of the tables for the nursery began and are underway.
In these quarters, seeds are not yet being collected. ʻAʻaliʻi and Koa are currently blooming during this report and seeds will be gathered in quarter three.

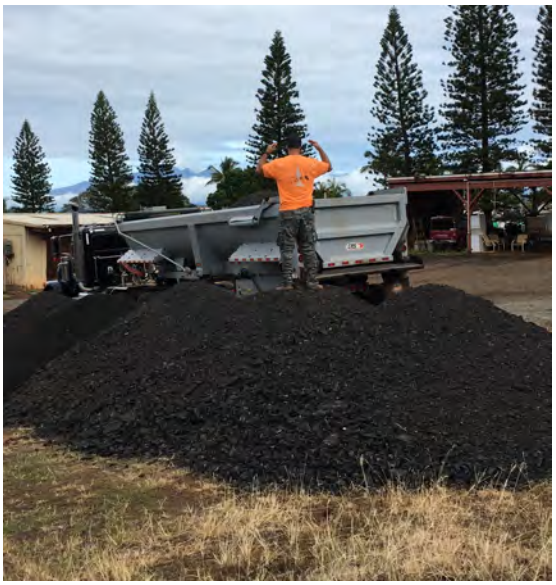


Fig 3: Native Plant Nursery infrastructure upgrades began in Quarter 2

Landscape Restoration:
Wao Kele o Honolua (Field 52) as well as areas along the streambed were landscaped in quarter 1 and 2. Approximately 32 meters of Field 52 were completed by crew and pre-screened contractors during COVID to ensure the safety and health of all team members and community.

A total of 2,419 plants were planted in the first and second quarter. These included Koa, ʻŌhia Lehua, Māmaki, ʻAʻaliʻi, Lāʻī, and ʻUkiʻuki.

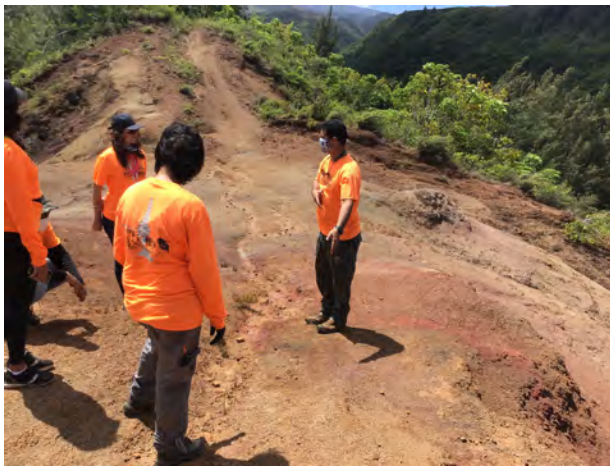
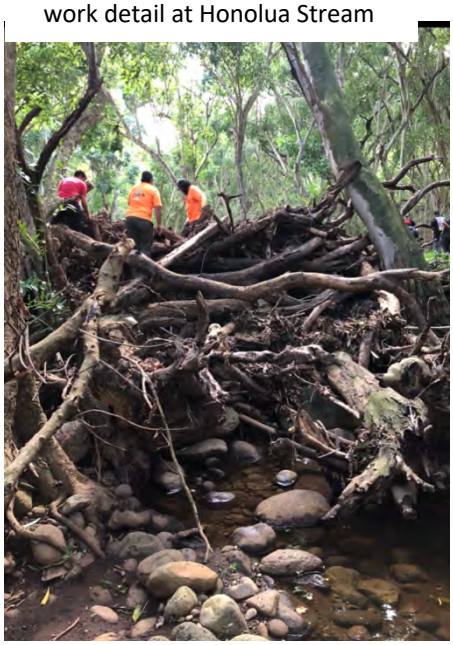


Fig 4: PKW team receives training regarding the Honolua erosion scar

Fig 5: PKW team assessing the work detail at Honolua Stream



Stream/Gulch Bank Restoration:
During the first quarter of this fiscal year, PKW received significant assistant from the Andaz Hoʻolana program who brought their team of 15 to assist with the Honolua stream blockage from a previous storm. Laulima was achieved! Many hands make light work as was evidenced in the clearing of 75% of this barrier in a few hours at Honolua stream. Without this assistance, it may have taken PKW crew many more days of hard labor to remove this major obstacle.

