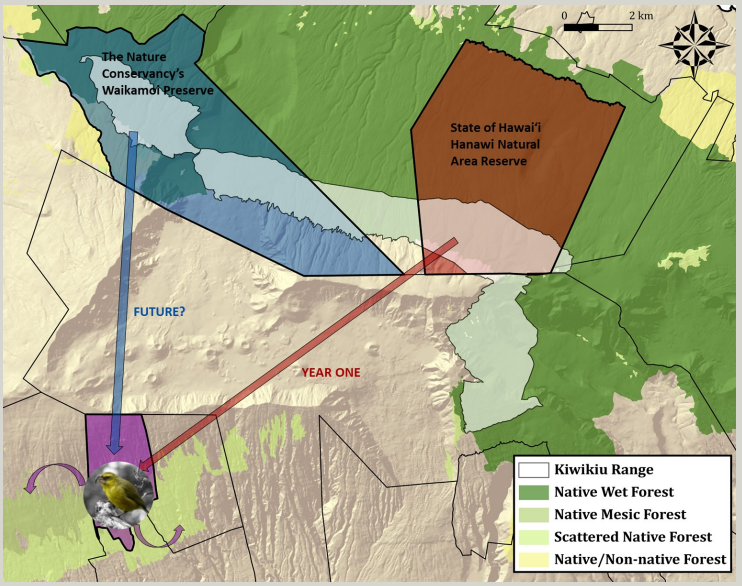
Semi Annual Report | Spring 2019

Kiwikiu news

Kiwikiu Reintroduction Plan

Kiwikiu (Maui Parrotbill; *Pseudonestor xanthophrys*) are among the rarest and most endangered birds in Hawai'i. Because of this, US Fish & Wildlife Service has recommended establishing a second population on the leeward slope of Haleakalā to increase total population size and protect the species from severe weather events or other catastrophic loss in their small current range. Nakula Natural Area Reserve (NAR) on the leeward slope of Haleakalā was selected as the site of the first releases of Kiwikiu to begin establishing a second population.



Kiwikiu were once found in this area, but the forests were degraded from a history of introduced ungulate impact. However, large, intact forest sections remain and the majority of this habitat is now either fenced or will be shortly. Following fencing and eradication of ungulates, the forest in this area has begun to recover through natural regeneration and conservation restoration efforts (see page 3).

In 2018, the Maui Forest Bird Working Group* completed the Kiwikiu Reintroduction Plan. The plan outlines the steps of establishing Kiwikiu on the leeward slope, including the procedures for the first year of releases in Nakula. Here is a short summary:

- **Cohort for release will consist of 12 wild and 8 captive individuals.** Captive birds consist of seven males and one female; therefore a release of more males than females is very likely. Wild individuals will be caught in Hanawi Natural Area Reserve.
- **Soft Release Technique**: All 20 birds will be held in paired aviaries at 10 sites within Nakula. Birds will be held for up to 3 weeks. Aviaries will be opened to release birds to site incrementally to help anchor birds to the area.
- **Food supplementation** will be provided in and around the aviaries as long as the birds need.
- **Post-release monitoring** will use radio transmitters and color-band resighting.

This is the first step of a multi-year effort. Following the first year, the results will be evaluated to determine if, and in what ways, additional releases should be conducted. The short term goal is to create a disjunct population of Kiwikiu that survives multiple years. The ultimate goal is to establish a self-sustaining population of Kiwikiu in Kahikinui.

*Maui Forest Bird Working Group is made up of these organizations: American Bird Conservancy, Haleakalā National Park, Leeward Haleakalā Watershed Restoration Partnership, Maui Forest Bird Recovery Project, National Park Service Inventory & Monitoring, Pacific Bird Conservation, Pacific Cooperative Studies Unit, San Diego Zoo Global, State of Hawai'i Department of Land & Natural Resources – Forestry & Wildlife, State of Hawai'i Department of Land & Natural Resources – Native Ecosystems Protection & Management, The Nature Conservancy of Hawai'i, US Fish & Wildlife Service, and US Geological Survey - Biological Resources Division.

Kiwikiu Facts:

- Specialized insectivorous Hawaiian honeycreeper.
- **Endangered:** <312 individuals in ~30km² of high-elevation native forest on windward slope of Haleakalā.
- **Threats:** habitat degradation/loss, non-native predators, introduced mosquitoes and disease, climate change
- **Next recovery goal:** Restore native forest on leeward Haleakalā and establish second population there.
- **Research shows**: Low annual productivity, High nest failure rate due to poor weather, High adult survivorship, Low juvenile survivorship, Large home ranges

