



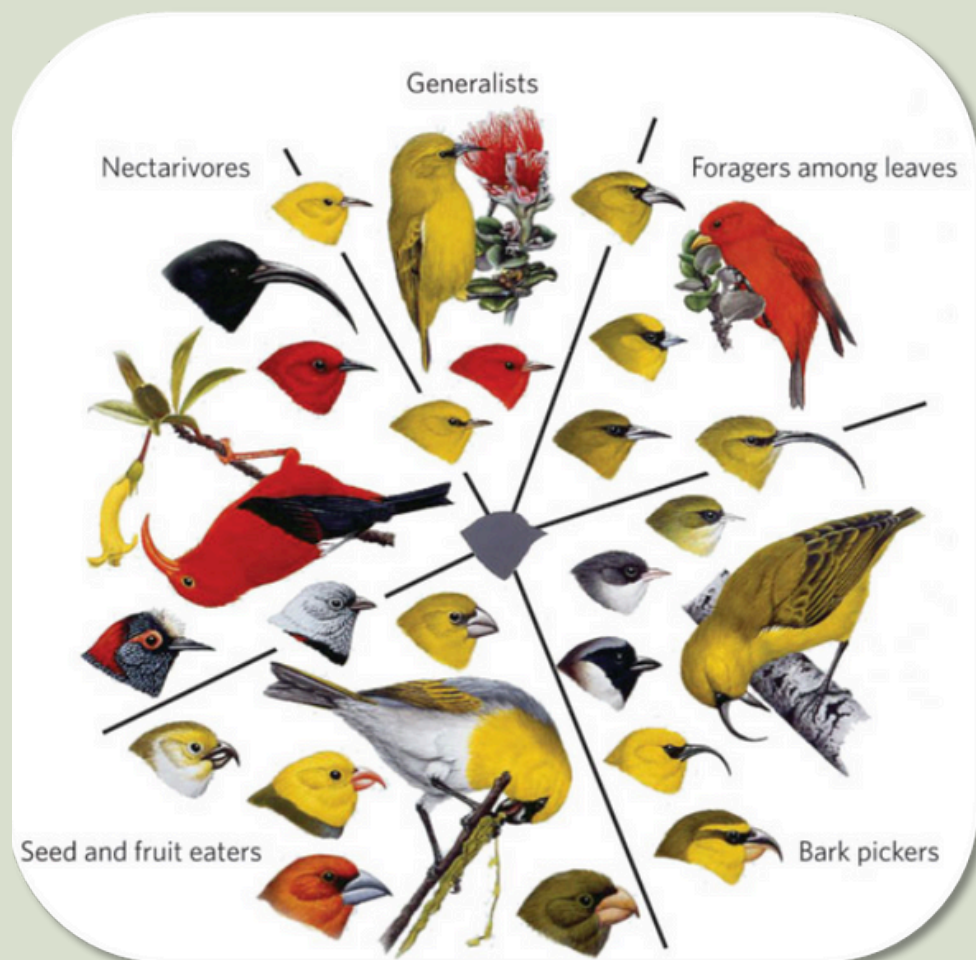
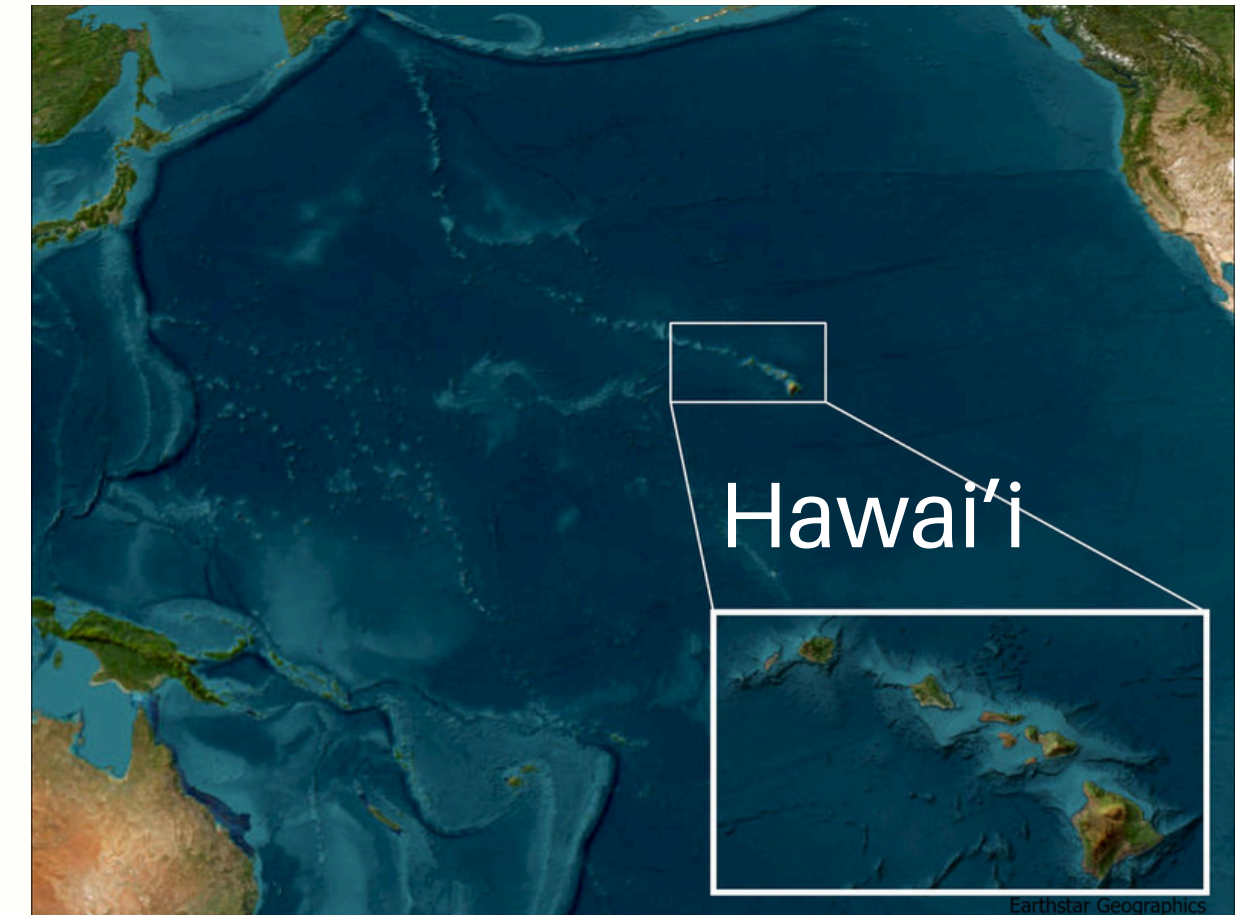
Innovative Strategies for Saving Hawaiian Birds: Controlling Invasive Disease and Exploring Conservation Introductions

