

EXECUTIVE DIRECTOR'S MESSAGE

Aloha Friends and Supporters,

In the intricate tapestry of our natural world, forests stand as towering sentinels, guardians of biodiversity, and reservoirs of life. Yet, in the face of an ever-changing climate, these majestic woodlands find themselves vulnerable, facing threats that challenge their very existence. In Hawaii's mauka forests—including the Kuli'ou'ou Ridge watershed—rising temperatures and decreasing rainfall patterns are altering the fabric of its natural habitats. The restoration of our state's watersheds is no longer a choice, but a fundamental necessity.

In the face of these challenges, Aloha Tree Alliance (ATA) remains resolute in its mission. ATA is not just planting trees; it is nurturing a sustainable future for generations to come. Our work is not merely about restoration; it is about **building resilience**—successfully coping with and managing impacts in the face of adversity.

For ATA, building climate resilience starts with deepening its commitment to conservation, adapting, and adjusting forest management practices. In 2023, ATA increased its climate adaptation efforts aimed at protecting against threats that already exist, and preparing for more change to come. In addition to having planted over 1,000 more native trees and shrubs, removed hundreds of invasive species, remediated 25 shortcuts to curb erosion, the ATA team employed biological control methods to protect the Kuli'ou'ou watershed and reduce the spread of invasive plant species (see story on page 4).

The ATA team carefully assessed sites and planted the right tree in the right place, using the right techniques for climate resilience in Kuli'ou'ou's magical mixed mesic forest (see story on page 6).

ATA's Foster-a-Plant program also enabled individuals to foster native plants at their home until ready to take root in the forest (see story on page 5). This mutually beneficial arrangement helps ensure access to the types of plants most needed on the Kuli'ou'ou Ridge Trail and enables volunteers to take a positive and personal step toward improving the environment.

Through collaborative efforts with local communities, government agencies and environmental organizations, ATA has utilized traditional Hawaiian land management and conservation practices to advance more resilient natural ecosystems—recent events have shown that altering the native ecosystem can have devastating effects—and engage in educational initiatives to raise awareness about the importance of preserving Hawai'i's natural heritage (see page 8).

We hope you will enjoy reading in the pages that follow the stories about ecosystem restoration, sustainable forest management practices, reforestation initiatives, community engagement efforts, and the extraordinary people who make it all possible. It is a narrative of adaptation, innovation, and unwavering dedication to preserving the lifeblood of our planet.

Mahalo generous donors, fellow volunteers, and friends for joining us in this crucial mission—where every tree planted, every ecosystem restored, and every community empowered contributes to the resilience of our forests. By investing in the resilience of our forests, we invest in the future of our planet, ensuring a legacy of biodiversity, clean air, and sustainable resources for generations to come.



ALOHA, LAURIE CHANG



Photos courtesy of ©William Weaver
Photography and ©Howard Wolff Photography
(www.howardwolffphotography.com)



INVASIVE STRAWBERRY GUAVA TREES "CATCH THE BUG"

Scientists use biological control to help native forests thrive

Imagine this: it's been two hours since you started hiking. You come across a ripe and pristine guava fruit and your parched mouth is relieved by the succulent, sweet juices. You welcome the refreshing snack until your friend tells you that Strawberry Guava trees are highly invasive, and have contributed to the detriment of native forest habitat. Suddenly, the guava tastes a little less sweet.

Strawberry Guava, also known as Waiawī or Psidium cattleianum, was introduced to Hawai'i in 1825 from Brazil as a popular fruit. It is a beloved tree with many uses, including making jams and jellies with its fruit and bowls with its wood.



What started as an innocent snack turned into a big problem for conservationists. Difficult to control, Strawberry Guava forms dense, monotypic stands of forest. It inhibits other plants from growing under its canopy, depletes aquifers, and diverts rainfall into runoff. When native forests are replaced with Strawberry Guava, it is estimated that the amount of groundwater recharge lost is 25% (Board of Water Supply). Scientists, state agencies and conservation groups consider it one of the most destructive invasive species to Hawaii's native forests.