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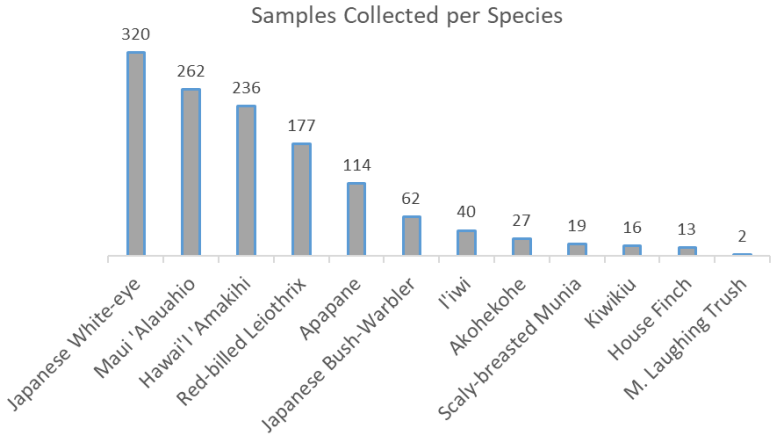
Avian Research & Management *Update*

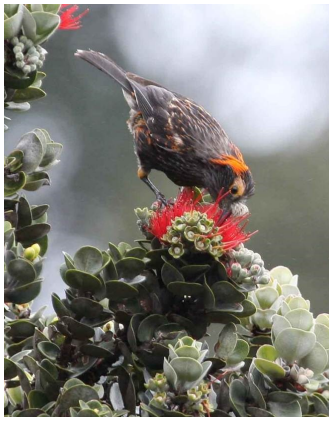
Our focus this year has been on preparing for the Kiwikiu reintroduction to Nakula Natural Area Reserve. We presented a poster on the Kiwikiu Reintroduction Plan at the IUCN Wildlife Reintroduction Conference in Chicago, which can be viewed here: Kiwikiu Recovery Wildlife Reintroduction Conference Poster. You can view more papers and presentations on our website.

In addition to planting and restoring habitat in Nakula, we built wooden platforms for aviaries to be installed on, to house Kiwikiu as they acclimate to their new home in Nakula. We also started predator control in the area to reduce the numbers of predators prior to the Kiwikiu release.

Diet Studies Using Fecal Samples

While mist netting and banding birds, we oftentimes will collect fecal samples. Whenever a bird is caught, it is carried in a cloth bag and sometimes while in the bag, the bird will defecate and we collect the sample. It is important to collect these fecal samples because it allows us to conduct diet analyses like the one by Peck et al. 2015. We can assess what food resources and plants the birds need to thrive. Also important is looking at diet overlap with non-native birds, a possible graduate research project. MFBRP has samples dating as far back as 1993. Though most of them were collected at multiple sites annually starting in 2009. Sites include The Nature Conservancy's Waikamoi Preserve, Hanawi Natural Area Reserve (NAR), Nakula NAR, Kula Forest Reserve, Waihe'e Ridge Trail, Garden of Eden, and Kipahulu Preserve. The graph portrays the number of individuals that MFBRP has collected samples from, not the total number of fecal samples collected.





Rapid 'Ōhia Death (ROD) on Kaua'i

At the end of 2018, *Ceratocystis lukuohia*, a fungal pathogen causing ROD was found during a survey on Kaua'i. This now means that both pathogens, *C. lukuohia* and *C. holiohia* are found on Kaua'i. Aerial surveys by helicopter and drones are conducted on the islands to survey the distribution and severity of the disease. Discussion of these surveys is located here and Kaua'i Invasive Species Committee. Both *C. lukuohia* and *C. holiohia* typically enter a wound of a tree, i.e. broken branch or scuffed exposed root. *C. lukuohia* can kill a tree within weeks while *C. holiohia* can take months. Both will be noticeable in trees through browning of limbs or the crown. Since there is no cure for ROD, prevention has become the first line of defense against further spread. While ROD has not been found on Maui yet, here some good steps to follow:

- **Avoid injuring 'ōhia.** This includes pruning.
- **Clean off your gear and equipment**, including shoes and clothes, before and after entering areas with 'ōhia. Clean by brushing off soil and seeds; then spray with 70% rubbing alcohol. Wash clothes with hot water & soap.
- **Wash your vehicle** with a high-pressure hose or washer, especially on and around the tires and the vehicle undercarriage.
- **Do not move 'ōhia wood** around. If it is infected, moving the wood could spread the pathogens.
- If you see a tree possibly infected (limb or crown leaves turning brown), take a picture and **contact 643-PEST or 643PEST.com.** Do not try to take a sample, as trained technicians must sample the wood and test it themselves.

Nakula Forest Restoration *Update*

Plot Monitoring and 5-year Update:

By the end of 2012, the State of Hawai‘i had eradicated ungulates from a sizable section of Nakula NAR. These animals had munched and trampled the forest for >150 years. One of the goals for Nakula was to restore the forest. At that time, we did not know what level of intervention would be required to expand and enhance the remaining Nakula forest. Would we be able to let nature repair itself? Would we have to plant nursery-raised seedlings? Would these seedlings even survive? To answer these and other questions, MFBRP conducted experimental restoration trials in Nakula between 2013-2015. Check out the recently published report <here>.