Laura Berthold, Hanna Mounce,
Cali Crampton, Christa Seidl,
Hillary Foster, Sonia Vallocchia,
Allison Cabrera, Serena Zhao

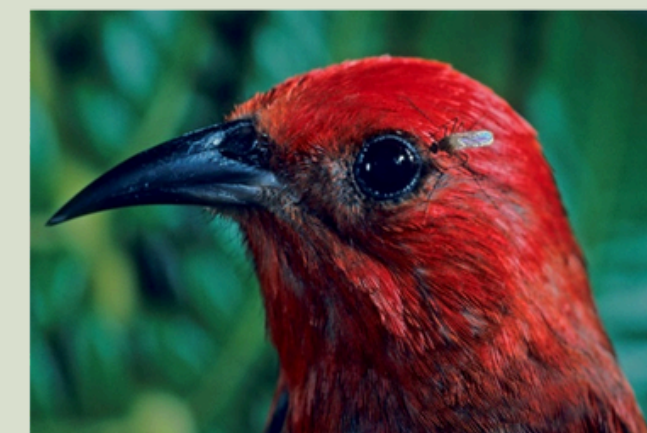


Hawaiian honeycreepers

- 50+ species evolved from one finch
- Only 17 remain; 11 endangered
- Threats: habitat loss, invasive predators, **mosquito-borne disease**
- Climate change shrinking their last safe habitats



Jack Jeffrey



Jack Jeffrey



Extinct birds

Testing of Two Methods

To combat avian malaria, we are testing out two mosquito control techniques



Bti Biolarvicides that produce toxins lethal to mosquito larvae



Incompatible Insect Technique (IIT) using *Wolbachia* to prevent viable reproduction



Aerial Application of Bti

*come to poster session on the 17th for more info!