Over the years, forest managers attempted to control Strawberry Guava through manual removal and herbicide. But the efforts were not enough to keep up with hundreds of acres of the quickly spreading trees. It was time to fight nature using nature.

Biological control, or biocontrol, is the process in which scientists control or weaken the population of an invasive species by introducing host-specific pests. Biocontrol is tested in a controlled laboratory and studied vigorously for many years to ensure that the pests do not jump species in nature. In severe cases, biocontrol is the only cost-effective, long term solution to effectively mitigate invasive species (Hawai'i Invasive Species Council).



Can biocontrol contain Strawberry Guava? Scientists sought answers in Brazil (native home of the Strawberry Guava) and discovered Tectococcus ovatus, a scale insect that inhibits the growth of guava fruits. After ten years of intensive study in Brazil and four years of laboratory testing in Hawai'i, scientists cleared T. ovatus for usage in Hawai'i in 2014. It has been released in dozens of watersheds across Oʻahu to slow the spread of Strawberry Guava forests.

Kuli'ou'ou Valley recently joined the list of watersheds in which T. ovatus has been introduced. After securing a permit to release T. ovatus from the Department of Forestry and Wildlife (DOFAW), ATA has worked in collaboration with Tim Kroessig, Lyon Arboretum's horticulturist, to grow and deploy Strawberry Guava seedlings infested with T. ovatus. ATA closely monitors its growth and progression and submits monthly reports to DOFAW.



By utilizing a combination of biocontrol methods and manual removal, ATA hopes these restoration tactics will give native trees a chance to grow back, and ultimately, perpetuate healthy forests for the future.



FOSTER-A-PLANT PROGRAM GIVES SEEDLINGS A HOME

Kanoa Nakamura knows that planting seeds takes time and patience. Newly planted seedlings need care like all young, and just the right amount of sunshine and water.

Kanoa, an experienced nursery and landscape manager, started the Foster-a-Plant program in March of 2023. Community members can foster native trees and plants at home until they are established enough to take root in the forest.

So far, 60 of Kanoa's native plants, ranging from Milo and Alahe'e trees to A'ali'i shrubs and Ilie'e groundcover, have been adopted by 16 community members through the Foster-a-Plant program. All seedlings must pass government inspection to help ensure the health of the Kuli'ou'ou forest. "By planting and raising seedlings, we are able to ensure access to the types of plants that are most needed on the Kuli'ou'ou Ridge Trail," said Kanoa.

"It also helps us to diversify the types of plants we are able to grow and reduce the costs of having to purchase hundreds of trees and plants at local nurseries. We can then redirect funds to other program expenses."

It's not just the forest that benefits from the plants; people do, too. Bio-foster parents know that plants rely on them for the right growing conditions in order to survive. Volunteers report the positive feeling that comes with nurturing a seedling into a young plant ready for life in the forests of Kuli'ou'ou. "The immediate opportunity to form a connection between people and the plants they nurture inspires me," said Kanoa. "It keeps people rooted to nature while contributing to the well-being of our community."



KULI'OU'OU'S MAGICAL MIXED MESIC FOREST

By Laurie Chang and Wiliwili Weaver

Everyone knows Hawaii is renowned for its world-class beaches and volcanic landscapes. But not many know of the amazing secret it cradles within its verdant embrace. The 50th state boasts a staggering array of 48 distinct native Hawaiian forest and woodland types—including the nation's only tropical rainforests—totaling almost as many native forests as there are U.S. states.

Characteristic forests within each island unveil their own unique arboreal story. The Big Island's sub-alpine Mamane-Naio forest stands tall on the slopes of Mauna Kea; Lanai's dryland forest contains remnants of the endemic olopua and lama trees; Kauai enchants with its misty swamp forests, home to dwarf 'Ōhi'a and lapalapa; while O'ahu fascinates with its many diverse mesic, and lowland mesic forest areas in the Koʻolau and Waianae mountain ranges. Scientists, having found Hawaii's many forest types difficult to name with its long list of constituent trees and the intermixed forest types that prevent a single species from reigning supreme, have conjured the term "diverse mesic forests" (Sailor, 2003). Neither entirely wet nor dry, these mesic forests embody the delicate balance between nature's extremes—too moist for arid desolation and too dry to support sprawling rainforests.