We also just monitored the same experimental plots at the five-year mark and are preparing a report on those findings. Through these trials we learned a few important things. Naturally germinating native seedlings were largely restricted to two species, ‘a‘ali‘i and koa. However, these two have transformed huge sections of Nakula from a grassland with scattered, ancient koa to a burgeoning forest. Unfortunately non-native grasses (like kikuyu) grow densely and limit germination of native plants. In the trials, we experimented with removing the grasses using herbicide and weed-whackers. We found that by completely removing the grass and exposing the topsoil, we can stimulate nearly 20× more ‘a‘ali‘i seedlings to come up on their own than without intervention. Given that only two species account for most of the natural regeneration, it became clear that planting nursery-grown seedlings was going to be needed in order to diversify the forest. Given the time, money, and effort it takes to plant in such a remote location, we were thrilled to see that two-year survivorship in experimental plots was over 80%. Our recent monitoring revealed a drop in survivorship in some species, likely owing to grass competition, but overall survivorship remains over 71% after five years! The benefits of applying herbicide to reduce grass prior to planting was even more evident after five years, particularly in growth rates. For example, koa planted in treated plots, where grass was removed, >60% of seedlings were taller than 4 m, while only 30% reached this height in plots without grass control. At this size, these “seedlings” no longer deserve that name, they are trees that tower over our heads!

It’s hard to express to people who haven’t seen the process over the past six years exactly what Nakula was like just after the ungulates were removed. There was a time when we would exclaim over the sighting of a lone seedling. Now, we have to push our way through dense patches of young koa and ‘a‘ali‘i. There is a long way to go to returning Nakula to its former glory. But, hey, it’s only been six years! In March, we surpassed 65,500 native seedlings!

‘Iliahi (*Santalem haleakalae*) or Hawaiian Sandalwood is an important tree species that we’ve planted in Nakula. ‘Iliahi was heavily harvest in the early 1800’s for trade, for its fragrant smell and wood. Due to this it is not as common as it once was. It is scattered across the alpine shrubland, in places like Haleakalā National Park, Kula Forest Reserve, and Nakula. ‘Iliahi are hemi-parasitic and need a host plant to help them grow. Through special roots, they take nutrients from the host, though there may be shared benefits. When planting, we make sure ‘Iliahi have a “buddy”, usually a seedling near by.

Mahalo!

Thank you to our volunteers & partners who helped in Nakula September 2018-March 2019:
Lawrence Warnock, Becky Geelhood, Duncan Yeaman, Alex Lake, Andy Fox, Nora Ives, Meghan Hernandez, Cody Roberts, Dan Rezac, Jessica Middleton, Kristin Markham, Dan Markham, Eric Hamren

Project Support & Partnerships

New Project Support & Grants

MFBRP was lucky to receive some major support in the last few months. Thank you to the following new supporters (receiving over $10,000 in funds towards Kiwikiu Recovery): Disney Conservation Fund, Doolin Foundation for Biodiversity. Fred Baldwin Memorial Foundation also gave us a $5,000 grant to help plant more seedlings in Nakula.

Additionally we would like to mention that Kiwikiu recovery efforts and plans have been funded by the State Department of Land & Natural Resources, US Fish & Wildlife Service, American Bird Conservancy, National Fish and Wildlife Foundation, Disney Conservation Fund, San Diego Zoo Global, Mohamed bin Zayed Species Conservation Fund, Patagonia, Tri-Isle RC&D Council, Inc., and Nā Koa Manu Conservation, Inc.

Events

Check out events page for full list.

Unique Maui Tours

Unique Maui Tours has been supporting Maui Forest Bird Recovery Project since Delphine Beribigier started the adventure tour company on Maui. Delphine is a Certified Interpretive Guide from the National Association of Interpretation. Delphine is passionate about sharing her knowledge and appreciation of Maui and the Hawaiian culture and environment on her tours. She sponsors a tree for every tour, by supporting MFBRP's planting efforts. They are members of the Hawaii Ecotourism Association, support other environmental organizations like Hawaiian Islands Land Trust, and use environmentally friendly products like stainless steel water bottles and utensils on the tours.

Aloha to KJ Passaro, Field Associate with MFBRP. He will be joining the State of Hawai'i Department of Land and Natural Resources-Division of Forest & Wildlife team. We wish him luck on his next move in conservation. Continue the good work!

E komo mai to our Kupu Conservation Leader, Kristi Fukunaga. **Mahalo** to all our volunteers, donors, and supporters. One volunteer received the **President's Volunteer Service Award: Lawrence Warnock.** This award is given to volunteers who give over 100 hours of their time over a 12-month period.