Bti, a bacterial larvicide, is aurally sprayed to kill mosquito larvae

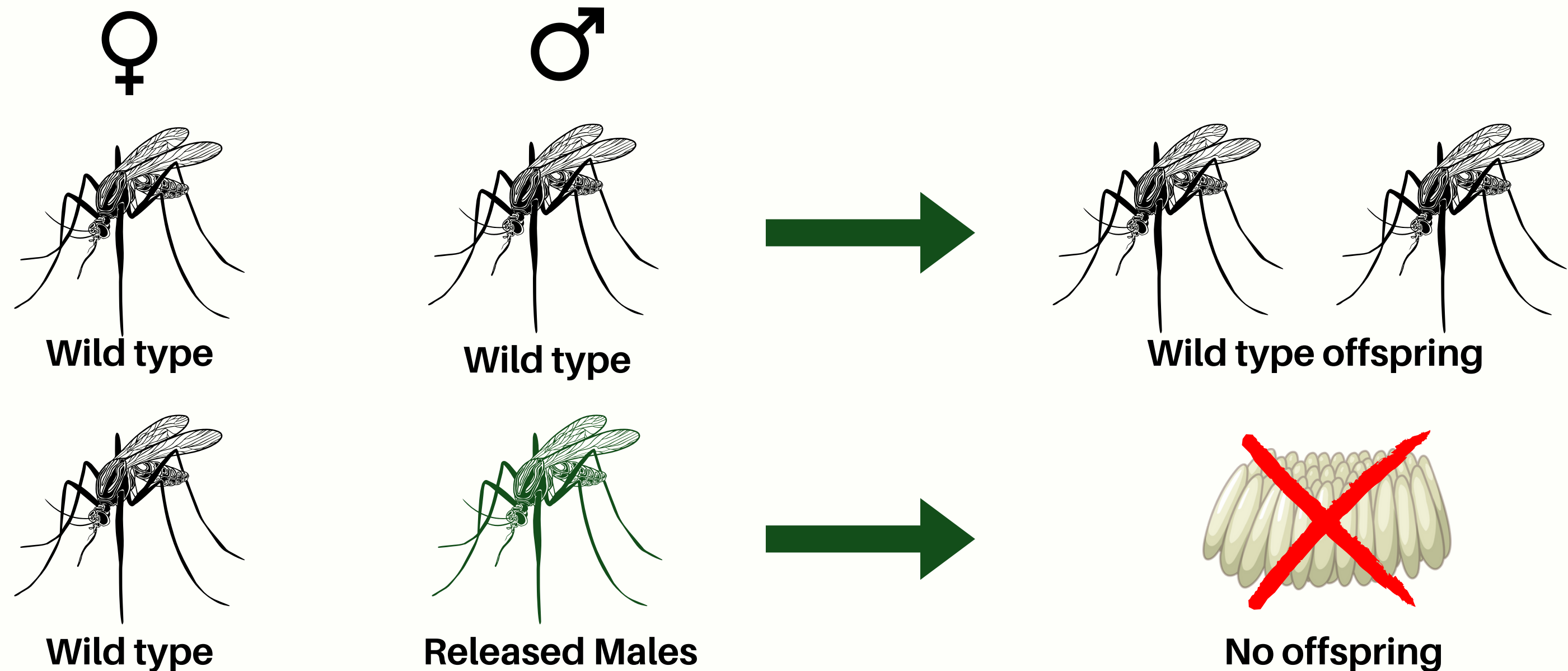
-2023 trial on >200 ha on 2 islands

-See Zhao et al. 2024



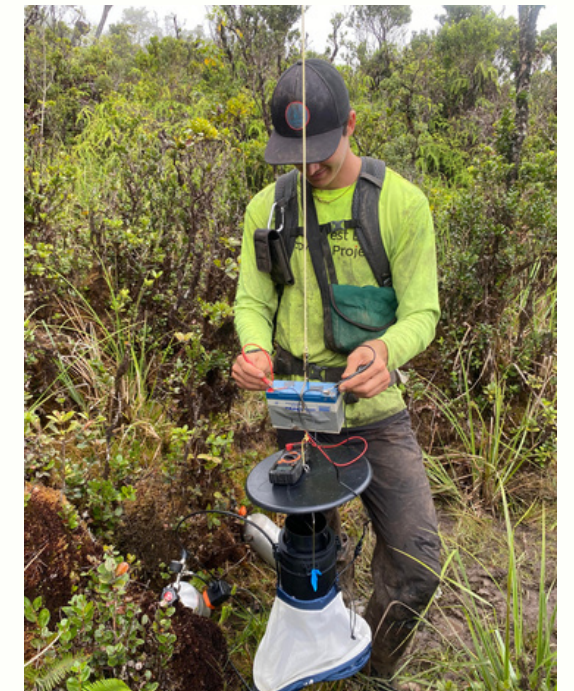
Incompatible Insect Technique (IIT) Wolbachia

- Trial helicopter releases of lab-raised males carrying a different strain of *Wolbachia* bacteria than wild females
- No viable offspring created when these males mate with wild females
- First application for conservation benefit rather than for human health