Historically, Hawaiian mixed-mesic forests supported an impressive diversity of tree species, perhaps more than any other Hawaiian forest type (Rock, 1913). These unique and vital forest ecosystems are found in coastal, lowland, and montane areas that receive 1200 mm – 2500 mm rainfall annually (Wagner et al., 1998). In addition to being a storehouse of ecological diversity, they significantly supplement groundwater recharge, and buffer wet forested areas from degradation by land use change, ungulate damage, and fires (Sailer, 2003; Mair and Fares, 2009).

Sadly, much of the Hawaiian mixed-mesic forest has been severely impacted by disturbance and the subsequent introduction of many non-native species (Juvik and Juvik, 1998; Takahashi et al., 2010; Mair and Fares, 2009). By the late 1800s and early 1900s, mesic forest decline was very high due to intentional burning to locate fragrant sandalwood, commercial logging, conversion to agriculture and pastureland, heavy grazing by hoofed mammals and the increased frequency of wildfires (Tomich, 1986; Cuddihy and Stone 1990; Friday, 2003). Disturbance of these areas has allowed for invasions of non-native plants. Many of the plants and trees that were introduced accidentally or intentionally as ornamentals, or used in agriculture and forestry have naturalized and are serious threats to disturbed, as well as intact, native ecosystems (Staples and Cowie 2001; Friday, 2003; Woodcock, 2003).



Hawaiian forests evolved in isolation and many native species lost the competitive defenses and adaptations that subsequent invasive species possess. Invasive plants outcompete natives for resources as they rapidly grow, reach maturity at a relatively young age and excel at dispersal (Vitousek et al., 1987; Mack et al., 2001; Friday, 2003). In addition, they can affect ecosystem processes such as primary productivity, decomposition, hydrology, nutrient cycling and natural disturbance regimes (Vitousek et al., 1987; Vitousek, 1990; Mack et al., 2001).

"Hawaiian mixed-mesic forests are now made up of relatively few incredibly successful non-native plants and trees such as the myrtles and melastomes, with monotypic constituents like Strawberry Guava (Psidium cattleianum) and clidemia (Koster's curse, Clidemia hirta)," said ATA Restoration Specialist Will Weaver. "Forest ecological diversity and structure has declined significantly in Hawai'i over time, leading to loss of resilience and balance in the face of climate change."

Although just remnants of a once rich ecological tapestry of plant and animal species remain, protection and restoration of these mixed-mesic forests—like the one nestled within Kuli'ou'ou Valley—continue to be a priority for conservation organizations like Aloha Tree Alliance. This beautiful valley has been home to a variety of native tree and plant species, including 'Iliahi (Sandalwood; Santalum paniculatum), 'Ōhi'a (the state tree, Metrosideros polymorpha), Koa (Acacia koa), Alahe'e (Psydrax odorata), Lonomea (Oahu soapberry; Sapindus Oahuensis), 'Ulei (Osteomeles anthyllidifolia), and A'ali'i (Dodonaea viscosa), which have thrived in the region's specific environmental conditions. These plants, with their unique foliage and vibrant blooms, have not only added to the scenic beauty of the trail but have also played a significant role in the ecosystem's delicate balance.

"As ATA enters its third planting season, we will intensify our efforts to remove invasive species, reforest with native trees and shrubs, remediate trail shortcuts to prevent erosion, and



combat the effects of climate change with climate-resilient approaches to protect the ecosystem integrity of the Kuli'ou'ou Ridge Trail and watershed," said ATA Executive Director Laurie Chang.

Preserving Hawaii's precious watersheds and advancing resilient forest and coastal ecosystems are not, however, the only reasons for protecting Hawaii's mesic forests. Forests provide social and physical benefits and contribute to quality of life for countless local residents and visitors. The Kuli'ou'ou Ridge Trail remains one of Hawaii's most popular and accessible choices for recreational and aesthetic enjoyment.