Graduate students from the University of California Berkeley (Fig 6) in partnership with PKW, West Maui Ridge to Reef, CORAL (Coral Reef Alliance), US Army Corps of Engineers, and US Geological Survey (USGS) conducted a two part 44-page study to assist the partners with possible mitigation strategies for Honolua Bay and Papua Stream. In Phase I, the students addressed the history and environmental impacts of sediment, quantified the capturing of sediment while studying the volume of water captured, intervention process, building and maintenance, and traditional management solutions with the expansion of micro-basin implementation for Honolua and Papua which concluded Phase 2 of the study. This process gave PKW a moment to share our passion of native conservation and land management with young graduate students who were excited to develop solutions while using their technological skills and talents to give a comprehensive picture of the opportunities available.
The report: https://storymaps.arcgis.com/stories/67f74f370af6414f9238e8d61158fd5c/print

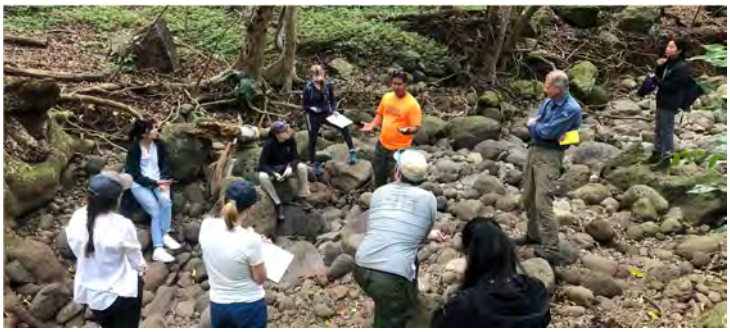


Fig 6: PKW Conservation Manager Pōmaikaʻi Kaniaupio-Crozier briefs UC Berkley graduate students at Honolua Stream

Loʻi Kalo Restoration:

The restoration of loʻi is important to the PKW crew and community especially in a time of COVID when remote areas like Honokohau are sometimes cut off from the general public. In the first quarter, inclimate weather made it challenging for any restoration work to be done. In January, Puʻu Kukuiʻs USGS rain gauge showed 34" of rain followed by 20" in February and 27.5" in March. School groups like Kula Kaiāpuni o Maui Hawaiian Immersion program at Lahainaluna High School has made a commitment to continuing this loʻi restoration project with PKW as soon as it is safe for the students to return. PKW will continue to support their learning with traditional methods of building the loʻi and how to grow and harvest kalo as soon as we are able to safely do so.
It is still the intent of PKW to identify other multi-tiered loʻi sites within the valley and to prepare a plan for action to support this initiative. GIS will be taken to mark the area in order to be able to execute the opening of these future sites and share it with our education partners.

Conservation Fence Maintenance:

During Quarter 1 and 2, PKW crew was able to check and construct 2080 meters of the boundary fence (BF) in Maunalei Arboretum. Upon fence inspection, it was determined to be in good condition. Uncertainty of the COVID pandemic caused a shut down of PKW team from all helicopter access. Traveling into the fenced areas could mean the crew walking for many hours in unstable terrain in order to accomplish this task. During Covid-19, the Conservation Manager exercised his safe judgement call to keep the team free from injury especially when there was a high volume of water coming down the mountain and streams. There is a consistent assessment of the current conditions despite COVID and constant monitoring of what resources and equipment are needed and avaible to the team to ensure a safe and efficient working environment.

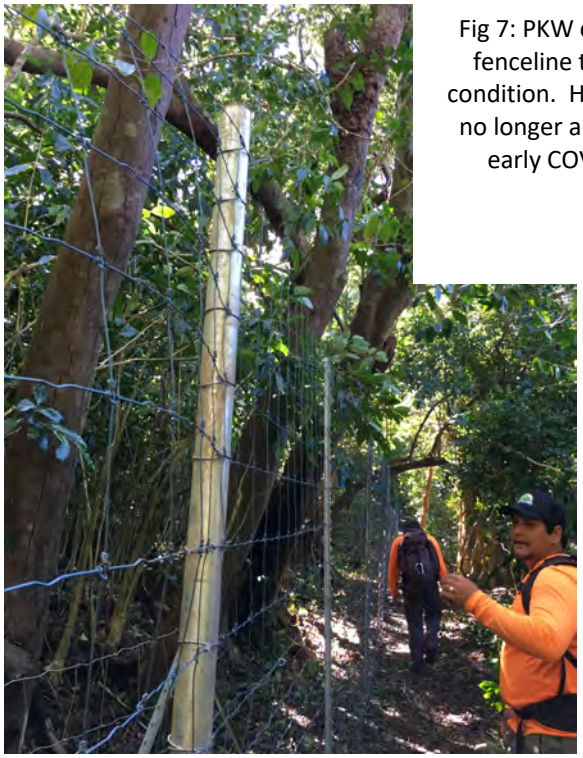


Fig 7: PKW crews walk the fenceline to check their condition. Helicopters were no longer an option in the early COVID months.