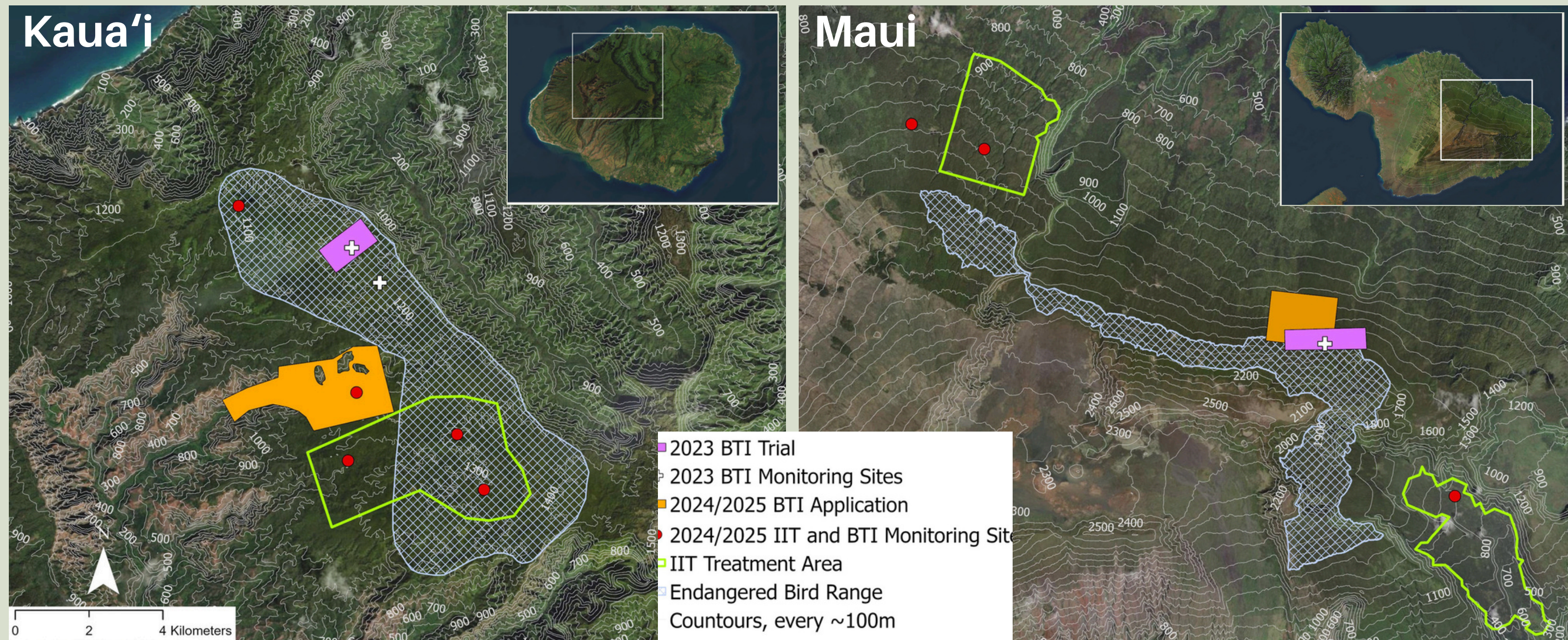


Monitoring of IIT Wolbachia males

- >25 million IIT mosquitoes have been released within trial areas
- Monitoring distribution of released males and overall prevalence of mosquitoes within trial sites
- Collecting egg rafts and larvae to estimate percentage of viable offspring hatched within trial sites
- *In progress:* Data collection/analysis. Results not yet available.



Treatment Areas



- Demonstrated aerial treatment of Bti and IIT in remote, mountainous terrain
- Monitoring results are promising but highly variable
- Requires sustained application across landscape
- Integration of both techniques may allow for more success but will need \$\$\$.



Captive Breeding and Conservation Introductions?

- The most vulnerable bird species (currently targeting 3 species) are being brought into captive care to prevent extinction in the wild.
- For species that do poorly in captivity-conservation introductions to higher elevation islands are being assessed through habitat and population modeling, risk analysis, cultural assessments, and protocols.

Collection of birds



Captive Populations



Potential Translocations



Collaboration & Acknowledgments



- Mosquito control
- Forest Restoration (fencing, planting, weed control)
- Invasive species control and prevention
- Cultural protocols and knowledge
- Captive breeding and conservation translocations
- Research, funding, and collaborating for new techniques



QUESTIONS

mauiforestbirds.org
kauiforestbirds.org
birdsnotmosquitoes.org