"Aloha Tree Alliance is committed to protecting and restoring the native mesic forests that remain," said Chang, "not just for the many ecological services they provide, but also for the intrinsic human values associated with them."

ATA'S CLIMATE-RESILIENT REFORESTATION APPROACHES

Tree Species:

Planting the right tree and plant species at the right time and in the best possible location helps ensure ATA's plantings will best adapt to and withstand current and future climate conditions and help increase forest resiliency.

Climate Adaptive Planting:

Climate adaptive planting is as important as selecting the right trees. ATA utilizes techniques that optimize each planting for its environment and climate adaptation. These include mulching, group planting to maximize moisture retention, and taking into consideration water availability, wildfire risk, and soil stabilization.

Site Assessment and Planning:

ATA determines restoration sites that are best positioned for successful planting in the dry mesic Kuli'ou'ou forest.

Adaptive Management:

ATA incorporates science, research and evaluation of reforestation actions when implementing its projects to make best management decisions and ensure its restoration goals are effectively met.

Reference: Daley, J., 2020. A Recipe for Climate Resilient Reforestation. http://www.americanforests.medium.com

Page 7

RESTORING KULI'OU'OU: HONORING HAWAIIAN CULTURE

AND ECOLOGY

By Claire Generous

Angela Correa-Pei and her sister Kalikolani Correa have deep roots in Kuli'ou'ou Valley spanning eight generations, with a profound connection to the land. As children, they would often head mauka to swim in the pools in the back of the valley and play in the river with their family. They gathered plants to make lei and learned about native foliage and lā'au lapa'au (traditional medicine) from their kūpuna.



"To be up there, be free, and be part of this 'āina, playing in the rivers when the water was still running, and knowing where our kūpuna came from and lived—for me, it was really experiential," reminisced Angela.

Kalikolani echoes this sentiment, emphasizing the importance of being a respectful visitor, noting, "Even when it's considered a space we're so connected to, asking permission to enter, asking akua [divine] to watch out for you, I think that's one of the ways our kūpuna has passed down knowledge to us."

Like many parts of Hawai'i, Kuli'ou'ou Ridge Trail has been historically affected by agriculture, modernization, and development, resulting in damaged soil and invasive species dominating the forest. The Correa sisters have witnessed the changes in the valley over the years and observed how water has dwindled, impacting their family's ability to swim.

Despite these challenges, Angela and Kalikolani envision a future where Kuli'ou'ou is restored to health with native plants, accompanied by a revival of Hawaiian culture and language. Their efforts to restore the valley through their non-profit organization, Kupa'aina o Kuli'ou'ou, and their volunteer work at the ancient Hawaiian fishponds located at the coastal side of the valley exemplify the traditional Hawaiian land practice of mauka to makai stewardship

that ATA shares. The ahupua'a system, which connects ridge to reef, was crucial in passing down wai (water) from the wao akua (the realm of the gods) to the wao kanaka (realm of man) and through the ahupua'a to support resources like lo'i (water taro patch) and fishponds.

Keoki Limasa-Viena, an active steward of the ahupua'a system, has assisted ATA with restoration efforts at the Kuli'ou'ou Ridge Trail through Nā Ala Hele. He provides valuable insights into how certain plants can thrive in upland forests compared to lower elevation forests.

"When you look at a native forest, like 'Ōhi'a, their roots go down to the soil and take nutrients, but also give back to the aquifer, to the land itself—that's where we get springs and we can grow lo'i," said Keoki. He also emphasizes the importance of understanding the cultural intentions and uses of these plants, such as for lā'au lapa'au. "This is why ATA places such strong importance on connection to the 'āina, the types of native plants they grow and being mindful of traditional Hawaiian practices that support a healthy ahupua'a," he said.