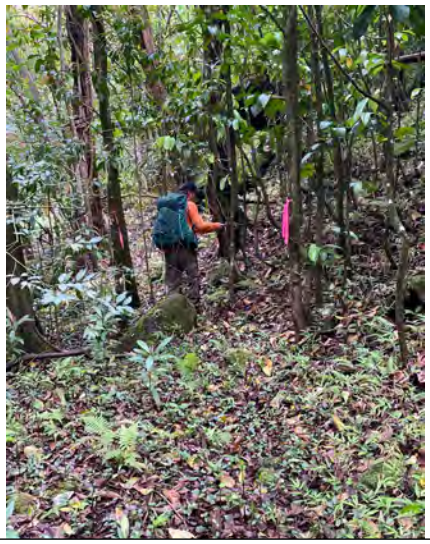


Fig 8: PKW Crew check each snare group, activate those that are inactive and replace those that are needed. This process could take hours as logging of data is also important to any future checks and or equipment needed in the area.

Feral Ungulate Management:

In quarter one and two a total of 270 snare traps were checked and five (5) ungulates were removed. Three (3) pigs in Anakaluahine and two (2) in Kahana Valley.

Invasive Plant Management:

Invasive plant management can be a greater focus with the potential of volunteers to social distance themselves. This Covid season, PKW began a special program to address trained volunteer's desire to assist the team. PKW developed a pilot PKW Ohana program that selected trained adults and their family, who live in the same home, to come intermittently to help the crew with simple projects. They would drive their own car to the location and volunteer for a few hours to remove invasive plants. The success of the pilot will roll into the coming quarters to serve the community and PKW's deliverables. This is a healthy alternative for those who are seeking to be productive and safe.

A total of 3.5 acres of weeds were removed. The species removed included Tibouchina Herbacia, Clidemia Hirta, and Megathyrsus Maximus from T4 and Wao Kele o Honolua.

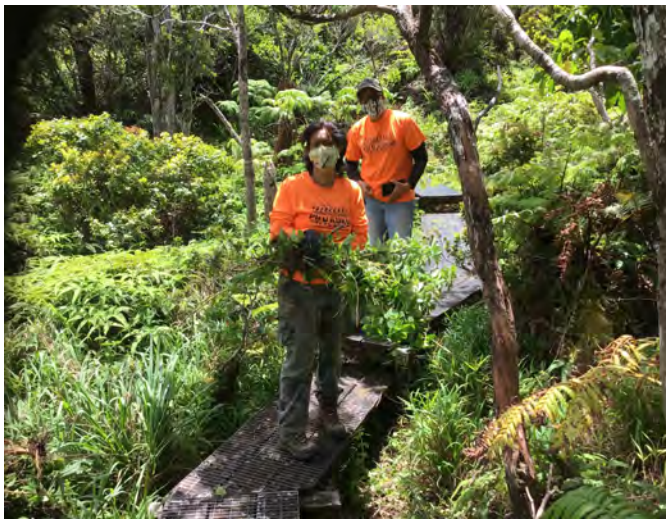


Fig 9: Despite COVID, these invasive weeds continue to grow. Efforts to remove them carry on.

Education and Outreach:

From January thru early March, PKW engaged 1,152 individuals who volunteered their time to plant, collect seeds, remove stream blockages (highlighted previously) and worked in PKW's outreach booth at various events including the PGA Tournament of Champions, 'Olukai's public meet and greet the watershed team event, and Andaz and Ritz Carlton's tree planting events. Knowledge is powerful when we are able to present the mountain and her signficance to the community and visitors alike. The result of these education and outreach events is a greater awareness of the importance of why the mountain must be cared for and how each person can assist with the conservation of water and the native plants and trees that deliver the production of water.

PKW is reassessing the Covid protocols as they arise and will be able to further implement future opportunities in the coming quarters.