The Correa sisters, Keoki and ATA envision a healthy future for the Kuli'ou'ou watershed. Angela said with native forest restoration there will also be "the resurgence of our Hawaiian culture and language." ATA is excited to partner with the Department of Forestry and Wildlife to plant native hardwood trees that will supply wood for cultural practitioners to use for ceremonies, tools, musical instruments, lā'au lapa'au and more. Successful restoration efforts require collaboration with kanaka maoli, like the Correa sisters and Keoki, who can share their knowledge about the ecological and cultural significance of reforestation. Together, we mālama 'āina, honor kūpuna, and one another for the benefit of future generations.

GROWING HAWAI'I'S FOREST STEWARDS

By Cailyn Schmidt

Throughout the year, Aloha Tree Alliance brings youth out of the classroom and into the forest to learn the ancient Hawaiian value of mālama 'āina, or caring for the land.

Educating the next generation of forest stewards is a large part of ATA's mission. ATA core team members work hard to plan meaningful experiences for the students, including teaching them about native plant identification and important trail restoration skills necessary to protect Kuli'ou'ou Valley, from ridge to reef.



Since January 2023, Aloha Tree Alliance has impacted 300 students and youth from Hanahauoli School, SEEQS, Punahou School, Hawai'i Technology Academy, Radford High School, Trees-to-Sea camp, KUPU Hawai'i Youth Conservation Corps, 'lolani School, Boy Scouts, BioJam Teens, and Mo'o School. Their combined efforts contributed to the planting of 235 native trees and shrubs and propagating 100 native Wiliwili trees.

"It was really awesome to learn the Hawaiian names of native plants and trail restoration and conservation efforts in the State of Hawai'i," said Punahou senior, Katelyn Bolton. "I learned so much about biocontrol efforts and why native forest ecosystems are so vital to everyone's livelihood. They provide for us and it's only right to preserve the health of these forests to keep local communities healthy and to revive biodiversity."



When participating in conservation activities on the Kuli'ou'ou Ridge Trail, students learned about biocontrol, native trees, ecosystem services, and climate change. The opportunity to plant native species, clear restoration sites, remediate trail shortcuts to curb erosion, and learn about the interconnectedness of the ancient ahupua'a watershed system, from mauka to makai, left many inspired.

"ATA taught me about the research and methods behind environmental restoration techniques, and gave me the most insight into my future in environmental science," said KUPU team leader Cali Mavri. "I got to apply my knowledge in memorable and rewarding ways. Best of all, I feel hopeful and energized about my future."

Few things give the Aloha Tree Alliance team more pleasure than to provide youth with the tools they need to build a resilient future. It all starts with digging a hole, planting a tree, and returning to the 'āina.



FROM MAUKA TO MAKAI: A TAPESTRY OF PARTNERSHIPS

IN CONSERVATION

BY CLAIRE GENEROUS

In the heart of Kuli'ou'ou Valley, Aloha Tree Alliance (ATA) is hard at work, following the Hawaiian tradition of mauka-to-makai management and conservation. With a mission to restore this unique watershed, ATA understands that the task is too monumental to tackle alone. Instead, ATA has forged partnerships with an inspiring array of local and government organizations, nonprofit organizations and individuals from various sectors to make a lasting impact on the community and the environment.

The strength of ATA's conservation work lies in its volunteers, who gather for monthly community trail restoration workdays, Aloha Friday Watering events, and participate in the Adopt-a-Kīpuka program. These dedicated individuals are vital to aiding ATA in the protection of the Kuli'ou'ou watershed through reforestation efforts such as removing invasive species, remediating shortcuts caused by hikers that create erosion, and planting native trees and shrubs. Their collective efforts help ensure a more sustainable watershed for the native flora, fauna, and surrounding Kuli'ou'ou Valley community.



ATA has also cultivated connections with local nonprofit organizations, including Mālama Maunalua (MM). This past spring, ATA teamed with MM to host one day of restoration activities on the Kuli'ou'ou Ridge Trail as part of MM's annual Trees to Sea spring camp. Young interns learned about the ancient ahupua'a land management system which helped foster a deep connection to the 'āina. From 2023 to 2025, ATA will partner with MM (project lead) and eight local conservation groups in a collective \$8 million project that will use Hawaiian land management principles to help restore three natural watersheds in East Honolulu. ATA will receive \$50,000 for each of the three years.

Protect & Preserve Hawai'i shares with ATA a common "ridge-to-reef" restoration goal in the Waimānalo watershed and supports one another's projects. Liveable Hawai'i Kai Hui spearheads the Maunalua Bay and Kaiwi Coast Watershed Alliance, a convening of several regional non-profits partners, including ATA. ATA's partnerships with Kokonut Koalition, Maunalua Fishpond Heritage Center, and Koʻolau watershed Mountain Partnership provides further evidence that when nonprofits and community partners unite, meaningful change becomes possible.



ATA's partnerships with The Division of Forestry and Wildlife (DOFAW) and the Department of Land and Natural Resources (DLNR) continues to underscore the importance of government partnerships in supporting grassroots conservation efforts. ATA is grateful to DOFAW for its support in supplying native plants, issuing land permits, and delivering water to fill ATA's catchment tanks. The "Hike Pono Project," a collaborative and creative signage project between ATA and DOFAW, educates and inspires hikers to use proper hiking etiquette while on the Kuli'ou'ou Ridge Trail. These partnerships highlight the symbiotic relationship between governmental agencies and nonprofits dedicated to environmental conservation.

Private and public grants and donations also have played a vital role in ATA's journey. The Coconut Traveler, Xylem Watermark Community Grant, Nan, Inc., and private funders have all contributed to ATA's financial sustainability and the success of its projects. The Kaulunani Urban and Community Forestry program has awarded ATA with three grants to help fund the Kuli'ou'ou Ridge Trail restoration project and a native plant nursery. ATA, like many nonprofits, has operated with one part-time paid employee, and the generous donation of time by Executive Director Laurie Chang and the support of incredible volunteers who share ATA's mission.

A SURPRISE VISIT TO THE KULI'OU'OU RIDGE TRAIL

Chair of White House Council on Environmental Quality Brenda Mallory paid a welcomed visit to the Kuliʻouʻou Ridge Trail in May 2023 bringing attention to a landmark grant that will foster traditional watershed management in modern-day Honolulu. ATA is one of eight groups, led by Mālama Maunalua, that was awarded an \$8 million NOAA grant to implement traditional, ridge-to-reef ahupuaʻa management-native plant reforestation, invasive species control, ungulate removal, stream rehabilitation, and coral reef restoration—to address habitat degradation in three watersheds of Maunalua Bay, including Kuliʻouʻou, Niu and Wailupe Valley. ATA was awarded \$50,000 a year for three years through this grant.

This historic award will enable organizations, businesses, the public, and government to work together to address climate resilience, restore native habitat, and engage the community in a culturally sensitive manner. Work is slated to commence in fall 2023.



Read more about Chair Mallory's visit and this historic grant in the informative Civil Beat article, "This is Gold: An Unprecedented Push to Restore Urban Honolulu's Watersheds From Ridge to Reef."

MAHALO TO DONORS AND SUPPORTERS

Aloha Tree Alliance extends heartfelt gratitude to our generous donors and partners for helping us grow the roots of our mission to protect Hawai'i's watersheds, advance resilient ecosystems and promote environmental stewardship. Your unwavering support has enabled us to cultivate a greener, healthier future for our island state and planet.

With your contributions, we've planted thousands of seeds of positive change, nurturing not just trees but

communities and ecosystems. Your belief in our cause empowers us to continue our journey towards a more sustainable and resilient world. **Mahalo nui loa** for standing with us as guardians of the environment, and for being instrumental to the growth and success of Aloha Tree Alliance. We are continually grateful for your acts of kindness and generosity. Together, we will continue to sow the seeds of a brighter tomorrow.























Connect with us:



info@alohatreealliance.org

7192 Kalanianole Hwy, Ste. A-143A PMB 270 96825 Donate to Aloha Tree Alliance to help build resilient forests in Hawai'i today