Fig 10: Volunteers decontaminate their shoes and bags prior to going into the field so not to carry spores that could contribute to Rapid Ohia Death (ROD).

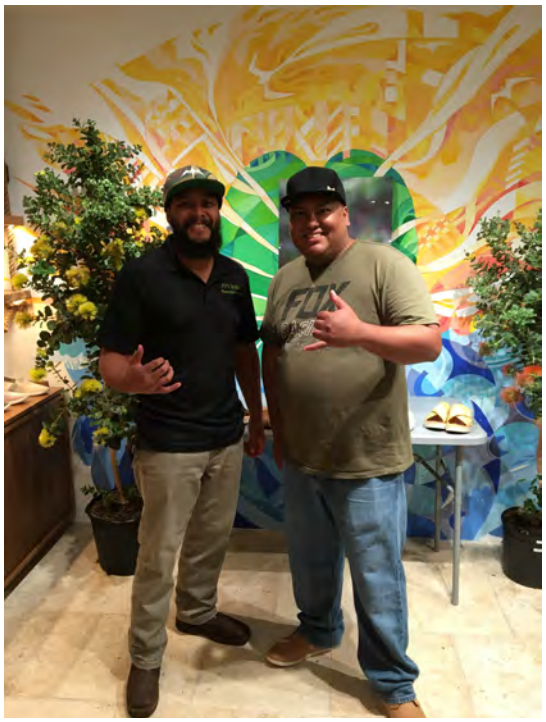


Fig 11: Outreach Event Olu Kai hosted a public event to introduce their Mo'olelo line and the talk story about the watershed.

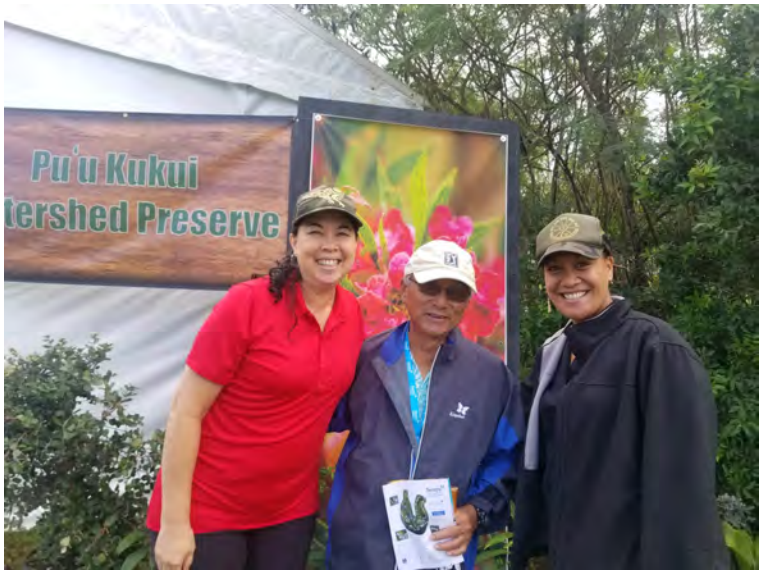


Fig 12: Outreach Event PGA Tournament of Champions featured PKWP at its annual event in Kapalua. Kupuna who lived in the area during the plantation era drop by to tell us stories of the mountain in the past. Pre-Covid-19.

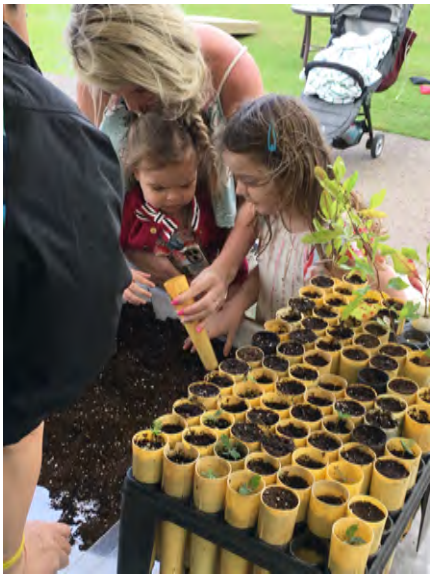


Fig 13: Outreach Event
Ritz Carlton Kapalua invited PKW to provide a display and planting opportunity for their guests. Education of the visitors and their children cast a wider net of education not only for Hawai'i but for their homes as well. Pre-Covid-19

"Hāhai nō ka ua i ka ulu lā'au"

The rain follows the forest
'Ōlelo No'eau